Project of Capacity Development for the Implementation of Agricultural Insurance

AUTP Promotion and Feasibility Study on AYII: Completion Report

BAPPENAS
Kementerian Perencanaan Pembangunan Nasional/ Badan Perencanaan Pembangunan Nasional

KEMENTERIAN PERTANIAN
REPUBLIK INDONESIA

asuransi jasindo
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JICA
Japan International Cooperation Agency

SCI Sanyu Consultants Inc.

SOMPO RISK MANAGEMENT
A Theme Park for Security, Health & Wellbeing

Author:

Sanyu Consultants Inc. and Sompo Risk Management Inc.

Sanyu Consultants Inc.

Nihon Sogo-Jisho Otsuka Bldg. 1-13-17, Kita-Otsuka, Toshima-ku,
Tokyo, 170-0004, Japan
Email: M-OVS-EIGYO@sanyu-con.co.jp
Website: http://sanyu.tcp.jp/english/index.html

ISBN: XXXX

Redaction:

Ministry of National Development Planning/National Development Planning Agency(BAPPENAS)
Jalan Taman Suropati No.2, Jakarta 10310, Indonesia
E-mail:pertanian@bappenas.go.id (Directorate for Food and Agriculture)
Website: https://www.bappenas.go.id/

Ministry of Agriculture
Jl. Harsono RM. No. 3 Ragunan – Pasar Minggu – Jakarta Selatan 12550 DKI Jakarta
E-mail: ditjen.psp@pertanian.go.id (Directorate General of Agricultural Infrastructure and Facilities)
Website: https://pertanian.go.id

PT. Asuransi Jasa Indonesia (Jasindo)
Graha Jasindo
Jl. Menteng Raya No. 21, Jakarta Pusat, 10340
E-mail: contactcenter@asuransijasindo.co.id
Website: https://jasindo.co.id/

Japan International Cooperation Agency (JICA)
JICA Indonesia Office, Sentral Senayan II, 14th Floor, Jl. Asia Afrika No. 8, Jakarta 10270, Indonesia
Website: https://www.jica.go.jp/english/index.html

Publisher:
Ministry of National Development Planning/National Development Planning Agency (BAPPENAS) and Japan International Cooperation Agency (JICA)

Final Draft produced in April 2023

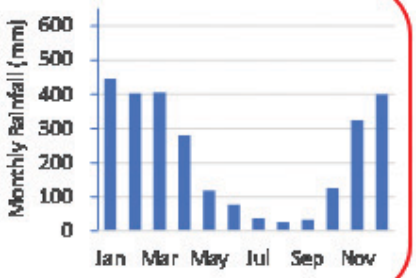
First Printed in May 2023

This report was prepared as part of the Project of Capacity Development for the Implementation of Agricultural Insurance in The Republic of Indonesia, which is jointly implemented by the Ministry of National Planning/National Development Planning Agency (BAPPENAS), the Ministry of Agriculture, the Ministry of Finance, the Agency for Meteorology Climatology and Geophysics (BMKG), PT Asuransi Jasa Indonesia (Jasindo) and the Japan International Cooperation Agency (JICA).

Location MAP: Project of Capacity Development for the Implementation of Agricultural Insurance

Output 2
West Java

Area: 37,069 km2
Population: 46,55 thou.
Pop. density(/km2): 1,255
Annual precip.: 2,679 mm
Paddy area: 912,794 ha
Irrigated paddy area: 80.7 %
Yield 5.89t/ha (2017)

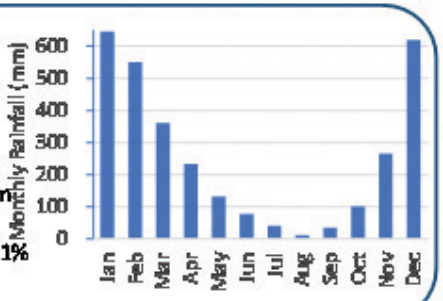


Output 1
East Java

Area: 48,030 km2
Population: 38,756 thou.
Pop. density(/km2): 807
Annual precip.: 1,649 mm
Paddy area: 1,091,752 ha
Irrigated paddy area: 78.0%
Yield: 5.72t/ha (2017)

Output 1
South Sulawesi

Area: 45,278 km2
Population: 8,493 thou.
Pop. density(/km2): 188
Annual precip.: 3,082 mm
Paddy area: 628,148 ha
Irrigated paddy area: 61.1%
Yield: 5.09t/ha (2017)



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Unit Conversion

1 lb (pound)	0.453592 kg
1 kilogram	2.205 pounds
1 gallon	4.5461 litre
1 litre	0.2200 gallon

1 inch (in.)	2.54 cm
1 feet (ft.)	30.5 cm
1 meter	3.279 feet
1 kilometer	0.621 mile
1 mile	1.601 kilometer
1 acre (ac)	0.40468 ha
1 hectare (ha)	2.471 ac

Currency Exchange Rate (As of July 2021)

1 US$	=	110.552 Japanese Yen (TTB)
1 IDR	=	0.00761 Yen
1 US$	=	14,475 IDR

Fiscal Year
1st January – 31st December

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FOREWORD

Climate changes are expected to have adverse impacts on agricultural production. For instance, the production of rice, a major staple in Indonesia, is vulnerable to changes in the onset and length of the wet season influenced by El Niño events which are projected to increase from climate change. Also, rice production is sensitive to temperature changes. Some study estimates that an increase of 1°C could reduce national production by 10%–25%.

The negative impacts of extreme climate conditions on agriculture production will likely increase food prices, and this has a serious implication to food security and poverty in Indonesia. The World Bank study shows that a 100% increase in food prices would increase the number of Indonesians in extreme poverty by more than 25%.

Agriculture insurance is one of the risk management instruments which the Government of Indonesia strategically employs to protect our farmers from climate risks. Law number 19 of the year 2013 on protection and empowerment of farmers stipulates that one of the strategies to protect farmers is through agriculture insurance (Article 7 Clause 2) and that the central and regional governments are obliged to protect farmers in the form of agriculture insurance (article 37 clause 1). Agriculture insurance is also referred as one of the priority projects in the presidential regulation number 18 of the year 2020 on the national medium-term development plan (RPJMN) 2020-2024.

Japan International Cooperation Agency (JICA) is one of our long-standing development partners who has been accompanying the process of developing agriculture insurance in Indonesia. Their support to agriculture insurance in Indonesia started in 2013 as a sub-component of the Project of Capacity Development for Climate Change Strategies and assisted in piloting an indemnity-based insurance product for paddy which is now being rolled out as the paddy farming insurance scheme (AUTP) by the Ministry of Agriculture.

This report is one of the deliverables produced under the subsequent project: Project of Capacity Development for the Implementation of Agriculture Insurance, implemented by the Government of Indonesia led by the Ministry of National Development Planning (BAPPENAS) under the collaboration with JICA. Under the Project, we produced training modules on agriculture insurance which are now integrated into the regular training programs of the Ministry of Agriculture targeting agriculture extension officers nationwide as well aspiloted a new product: Area Yield Index Insurance, supplementary to the existing AUTP to increase the protection options for paddy farmers.

While we are still on this long journey, committing ourselves to continue further efforts in the development and improvement of agriculture insurance schemes in Indonesia, it is hoped that the publication of the Project deliverables will also foster the understanding of success and challenges in Indonesian agriculture insurance among those who are interested in joining our journey and further cooperation and collaboration.

Deputy Minister for Maritime and Natural Resources

Ministry of National Development Planning (BAPPENAS)

Republic of Indonesia

Vivi Yulaswati

Acronyms and Abbreviations

AUTP	Asuransi Usaha Tani Padi
AYII	Area Yield Index Insurance
BAPPENAS	Badan Perencanaan Pembangunan Nasional (Ministry of National Development Planning)
BMKG	Badan Meteorologi, Klimatologi dan Geofisika (Agency for Meteorology Climatology and Geophysics)
BPS	Badan Pusat Statistik (BPS Statistics Indonesia)
C/P	Counterpart
CCE	Crop Cutting Experiment
eMAFF	Ministry of Agriculture, Forestry and Fisheries Common Application Service
ESA	European Space Agency
FVC	Food Value Chain
IRRI	International Rice Research Institute
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
LAI	Leaf Area Index
LAPAN	Lembaga Penerbangan dan Antariksa Nasional (National Institute of Aeronautics and Space)
MOA	Ministry of Agriculture
MOF	Ministry of Finance
NAIS	National Agriculture Insurance Scheme
NASA	National Aeronautics and Speace Administration
NDVI	Normalized Difference Vegetation Index
OJK	Otoritas Jasa Keuangan (Financial Services Authority)
PDM	Project Design Matrix
PMFBY	Pradhan Mantri Fasal Bima Yojana
POKTANI	Kelompok Tani (Farmers Group)
PQ	Prequalification
PSBB	Pembatasan Sosial Berskala Besar
QCBS	Quality -and Cost- based Selection
R/D	Record of Discussion
RPJMN	Rencana Pembangunan Jangka Menengah Nasional (National Medium Term Development Plan)
RS	Remote Sensing
SAR	Synthetic Aperture Rader
SIAP	Sistem Informasi Asuransi Pertanian (Agricultural Insurance Information System)
TOR	Terms of Reference
TOT	Training of Trainer
UAV	Unmanned Aerial Vehicel
W/S	Workshop
WMO	World Meteorological Organization

Terminology

No.	Term	Description
1	Actual Yield	Actual Yield (AY) is the average actual yield per hectare in a village calculated based on a CCE survey.
2	Benchmark Yield	Benchmark Yield (BY) is the threshold value used for the calculation of the claim amount. The benchmark yield is 85% of the historical average yield for the past 7 years.
3	Claim	A claim is a kind of payment request for an insurance company based on the insurance contract.
4	Compensation	Compensation is a payment of a sum of money to the insured as a replacement for damage and/or loss due to risk covered by the policy.
5	Crop Cutting Experiment (CCE)	Crop Cutting Experiment (CCE) is a kind of yield sampling survey method to estimate crop yield in a specific area. A surveyor harvests and measures crop yield from randomly selected plots. The result of the CCE can represent the crop yield of an entire specific area.
6	Insurance	Insurance is a mechanism for transferring risk from an insured to an insurer with the payment of insurance premiums so that the insurer is obliged to pay for the losses that occur and are guaranteed.
7	Insurance Policy	Insurance Policy is an insurance engagement document between an insured and an insurer, signed by the insurer, which includes, among other things, the rights and obligations of each party and is written evidence of the existence of an insurance agreement.
8	Loss Adjustment	Loss adjustment is the process of evaluating and settling insurance claims. An insurance company conducts loss adjustment to determine the claim amount for an insurance policyholder.
9	Premium	Premium is the amount of money determined by an insurer and paid by an insured as a condition of the validity of the insurance agreement and gives the insured the right to claim losses.
10	Sum Insured	The amount stated in this Policy Summary represents the maximum responsibility of an Insurer for claims arising under the Policy.

PART I OUTLINE OF THE PROJECT

CHAPTER 1 RATIONALE, PURPOSE, OUTPUTS AND ACTIVITIES

1.1 Rationale of the Project and the Consultant Services

The Government of Indonesia has been conducting a pilot basis agricultural insurance program as an important mean of securing food security of the nation. For example, from 2015 to 2019 corresponding to the last mid-term national development plan (RPJMN2015-19), an indemnity-based agricultural insurance (Asuransi Usaha Tani Padi; AUTP) had been tried every year targeting as much as 1 million ha of paddy land. Thereafter, the current RPJMN 2020-2024 also upholds agricultural insurance as one of priority programs, whereby the indemnity-based insurance is on-going.

While AUTP has achieved quick increase of insured farmers, necessary institutional capacity as well as the structural set-up have been left behind a bit. Facing these issues, the Government of Indonesia requested the Government of Japan to bring about the Project of Capacity Development for the implementation of Agricultural Insurance. Responding to the request, JICA is now implementing the Project with the schedule from October 2017 to end September 2022. As of April 2020, two JICA long-term experts, the Chief Advisor and the Coordinator, are assigned.

The Project has so far conducted surveys and policy recommendations for the purpose of improving the AUTP implementation. A mid-term evaluation was conducted in February 2020, during which a series of measures were raised in order to improve f the implementation capacity of the concerned officers/staff, e.g. strengthen the extension activities of AUTP, support the officers/staff in understanding agricultural insurance scheme management, etc. In addition, to supplement the AUTP, a new insurance scheme, an Area-Index based insurance scheme, was also suggested to try. Hence, we, the technical consultant team, were procured by JICA to support the implementation of the Project.

1.2 Purpose, Outputs and Activities of the Project and the Consultant Services

The Project of Capacity Development for the Implementation of Agriculture insurance started in October 2017 based on the Record of Discussion (R/D) agreed upon between the Government of Japan and the Government of Indonesia on April 5, 2017. The set-up of the Project agreed upon between JICA and the Government of Indonesia is summarized showing overall goal, purpose of the Project, outputs, activities, implementing agencies, etc. as in the following box (see the light brown colored box at the end of this sub-chapter).

This Consulting Services are provided within the framework of "The Project of Capacity Development for the Implementation of Agriculture insurance". The main objective of the consulting services is to achieve the expected outputs of the Project through focusing on the following four major activities:

1) Conduct TOT for extension workers/pests control specialists, DINAS officers, Jasindo staff and other relevant stakeholders in the pilot sites to promote AUTP (Activity 1-2),
2) Support dissemination of agriculture insurance operation system (i.e. SIAP) (Activity 1-3),
3) Conduct a feasibility study on Area-Yield Index(AYI) insurance at the pilot site (Activity 2-2),
4) Produce policy recommendations on the index-based agriculture insurances to supplement AUTP (Activity 2-3).

In addition, the COVID-19 pandemic may be giving negative impacts on the agricultural sector. This consulting service includes a study on COVID-19 impacts on agricultural sector in Indonesia. Thus, the consultant team tries to reveal the impacts of COVID-19 on agricultural value chain mainly for rice as well as the agriculture insurance operation. The result of the study is taken into consideration for the agriculture insurance operation in the future.

Agriculture insurance may have to be promoted by maintaining social distance in a post corona society. Adapting this new normal style, this consulting service will take into account remote sensing technologies for damage assessment process for the insurance, introduction of mobile applications for insurance promotion, on-line training for agricultural extension workers and social, thus mainstreaming the social distance for agriculture insurance businesses.

Overall Goal

To improve the management of agriculture insurance in Indonesia

Purpose

Capacity of the key ministries/institutions, the concerned local governments, and other relevant organizations to enhance the implementation of agriculture insurance is strengthened.

Outputs

1. Capacity to implement the current scheme of agriculture insurance for paddy (AUTP) strengthened.
2. Capacity to analyze, develop and improve agriculture insurance scheme strengthened.

Activities

0-1. Conduct the baseline survey.
0-2. Facilitate the consensus building among the implementing Agencies on agriculture insurance policies and operations.
0-3. Conduct the endline survey.

1-1. Carry out surveys and monitoring to improve AUTP.
1-2. Conduct TOT for extension workers/pests control specialists, DINAS officers, Jasindo staff and other relevant stakeholders in the pilot sites, to promote AUTP.
1-3. Support dissemination of agriculture insurance operation system (i.e. SIAP)

2-1. Conduct trainings on meteorological and climate data analysis suitable for the development of the agriculture insurance.
2-2. Conduct a feasibility study on AYI insurance at the pilot sites.
2-3. Produce policy recommendations on the index based agriculture insurances, to supplement AUTP.

Target Area Jakarta, East Java and South Sulawesi (Output 1), West Java (Output 2)

Implementing Agencies BAPPENAS, MOA, MOF, BMKG and PT Asurani Jasa Indonesia (Jasindo)

Period 1 October 2017 – 30 September 2022 (5-year)

1.3 Implementation Structure

The implementation structure of this consulting service is described in Figure 1.3.1. The consultant team communicates with the JICA expert team closely to discuss the plan of operation, progress of the activities and coordination for a series of workshops and training sessions.

There is the MOU between JICA and Swiss Re, a Swiss based re-insurance company. Based on the MOU, the consultant teammay possibly obtain technical advice from the Swiss Re. For example, the consultant team expects Swiss Re to share the information about resource persons for the training in India as well as technical review on an AYIIpilot product. The consultant team would utilize these resources to implement the activities smoothly.

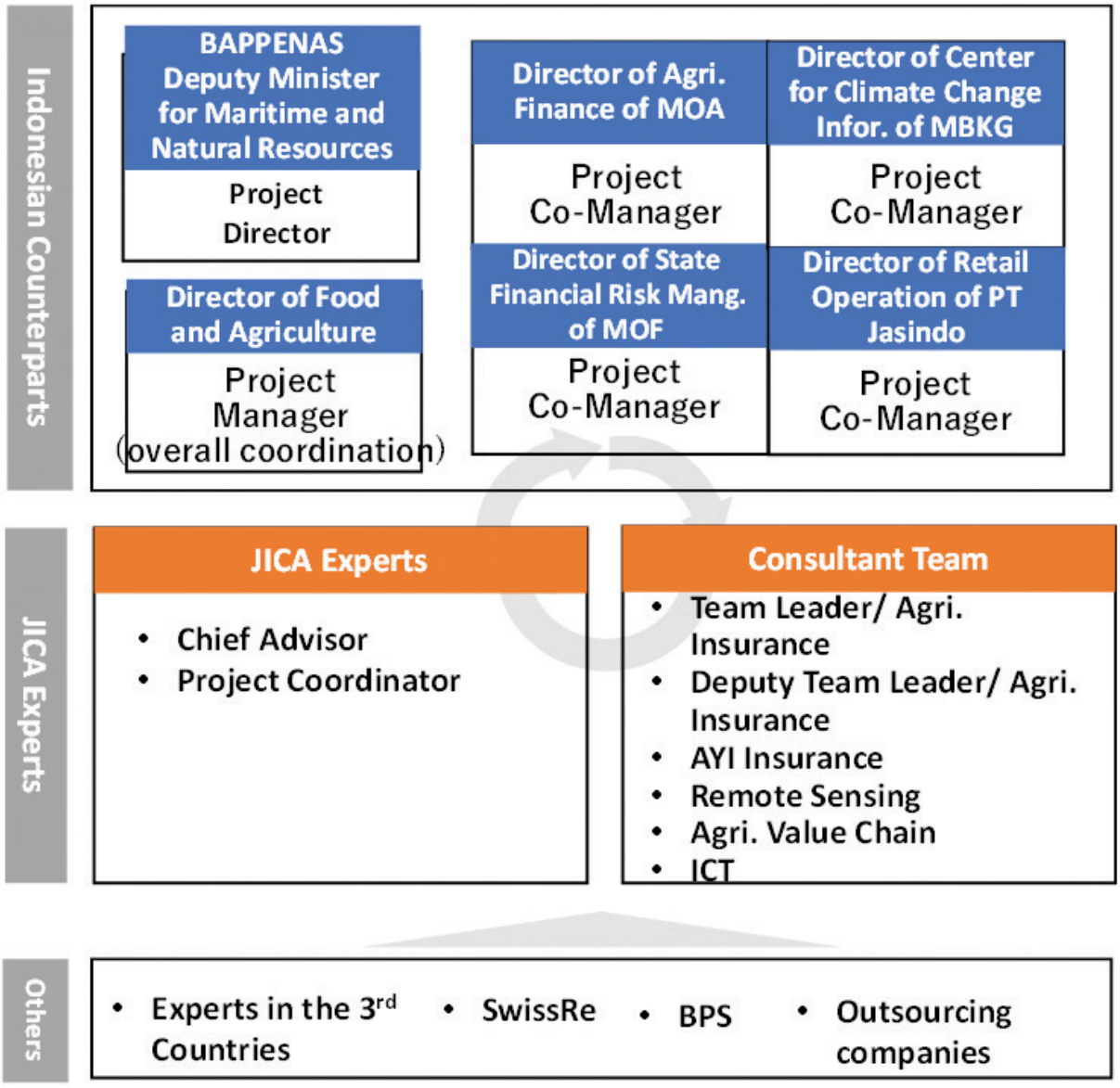


Figure 1.3.1Project Implementation Structure

CHAPTER 2 SUMMARY OF JOINT COORDINATION COMMITTEES

2.1 Joint Mid-Term Review (February 2020)

Ajoint mid-term review for the "Project of Capacity Development for the Implementation of Agriculture insurance in the Republic of Indonesia" was conducted in February 2020, that is prior to the commencement of the consultant services, to assess the progress of the activities so far made. The following are the summary of the results of the mid-term review:

2.1.1 Evaluation by Five Criteria

RELEVANCE: The relevance is high in views of policy context and intervention needs as well as mandate of the implementing agencies. Agriculture insurance is included in the RPJMN 2020-2024, the national development plan. Also, agriculture insurance is featured in the five-year plan for MOA for 2020-2024. In addition, the Project fits in the area of capacity building to address the challenges faced by Asian and international communities, with the theme adaptation to the global climate change.

EFFECTIVENESS: The effectiveness is relatively low. By the design of the Project, enhancement of AUTP management is unlikely to produce significant improvement on the level of farmers' appreciation for and participation in AUTP. The activities planned to be undertaken by the Project would not contribute to any significant extent to the attainment of the Project Purpose as defined by tis indicators.

EFFICIENCY: The efficiency of the Project mainly in terms of time utilization, is relatively low. Since agriculture insurance is relatively new area for Japanese assistance, input of human resources was not done in a timely manner, and that causes delays of the Project activities. Also, it is not easy to create a synergy capitalizing among the implementing agencies. Particularly, the MOA staff are too busy to get involved in a series of discussions and taking actions for recommendations suggested by the Project. For all these reasons, the efficiency is low when it comes to time utilizations.

IMPACT: The impact of the Project is at this moment moderate. One of the indicators for overall goal has already been achieved. The indicator is: "agriculture insurance continues to be recognized as an important government program under the following mid-term national development plan (RPJMN)". Agriculture insurance has included in RPJMN2020-2024.

SUSTAINABILITY: The sustainability is relatively low. Policy and financial sustainability have confirmed that there is the commitment of the government clearly shown in the policy documents such as RPJMN 2020-2014 and Agricultural Strategic Policy 2020-2023 of the MOA. The counterpart personnel for agriculture insurance may be transferred to other positions as a matter of routine every 2-4 years. Countermeasures should be considered such as establishment of in-service training.

2.1.2 Recommendations

The joint mid-term review mission made recommendations as follows:

- √ Clarify priorities of the Project activities, taking into consideration the constraints on human and financial resources,
- √ Revise the Project Design Matrix (PDM),
- √ Support promotion of the digitalization of agriculture insurance operations to increase efficiency,
- √ Implementation of the Project activities pillars 2020-2022 as agreed in the 3rd JCC,

√ Utilization of relevant studies and recommendations to improve project implementation.

When it comes to the PDM revision, the review mission team specified the recommendations for Output 1 and Output 2 as shown below. This consulting service takes into consideration the following specific recommendations to conduct operational improvement of AUTPand a feasibility study for AYI insurance.

Focus on Improvement of Operational Capacity of AUTP (Output 1): there are two recommendations: i) deliver trainings for agriculture insurance personnel (i.e. extension workers, DINAS officers) on socialization and promotion of agriculture insurance to farmers and ii) improve the operations procedures of agriculture insurance (i.e. disseminate the use of SIAP, improve claim settlement process etc.).

Conduct a Study to Develop Area-Yield Index (AYI) Insurance (Output 2): feasibility study for AYI insurance is one of the prioritized activities in the Project. Both Indonesian and Japanese sides should promptly make decisions implementation of the feasibility study including the appointment of focal points from project stakeholders. The target site for the study should be West Java Province as discussed at the 3rd JCC. In addition, it is necessary to get involvement of agencies which have not been fully involved in the Project so far such as the Indonesia Financial Services Authority (OJK), authority for a new insurance product, the National Institute of Aeronautics and Space (LAPAN) for the possible introduction of the remote sensing technologies and the Statistical Bureau (BPS).

2.2 Joint Coordination Committee (November 30,2020)

After the above joint mid-term review was undertaken, the consultant team was procured by JICA headquarters, and the Team commenced relevant services accordingly. After about half a year from the commencement, a Joint Coordination Committee (JCC) meeting was held on November 30, 2020, which is the 5th JCC for the project.The following are the summary of the results of the JCC:

2.2.1 Key Participants

Total 42 relevant officers had participated in the Joint Coordination Committee meeting composed of 23 participants from Indonesian implementing agency side and 19 from JICA side. The key participants are as follows:

Indonesian Key Participants:

√ Dr. Ir. Arifin Rudiyanto, Deputy Minister of Maritime and Natural Resources, Bappenas

√ Ir. R. Anang Noegroho, Director of Food Crop and Agriculture, Bappenas

√ Ir. Ika Purwani,Coordinator of capital empowerment and agricultural insurance, Directorate of Infrastructure and Facilities, MOA

Japanese Key Participants:

√ Ms. Keiko MIZOE, Director, Agricultural and Rural Development Group 1, JICA HQs

√ Ms. Mihoko SAITO, Deputy Director, Agricultural and Rural Development Group 1, JICA HQs

√ Ms. Akiko AIKAWA, JICA Project Chief Advisor

√ Mr. Kosei HASHIGUCHI, Consultant Team Leader, Sanyu Consultants Inc.

√ Mr. Kota HIRAYAMA, Consultant Deputy Team Leader, Sanyu Consultants Inc.

2.2.2 Discussions onAUTP and AUTP TOT

Following are the major discussions for the TOT of AUTP, which was conducted 2 – 4 November 2020 for Sulawesi Selatan province and 10 – 12 November 2020 for Jawa Timur (for detail, see Part II, Chapter 2):

- √ MOA stated that the project has done the first TOT for extension officers and pest disease officers in Jawa Timur and Sulawesi Selatan and received good responses from the participants. With the TOT, MOA hopes that we can motivate the officers to be more active in facilitating farmers and other officers to join AUTP.
- √ MOA also stated that this is to realize the target for Sulawesi Selatan. For Jawa Timur, there are a lot of officers who had already understood the TOT materials and the AUTP contribution of the provinceto the nation-wide achievement is the highest. The participants are more concerned and interested in the IT utilization such as SIAP application and also PROTAN for facilitating claiming procedure. Some points achieved after TOT are about internalizing the concept of insurance, AUTP socialization and implementation, further action plans, and more understanding regarding the overall procedure.
- √ BAPPENAS stated that seeing from the TOT outputs, we have to prepare for the targeted 36 million farmers by making a better plan and an integrated result through this AUTP. We should not stop at TOT, but continue the training to all 45,000 extension workers to raise their awareness. We should produce a national module for this activity, involving academics (e.g., IPB: Bogor Agricultural Institute) and other institutions. So, all extension workers may even be certified as insurance agents. Further, we should focus on extension workers and pest and disease officerssince DINAS officers are busier with desk works. In addition, aspect of IT also should be highly recommended to be developed further.
- √ JASINDO maintained that we support the program made by the Government, which is included in the RPJMN. JASINDO also agrees to develop a more accountable and transparent claiming procedure through an application. There are indeed problems regarding the claiming process on the field even though the claiming is regularly done, but JASINDO is actively working in finding the solution. Along with JICA and experts, JASINDO had discussed the premium rate and supports the scheme to be implemented.
- √ MOF raised by saying that we do not know the reception and comprehension of the regional offices after the training regarding AUTP and insurance itself. As we know that regional government has the responsibility in implementation of AUTP, we need to know their comprehension of the AUTP importance. Also, we have to know how the easier claiming process actually benefit the farmers and whether the farmers themselves understand the benefit.
- √ BAPPENAS raised that JASINDO and MOA should present evaluation reports of the 5-year AUTP implementation about the exemplary achievements/outcomes and comments regarding what needs to be improved. Hence, the stakeholders could see the eligibility of 80% subsidy from the Government. Further requested were to incorporate JASINDO& MOA's comments or recommendations for any specific partsinto the evaluation report to be considered by BAPPENAS, and also for Jasindo to provide the product development plan in the evaluation report as well.
- √ MOA responded that MOA already has working groups from various counterpart institutions to produce the evaluation report. MOA will later share the result of the evaluation of field monitoring from the group. However, MOA decided that field monitoring this year 2020 would not be conducted due to concern of COVID-19 pandemic. Thus, the evaluation for this year's implementation might be different.
- √ MOA also added that some regional governments already have governor's decree to aid AUTP program such as Jawa Timur province; it gives protection and easier process for AUTP registration.

Another example in Central Java province is that, for farmers with < 0.25 Ha, the governor pays for the AUTP premium. Also, MOA should consider dividing the potential paddy field condition to see how much one province should take AUTP target/quota for its nationwide realization. Thus, the MOA needs support from each head of DINAS offices to have better implementation.

√ MOA further pointed out that AUTP participants are usually farmers who had experienced claim, while for those who ever joined but never claimed, they do not feel the need to join insurance because their land is free from disasters. MOA understands that it will be difficult for JASINDO if participation comes only from high claim areas. Nevertheless, MOA would ask JASINDO to not reject AUTP registration if such areas register again after experiencing failure.

2.2.3 Discussionson Area-Yield Index Insurance (AYII) Progress

Second issue for the JCC discussions had centered on the AYII. As the AYII is the first trial in Indonesia, the Consultant team explained the progress after the commencement of the services, and preliminary concept of the insurance product being designed as of the time. Following the explanation, questions and clarifications were made as below:

√ MKG asked that what the chance is if AYII is implemented in other regions in addition to Jawa Barat (West Java) province, especially in areas which are not focused on rice production. The Consultant team replied that as long as the regions have historical yield data for at least 15 to 20 years back, then AYII is possible to be designed there.

√ BAPPENAS asked what the rice variety is in such areas where rice yield had declined, for example, in 2008, 2017, and 2019 as this is important for us to know whether the cause is rice variety or climate condition. The consultant team replied that unfortunately, we do not know the exact variety as the given data from Kecamatan offices do not provide that specific information, and agreed upon that the Consultant Team would try to find out the majority rice varieties used in Karawang Kabupaten.

√ BAPPENAS inquired that if MOA has regional data related to farming risks, e.g., high risk, low risk as such data is needed to strengthen the agricultural insurance program. MOA replied that there is a tabular data and BAPPENAS could help in turning the tabular data into spatial data.

√ BAPPENAS needed clarification for the pilot project implementation budget: if it is from Indonesian side, which institution should pay for this, namely, Central government or regional government. The Chairperson (Mr. Anang) shared that BAPPENAS will discuss with JICA as the Indonesian side would like JICA to also bear some. Currently, all budget is held by the central government, yet later we may expect relevant regional government also to support some portion, maybe for high-risk areas. In 2022, we may expect different budgeting options. Also added was that the Indonesian side requests the Consultant team to transfer their knowledge to the Indonesian experts or consultants for future implementation.

√ MOF requested to make available of documentation for all those activities, especially for the sake of producing the decree. MOF needs to better see the concerns from regional initiative, so that the decree can accommodate further government involvement. As there is also a possibility of making Commercial Insurance, General Product, and Premium Product available, the relevant parties are requested to conduct a study regarding that matters. For farmers, we may have to provide a letter or statement, which ensures them that they can choose both AUTP and AYII or just one.

2.2.4 Agreement

Summarizing the discussions elaborated above, following were highlighted and also agreed upon among the JCC participants:

- √ Some lessons and recommendations were drawn from the 1st AUTP TOT summarized as follows, and JCC requests the Ministry of Agriculture to reflect the recommendations when revising the AUTP guidelines:
- √ Set clear targets at Kecamatan level to motivate extension staff and clarify their roles and responsibilities to promote AUTP.
- √ Share the best practice of socialization activities with other areas through social medias, guidelines or any other materials related to AUTP.
- √ Promote AUTP together with other governmental programs such as agricultural machinery and fertilizer aid to motivate farmers to join AUTP and promote it efficiently.
- √ Provide proper training on SIAP/ PROTAN regularly to get extension officer to improve operational process. Also, online SIAP training and manual should be prepared.
- √ Define more clearly 75% damage level on the field. Particularly, it should be mentioned about how to assess 75% of crop failure using photos and pictures in the guideline.
- √ JCC participants have been updated about the current status and workplan for AYII feasibility study and possible pilot activities including the cost sharing plans. The budgeting issue for piloting AYII in year 2021 and onwards requires urgent attentions; thus BAPPENAS will call for a separate meeting with JICA to discuss the budget issue in detail.
- √ JCC approves the formulation of a core team who will fully engage themselves in drafting an academic paper for the draft presidential decree on agriculture insurance, and JICA Experts will provide the team with technical inputs. BAPPENAS will call for a team meeting to finalize the workplan for the project activities related to the academic-paper drafting, and its result needs to be reported at a technical meeting in December 2020.
- √ JCC confirmed that commitment and active supports from the pilot provincial governments are essential to implement the activities for AUTP socialization and AYII feasibility study. In this concern, the current Record of Discussions (R/D) and its amendment only refer to the names of pilot provinces, and there is no written agreement that formalizes the engagement of those named provincial governments. For this, BAPPENAS is planning to exchange the letters with pilot provincial governments to secure their cooperation and commitment on pilot activities. JCC requested BAPPENAS for its continued supports in facilitating the project activities in the pilot provinces. In addition, BAPPENAS will call for a technical meeting in December 2020 to review the monitoring sheets of the year 2020.

2.3 Joint Coordination Committee (May 25, 2021)

After the above Joint Coordination Committee (JCC) meeting held on November 30, 2020. Another JCC, the 6th JCC, was held on May 25, 2021 through on-line Zoom meeting. The following are the summary of the results of the 6thJCC (it is 2nd JCC for the consultant team):

2.3.1 Key Participants

Total 29 relevant officers had participated in the Joint Coordination Committee meeting composed of 17 participants from Indonesian counterpart side and 12 from JICA side. The key participants are as follows:

Indonesian Key Participants:

- √ Dr. Ir. Arifin Rudiyanto, Deputy Minister of Maritime and Natural Resources, Bappenas
- √ Ir. R. Anang Noegroho, Director of Food Crop and Agriculture, Bappenas
- √ Ir. NoorAvianto, Coordinator of Livestock, Directorate for Food and Agriculture, Bappenas
- √ Ir. Indah Megahwati, Director for Agricultural Financing, MOA
- √ Ir. Ika Purwani, Coordinator of Capital Empowerment and Agricultural Insurance, MOA
- √ Ir. Novijan Janis, Head of Risk of PSO on SOE II Section, Directorate for State Financial Risk Management, MOF
- √ Ir. Diwe Novara, Director for Business Development, Jasindo
- √ Ir. Fauzi Ridwan, Group Head of Agricultural Insurance, Micro Insurance, and Government Program, Jasindo

Japanese Key Participants:

- √ Ms. Keiko MIZOE, Director, Agricultural and Rural Development Group 1, JICA HQs
- √ Ms. Mihoko SAITO, Deputy Director, Agricultural and Rural Development Group 1, JICA HQs
- √ Ms. Akiko AIKAWA, JICA Project Chief Advisor
- √ Mr. Kosei HASHIGUCHI, Consultant Team Leader, Sanyu Consultants Inc.
- √ Mr. Kota HIRAYAMA, Consultant Deputy Team Leader, Sanyu Consultants Inc.

2.3.2 Discussions onOutput 0, Presidential Degree

BAPPENAS informed the JCC members that the drafting of the presidential decree has been officially positioned in the approved RKP (Government Work Plan) 2022 to strengthen the regulatory framework of agriculture insurance. This means that, by the end of 2021, drafting of the academic paper for the decree needs to be completed. This is so important for the Government to stabilize the agricultural insurance through the presidential decree and mitigate the various risks that farmers face.

JCC confirmed that the academic paper will serve as a background paper for the presidential decree on agriculture insurance, as suggested by the special advisor to BAPPENAS minister. On this, the BAPPENAS explained that the academic paper needs to be drafted within 2021, before the inter-ministry consultation, andthe BAPPENAS is to present timeline for the Presidential Decree as soon as possible after the 6th JCC, to be followed up by the Project.

2.3.3 Discussionson AUTP (Output 1)

JASINDO informed that the AUTP in 2020 has finally achieved the targeted participation of AUTP and AUTS (livestock insurance), and therefore JASINDO expects the support from all the participant stakeholders this year 2021 to ensure another good result for the AUTP program.

JCC confirmed that the results and the lessons learned from the AUTP-TOT conducted under the Project need to be institutionalized as an official activity of MOA, possibly by reflecting it in national policies and in RKP (Government Work Plan). MOA referred to a comment from their new Director General that the target for AUTP has been achieved last year, and therefore socialization may not be so much issue now, yet MOA admits that socialization in remote areas may still be weak and likely face some difficulties.

2.3.4 Discussionson Area-Yield Index Insurance (AYII) Progress(Output 2)

JASINDO informed that the product permit for AYII has been issued by OJK (Financial Services Authority) on May 24, 2021. In response to the permit of the product, MOA informed the JCC that the AYII

guideline is almost finalized. The current draft will be submitted to the legal department for final comments, and then forwarded to the DG (Directorate General) office of PSP (Agricultural Infrastructure and Facility) for signing.

MOA maintained that on 27 May, MOA staff will join the TOT to be held in Bogor to better understand and prepare for the implementation of AYII pilot activities.It is important to avoid farmers to feel disappointed to AYII by the first impression. Once farmers are disappointed, it would be difficult for the project implementors to plan similar activities in the future. It is therefore especially important to avoid disappointment at the payment procedures. Further, commitments from all parties involved are necessary for smooth implementation of AYII pilot activity, and close involvement of PPL (extension worker) is especially important.

JASINDO mentioned that it has an indemnity-based agriculture insurance and an index-based agriculture insurance as of now. It is now expected that AYII may be able to encourage regions with more modern farming method, like the ones in the food estate program, to register for insurance. JASINDO understands the limited number of PPL is one of the issues faced by the insurance program, and needs any solution from the government side.

Jasindo further shared an idea that KUR (credit program) may have a quite big potential especially if it is bundled with the insurance program. On this, BAPPENAS needs more inputs for the ideas to bundle agriculture insurance with KUR, so that BAPPENAS can properly discuss with MOF. If necessary, BAPPENAS could also invite HIMBARA (association of state-owned banks) for further discussions.

2.3.5 Others

BMKG requested JICA to conduct a capacity building session to better understand how to utilize climate data for index insurance, and JICA is to inform on the possibility of a training on utilization of climate data for index insurance for BMKG staff.

MOF commented that the director has directed MOF to be more involved in future activities of the Project, so that MOF could better support other counterpart organizations. MOF is indeed interested in joining future CCEs (crop cutting experiments) as well as premium calculation to deepen the understanding on the AYII.

2.4 Joint Coordination Committee (April 6, 2022)

The 7th Joint Coordinating Committee (JCC) was held online on April 6th, 2022. The following are the summary of the results of the 7thJCC:

2.4.1 Key Participants

In total,32 relevant officers had participated in the Joint Coordination Committee meeting composed of 19 participants from Indonesian counterpart side and 13 from JICA side. The key participants are as follows:

Indonesian Key Participants:

- √ Dr. Ir. Arifin Rudiyanto, Deputy Minister of Maritime and Natural Resources, Bappenas
- √ Ir. NoorAvianto, Coordinator of Livestock, Directorate for Food and Agriculture, Bappenas
- √ Dr. Leli Nuryati, Head of Agricultural Training Center, Agricultural Extension and Human Resources Development Agency, MOA
- √ Ir. Ika Purwani,M. SiCoordinator of Capital Empowerment and Agricultural Insurance, MOA

- √ Marresya Dessilvia, Sub-coordinator of Cooperation, Agricultural Extension and Human Resource Development Agency
- √ Yeni Fauziah, Head of Government Program, Jasindo
- √ Zainul Muqorobin, Head of Group, Jasindo
- √ Ir. Novijan Janis, Head of Risk of PSO on SOE II Section, Directorate for State Financial Risk Management, MOF
- √ Tony Prianto, Head of Sub-directorate, BUMN Risk Mitigation, Directorate General of Financing and Risk Management, MOF
- √ Kadarsah, Coordinator of Climate Change Analysis Division, BMKG
- √ Dadan Danny Yuliandi, Head of Food Crops Division, Kabupate Karawang Agricultural Dinas
- √ Dewi Appriliani, Head of Food Crops Division, Kendal Kabupaten Agricultural Dinas

Japanese Key Participants:

- √ Ms. Keiko MIZOE, Director, Agricultural and Rural Development Group 1, JICA HQs
- √ Ms. Mihoko SAITO, Deputy Director, Agricultural and Rural Development Group 1, JICA HQs
- √ Ms. Akiko AIKAWA, JICA Project Chief Advisor
- √ Mr. Kosei HASHIGUCHI, Consultant Team Leader, Sanyu Consultants Inc.
- √ Mr. Kota HIRAYAMA, Consultant Deputy Team Leader, Sanyu Consultants Inc.

2.4.2 Discussions onOutput 0, Progress of Presidential Degree

Regarding the draft of presidential regulation on agriculture insurance which is a part of the Project Activity 0-2, BAPPENAS reported that the initial drafting by the Project had been completed in March 2022 and they would start the internal verification process within the Ministry, followed by the official process of the Government of Indonesia for finalization and authorization.

BAPPENAS emphasizedthat this presidential regulation aimsto strengthen the regulatory framework of agriculture insurance. It is significant for the Government to stabilize the agricultural insurance by the presidential decree and to mitigate various risks that farmers face.

2.4.3 Discussionson AUTP (Output 1)

In relation to the Project Activity 1-2 and 1-3, MOA reported that the 3rd Training of Trainers (TOT) on AUTPin East Jawa and South Sulawesi provinces had been completed successfully. Offline AUTP TOTswere held in East Java and South Sulawesi provinces. The Objective of the AUTP TOT is to develop the implementation capacity of agricultural staff and other officers who engage in the promotion of AUTP to farmers. The East Java TOTwas held at BBPP (Agricultural Training Center) Ketindan Malang and was attanded by 40 participants from 2 Kabupaten (Kediri and Pasuruan) and 10 Widyaiswara (governmental trainers of BBPP whose task is to train such civil servant as DINAS staff and PPL). The South Sulawesi AUTP TOTwas heldatBBPP Batangkaluku, Gowa Kabpaten and was attanded by 40 participants from Luwu Utara and Bantaeng Kabupaten and 10 Widyaiswara.

In addition, BAPPENAS and MOA agreed toinitiate the plan of TOTs for year of 2023 with supportsby the Agency for Extension and Development of Agricultural Human Resources (BPPSDMP) of MOA.

2.4.4 Discussionson AYII Pilot Progress(Output 2)

It was agreed at the 7th JCC that the Project extendedthe technical support on the pilot of AYII in Karawang Kabpatentargeting at the 1st paddy planting season of year 2022, and the Project continued to support the Karawang pilot throughout the year of 2022. JICA noted the request and would respond to

the counterparts after they have confirmed the availability of the experts.

The consultant team reported the AYII pilot progress to the counterparts. First, AYII pilot in Indonesia was successfully implemented in the MT 2 season of 2021 in Karawang Kabupaten. The pilotin year 2021 achieved more than 300 farmers whojoined the AYII covering more than 470 ha of farmland insured. The AYII in theMT2 season of 2022 in Kendal starting at March 2022would be also targetedas the extention of AYII pilot.

The consultant team presented the lessons learned from the AYII pilot, including:

1. Product design: Some farmers wereconcerned that benchmark yields might not well reflect the recent yields, and the compensations amount, i.e. proportional payment of the 6 millionIDR per hectare,wassmall. Even the maximum compensation amount is not adequate to cover the recent production cost. In accordance with the product design issues, the consultant team gave such recommendations as: i) benchmark yield should be reviewed and updated periodically, ii) the compensation amount should be fixed at least 6 million RIDRwhich is same as the amount of AUTP, and iii) the maximum compensation amount should be reviewed referring to actual paddy production cost.
2. Socialization: Several issues were raised, including: i) the roles and responsibilities of each stakeholder should be clarified, ii)it is difficult for some farmers to understand the AYII brochure, iii) the budget for AYII socialization was not well allocated to the Kabupaten. According to the issues, the consultant team gave recommendations as: i)the roles and responsibilities of each stakeholder should be clarified in detail, be shared among stakeholders, and be agreed in advance, ii) the contents of AYII brochures and other socialization materials should be updated based on the feedback from the farmers and PPLs, and iii)the stakeholders clarifyown activities in advance and secure budget required.
3. CCE Implementation: It took time to complete all the CCE results in the target areas.The CCE is carried out manually, so that mistakes might happen and CCE requires a long time to complete the process. The consultant team recommended that;i) it is vital for stakeholders to schedule the CCEsof all the target area and share the schedule with the stakeholders before CCEsstart, and ii)development and use of an smartphone application for AYIIcan be an idea to make the CCE process faster and reduce mistakes.
4. Others: There is no monitoring and evaluation (M&E) system for the AYII scheme.It is important to monitor and review the claim process since the understanding of farmers on AYII design is limited. It was recommended that i) M&E system should be established and the AYII pilot activities be reviewed continuously, ii) intensive socialization activities should be carried out for farmers at the beginning of the AYII introduction, and iii)the AYII may be combined withsuch government programs as agricultural loans and subsidized fertilizer delivery.

The consultant team explained that the Poject planned to conduct a product review survey forevaluatingfarmers' satisfaction and acceptance of AYII product.The objective of survey is to obtainfeedback from farmers and related officers on AYII product. The schedule and contents of the survey were approved at the JCC.

It was also reported that the consultant team was preparing the AYII implementation guide.The guide provides summary of AYII implementation procedure as well as essential steps for the AYII development and operation based on the experiences of the AYII pilot activities under the Project. It was expected that the guide alsosupportsstakeholders including BAPPENAS, MOA, JASINDO, regional

governmenst and other related organizations onthe implementation of the AYII.

2.4.5 Others

The MOF stated that MOF basically supports AUTP and AYII program. The MOF expectedthat the programs have clear milestones. Depending on whether the programs would be combined with other government programs or expanded separately, the MOF would be able to make the budget allocationclear. It is also hopedthat the agricultural insurancesare linked with other agricultural financing product such as KUR (Kredit Usaha Rakyat; bank credit), fertilizer subsidy program, or others.

BMKG expected to be involved in the training programs of AUTP and/or AYII from the view point of climate and weather either as participant or trainer, so that BMKG improves capacity of the staffin terms of agricultural insurance. BMKG desires to collaborate on technical aspectsof theProject in future.

2.5 Joint Coordination Committee (October31, 2022)

The 9th Joint Coordinating Committee (JCC) was held online on October31st, 2022. The following are the summary of the results of the 9thJCC:

2.5.1 Key Participants

In total, 46 relevant officers had participated in the Joint Coordination Committee meeting composed of 27 participants from Indonesian counterpart side and 19 from JICA side. The key participants are as follows:

Indonesian Key Participants:

- √ Dr. Vivi Yulaswati, Acting Deputy Minister of Maritime and Natural Resources, Bappenas
- √ Anang Noegroho, S.M., Acting Director for Food and Agriculture, Bappenas
- √ Ir. Noor Avianto, Functional Planner of Livestock, Directorate for Food and Agriculture, Bappenas
- √ Dr. Leli Nuryati, Head of Agricultural Training Center, Agricultural Extension and Human Resources Development Agency, MOA
- √ Ir. Ika Purwani, M. Si Coordinator of Capital Empowerment and Agricultural Insurance, MOA
- √ Dewi Darmayanti, Coordinator of Planning Group, Agricultural Human Resources Extension and Development Agency
- √ Cordelia Ervina, Coordinator of Programs and Training Cooperation, Agricultural Training Center, Agricultural Extension and Human Resources Development Agency, MOA
- √ Yeni Fauziah, Head of Government Program, Jasindo
- √ Dicky Anggakusuma, Relation Manager, Government Program Unit, Jasindo
- √ Dicky Muhammad Ramdhani, Junior Statistician, Indonesian Statistics Agency
- √ Indra Fajar, Staff, Directorate for State Financial Risk Management, MOF
- √ Anis, Staff Representative, Central Java Provincial Agricultural Dinas
- √ Rinda Lestari Rahayu, Staff Representative, East Java Provincial Agricultural Dinas
- √ Aang Kurniawan, Food Crop Protection Sub-coordinator, KabupatenKarawang Agricultural Dinas
- √ Dewi Appriliani, Head of Food Crops Division, Kendal Kabupaten Agricultural Dinas

Japanese Key Participants:

- √ Ms. Keiko MIZOE, Director, Agricultural and Rural Development Group 1, JICA HQs
- √ Ms. Mihoko SAITO, Deputy Director, Agricultural and Rural Development Group 1, JICA HQs

- √ Mr. Kenji OKAMURA, Senior Representative, JICA Indonesia
- √ Ms. Erika INOUE, Project Formulation Advisor, JICA Indonesia
- √ Ms. Akiko AIKAWA, JICA Project Chief Advisor
- √ Ms. Terumi SHIKATA, JICA Project Coordinator
- √ Mr. Kosei HASHIGUCHI, Consultant Team Leader, Sanyu Consultants Inc.
- √ Mr. Kota HIRAYAMA, Consultant Deputy Team Leader, Sanyu Consultants Inc.
- √ Mr. Taketo EGUCHI, Remote Sensing Expert, Sanyu Consultants Inc.

2.5.2 Discussions onAUTP TOT Plan

The TOT materialsthat have been prepared by the projectcan be utilized by Agricultural Training Center (Puslatan), BPPSDMP, which is expected to implement the training on AUTP after the project completion. In the current plan of Puslatan, the TOT is to be implemented based onthe schedule which is recommended by JICA side.It is planned that the training is held once per 2 months. The TOT will involve Widyaiswara and capable lecturer expectingmore than 7,000 participants. There should be at least 1 extension officer from 1 Kecamatan. The training will be conducted online.

There is also an option for hybrid type training, where participants gather at aKecamatan office or Kabupaten Agricultural Office (Dinas) and the lecturers give lecturesthroughonline platform, e.g. Zoom. The materialsare the same with the one made by the projectcovering general information of AUTP, regulation, registration and claim process, and enhancement of understanding of SIAP application. The training will provide working credits for participants. Certificates can be issued,which can be downloaded by the participants at the end of trainingafterthe online test and evaluation process.

There were further discussions as follows:

- √ Pre- and post-evaluation of the TOT should be prepared and assigned to the participants, especially farmers,because of the low insurance literacy.
- √ There should be a kind of FAQ section or hotline for questioningforthe cases that the participants still have questions after the training.
- √ Training should be aligned with AUTP timeline designed by the central government.
- √ There should also be offline sessions to emphasize the importance of IT utilization, i.e.use of SIAP and Protan applications prepared for registration and claim process respectively. There are still a lot of data inputting errors in the processes, so that extension officers, Dinas, and Jasindo are often protested by farmers.
- √ What matters for conducting offline training is the budget for accommodation and transportation for participants.It is requested for MOA to make decision where offline sessions should be held, or not, and inform the result to Pusulatan.

2.5.3 Discussionson AYII Pilot Progress and Work Plan

AYII pilot has been carried out in Karawang Kabupaten and Kendal Kabupaten in years of 2021 and 2022 targeting at 5 Kecamatan in Karawang and 4 Kecamatan in Kendal. The realization of insurance registration has not achieved the goal in every season. There have been some cases that the farmers who have yield higher than the benchmark yield received compensation. MOA should review the AYII scheme towardsimplemenation in year of 2023. There are also some comments that AYII should include risks which is not covered in AUTP for protecting farmers. Other countries implementing AYII also include riskssuch as strong wind (lodging) and bird attack in their insurance schemes.

Also, the importance of accurate calculationof CCE should be emphasized to field officersfor avoiding mistakes and loss of insurer. Supports from BPPSDMP (Puslatan) is needed to train the officers. It is

also necessary that Indonesian government consider the coordination with BPS.

A suggestion from DG of PSP, MOA is to add another piloting location. There is no need to increase the budgetsince the target area is not yet achieved by the two Kabupatens. In addition, the risks covered by AYII should also be improved. There will be chancesin case thatrisks other than drought, flood, and pest are covered by AYII. More farmers may be willing to join the improved AYII. The AYII monitoring team of MOA has already carried outthe field survey to see the suitability of piloting.The report is going to beprepared. Also, MOA should hold training for field officers especially on CCE and data collection.

It is considered that the concept of AYII, i.e. area yield based insurance, is attractive as it is different from indemnity based AUTP. The difference should always be reminded to officers and farmers. Farmers think that AYII is simillar to AUTP and expect immediate compensation for the indivisuall loss. The administration side needs to imporove the socialization.

There were further discussions and notes as follows:

- √ Improvement of business process and the general guideline should be considered as a legal basis for auditing.
- √ Socialization methodshould be improved for farmers' better understanding on AYII.
- √ Allowance for CCE officers and compensation for farmers' loss caused by CCE sampling need to be considered.
- √ There is an option to select another Kecamatan when the existingpilot Kecamatancannot achieve the plan and goal.
- √ Proportional payout scheme should be re-considered.
- √ Claim calculation flowshould be more clarified to implementing officers for having common understanding and avoiding misconducts.

2.6 Joint Coordination Committee (February 3, 2023)

The 10th Joint Coordinating Committee (JCC) was held on February 3rd, 2023. The following are the summary of the results of the 10th JCC :

2.6.1 Key Participants

In total, 40 relevant officers had participated in the Joint Coordination Committee meeting composed of 21 participants from Indonesian counterpart side and 19 from JICA side. The key participants are as follows:

Indonesian Key Participants:

- √ Anang Noegroho, S.M., Acting Director for Food and Agriculture, Bappenas
- √ Ir. Noor Avianto, Functional Planner of Livestock, Directorate for Food and Agriculture, Bappenas
- √ Ir. Ika Purwani, M. Si Coordinator of Capital Empowerment and Agricultural Insurance, MOA
- √ Wiweko Setiawan, Staff, Agricultural Human Resources Extension and Development Agency
- √ Novijan Janis, Sub-Coordinator of Risk of PSO, Directorate of State Financial Risk Management
- √ Dicky Anggakusuma, Relation Manager, Government Program Unit, Jasindo
- √ Mr. Kadarsah, Coordinator of Climate Change Analysis Division, BMKG
- √ Heru Djatmika, Head of Agricultural Facility and Infrastructure Division, Agriculture and Plantation Office of Central Java Province
- √ Rinda Lestari Rahayu, Staff Representative, East Java Provincial Agricultural Dinas
- √ Taufik Lukman, Regional Agricultural Training Center (BBPP) of Lembang

√ Dewi Appriliani, Head of Food Crops Division, Kendal Kabupaten Agricultural Dinas

Japanese Key Participants:

√ Dr. Masato KAWANISHI, Senior Advisor, JICA HQ

√ Mr. Daichi BAN, Assistant Director, Agricultural and Rural Development Group 1, JICA HQ

√ Mr. JunKOIDE, Agricultural Policy Advisor, JICA Indonesia

√ Ms. Erika INOUE, Project Formulation Advisor, JICA Indonesia

√ Ms. Akiko AIKAWA, JICA Project Chief Advisor

√ Ms. Terumi SHIKATA, JICA Project Coordinator

√ Mr. Kosei HASHIGUCHI, Consultant Team Leader, Sanyu Consultants Inc.

√ Mr. Kota HIRAYAMA, Consultant Deputy Team Leader, Sanyu Consultants Inc.

2.6.2 Presentationonthe Project Completion Report

TheChief Advisor of the project gave a presentation on the zero draft of project completion report. The participants agreed to have the first draft by March 10th for receiving comments and having revisions.

2.6.3 Discussions onKey Findings and Suggestions from the JICA Headquarters Mission

Themission from JICA headquarters presented the following points which were acknowledged by the implementing agencies:

1. The draft presidential regulation on agricultural insurance: The presidential regulation in which the establishment of an inter-agency coordination mechanism for improved agricultural insurance operation has already been drafted under the project and waits for the official approval.
2. The status of agricultural insurance program in the next RPJMN 2025-2029: MOA aims to attain that the agricultural insurance program changes its status from an extended pilot program to a national program in the next RPJMN period.
3. Bundling agricultural insurance with other agricultural assistances: Securing the certain scale of insurance subscribers and the consequent scale of the premium revenue is key to the stabilization of the agricultural insurance schemes. To make insurance mandatory for all the beneficiaries of agriculture assistances provided by the MOA might be one option for further consideration.
4. Potentials and challenges for the utilization of the remote-sensing (RS) technology: RS technology for paddy production estimation is progressing, though it needs to be confirmed whether its replacement with CCE is already realistic. Field data collection through CCEs need to continue while the applicability of RS technology for insurance purpose is to be further explored.

The mission added the suggestions as follows:

1. The status of the presidential regulation and the establishment of the inter-agency coordination mechanism are closely monitored by BAPPENAS.
2. To prepare for CCE expansion, BAPPENAS and MOA continue to work with BPS and other stakeholders to tackle the issues of clear responsibilities and assignment as well as human and financial resources. Possibility for the utilization of RS technology will be also explored.
3. MOA and Jasindo with the support from BAPPENAS and other institutions start to discuss the feasibility of bundling insurance with other agricultural services such as fertilizers and credits.
4. MOA with the support of BAPPENAS and MOF works towards the official acknowledgement of

agriculture insurance program as the national program in the next RPJMN 2025-2029.

2.6.4 Presentationonthe Planning of TOT on Agriculture Insurance by Puslatan

Puslatan plannedthe Training of Trainer (TOT) on agricultural insurance to be held in year of 2023, targeting extension officers (PPLs), widyaiswara (master trainers), lecturers and teachers, as a part of the regular maximum program.The TOT is scheduled in the last week of April, which aims to improve the participants' understanding on the utilization of agricultural insurance as a solution for farming risks mitigation.The target numberis 18,500 participants.

In addition, one-time supplemental training is considered targeting at 30 participants including PPL and Widyaiswara, and other officers from theAYII target areas, namely Karawang and Kendal Kabupaten. The training is to be conducted at BBPP Lembang, West Java. It is expected for the project to share available AYII materials with the BBPP Lembang.

CHAPTER 1 TRAINING OF TRAINERS (TOT) FOR AUTP EXTENSION

1.1 Basic Structure of the Training of Trainers

A series of training sessions were organized to promote AUTP through Training of Trainers (TOT), whereby cascading the training beneficiaries within the target provinces. There are two steps in the TOT structure. Firstly, the consultant team provides training to selected district and sub-district officers to develop master trainers for the AUTP promotion. Secondly, these master trainers conduct training for selected sub-district officers (Figure 1.1.1).

The first step is to organize external training as the Training of Trainers (TOT) sessions to develop master trainers. The second step is to organize internal training (cascade style training)to expand knowledge and skills from the master trainers to the follower officers. The main participants of the TOT sessions include district officers as well as sub-district officers who are promoting AUTP to farmers on the ground. The master trainers provide cascade-style training as an internal training session to non-trained officers atthe sub-district level.

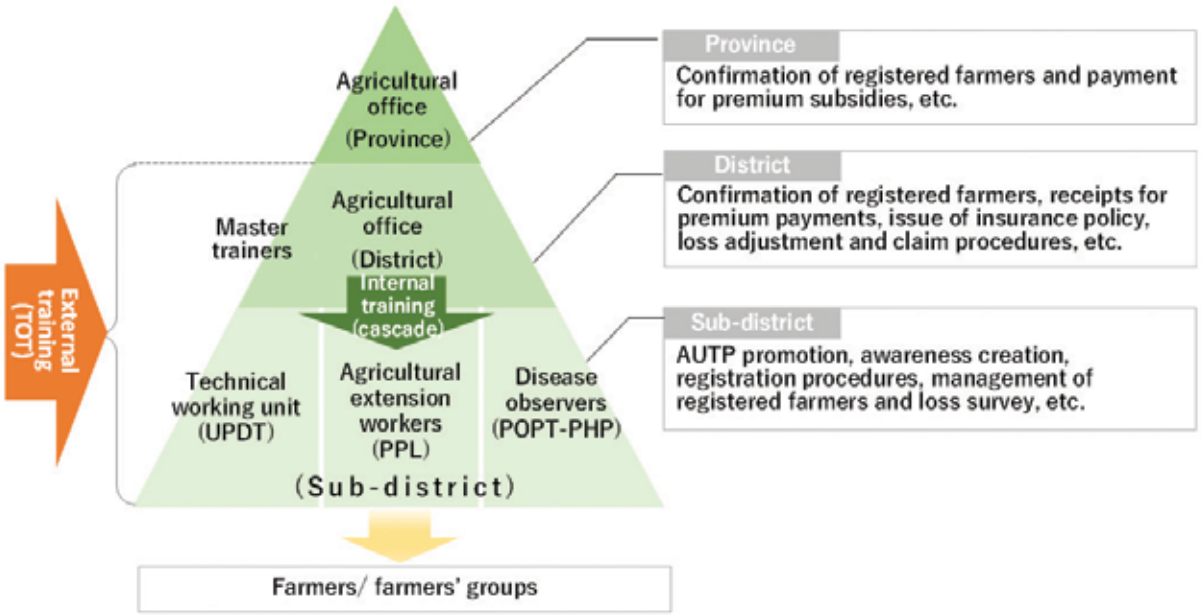


Figure 1.1.1 Cascade Structure of Training of Trainers

The TOT and the internal training contents include both theoretical knowledge ofagriculture insurance and practical skills for insurance promotion activities by the following reasons:

- √ Theoretical knowledge is essential to convey the nature of AUTP correctly. The correct information and knowledge are also important to get credibility from farmers including insurance coverage, loss adjustment process and other characteristics of AUTP.
- √ The government takes an initiative to promote AUTP, yet AUTP is not compulsory for farmers and sign-up for AUTP is stillvoluntary based. Thus, proactive communications with farmers are key to promoting AUTP.

1.2 Training Modules for AUTP Extension

The TOT program consists of four modules; (i) introduction of AUTP including agriculture insurance overview, (ii) practical skills for AUTP promotion, (iii) loss adjustment process and (iv) how to use SIAP (agriculture insurance system in Jasindo) and introduction of PROTAN (loss assessment application) (Table 1.2.1).

Table 1.2.1Training Module and its Target

Modul	District officer	Sub-district			Jasindo
		Agri. officer	Extension	Disease observer	
1. Pengenalan AUTP	○	○	○	△	△
2. Promosi AUTP	○	○	○	△	○
3. Penilaian Kerugian	○	○	○	○	○
4. SIAP & PROTAN	○	○	○	△	

*○: compulsory △: optional —: non-target

The internal training is organized by the master trainers who attend the TOT sessions. The training modules for the internal training are the same as the TOT. The internal training is cascade-style training.

1.3 Involvement of BBPPSDM and PUSLATAN

The BBPPSMD of the Ministry of Agriculture (MOA), Agricultural Human Resources and Extension and Development Directorate, is responsible for strengthening human agricultural human resources and extension. The PUSLATAN of the MOA, Agricultural Training Center, is responsible for organizing and providing training to agricultural extension officers as well as other related officers. Facilitating institutionalization of the AUTP TOT after the Project, the BPPSDMP and the PUSLATAN play important roles to conduct the AUTP TOT continuously as part of their regular training program.

Particularly, there are 10 BBPPs (Agricultural Extension Centers) under the PUSLATAN. The PUSLATAN has its trainers called Widyaiswara. The Widyaiswara is a government officer with duties and responsibilities for educating and teaching government officers at government training institutions. There are 205 Widyaiawaras with different expertise specifications spread over 10 BBPPs throughout Indonesia.

The PUSLATAN and the Widyaiswara have been involved in the 3rd AUTP TOT under this project. The Widyaiswaras participated in the AUTP TOT to prepare for the implementation of the AUTP TOT in the year 2023.

1.4 Development of Training Materials

1.4.1 Module 1: AUTP Introduction

The main objectives of this module are to internalize the concept of crop insurance and to acquire basic knowledge of AUTP and its operation. The training material for this module has been developed as PowerPoint slides. Trainers are expected to give a lecture to trainees with these presentation slides. As an introduction module, trainers are also expected to facilitate discussions and interactions among trainees on their AUTP experience. The following are the major topics and contents of the training material in this module:

- √ Introduction of agricultural risk management
- √ Risk management strategies
- √ Agricultural insurance/ crop insurance
- √ Insurance terminology
- √ Crop insurance program in Indonesia/ overview of AUTP program
- √ AUTP implementation structure

1.4.2 Module 2: AUTP Promotion

The main objectives of this module are to understand the importance of AUTP socialization and an effective socialization approach. The training material for this module has also been developed as PowerPoint slides. This module includes action plan-making to achieve trainees' AUTP target numbers. For this reason, the AUTP target numbers should be clarified before this module so that trainees might be able to make a practical action plan to achieve their target. The following are the major topics and contents of the training material in this module:

- √ Why socialization is important?
- √ Objectives of socialization
- √ Socialization approach
- √ Materials and tools
- √ Current socialization practices
- √ Action plan making

1.4.3 Module 3: Loss Assessment Survey and Claim Procedure

The main objectives of this module are to understand the basic procedure of loss assessment survey and claim process. The training material for this module consists of two parts: 1) claim procedure and 2) loss assessment survey. JASINDO is responsible for loss assessment and claim procedure under the AUTP scheme. JASINDO staff use their internal materials for this training module. Also, a surveyor, who works for JASINDO to carry out a loss assessment survey, gave practical input for the material of the loss assessment survey. The following are the major topics and contents of the training materials in this module:

- √ AUTP claim reporting process
- √ Claim process/ claim documents
- √ Claims payment management
- √ AUTP claim survey scheme
- √ Compensation calculation
- √ Measurement of rice fields
- √ AUTP policy and attachments

1.4.4 Module 4: Introduction of SIAP and PROTAN

The main objective of this module is to understand how to use SIAP (agricultural insurance system in JASINDO) and to introduce PROTAN, a mobile application for loss assessment. SIAP was introduced in 2019 and PROTAN was the newly developed application in 2020. Both applications are still new to most agricultural extension officers. JASINDO prepared presentation slides for SIAP and a video clip for PROTAN introduction.

All the training materials are attached as appendixes.

CHAPTER 2 IMPLEMENTATION OF TOT FOR AUTP EXTENSION

2.1 Overview of TOT Implementation

The target areas of the TOT are East Java and South Sulawesi Provinces. The TOT was organized three times during the project period. Each TOT targets different officers within the target provinces. The following table shows the overview of the TOT implementation:

Table 2.1.1 Overview of the TOT Implementation

Item	1st TOT (Nov.2020)	2nd TOT (Aug.2021)	3rd TOT (Mar.2022)
Implementation date	3-5 Nov. 2020 di SS* 10-12 Nov. 2020 di JT*	3-4 Aug. 2021 di SS 9-10 Aug. 2021 di JT	30-31 Mar. 2022 di SS 21-22 Mar. 2022 di JT
Training style	On-line 3-day training	On-line 2-day training	Off-line 2-day training Venue
Target area (Kabupaten)	SS: Bone & Maros JT: Lamongan & Ngan-juk	SS: Barru & Pangkep JT: Jombang & Tuban	SS: Bantaeng & Luwu Utara JT: Kediri & Pasuruan
Training module	1. AUTP introduction, 2. AUTP socialization, 3. Loss adjustment 4. SIAP & PROAN introduction		
No. of participants	Approx. 40 participants	Approx. 40 participants	Approx. 40 participants
Remarks	-	-	8 Widyaiswara joined in each province.

Note: SS: South Sulawesi, EJ: East Java

Source: JICA Consultant Team

2.2 The First TOT (November 2020)

2.2.1 Outline of the Fist TOT in November 2020

The 1stTOT was held in November 2020. This 1st TOT was organized as a 3-day training program held online with zoom (a cloud-based video conferencing service) throughout the program due to the COVID-19 pandemic. The table below shows the outline of the 1stTOT:

Table 2.2.1 Outline of the 1st TOT

Item	South Sulawesi	East Java
Date	November 3,4,5 (3-day)	November 10,11,12 (3-day)
No. of Participants	Nov. 3rd: 47 Nov. 4th: 60 Nov. 5th: 58 No. of participants for the whole 3-day program: 39	Nov.10th: 61 Nov.11th: 41 Nov.12th: 59 No. of participants for the whole 3-day program: 36
Kabupaten	2	2

Rincian	Sulawesi Selatan	Jawa Timur
No. of Kabupaten	10	10
Style	Online training via zoom	
Target	Agricultural DINAS officers, extension officers, pest and dieses inspectors, JASINDO staff	

Source: JICA Consultant Team

The TOT program consists of 4 modules: 1) AUTP introduction, 2) AUTP promotion including action plan making, 3) loss assessment survey and claim procedure, and 4) introduction of SIAP1[1] and PROTAN2[2]. These 4 modules were covered within the 3-day program. The TOT program is the same content for both provinces as shown in the table below:

Table 2.2.2 TOT Program (1st TOT)

Day	Time	Contents	Lecturer	Material
Day 1	AM	**[Module 1]** √ Agricultural risk management √ Introduction of AUTP	Ms. Ika (MOA)	PPT
	PM	**[Module 2]** √ Socialization of AUTP √ Action plan making	Ms. Ika (MOA)	PPT Group work
Day 2	AM	**[Module 3]** √ Loss assessment survey √ Case studies/ lessons learnt	Mr. Budi (Expert) Mr. Irwan (JASINDO)	PPT Group work
Day 3	AM	**[Module 4]** √ Introduction of SIAP √ Introduction of PROTAN	JASINDO staff	PPT/Video
	PM	√ Exercise for SIAP operation	JASINDO staff	Group work

- √ Ms. Ika of the Ministry of Agriculture, one of the counterpart members of the Project, was in charge of the Module 1 and the Module 2.
- √ The Module 3 was organized by Mr. Irwan of JASINDO and Mr. Budi, a consultant working for JASINDO. Mr Budi introduced practical process of the loss assessment survey and shared with the trainees lessons learned from his experience in loss assessment survey.
- √ Mr. Irwan of JASINDO was also in charge of the Module 4. He introduced how SIAP works in AUTP operation. Also, Mr. Teuku of JASINDO explained the basic concept of PROTAN in the Module 4.
- √ In the Module 4, there was an exercise session for SIAP. JASINDO staff facilitated group works and demonstrated how to use SIAP through sharing their SIAP screen with the trainees.

The main format for the TOT materials is Microsoft PowerPoint (PPT). In addition to the PPT materials, the video materials were used for SIAP and PROTAN introduction in Module 4. These video materials were prepared by JASINDO to promote SIAP and PROTAN for their own purpose. All the TOT materials are stored online and the training participants could access these materials anytime even after the completion of the TOT program.

1 Sistem Informasi Asuransi Pertanian (SIAP): SIAP is an information system for AUTP operation including farmers' registration, payout process and premium collection.
2 PROTAN is a smart phone application for loss assessment. JASINDO is planning to introduce this application in 2021.

The 1st TOT targeted 2 kabupatensfrom South Sulawesi and East Java provinces, respectively. Agricultural DINAS selected 5 kecamatans in each kabupaten. In total, the targets were 20 kecamatans in each province; namely, 10 kecamatans were selected from 2 kabupatens in South Sulawesi and 10 kecamatans were selected from 2 kabupatens in East Java. These target kabupatens are considered the prioritized areas for the AUTP promotion. The TOT participants are agricultural officers at kabupaten offices, extension officers at kecamatan level, pests and diseases inspectors and JASINDO staff.

According to the results of the questionnaire survey for the TOT participants (Figure 2.2.1), more than 80% of the participants have experienced AUTP activities. Particularly, most of them have been involved in AUTP socialization activities. This is because the majority of the participants were agricultural extension officers so their experience is concentrated on the socialization activities. In other words, the experience of other AUTP activities such as loss adjustment surveys and claim procedures are rather limited.

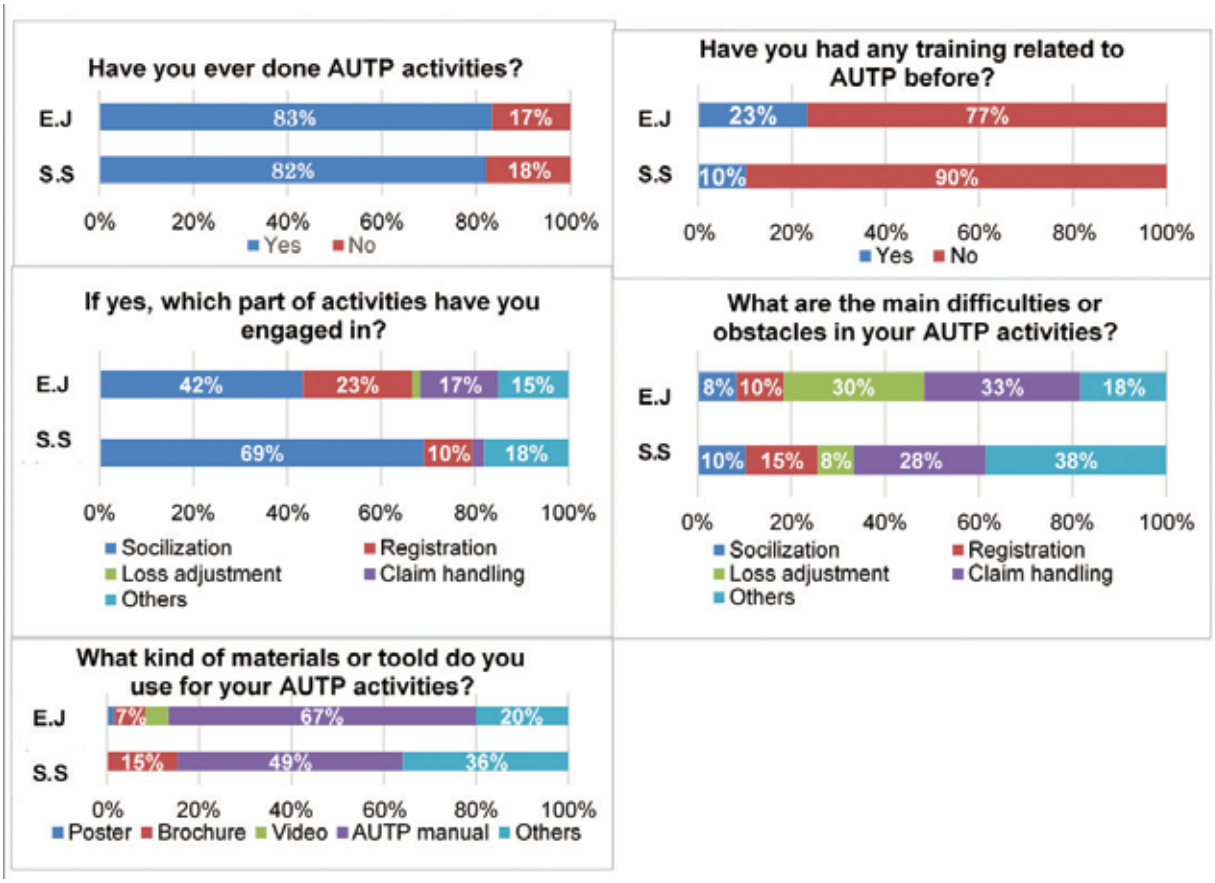


Figure 2.2.1 AUTP Experience of TOT participants

Source: JICA Consultant team

The questionnaire survey also revealed that most of the participants have faced difficulties in the loss assessment survey and insurance claim procedures. Sharing the experience of the AUTP activities is also an important aspect of the TOT program. In fact, this TOT program provided an opportunity for the participants to discuss and share their difficulties and success stories in the AUTP promotion. The TOT does not only provide knowledge and skills of the AUTP promotion, but also it plays an important role in facilitating knowledge exchange and experience sharing among AUTP practitioners.

2.2.2 TOT Implementation Result

1) Achievement of the 1st TOT

The main purpose of the TOT is to strengthen capacity of the AUTP stakeholders. The following 6 specific objectives were set up to achieve the TOT purpose:

Table 2.2.3TOT Objectives

No.	Objectives	Related module
1	Internalize the concept of agricultural insurance	Module 1
2	Acquire basic knowledge of AUTP and its operation	Module 1
3	Acquire basic skills for AUTP socialization and implementation	Module 2
4	Prepare action plans for AUTP promotion	Module 2
5	Acquire skills and knowledge of loss claim procedure	Module 3
6	Acquire basic knowledge of SIAP	Module 4

The TOT achievement was measured by self-evaluation of the understanding of the training contents. The self-evaluation was carried out at the end of each TOT module. The following table shows the summary of the self-evaluation results:

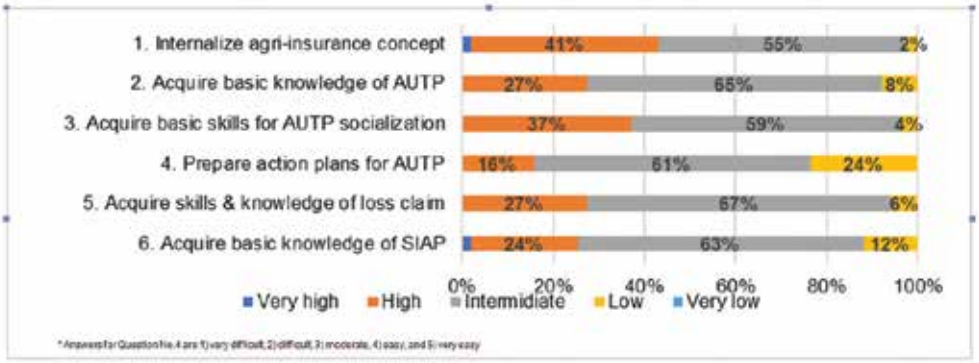


Figure 2.2.2 Achievement of TOT Objectives in South Sulawesi

Source: JICA Consultant Team

The self-evaluation result in South Sulawesi (Figure 2.2.2) shows that skill acquisition in the agricultural insurance concept is high compared to the other topics. Also, 37% of the participants responded "Hight" for acquisition of AUTP socialization skills. This is also a higher acquisition level than that of other training topics. On the other hand, 12% of the participants answered "Low" for skill acquisition in SIAP. This result indicates that the training program for SIAP could be improved to increase the level of skill acquisition in the future.

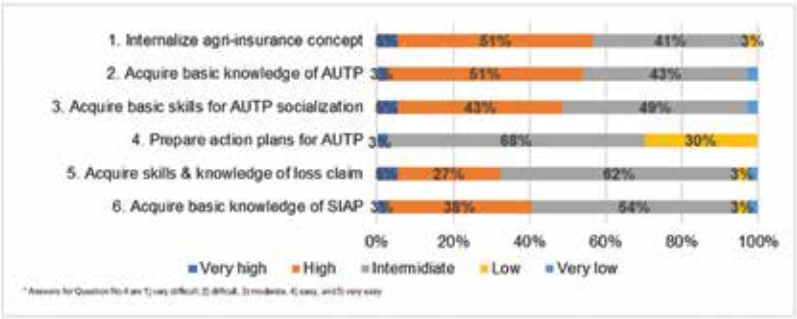


Figure 2.2.3 Achievement of TOT Objectives in East Java

Source: JICA Consultant Team

The self-evaluation result in East Java (Figure 2.2.3) is almost the same trend as the result in South

Sulawesi. Skill acquisition level is rather high in general agricultural insurance and AUTP concept. East Java is one of the most active provinces in terms of AUTP promotion. In fact, East Java is one of the largest insured areas in Indonesia. Considering this situation, the TOT participants in East Java are more familiar with AUTP activities than the participants in South Sulawesi.

Skill acquisitions in loss assessment and SIAP usage are, however, still limited even in East Java. This result indicates that strengthening the capacity of loss assessment and SIAP operation is key to the further promotion of AUTP. The training materials and the guidelines should also be upgraded to strengthen the capacity of these aspects. The TOT program and materials would be revised for the 2nd TOT reflecting the lessons learned of from 1st TOT result.

In summary, these self-evaluation results indicate two things. Firstly, the concept of agricultural insurance has prevailed steadily since AUTP scheme was introduced in 2015. For this reason, the TOT participants already had at leasta basic idea of AUTP. This situation helps them understand how agricultural insurance works easily. Secondly, it takes time to learn how to operate insurance services using applications such as SIAP and PROTAN. Particularly, it might be difficult for the participants to acquire skills in SIAP and PROTAN within the limited time of the 3-day TOT.

Considering this second point, the TOT should be provided as a part of the effective learning process to acquire SIAP and PROTAN skills. It is necessary to take time to acquire SIAP and PROTAN skills by spending a certain amount of time using these applications rather than learning these skills through lectures. Therefore, SIAP and PROTAN training should be provided through not only the TOT program, but also through a continuous learning program to improve skill acquisition in these applications.

2) Understanding of the TOT Contents

Comprehension mini-tests were carried out to check the participants' understanding of the TOT contents at the end of each training module. The comprehension mini-tests were carried out through "Google Form" consisting of 3-5 questions for each module. Most of the questions are basic ones to see if the participants understand the contents of each module. The following tables summarize the results of the comprehension mini-tests:

Table 2.2.4 Results of the Comprehension Mini Tests

Module 1: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. The base of law in implementing agriculture insurance in Indonesia is:	a. Regulation No 15 in 2011 b. Regulation No 19 in 2013 c. Regulation No 9 in 2013 d. Regulation No 15 in 2011	b	100%	80%
2. Minister of Agriculture's Decree regarding Agriculture Insurance Facilitation is the decree number:	a. No 40 in 2015 b. No 41 in 2015 c. No 40 in 2014 d. No 41 in 2014	a	80%	65%

Module 1: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
4. How much is the AUTP claim compensation per hectare per cropping season?-	-	Rp.6m	92%	93%

Module 2: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. The criteria of AUTP participants are:	a. Individual farmers with max. 2 ha of field for each registration per cropping season b. Farmers within a farming group with max. 2 ha of field for each registration per cropping season c. Individual farmers with max. 3 ha of field for each registration per cropping season d. Farmers within a farming group with max. 3 ha of field for each registration per cropping season	b	86%	83%
2. AUTP Premium Aid given by the government is for:	a. IDR 180,000/ha/CS b. IDR 36,000/ha/CS c. IDR 144,000/ha/CS d. IDR 160,000/ha/CS	b	61%	86%
3. One of the criteria of suitable land for AUTP program is:	a. Tidal swamp paddy field without water system b. Rainfed paddy field without water sources c. Peatlands with water source(s) d. Paddy field with technical irrigation, half-technical irrigation, village irrigation, and simple irrigation	d	96%	100%
4. How much is the AUTP claim compensation per hectare per cropping season?-	-	Rp.6m	92%	93%

Module 3: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. Which of the followings is the correct application used to make an easier AUTP implementation in 2020?	a. SIAP b. PROTAN c. All correct	a	69%	61%
2. During AUTP claim survey with an insurance officer, the following parties should be present at the location except . . .	a. Extension workers b. Pest-disease officer c. Head of Dinas d. Insurance participant/ farmer/farming group	c	94%	98%
3. Which of the following tools that you think is most accurate to measure total damage of AUTP insured area?	a. Roll/electric meter b. GPS c. Farmer's/farming group's estimation	b	67%	82%
4. Claim approval is given by the insurance company within 14 working days according to which following condition?	a. After claim is reported to insurance company b. After Form 7 is signed by all related parties c. After Form 7 is correctly filled, signed, and uploaded to SIAP application	c	82%	82%
5. In your opinion, which form of legality of AUTP is considered the most complete and valid at the time of filing a claim that can be used as the basis for insurance companies to pay claims to AUTP participants?	a. Proof of self-help premium payment (premium 20%) b. Proof of AUTP policy c. DPD Decree Determination of participants by the Regency / City Office d. Decree of 80% premium distribution from the Ministry of Agriculture	d	29%	25%

Module 4: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. All of the stated natural disasters below are included in the insured risk by AUTP policy except . . .	a. Flood b. Draught c. Landslide	c	98%	100%
2. Maximum of insured land allowed for AUTP program is for:	a. 2 ha b. 3 ha c. 5 ha	a	100%	100%

Module 4: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
3. All farmers are allowed to be AUTP participants except . . .	a. Land-owning farmers b. Working/labor farmer c. Foreign farmers	c	100%	100%
4. These are the use of GPS except . . .	a. Telling coordinate b. Measuring total area c. Communication	c	98%	97%
5. How long does the AUTP policy apply?	a. Since planting to harvest time (estimation) b. A lifetime c. During claim	a	86%	97%

Source: JICA Consultant Team

It is easy for the participants to answer most of the questions since most of the questions are basic ones. In fact, in 13 questions out of the 17 questions, correct answer rates are more than 80% in South Sulawesi and East Java. Considering the fact that most questions are basic ones, the participants should have answered more correctly. They should fully understand the basic knowledge of AUTP after the TOT program.

In South Sulawesi, some of the participants did not know the subsidiary amount for the insurance premium.The correct answer rate for the insurance subsidiary was approximately 60% (refer to question No.2 of Module 2). In East Java, only 60% of the respondents answered correctly to the question about requirements for insurance claim (refer toquestion No.3 of Module 1). All the AUTP stakeholders including extension officers, disease inspectors and other government officers should have the basic knowledge to promote AUTP effectively.

Question No.5 of Module 3 is one of the most difficult questions for the training participants. The correct answer rate for this question is less than 30% both in South Sulawesi and East Java. Particularly, it might be difficult for agricultural extension officers to answer this question because they do not involve in claim procedures. Yet, the officers in charge of AUTP socialization should be able to provide the correct information about insurance payout to farmers.

The results of the comprehension mini-tests reveal that the TOT participants could acquire AUTP knowledge through the TOT; yet the participants could still be improved their understanding of the AUTP activities.Conveying accurate information about AUTP is the first step to increasing the number of insured areas and farmers under the AUTP scheme. Preparing FAQs based on questions raised during the TOT might help improve understanding of the TOT participants toward AUTP program.

3) Discussions on AUTP Experience

The TOT participants shared their experiences in the AUTP activities with other participants during the TOT. This experience-sharing session was a good opportunity for the participants to learn the reality of AUTP activities in other areas. The participants shared the challenges and problems they faced in the AUTP activities. Some of the participants also shared how they solved the challenges and ideas for effective AUTP socialization. The discussion was based on the firsthand experience of the AUTP practitioners. For this reason, this session could be helpful to improve the AUTP operation in the future. The following is the summary of the experience-sharing session:

Table 2.2.5Discussion on AUTP Experience

Category	Main Points
Farmers' registration	√ Most farmers have objections to registering to become AUTP participants, they need evidence and confidence that if there is a Failure to Harvest, they will really get compensation. √ The registration process for insurance participants at the kecamatan level needs a high level of technicality related to the determination of the CPCL AUTP √ The payment of the premium for each farmer still relies on savings from the farmer groups. The awareness of each farmer to pay his own premium is still lacking.
AUTP socialization	√ Based on stories from farmers in other areas, that AUTP is complicated. The problem is, for example, the claim survey took too long, it was clear that the drought was evident, but it was claimed to have been exposed to herbicides, etc. √ Farmers are less interested in all types of insurance √ The implementation of insurance socialization is really needed by farmers because many farmers do not understand AUTP. √ There is a unique experience so that socialization is interesting so we can pay attention to the segment of the participants or audience. Because Lamongan Regency is a religious area (Islam), we joined the AUTP socialization with religious lectures and we are grateful that this is easier to understand. √ A comparative study was also held by visiting farmer groups whose AUTP management was good and by making these groups become resource persons during AUTP socialization events. √ Introducing the new AUTP program to reach farmers requires synergy between the district agriculture agency, sub-district agricultural extension officers and farmers. √ Registration of AUTP participants encountered a problem when farmers had to pay even though it was only 20% in the amount of IDR 36,000 / Ha. Farmers want it for free and do not want to pay a premium. √ Farmers are less responsive, less proactive, lack of understanding of AUTP as insurance to save farmers who fail crops due to floods, drought, and pests and diseases. √ Farmers think the time limit for survey claims is too longbecause it greatly affects the planting schedule for the next season. √ Difficulties related to invalid ID card numbers.

Claim procedure	√ Farmers wait too long for the claim survey from Jasindo, sometimes it exceeds the estimated time of the survey that we have submitted so that many farmers cannot wait for Jasindo officers so that physical evidence of crop failure is gone because the land has been replanted or planted other commodities because farmers are afraid to miss the time for the next planting period. √ The designation for claimable categories is not well understood by farmers. √ As an experience, during observation on the perimeter plot periodically and plants were found inundated for more than three days, the water did not recede and resulted in crop failure, as well as drought which resulted in unproductive plants and plants dying slowly, and the intensity of pest and disease attacks more than 75 percent, so it is entitled to submit an insurance claim. √ Jasindo staff has promised to carry out a claim survey and the farmers have been waiting by delaying land cultivation for the next season, apparently within 4 weeks after the claim submission was rejected on the grounds that the claim report was late. √ Sometimes the claims of Jasindo officers regarding data on hectares of paddy land change, so the farmer groups feel cheated, and the farmers feel disappointed. √ Often constrained by the 80% premium that has not been paid by the local government / Ministry of Agriculture so that it slows down the time for the claim disbursement. √ When there is a failure / pest attack / weather effect, the claim survey period is too long so farmers are impatient in reprocessing their paddy fields.

Source: JICA Consultant Team

There are 3 main topics for the AUTP experience sharing: 1) the farmers' registration process, 2) AUTP socialization and 3) the claim procedure. As for the farmers' registration process, one of the most common experiences of the participants is a lack of farmers' interest in the AUTP program. Some farmers still do not understand how AUTP works, and they are still skepticalabout whether they could receive the insurance payout if their crops are damaged. The lack of farmers' awareness of agricultural insurance is still a major challenge for the further expansion of AUTP.

One of the main challenges in AUTP socialization is the lack of coordination among the AUTP stakeholders. In fact, there are many stakeholders for the AUTP promotion such as agricultural officers, extension officers, disease inspectors, JASINDO staff and local farmers. It is necessary to coordinate all these stakeholders to implement the AUTP program effectively. A good example of coordination is that agricultural officers worked together with local religious leaders, and the involvement of the religious leaders could facilitate the AUTP socialization in some areas.

In addition, the TOT participants shared the case study for study tours. In some areas, agricultural officers took farmers' groups to other areas where farmers are active and understand the benefit of the AUTP program. Farmers are sometimes more likely to accept advice from other farmers than advice from governmental officers. Agricultural officers and extension officers could successfully create an interaction between farmers to promote AUTP. These examples could help the TOT participants to think about how they could improve their AUTP socialization activities.

The claim procedure is of the most discussed topics during the experience-sharing session. Most of the participants pointed out 2 things: 1) the claim process is too long and 2) the loss assessment is sometimes inappropriate. According to JASINDO, there is often a lack of documents or uncompleted information when farmers make a claim. JASINDO has to confirm missing information many times before they finalize the claim procedure. For this reason, the claim procedure takes a longer time than farmers

expected. Therefore, it is important for farmers to understand how to make a claim properly and what kind of information they have to attach to the claim document.

In addition, disease inspectors pointed out that it is not clear to them how to evaluate 75% of damage in the field. This might make confuse both loss adjusters and farmers. Eventually, farmer might lose their interest in the AUTP program. Farmers cannot trust the AUTP program because they are not sure when they can receive the payout. To avoid this situation in the future, it is important to standardize the loss assessment survey method, and it should be clarified in the guideline or any other public documents.

4) Action Plan Making

Action plan making is also a part of the program during the 1st TOT. The main purpose of the action plan making is to clarify what actions the TOT participants have to take after the TOT. There are two main activities: 1) extension of the TOT contents to other officers and 2) promotion of the AUTP socialization. The TOT participants were divided into several online groups based on the area, and they discussed action plans as group work.

The TOT participants discussed the target numbers of insured areas at kecamatan level. This is because most of the TOT participants are agricultural extension officers as well as diseases inspectors at the kecamatan level. In addition to the insured areas, the participants discussed the target numbers of trained officers. The participants, however, did not have enough time to develop their own action plans during the TOT program. Furthermore, the 1st TOT was organized online, and most of the participants were not familiar with the online group work. Therefore, the Project team would follow up on the details of their action plan contents after the TOT completion.

A sample action plan for Lemongan kabupaten in East Java is shown in the table below. This action plan includes a series of activities for the AUTP socialization such as coordination with relevant stakeholders, farmers' awareness creation and supports for the registration process. These are common AUTP activities in all the areas where the AUTP program was introduced. The action plan-making process helped the participants to recognize each step for the AUTP promotion. Also, it helped them to understand their own roles in a series of the AUTP activities. As a result, the action plan-making process could motivate the officers to engage in the AUTP activities.

Table 2.2.6 Action Plan Sample in East Java

Place: East Java, Lamongan kab, Kembangbahu kec

Period: Nov.2020 – Oct. 2021

Target: 50 farmers' groups/ 20 Ha

Activities	PIC	Time Plan	Tools and Materials	Purposes and Descriptions
Coordinating with the Coordinator of BPP, POPT, and Desa Regional PPL	Coordinator of BPP and PPL	November 2020	AUTP Manual / Rainfall Guidelines for the last 2 years	Determine the map of areas that have a High and Routine disaster level
Socialization at the BPP Kembangbahu Level	Trainer, KUPT, BPP and PPL Coordinator	November 2020 February 2021	AUTP Manual Brochures, Posters AUTP Socialization Material Slide	Socialization at the BPP Kembangbahu level so that all PPLs understand the purpose and benefits of AUTP

Activities	PIC	Time Plan	Tools and Materials	Purposes and Descriptions
Coordination and outreach with the Camat and all Desa Heads in all Kecamatan Kembangbahu	Trainer, KUPT, BPP and PPL Coordinator	January 2021 April 2021	AUTP Manual Brochures, Posters AUTP Socialization Material Slide	Socialization at the Kembang-bahu Kecamatan level involv-ing village heads from all over the district. Kembangbahu by utilizing the time of routine Kecamatan meetings (hitching a routine agenda of Kecamatan meetings)
Hold meetings at the Desa Level / Gapoktan or Poktan	PPL target area and BPP Team	January 2021	AUTP Manual Brochures, Posters AUTP Socialization Material Slide	Main actors / farmers understand the purpose and benefits of AUTP well, so they are interested in joining and registering for the AUTP program.
Coordination with Jasindo	BPP Team	February 2021	AUTP Manual Book	Insurance Form
AUTP Registra-tion Assistance	BPP Team	February 2021 October 2021	AUTP registration format manual	Target of approximately 20 Ha per poktan (approximately 50 farmers)
Evaluation	BPP Team	February 2021 October 2021	AUTP Manual Book	Evaluate the obstacles and obstacles faced and solve the problems / solutions.

Source: JICA CDIAI 1st TOT in November 2020

Table 2.2.7Action Plan Sample in South Sulawesi

Place: South Sulawesi, Bone kab, Bontocani kec

Period: Nov.2020 – Oct. 2021

Target: 2 Gapoktan, 22 farmers' groups

Activities	PIC	Time Plan	Tools and Materials	Purposes and Descriptions
Socialization at the BPP and Village levels	Andi Jusman, SP	November 2020	AUTP Introduction Module	Delivering the results of TOT AUTP activities to the coordinator and the BPP at Kecamatan Bonto Cani Extension officer
Socialization at the farmer group level	Andi Jusman, SP	November 2020	TOT Handbook / AUTP Guideline	20 people - 25 people
Coordination to the Head of Kecamatan Bonto Cani and Head of Villages.	Extention Officer	November 2020	AUTP Premium As-sistance Guidelines and Brochures	Socialization at the Kecamatan level was successful until the village head learned about the AUTP program

Activities	PIC	Time Plan	Tools and Materials	Purposes and Descriptions
Meeting with farmer group representatives	BPP tem ini Kecamatan Bonto Cani	November 2020 March 2021	Brochures and AUTP guideline	Each of the representatives of 22 farmer groups
AUTP registration	BPP tema at Kecmatan Bonto Cani	December 2020 April 2021	manual book of AUTP registration format	2 Farmers group

Source: JICA CDIAI 1st TOT in November 2020

The TOT participants are expected to be trainers for other officers. It is important to follow up on the progress of their action plans and confirm how many times they conduct training after the TOT. For example, the participants from South Sulawesi set a target for providing training to around 24 officers. The Project team would monitor the progress of these action plans through WhatsApp groups and try to get regional and provincial agricultural officers involved in this monitoring activity.

2.2.3 Feedback from the Participants

A feedback survey was carried out at the end of the TOT to improve the TOT contents in the future. The survey result shows that 67% of the participants in East Java answered either "very satisfied" or "satisfied" with the overall TOT program and 87% in South Sulawesi. The participants in South Sulawesi are more satisfied with the TOT than the participants in East Java. This is partly because the contents of the TOT focus on basic knowledge of the AUTP program.

In East Java, they have been involved in the AUTP program actively. People in East Java have a better understanding about the AUTP program than people in South Sulawesi. Most of the training topics are not new to participants from East Java. On the other hand, the AUTP program is still new to people in South Sulawesi, and they have not had many chances to join the training about AUTP before. Therefore, there are fewer "satisfied" participants in East Java compared to those in South Sulawesi.

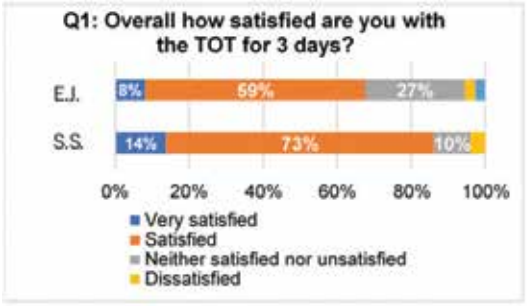


Figure 2.2.4 Overall Satisfaction

Source: JICA Consultant Team

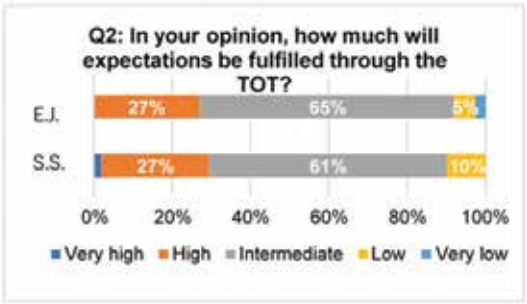


Figure 2.2.5 Fulfillment of Expectations

Source: JICA Consultant Team

Approximately 30% of the total participants responded that their expectations were fulfilled. The most frequent answers, however, are "Intermediate". This indicates that the TOT contents could be improved in the 2nd and 3rd TOT. Particularly, the contents and materials of the loss adjustment survey should be reviewed to improve trainees' satisfaction. Also, it might be considered to conduct a training needs analysis. Particularly, SIAP/PROTAN could be introduced more specifically and practically.

It was expected that internet connection might be the biggest problem for the participants. The feedback survey indicates that 35% of the participants in East Java and 43% of those in South Sulawesi mentioned that their internet connection was unstable and sometimes this hindered them from joining the TOT. Also, 60-70% of the participants responded that their internet connection was slow; yet they were still able to join online TOT.

One of the most common requests from the participants is that the TOT program should include more exercises and demonstrations. 40% of East Java and 50% of South Sulawesi participants pointed out this aspect in the feedback survey. Also, most of the participants mentioned that the time was too short to complete the group work during the TOT. All these results indicate that the demand for practical training such as groups works, exercises and simulations is high. The results of the feedback survey would be considered for the next TOT program.

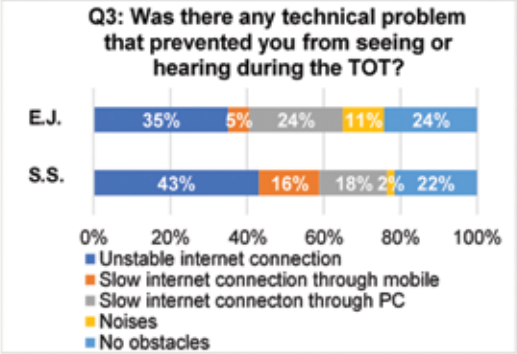


Figure 2.2.6 Technical Problems for TOT

Source: JICA Consultant Team

Figure 2.2.7 Improvements for the Future TOT

Source: JICA Consultant Team

2.3 The Second TOT (August 2021)

2.3.1 Outline of the Second TOT in August 2021

The 2nd of Trainers (TOT) was held in August 2021. This 2nd TOT was organized as a 2-day training program held online with zoom (a cloud-based video conferencing service) throughout the program due to the COVID-19 pandemic. The table below shows the outline of the 2nd TOT:

Table 2.3.1 Outline of the 2nd TOT

Item	Sulawesi Selatan	Jawa Timur
Date	August 3 and 4 in 2021 (2-day)	August 9 and 10 in 2021 (2-day)
No. of Participants	Aug. 3rd: 39 Aug 4th: 32	Aug.9th: 30 Aug. 10th: 36
Kabupaten	2	2
No. of Kecamatan	10	10
Style	Online training via zoom	
Target	Agricultural DINAS officers, extension officers, pest and dieses inspectors, JASINDO staff	

Source: JICA Consultant Team

Although the 2nd TOT program was shortened from 3-day training to 2-day training, the training content was almost the same as the training content of the 1st TOT program; namely, 1) AUTP introduction, 2) AUTP promotion including action plan making, 3) loss assessment survey and claim procedure, and 4) introduction of SIAP and PROTAN.The TOT program is the same content for both provinces as shown in the table below:

Table 2.3.2 TOT Program (2nd TOT)

Day	Time	Contents	Lecturer	Material
Day 1	AM	**[Module 1]** √ Agricultural risk management √ Introduction of AUTP **[Module 2]** √ Socialization of AUTP √ Action plan making	MOA Team	PPT Group work
	PM	**[Module 3]** √ Loss assessment survey √ Case studies/ lessons learnt	JASINDO staff	PPT Group work
Day 2	Pagi	**[Module 4]** √ Introduction of SIAP	JASINDO staff	PPT Group work
	Sore	**[Module 4]** √ Introduction of PROTAN	JASINDO staff	PPT/Video

Source: JICA Consultant Team

The main format for the TOT materials is Microsoft PowerPoint (PPT). In addition to the PPT materials, the video materials were used for SIAP and PROTAN introduction in the Module 4. These video materials were prepared by JASINDO to promote SIAP and PROTAN for their own purpose. All the TOT materials are stored online and the training participants could access these materials anytime even after the completion of the TOT program.

The 2ndTOT targeted 2 kabupatens from South Sulawesi and East Java provinces, respectively. The Provincial Agricultural DINAS selected these 2 kabupatens. These kabupatens are different kabupatens from the 1st TOT. Agricultural DINAS selected 5 kecamatans in each kabupaten. In total, the targets were 20 kecamatans in each province; namely, 10 kecamatans were selected from 2 kabupatens in South Sulawesi and 10 kecamatans were selected from 2 kabupatens in East Java. These target kabupatens are considered the prioritized areas for the AUTP promotion. The TOT participants are agricultural officers at kabupaten offices, extension officers at kecamatan level, pests and diseases inspectors and JASINDO staff.

According to the results of the pre-questionnaire survey for the TOT participants (Figure 2.3.1), 89% of the TOT participants in East Java have experienced in AUTP activities and 74% in South Sulawesi. Particularly, most of them have been involved in AUTP socialization activities. This is because the majority of the participants were agricultural extension officers so their experience is concentrated on the socialization activities. In other words, the experience of other AUTP activities such as the loss adjustment surveys and claim procedures are rather limited.

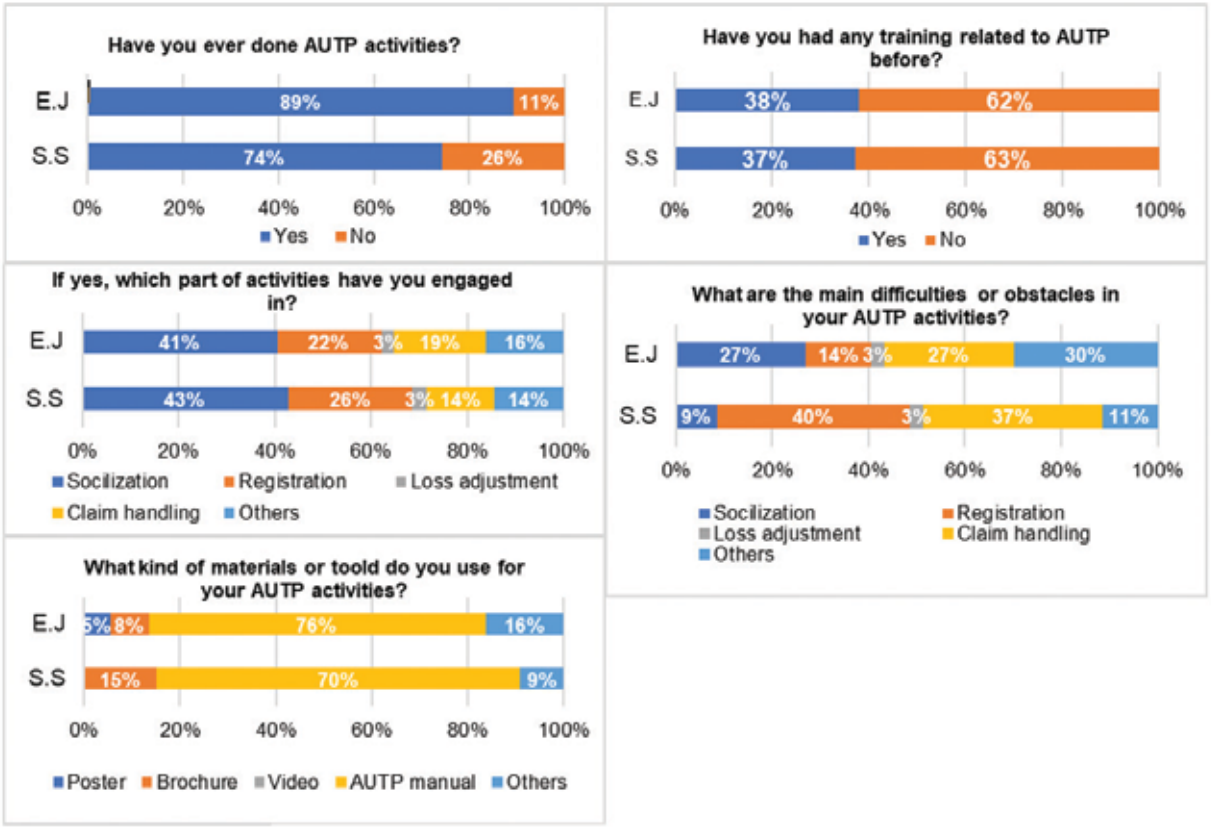


Figure 2.3.1 AUTP Experience of TOT participants

Source: JICA Consultant team

One of the differences between East Java and South Sulawesi is the main difficulties in the AUTP activities. There is no dominant answer in East Java. In fact, there are 30% of the participants for socialization, claim handling and others respectively. Whereas around 40% of the participants answered that registration is the main difficulty in their activities. The TOT provided an opportunity for the participants to discuss their experiences and lessons. It is expected that these difficulties were shared and how to be solved through the TOT program.

2.3.2 TOT Implementation Result

1) Achievement of the 1st TOT

The main purpose of the TOT is to strengthen capacity of the AUTP stakeholders. The following 6 specific objectives were set up to achieve the TOT purpose:

Table 2.3.3 TOT Objectives

No.	Objectives	Related module
1	Internalize the concept of agricultural insurance	Module 1
2	Acquire basic knowledge of AUTP and its operation	Module 1
3	Acquire basic skills for AUTP socialization and implementation	Module 2
4	Prepare action plans for AUTP promotion	Module 2
5	Acquire skills and knowledge of loss claim procedure	Module 3
6	Acquire basic knowledge of SIAP	Module 4

The TOT achievement was measured by self-evaluation on understanding of the training contents. The self-evaluation was carried out at the end of each TOT module. The following table shows the summary of the self-evaluation results:

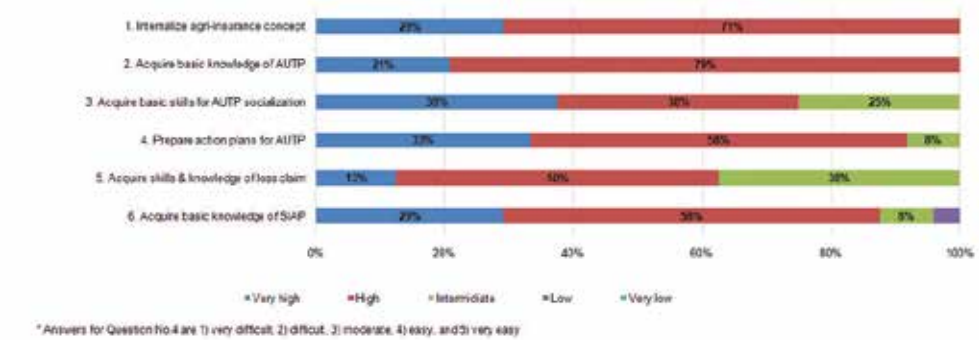


Figure 2.3.2 Achievement of 2ndTOT Objectives in South Sulawesi

Source: JICA Consultant Team

The self-evaluation result in South Sulawesi (Figure 2.3.2) shows that skill acquisition in the AUTP socialization is high compared to the other topics. Also, 29% of the participants responded "Very high" for the acquisition of agricultural insurance concept and basic knowledge of SIAP respectively. On the other hand, there are only 13% of the participants answered with "Very high" for knowledge of the loss claim. This result indicates that the training program for the loss claim could be improved to increase the level of skill acquisition in the future.

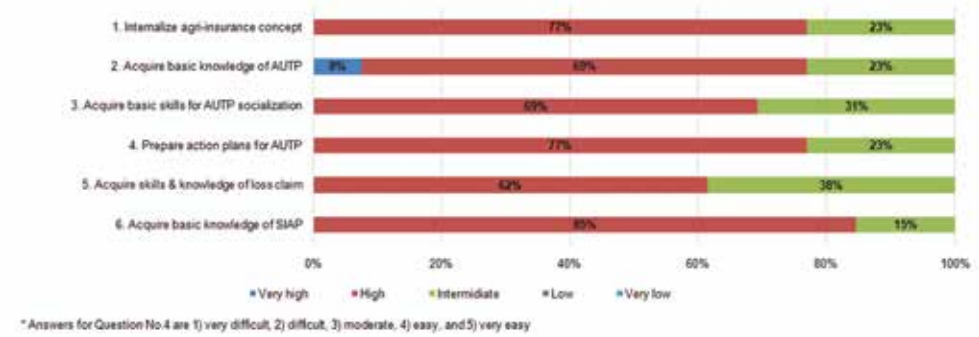


Figure 2.3.3 Achievement of 2ndTOT Objectives in East Java

Source: JICA Consultant Team

The self-evaluation result in East Java (Figure 2.3.3) is almost the same trend as the result in South Sulawesi. Skill acquisition level is rather high in agricultural insurance concept, AUTP socialization and basic knowledge of SIAP. It is noted that the total number of respondents is only 13 participants. This is because there was an internet connection problem so many of the participants could not respond to the questions about the achievement of the TOT objectives. Yet, the results show almost the same trend as the results of South Sulawesi.

Similarly, in South Sulawesi, skill acquisition in the loss assessment is still limitedin East Java. This result indicates that strengthening the capacity of loss assessment is key to the further promotion of AUTP. The training materials and the guidelines should also be upgraded to strengthen the capacity of these aspects. The TOT program and materials would be revised for the 2nd TOT reflecting the lessons learnedfrom the 1st TOT result.

2) Understanding of the TOT Contents

Comprehension mini-tests were carried out to check the participants' understanding of the TOT contents at the end of each training module. The comprehension mini-tests were carried out through "Google Form" consisting of 3-5 questions for each module. Most of the questions are basic ones to see if the participants understand the contents of each module. The following tables summarize the results of the comprehension mini-tests:

Table 2.3.4 Results of the Comprehension Mini Tests

Module 1: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Jawa
1. The base of law in implementing agriculture insurance in Indonesia is:	a. Regulation No 15 in 2011 b. Regulation No 19 in 2013 c. Regulation No 9 in 2013 d. Regulation No 15 in 2011	b	87%	77%
2. Minister of Agriculture's Decree regarding Agriculture Insurance Facilitation is the decree number:	a. No 40 in 2015 b. No 41 in 2015 c. No 40 in 2014 d. No 41 in 2014	a	87%	70%
3. Compensation is given to the insured/farmers if there is flood, draught, and/or pest-disease attack causing rice crop damage with conditioned situation such as:	a. 10 days past of planting time b. 30 days past of sowing (tabela technology) c. Damage intensity reaches >=75% and damaged area reaches >=75% at each natural plot d. All correct	d	81%	80%
4. Sum insured amount for AUTP claim, except:	a. 6 million per ha b. 12 million for 2 ha c. 3 million for half hectare d. Promotional multiplied by 12 million	d	52%	30%
5. Which pest is a guaranteed risk under the AUTP program?	a. Wind b. Elephant c. Bird d. Planthopper	d	97%	93%

Module 2: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. The criteria of AUTP participants are:	a. Individual farmers with max. 2 ha of field for each registration per cropping season b. Farmers within a farming group with max. 2 ha of field for each registration per cropping season c. Individual farmers with max. 3 ha of field for each registration per cropping season d. Farmers within a farming group with max. 3 ha of field for each registration per cropping season	b	100%	90%
2. AUTP Premium Aid given by the government is for:	a. IDR 180,000/ha/CS b. IDR 36,000/ha/CS c. IDR 144,000/ha/CS d. IDR 160,000/ha/CS	c	57%	71%
3. One of the criteria for the location of land that cannot join the AUTP:	a. Tidal swamp paddy field without water system b. Rainfed paddy field with available water sources c. Peatlands with water source(s) d. Paddy field with technical irrigation, half-technical irrigation, village irrigation, and simple irrigation	a	86%	74%

Module 3: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. Which of the followings is the correct application used to make an easier AUTP implementation in 2020?	a. SIAP b. PROTAN c. All correct	a	35%	69%
2. During AUTP claim survey with an insurance officer, the following parties should be present at the location except . . .	a. Extension workers b. Pest-disease officer c. Head of Dinas d. Insurance participant/ farmer/farming group	c	97%	100%

3. Which of the following tools that you think is most accurate to measure total damage of AUTP insured area?	a. Roll/electric meter b. GPS c. Farmer's/farming group's estimation	b	94%	81%
4. Claim approval is given by the insurance company within 14 working days according to which following condition?	a. After claim is reported to insurance company b. After Form 7 is signed by all related parties c. After Form 7 is correctly filled, signed, and uploaded to SIAP application	c	90%	73%
5. In your opinion, which form of legality of AUTP is considered the most complete and valid at the time of filing a claim that can be used as the basis for insurance companies to pay claims to AUTP participants?	a. Proof of self-help premium payment (premium 20%) b. DPD Decree Determination of participants by the Regency / City Office c. Decree of 80% premium distribution from the Ministry of Agriculture	c	6%	27%

Module 4: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. All of the stated natural disasters below are included in the insured risk by AUTP policy except . . .	a. Flood b. Draught c. Landslide	c	100%	100%
2. Maximum of insured land allowed for AUTP program is for:	a. 2 ha b. 3 ha c. 5 ha	a	100%	100%
3. All farmers are allowed to be AUTP participants except . . .	a. Land-owning farmers b. Working/labor farmer c. Foreign farmers	c	100%	100%
4. These are the use of GPS except . . .	a. Telling coordinate b. Measuring total area c. Communication	c	97%	81%
5. How long does the AUTP policy apply?	a. Since planting to harvest time (estimation) b. A lifetime c. During claim	a	100%	100%

Source: JICA Consultant Team

The results of the comprehension mini-tests indicate that the participants have basic knowledge of the AUTP program such as qualifications and risk coverage. The basic knowledge of the AUTP program has equipped the participants. This means that even onlinetraining could contribute to increasing at least the participants' basic understanding of AUTP. The correct answer rate for some basic questions such as the amount of the premium subsidy is still low. These topics particularly should be raised in the AUTP training in the future.

Question No.5 of Module 3 is one of the most difficult questions for the training participants. This is the same result as the 1st TOT. The correct answer rate for this question is less than 30% in East Java and even less than 10% in South Sulawesi. Particularly, it might be difficult for agricultural extension officers to answer this question because they do not involve in claim procedures. Yet, the officers in charge of AUTP socialization should be able to provide the correct information about insurance payout to farmers.

The results of the comprehension mini-tests reveal that the TOT participants could acquire AUTP knowledge through the TOT; yet the participants could still be improved their understanding of the AUTP activities. Conveying accurate information about AUTP is the first step to increasing the number of insured areas and farmers under the AUTP scheme. Preparing FAQs based on questions raised during the TOT might help improve the understanding of the TOT participants toward the AUTP program.

3) Discussions on AUTP Experience

The TOT participants shared their experience in the AUTP activities with other participants during the TOT. This experience-sharing session was a good opportunity for the participants to learn the reality of the AUTP activities in other areas. The following is the summary of the experience-sharing session:

Table 2.3.5 Discussion on AUTP Experience

Category	Main Points
Subsidized premiums	√ The only way the extension officers and regional agriculture office manage to reach the participation target and invite farmers to register for AUTP is by handling the 20% individual premium, which actually must be paid by the farmers, from their budget plan. √ By using the regional government or office's budget, the farmers are free from paying any premium and willing to be registered as AUTP participants. This 'solution' could be harmful as the farmers do not get the sense of being responsible of their own land and crop by trying to protect it using self-paid insurance. √ The farmers will be reluctant to join AUTP as they are not so willing to pay. Some TOT participants asked whether the ministry or central government could give 100% premium subsidy or additional amount for the subsidy. √ If there is any possibility to increase the quotas, then the ministry will try. However, the focus is to fill the quotas first. Still, there will be no way for the ministry to refuse the ones who already signed up and pay through SIAP app so it is better to sign and pay early to secure the subsidy.

AUTP socialization	√ There has not been any specific/main event for AUTP promotion only, thus they do not feel the sense of importance for the program. √ There has been no support from MOA nor Jasindo for the promotional activities. A lot of participants asked for more support in the form of assistance when doing on-site promotion, promotional budget, and updated promotional tools. √ MOA responded that unfortunately, they could not give any operational budget more than 10% of the premium subsidy—this is regulated by law—and thus the budget is limited. √ MOA could only give around IDR 20-30 million for several districts. For leaflet, brochure, and updated posters it is possible to distribute and will be done so as soon as possible.
Claim procedure	√ It is widely known that the payout process can take a lot of time. Most of the participants regret that they could not give any reassurance for farmers that the payout will be given at a specific time. √ The claim and payout process is too complicated and too long which causes the lack of interest for farmers to join AUTP. Several cases that were brought to the floor were a) claim not paid, b) long payout time, and c) cannot claim after twice claiming on previous insurance periods. √ Jasindo emphasized the importance of making a claim report via SIAP application on time with the complete required documents. The claim process has a designated reporting time which is max. 6 days after the damage occurred. If the claim is reported after more than 6 days, it cannot be processed. √ If the extension officers only make a claim notice via phone calls or WhatsApp message, it cannot be considered as a claim report since it must be via SIAP application—following the AUTP manual guideline. If there is no claim report or notice via SIAP application, Jasindo cannot give any payout to the farmers. √ The length of claim payout is also affected by the complete submission of required documents for min. 24 working days. If there are any missing documents, signs, or stamps on the uploaded documents, during the verification process, Jasindo will give notice to the reporting extension officers or sub-district office account to re-upload or re-submit the correct document(s). √ It is essential to have a strong coordination and responsibility regarding claim especially completing document. It is not entirely on the insurance company, but extension officers must also reflect whether they have fulfilled all parts for submission. √ It is stated in the manual guideline that if there is continuous claim for the same area and same farmer without any mitigation or countermeasure for the previous damage, the farmer cannot participate for AUTP and, of course, cannot claim. √ A new regulation in 2021 is that the limitation has been increased into three (3x) claim for every participating farmer. If they have claimed thrice without damage control or mitigation, they cannot participate again. When there has been damage control, the farmer and extension officer can notify Jasindo with proof and legitimate statement to be re-processed for AUTP registration.

Others	√ Not all extension officers are familiar with digital tools, computer, and technology. Some extension offices have a designated staff for AUTP data input, but the aim of the training is to make all participants able to utilize SIAP application. √ The extension officers must print out, sign, scan, and upload the scanned document into SIAP application. They deemed that this step is too long and complicated with the requirement to sign and scan. If possible, perhaps Jasindo could develop an easier way to upload prove of legalized documents. √ Since the officers are not all familiar with digital technology, Jasindo showed an alternative of using a PC or laptop application which allows digital signing. Even though it serves as an alternative, the application needs to be downloaded and installed first before use. Moreover, the extension officer must practice and familiarize themselves with the application to be able to use it effectively. √ There was also a concern regarding the need to use internet to utilize SIAP application. There is a possibility that in some areas, the signal or internet coverage is not good, thus making it hard for extension officers to access SIAP web application. When a claim needs to be reported, extension officers cannot report immediately via the application. AS a solution, Jasindo explained that extension officers may give an initial claim report through phone call, text message (Short Messaging Service/SMS), WhatsApp chat, or email. After that, they are given 6 to 7-day period to submit the claim report to SIAP application when they are in an area with good internet connection. √ They can also ask for help to other extension officers located in an area with good internet reception or to the district agricultural office. Therefore, the initial claim report can be made through phone call or text, but it must be followed-up with an official report through SIAP application within 7 working days.

Source: JICA Consultant Team

There are 4 main topics for the AUTP experience sharing: 1) Subsidized premiums, 2) AUTP socialization, 3) Claim procedure and 4) Others. As for thesubsidized premiums, some farmers are not willing to pay the premiums. Particularly, the regional government paid the remaining 20% of the premium instead of the farmers, and these farmers were reluctant to pay the premium from their pocket. Some of the TOT participants pointed out that providing a 100% subsidy could be harmful, however, this is the most effective way to achieve the target.

One of the main challenges in AUTP socialization is the lack of budget for conducting the socialization activities. Most of the TOT participants think that they need more socialization events and updated socialization tools. In other words, this situation indicates that farmers' awareness of agricultural insurance is still limited so it is still necessary to huge investments in creating awareness of farmers toward AUTP.

The claim procedure is of the most discussed topics during the experience-sharing session. Most of the participants pointed out that the claim process is too long. According to JASINDO, there is often a lack of documents or uncompleted information when farmers make a claim. JASINDO has to confirm missing information many times before they finalize the claim procedure. For this reason, the claim procedure takes a longer time than farmers expected. Therefore, it is important for farmers to understand how to make a claim properly and what kind of information they have to attach to the claim document.

4) Action Plan Making

Action plan-making is also a part of the program during the 2nd TOT. The action plan format is the same as the 1st TOT. The main purpose of the action plan making is to clarify what actions the TOT participants have to take after the TOT. There are two main activities: 1) extension of the TOT contents to other officers and 2) promotion of the AUTP socialization. The TOT participants were divided into several online groups based on the area, and they discussed action plans as group work.

The TOT participants discussed the target numbers of insured areas at the kecamatan level. This is because most of the TOT participants are agricultural extension officers as well as diseases inspectors at kecamatan level. In addition to the insured areas, the participants discussed the target numbers of trained officers. However, most of the participants did not have enough time to develop their action plans during the TOT program. The 2nd TOT was organized online, and most of the participants were not familiar with the online group work. Therefore, the Project team would follow up on the details of their action plan contents after the TOT completion.

2.3.3 Feedback from the Participants

A feedback survey was carried out at the end of the TOT to improve the TOT contents in the future. The survey result shows that 77% of the participants in East Java answered either "very satisfied" or "satisfied" with the overall TOT program and 87% in South Sulawesi. The participants in South Sulawesi are more satisfied with the TOT than the participants in East Java.

In East Java, they have been involved in the AUTP program actively. People in East Java have a better understanding of the AUTP program than people in South Sulawesi. Most of the training topics are not new to participants from East Java. On the other hand, the AUTP program is still new to people in South Sulawesi, and they have not had many chances to join the training about AUTP before. Therefore, there are fewer "very satisfied" participants in East Java compared to these in South Sulawesi.

Approximately 62% of the total participants in East Java responded that their expectations were fulfilled. In South Sulawesi, approximately 88% of the participants answered that they fulfilled their expectations either "Very high" or "Hight". This result indicates that the TOT contents matched with farmers' expectations. The 2nd TOT focused on more practical aspects of AUTP and was shortened to 2-day training. These changes seem to contribute to the improvement of the fulfillment of their expectations.

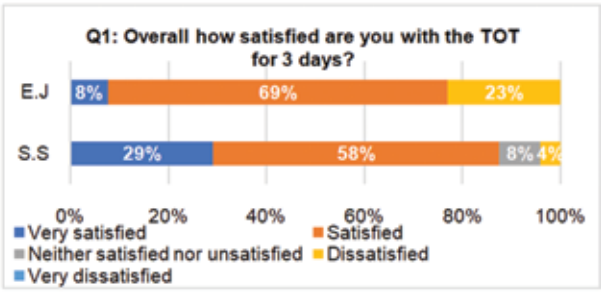


Figure 2.3.4 Overall Satisfaction

Source: JICA Consultant Team

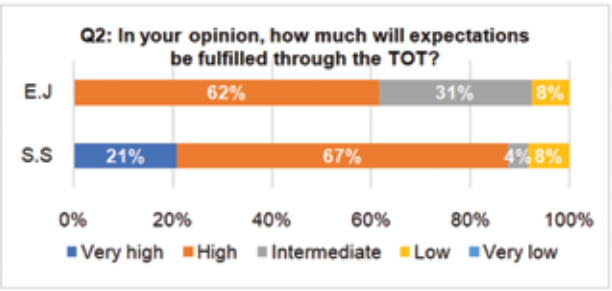


Figure 2.3.5 Fulfillment of Expectations

Source: JICA Consultant Team

It was expected that internet connection might be the biggest problem for the participants. The feedback survey indicates that 83% of the participants in East Java and 78% of those in South Sulawesi mentioned that their internet connection was unstable and sometimes this hindered them from joining the TOT. Also, 30% of the participants in East Java and 81% of the participants in South Sulawesi responded that they wanted to spend more time on simulation related to training implementation. It might be an idea to increase exercise or simulation the next time.

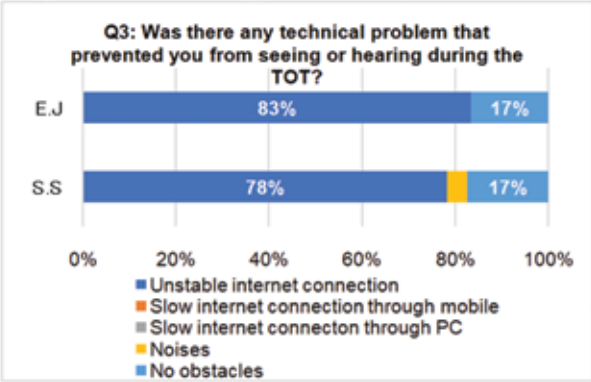


Figure 2.3.6 Technical Problems for TOT

Source: JICA Consultant Team

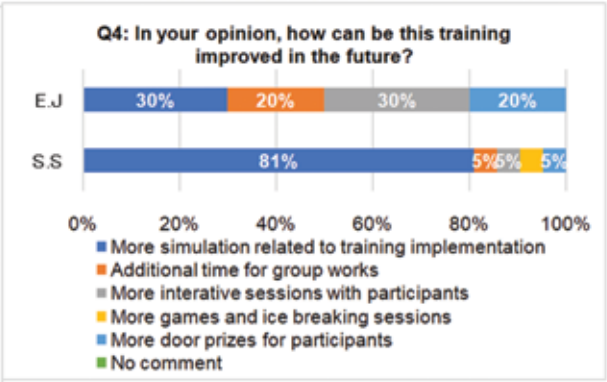


Figure 2.3.7 Improvements for the Future TOT

Source: JICA Consultant Team

2.4 The Third TOT (March 2022)

2.4.1 Outline of the Third TOT in March 2022

The 3rdof Trainers (TOT) was held in March 2022. This 3rdTOT was organized as a 2-day training program at BBPP Batangkaluku, Gowa in South Sulawesi and BBPP Ketindan, Malang in East Java. The table below shows the outline of the 3rdTOT:

Table 2.4.1 Outline of the 3rd TOT

Item	South Sulawesi	East Java
Date	March 30 and 31, 2022 (2-day)	March 21 and 22, 2022 (2-day)
No. of Participants	Mar 30th:53 Mar 31st: 53	Mar 21st: 50 Mar 22nd: 50
Kabupaten	2	2
No. of Kecamatan	10	10
Style	Off-line training at BBPP	
Target	Agricultural DINAS officers, extension officers, pest and dieses inspectors, JASINDO staff and Widyaiswara	

Source: JICA Consultant Team

Unlike the previous 1st and 2nd TOT, this 3rd TOT was held as off-line training at BBPP in South Sulawesi and East Java respectively. In this 3rd TOT, widyaiswara, master trainers at BBPP, were invited to the TOT since widyaiswara could be trainers of AUTP in the future. Although the training modality is different from the 1st and 2nd TOT, the training content was almost the same as the training content of the previous TOT programs; namely 1) AUTP introduction, 2) AUTP promotion including action plan making, 3) loss assessment survey and claim procedure, and 4) introduction of SIAP and PROTAN.

Table 2.4.2 TOT Program (3rdTOT)

Day	Time	Contents	Lecturer	Material
Day 1	AM	**[Module 1]** √ Agricultural risk management √ Introduction of AUTP **[Module 2]** √ Socialization of AUTP √ Action plan making	MOA Team	PPT Group work
	PM	**[Module 3]** √ Loss assessment survey √ Case studies/ lessons learnt	JASINDO staff	PPT Kerja kelompok
Hari 2	AM	**[Module 4]** √ Introduction of SIAP	JASINDO staff	PPT Kerja kelompok
	PM	**[Module 4]** √ Introduction of PROTAN	JASINDO staff	PPT/Video

Source: JICA Consultant Team

Before the main TOT event started, the Team invited the Widyaiswara from BBPP Batangkaluku and BBPP Ketindan to attend a Pre-TOT Session. The pre-TOT session was held to introduce the Project team to the Widyaiswara who would assist participants during the main TOT, as well as relaying knowledge on how to conduct the TOT and assist participants during action plan-making and SIAP application simulation. All that technicality needed to be applied to broaden the spread of knowledge regarding agricultural insurance or AUTP. The Widyaiswara welcomed the Team and was responsive when the modules were shared with them.

The 3rdTOT targeted 2 kabupatens from South Sulawesi and East Java provinces, respectively. The Provincial Agricultural DINAS selected these 2 kabupatens. These kabupatens are different kabupatens from the 1stand 2ndTOT. Agricultural DINAS selected 5 kecamatans in each kabupaten. In total, the targets were 20 kecamatans in each province; namely, 10 kecamatans were selected from 2 kabupatens in South Sulawesi and 10 kecamatans were selected from 2 kabupatens in East Java. These target kabupatens are considered the prioritized areas for the AUTP promotion. The TOT participants are agricultural officers at kabupaten offices, extension officers at kecamatan level, pests and diseases inspectors and JASINDO staff.

The main format for the TOT materials is Microsoft PowerPoint (PPT). In addition to the PPT materials, the video materials were used for SIAP and PROTAN introduction in Module 4. These video materials were prepared by JASINDO to promote SIAP and PROTAN for their own purpose. All the TOT materials are stored online and the training participants could access these materials anytime even after the completion of the TOT program.

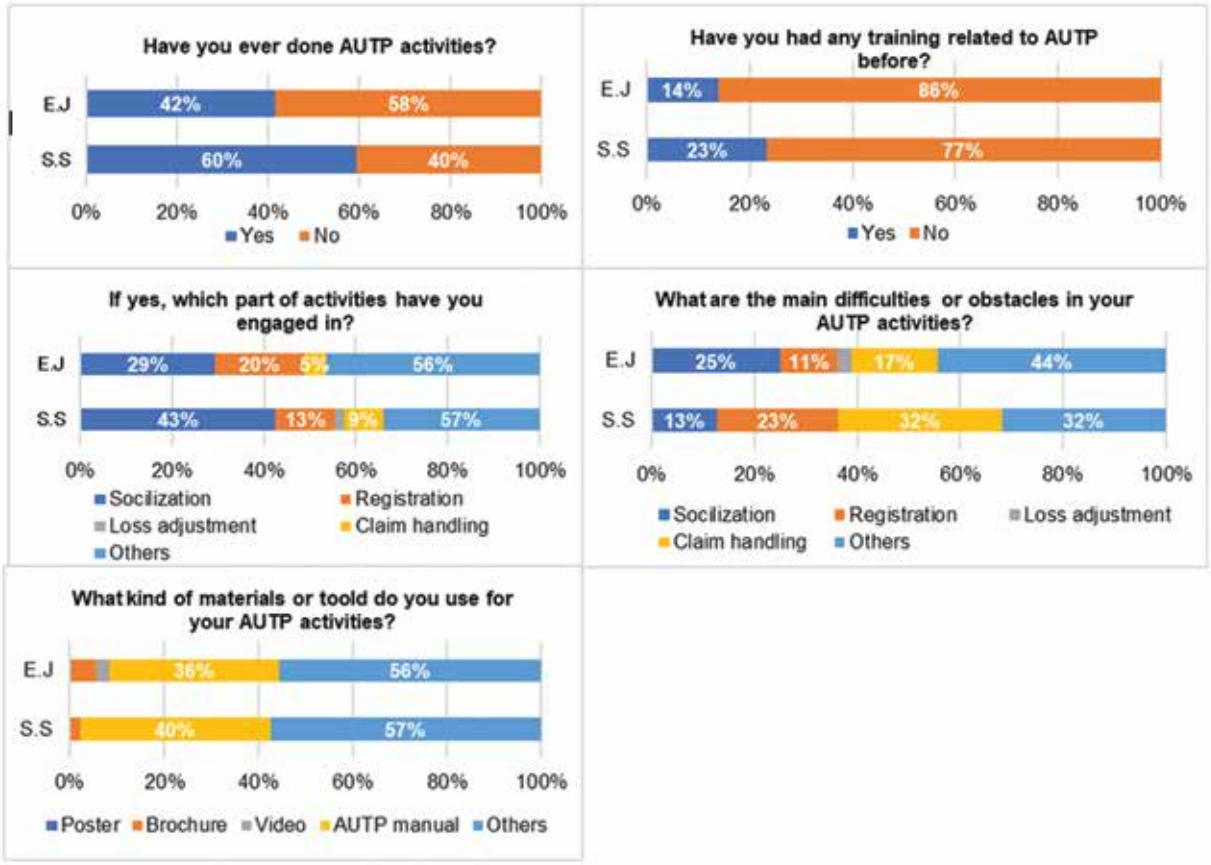


Figure 2.4.1 AUTP Experience of TOT participants

Source: JICA Consultant team

According to the results of the pre-questionnaire survey for the TOT participants (Figure 2.4.1), 42% of the TOT participants in East Java have experience in AUTP activities and 60% in South Sulawesi. This result is lower than that of the 1st and 2nd TOT participants. The participants of the 3rd TOT have limited involvement in AUTP. Therefore, more than half of the participants answered "Others" to the questions related to AUTP engagement and AUTP tools.

In addition, 86% of the participants in East Java has never had any training about AUTP and 77% of the participants in South Sulawesi have never had training about AUTP. This TOT was a good opportunity for the TOT participants to learn basic knowledge about agricultural insurance and AUTP. This offline 3rd TOT was particularly suitable for these inexperienced officers in AUTP. This is because main feedback of the 1st and 2nd TOT was that the TOT should be organized offline to learn more effectively.

2.4.2 TOT Implementation Result

1) Achievement of the 1st TOT

The main purpose of the TOT is to strengthen capacity of the AUTP stakeholders. The following 6 specific objectives were set up to achieve the TOT purpose:

Table 2.4.3 TOT Objectives

No.	Objectives	Related module
1	Internalize the concept of agricultural insurance	Module 1
2	Acquire basic knowledge of AUTP and its operation	Module 1
3	Acquire basic skills for AUTP socialization and implementation	Module 2
4	Prepare action plans for AUTP promotion	Module 2
5	Acquire skills and knowledge of loss claim procedure	Module 3
6	Acquire basic knowledge of SIAP	Module 4

The TOT achievement was measured by self-evaluation on understanding of the training contents. The self-evaluation was carried out at the end of each TOT module. The following table shows the summary of the self-evaluation results:

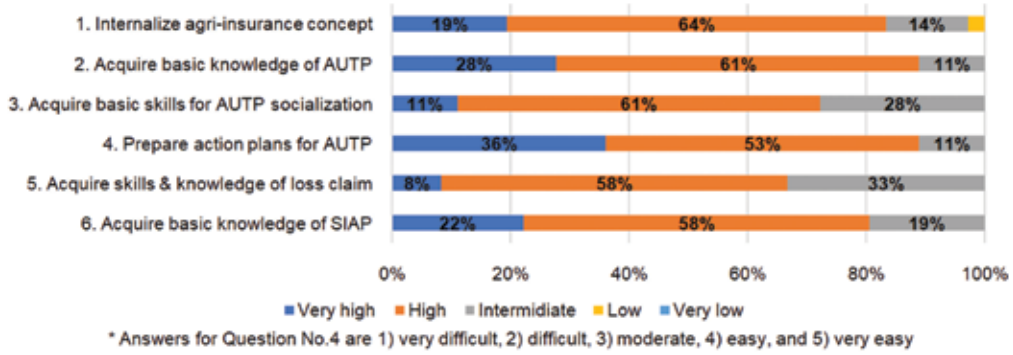


Figure 2.4.2 Achievement of 3rdTOT Objectives in South Sulawesi

Source: JICA Consultant Team

The self-evaluation result in South Sulawesi (Figure 2.4.2) shows that skill acquisition in preparation for action plans and basic knowledge of AUTP is high compared to other topics. This is because action plan-making was carried out as group work. They could discuss face-to-face and interactively prepare action plans. Thus, the skill acquisition of action plan-making becomes high. In fact, the skill acquisition of action plan-making in the 1st and 2nd TOT was not so high because they did action-making exercises on-line.

On the other hand, the skill acquisition for the loss claim is still limited. This is the same trend as the 1st and 2nd TOT. Only 8% of the participants answered "Very high" and 33% of the participants answered "Intermediate". This result indicates that the even offline training program could be improved for loss claim topics. It could be an idea to do practical exercises of loss assessment in the field in the future.

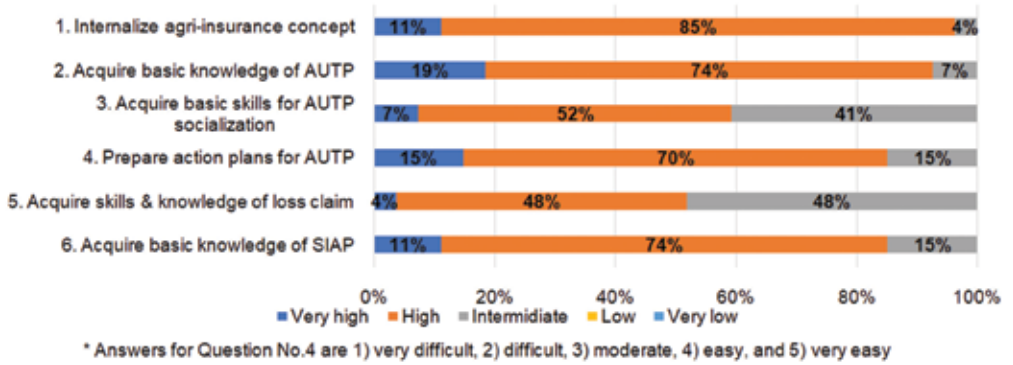


Figure 2.4.3 Achievement of 3rdTOT Objectives in East Java

Source: JICA Consultant Team

The self-evaluation result in East Java (Figure 2.4.3) is almost the same trend as the result in South Sulawesi. Skill acquisition level is rather high in action plan making and basic knowledge of AUTP. Particularly, more than 85% of the participants responded as "Very high" or "High" to the skill acquisition of the agricultural concept, basic knowledge of AUTP, action plan making and basic knowledge of SIAP. As shown in 2.4.1, most of the participants have never joined the training and their AUTP experience is limited. Thus, training contents seemed to be new to most of the participants.

Similarly, in South Sulawesi, skill acquisition in loss assessment is still limited in East Java. This result indicates that strengthening the capacity of loss assessment is key to the further promotion of AUTP. The training materials and the guidelines should also be upgraded to strengthen the capacity of these aspects.

2) Understanding of the TOT Contents

Comprehension mini-tests were carried out to check the participants' understanding of the TOT contents at the end of each training module. The comprehension mini-tests were carried out through "Google Form" consisting of 3-5 questions for each module. Most of the questions are basic ones to see if the participants understand the contents of each module. The following tables summarize the results of the comprehension mini-tests:

Table 2.4.4 Results of the Comprehension Mini Tests

Module 1: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. The base of law in implementing agriculture insurance in Indonesia is:	a. Regulation No 15 in 2011 b. Regulation No 19 in 2013 c. Regulation No 9 in 2013 d. Regulation No 15 in 2011	b	82%	84%
2. Minister of Agriculture's Decree regarding Agriculture Insurance Facilitation is the decree number:	a. No 40 in 2015 b. No 41 in 2015 c. No 40 in 2014 d. No 41 in 2014	a	78%	81%
3. Compensation is given to the insured/farmers if there is flood, draught, and/or pest-disease attack causing rice crop damage with conditioned situation such as:	a. 10 days past of planting time b. 30 days past of sowing (tabela technology) c. Damage intensity reaches >=75% and damaged area reaches >=75% at each natural plot d. All correct	d	76%	87%
4. Sum insured amount for AUTP claim, except:	a. 6 million per ha b. 12 million for 2 ha c. 3 million for half hectare d. Promotional multiplied by 12 million	d	59%	59%

5. Which pest is a guaranteed risk under the AUTP program?	a. Wind b. Elephant c. Bird d. Planthopper	d	94%	100%

Module 2: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. The criteria of AUTP participants are:	a. Individual farmers with max. 2 ha of field for each registration per cropping season b. Farmers within a farming group with max. 2 ha of field for each registration per cropping season c. Individual farmers with max. 3 ha of field for each registration per cropping season d. Farmers within a farming group with max. 3 ha of field for each registration per cropping season	b	93%	95%
2. AUTP Premium Aid given by the government is for:	a. IDR 180,000/ha/CS b. IDR 36,000/ha/CS c. IDR 144,000/ha/CS d. IDR 160,000/ha/CS	c	59%	74%
3. One of the criteria for the location of land that cannot join the AUTP:	a. Tidal swamp paddy field without water system b. Rainfed paddy field with available water sources c. Peatlands with water source(s) d. Paddy field with technical irrigation, half-technical irrigation, village irrigation, and simple irrigation	a	76%	61%

Module 3: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. Which of the followings is the correct application used to make an easier AUTP implementation in 2020?	a. SIAP b. PROTAN c. All correct	a	40%	29%
2. During AUTP claim survey with an insurance officer, the following parties should be present at the location except . . .	a. Extension workers b. Pest-disease officer c. Head of Dinas d. Insurance participant/ farmer/farming group	c	97%	94%
3. Which of the following tools that you think is most accurate to measure total damage of AUTP insured area?	a. Roll/electric meter b. GPS c. Farmer's/farming group's estimation	b	84%	79%
4. Claim approval is given by the insurance company within 14 working days according to which following condition?	a. After claim is reported to insurance company b. After Form 7 is signed by all related parties c. After Form 7 is correctly filled, signed, and uploaded to SIAP application	c	78%	79%
5. In your opinion, which form of legality of AUTP is considered the most complete and valid at the time of filing a claim that can be used as the basis for insurance companies to pay claims to AUTP participants?	a. Proof of self-help premium payment (premium 20%) b. DPD Decree Determination of participants by the Regency / City Office c. Decree of 80% premium distribution from the Ministry of Agriculture	c	46%	38%

Module 4: Question	Choices	Correct Answer	Correct Rate	
			South Sulawesi	East Java
1. All of the stated natural disasters below are included in the insured risk by AUTP policy except . . .	a. Flood b. Draught c. Landslide	c	100%	97%
2. Maximum of insured land allowed for AUTP program is for:	a. 2 ha b. 3 ha c. 5 ha	a	94%	100%
3. All farmers are allowed to be AUTP participants except . . .	a. Land-owning farmers b. Working/labor farmer c. Foreign farmers	c	97%	100%

4. These are the use of GPS except . . .	a. Telling coordinate b. Measuring total area c. Communication	c	84%	79%
5. How long does the AUTP policy apply?	a. Since planting to harvest time (estimation) b. A lifetime c. During claim	a	95%	88%

Source: JICA Consultant Team

The results of the comprehension mini-tests indicate that the participants have basic knowledge of the AUTP program such as qualifications and risk coverage. The basic knowledge of the AUTP program has equipped the participants. The correct answer rate for some basic questions such as the amount of the premium subsidy is still low. These topics particularly should be raised in the AUTP training in the future.

Question No.5 of Module 3 is one of the most difficult questions for the training participants. This is the same result as the 1st and 2nd TOT. The correct answer rate for this question is 38% in East Java and 46%% in South Sulawesi. Particularly, it might be difficult for agricultural extension officers to answer this question because they do not involve in claim procedures. Yet, the officers in charge of AUTP socialization should be able to provide the correct information about insurance payout to farmers.

The results of the comprehension mini-tests reveal that the TOT participants could acquire AUTP knowledge through the TOT; yet the participants could still be improved their understanding of the AUTP activities. Conveying accurate information about AUTP is the first step to increasing the number of insured areas and farmers under the AUTP scheme. Preparing FAQs based on questions raised during the TOT might help improve understanding of the TOT participants toward the AUTP program.

3) Discussions on AUTP Experience

The TOT participants shared their experience in the AUTP activities with other participants during the TOT. This experience-sharing session was a good opportunity for the participants to learn the reality of the AUTP activities in other areas. The following is the summary of the experience-sharing session:

Table 2.4.5 Discussion on AUTP Experience

Category	Main Q&A/ Discussions
Subsidized premiums	**Question:** For this round of TOT, there are two kabupaten which are Bantaeng and North Luwu. Are there any limited quotas for other regions subsidy that can be subsidized by MOA? **Answer:** For the overall target, we are coordinating with kabupaten. So, every year we calculate the target based on this coordination. If the kabupaten or the province wants to apply their farmers as much as possible, it is no problem and the application would not be stopped. There is only minimal number to be achieved instead of maximum limit for the registration and as long as the national target quota is not yet exceeded. **Question:** For insurance registration, where should we register and must the premium payment be done every month or every planting season? If there is harvest failure, where can we report it and where will it be forwarded to for the claim? **Answer:** For the premium payment, it is done once every planting season and not per month. If there is any harvest failure, farmer will be assisted by extension workers to report the claim and extension workers will send the report to UPTD. Later on, UPTD will forward the claim report to Jasindo. Usually, Jasindo will request for the damaged area photos as requirement for the claim.

AUTP socialization	**Question:** Based on the registration requirements, land should be measured per hectare so for claim we have to measure it in hectare as well. But what if farmers use per crop cutting area (rice field line) and the damaged area is only one crop cutting area? Will there be any area breakdown again after measurement during the survey? **Answer:** Of course, after that there will be field survey by Jasindo in order to assess if the field hectare area is qualified. Later on, the claim will be based on the assessed damaged area. **Question:** There are still a lot of farmers using the sow or non-seed planting (non-transplanting) system, how can they choose the planting system in the registration if there are no such options? **Answer:** For the planting method, actually it is similar with the options available in registration which there are. So, we suggest to choose the planting method that is similar with the ones offered in the registration form.
Claim procedure	**Question:** In North Luwu area, the main problem is landslide and recently there is also tornado happened. Is it possible for MOA or Jasindo to add these natural disasters as one of the risks that is covered by the insurance? **Answer:** For the General Guidelines, we also would like to apologize that the release has been delayed even more than in 2021 and for SIAP application also a little bit late due to the arrangement of duty stamp usage. This makes the usage of SIAP itself delayed and can only be started in March. We also collaborated with Land Protection Directorate in MOA, so hopefully we can cover all the suggested problems in the field because Finance Directorate is just focusing in payment activities. Also, if asked to include landslide and tornado in the risks, it can actually be arranged but we have to propose it back from the start. We have to propose it to Financial Services Authority (OJK) and Ministry of Finance because there will be recounting for the premium and claim amount which can be covered by the insurance. **Question:** Based on the policy and field survey, the area that is covered in claim is not the same as the registered area. If the area got damaged, it is better to be given the claim as per registered area (no need measurement of damaged area). Different case is when the land got infected with disease. During such cases, maybe then the claimed area can be measured based on the damaged area. Why is the claim become different and cannot include all of the registered area? **Answer:** In insurance, there are two principles, good faith with the agreement of both parties and compensation. If there is loss, then the compensation made will be based on the loss. That is why when there is a loss or damage in 0.5 ha from the total of 1 ha registered land, we will compensate the 0.5 ha land. **Question:** In submitting Form 6, all of us surely hope that it will not be complicated, meanwhile the claim can only be done after minimum of 75% planting area become damaged. If the land is already damaged, surely claim will be reported as soon as possible. What if the damaged area is only less than 10% and officers keep being contacted to check the field? **Answer:** For the damage percentage, it is already regulated by MOA in General Guidelines. As insurance company, we only follow the guidelines. Regarding continuous reports that makes officers keep being contacted over and over, technology recently had become more advance. Farmers can contact the officers through phone calls to consult on how far had the damage been happening before the officers check the field directly.

	Question: When the farmer plants their field and it usually has uneven condition, for example at first it was 4 natural plots then changed into 6 plots. Then the field got damaged by flood which based on the registration, the farmer can only claim 4 instead of the actual 6. How can the claim be handled? **Answer:** If such thing happens, it is better to report to Jasindo regarding the change of plot number because it will be categorized as an error input during registration. It is better to report to Jasindo if there are any changes so later on during the claim, it has already been adjusted.

Source: JICA Consultant Team

4) Action Plan Making

Action plan-making is also a part of the program during the 3rdTOT. The action plan format is the same as the 1st and 2nd TOT. The main purpose of the action plan-making is to clarify what actions the TOT participants have to take after the TOT. There are two main activities: 1) extension of the TOT contents to other officers and 2) promotion of the AUTP socialization. The TOT participants were divided into several online groups based on the area, and they discussed action plans as group work.

The TOT participants discussed the target numbers of insured areas at the kecamatan level. This is because most of the TOT participants are agricultural extension officers as well as diseases inspectors at the kecamatan level. In addition to the insured areas, the participants discussed the target numbers of trained officers. The 3rd TOT was organized offline so the participants worked on the action plan preparation as a group exercise. Unlike the 1st and 2nd TOT, the participants could prepare the action plan during the TOT program.

2.4.3 Feedback from the Participants

A feedback survey was carried out at the end of the TOT to improve the TOT contents in the future. The survey result shows that all the participants in East Java answered either "very satisfied" or "satisfied" with the overall TOT program and 98% in South Sulawesi. The participants in both South Sulawesi and East Java are almost all the participants satisfied with the TOT program.

Approximately 88% of the total participants in East Java responded that their expectations were fulfilled. In South Sulawesi, approximately 95% of the participants answered that they fulfilled their expectations either "Very high" or "Hight". This result indicates that the TOT contents matched with farmers' expectations. The 3rd TOT was organized offline so the participantsmore easily understand the training contents rather than online training. The change in the training modality seems to contribute to the improvement of the fulfillment of their expectations.

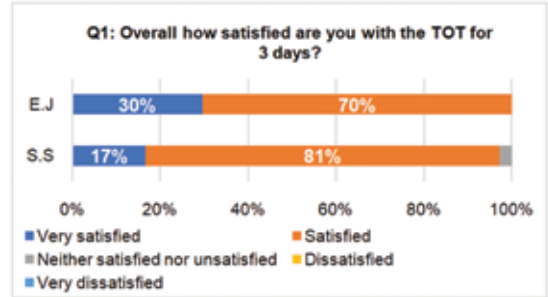


Figure 2.4.4 Overall Satisfaction

Source: JICA Consultant Team

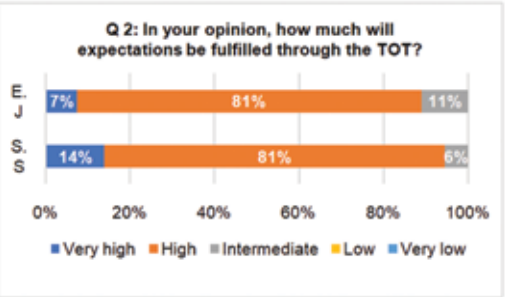


Figure 2.4.5 Fulfillment of Expectations

Source: JICA Consultant Team

2.5 AUTP TOT Review Survey

2.5.1 Objective of AUTP TOT Review Survey

The AUTP TOT review survey was carried out to see the impact of the TOT and deliver feedback and recommendations to the MOA, BAPPENAS and other stakeholders for implementing better AUTP TOT and to facilitate the institutionalization of the AUTP TOT in the Government of Indonesia. There are three specific objectives under this AUTP TOT Review: 1) To share TOT's lessons among all the stakeholders, 2) To know how effective the cascaded training has been conducted at the kecamatan level and 3) To know how effective socialization has been conducted to the farmers.

There are four main review contents to achieve those objectives. The following table shows the summary of the objectives and the review contents:

Table 2.5.1 Review Objectives and Contents

Objectives	Review Contents
Obj. 1: To share TOTs' lessons among all the stakeholders	1. Analysis and summarization of the 3 times TOTs results.
Obj. 2: To know how effective cascaded TOTs have been conducted at Kecamatan	2. Interview with TOT participants to check how much the action plan on the socialization has been conducted.
	3. Interview with TOT participants and their colleagues who have been cascade-trained by the TOT Participants.
Obj. 3: To know how effective socializations have been conducted to the farmers	4. Interview with the socialized farmers covering both 'joined the AUTP farmers' and 'not joined the AUTP'.

Source: JICA Consultant Team

1) Analysis and summarization of the 3 times TOT's results:The TOT participants evaluated their achievement of the TOT objectives by themselves. Also, the JICA Consultant Team conducted mini quizzes to check their understanding of the TOT contents. Summarizing and analyzing these results are carried out to understand the effectiveness of the AUTP TOT.
2) Interview with the TOT participants to check how much the action plan on the socialization has been conducted:The TOT participants prepared their action plans to conduct AUTP socialization after the TOT. Their action plans mainly included AUTP socialization activities, training for other extension staff and the target insured areas. A follow-up of their action plans was conducted to check the progress of their activities.
3) Interview with the TOT participants and their colleagues who have been cascade-trained by the TOT participants:Interviews were carried out to understand how effectively the contents of the TOT have been delivered to the farmers as well as other officers/ staff. Also, these interviews tried to reveal difficulties and constraints to implementing cascaded training and AUTP socialization activities after the TOT.
4) Interview with the socialized farmers covering both 'joined the AUTP farmers' and 'not joined the AUTP':Interviews were carried out to understand the impact of the AUTP TOT on the farmers. Also, it tried to identify how much farmers know and understand AUTP as well as their difficulties to understand AUTP. Through these interviews, farmers also evaluated AUTP socialization activities.

2.5.2 Methodology of AUTP TOT Review Survey

The following table shows the methodologies of the AUTP TOT Review. Analysis and summarization of the 3 times TOT results were carried out by reviewing the questionnaire survey, which was conducted during the TOTs. The action plan follow-up was done via WhatsApp and telephone interviews. Also, a series of offline focus group interviews were conducted in the target kabupatens in East Java and South Sulawesi provinces to know the AUTP TOT impacts.

Table 2.5.2 Methodology of AUTP TOT Review

Review Contents	Approach	Methodology
1. Analysis and summarization of the 3 times TOT results.	Analyze the feedback from the TOT participants and identify common areas to improve the TOT	Review the results of questionnaire survey conducted during the TOTs
2. Interviews to the TOT participants to check how much the action plan on the socialization has been conducted.	Check the progress of the action plans which TOT participants prepared during the TOTs.	Follow-up the action plans through WhatsApp or/and telephone
3. Interviews to the TOT participants and their colleagues who have been cascade-trained by the TOT Participants.	Interview with officers to understand how effectively the contents of the TOTs have been delivered	Off-line focus-group interviews
4. Interviews to the socialized farmers covering both 'joined the AUTP farmers' and 'not joined the AUTP'.	Interview with farmers to understand how much farmers know and understand AUTP.	Off-line focus group interviews

Source: JICA Consultant Team

2.5.3 Results of AUTP TOT Review Survey

1) Analysis and summarization of the 3 times TOT results:

The main purpose of the TOT is to strengthen the capacity of the AUTP stakeholders. The following 6 specific objectives were set to achieve the TOT purpose:

Table 2.5.3 TOT Objectives

No.	Objectives	Related module
1	Internalize the concept of agricultural insurance	Module 1
2	Acquire basic knowledge of AUTP and its operation	Module 1
3	Acquire basic skills for AUTP socialization and implementation	Module 2
4	Prepare action plans for AUTP promotion	Module 2
5	Acquire skills and knowledge of loss claim procedure	Module 3
6	Acquire basic knowledge of SIAP	Module 4

The TOT achievement was measured by self-evaluation of the understanding of the training contents. The self-evaluation was carried out at the end of each TOT module. The following table shows the summary of the self-evaluation results throughout the 3 TOTs.

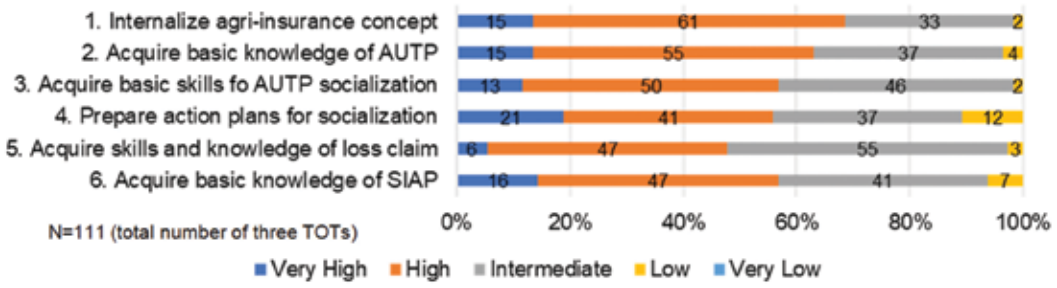


Figure 2.5.1 Achievement of TOT Objectives in South Sulawesi

Source: JICA Consultant Team

The self-evaluation result in South Sulawesi (Figure 2.5.1) shows that skill acquisition in the agricultural insurance concept is high compared to the other topics (percentage of "very high" and "high"). Also, nearly 20% of the respondents answered "high" for the understanding of action plan preparation. On the other hand, more than half of the respondents answered "intermediate" or "low" for skill acquisition in loss claims. This result indicates that the training program for loss claims should be given more focus to increase the level of skill acquisition and knowledge in the future.

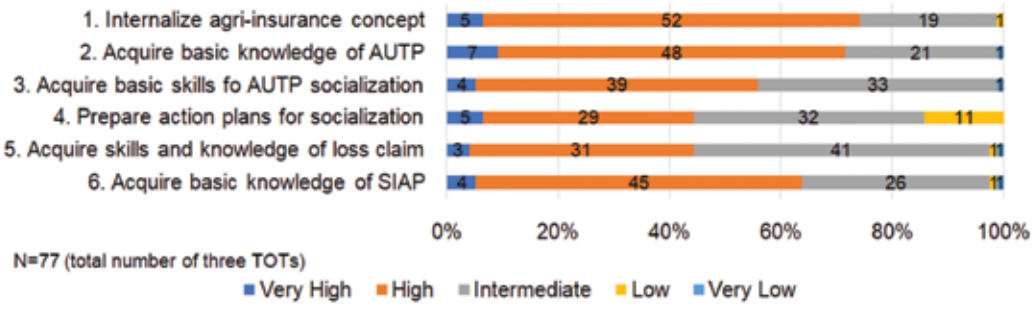


Figure 2.5.2 Achievement of TOT Objectives in East Java

Source: JICA Consultant Team

The self-evaluation result in East Java (see Figure 2.5.2) is almost the same trend as the result in South Sulawesi. Skill acquisition in the agricultural insurance concept arrived at around 70% of the total respondents. On the other hand, skill acquisition in loss claimswas still limited in East Java, too. Unlike the result in South Sulawesi, understanding of action plan preparation was also limited in East Java.

The number of respondents should be considered comparing the self-evaluation results between South Sulawesi and East Java. The number of respondents in East Java is much lower than that in South Sulawesi. This is because there was a network connection problem during the 2nd TOT in East Java. Thus, many participants could not answer the evaluation questionnaire.

In summary, these self-evaluation results indicate two things. Firstly, the concept of agricultural insurance has prevailed steadily since the AUTP scheme was introduced in 2015. For this reason, the TOT participants already had at least basic ideas of AUTP. This situation helps them easily understand how agricultural insurance works. Secondly, it takes time to understand the claim process and loss adjustment survey. Particularly, most of the TOT participants have to explain to the farmers how the loss adjustment survey is carried out. Yet, their understanding of the claim process and loss survey is still limited.

2) Understanding of AUTP TOT Topics:

Comprehensive mini-tests were carried out to check the participants' understanding of the TOT contents at the end of each training module. The comprehensive mini-tests were carried out through "Google Forms" consisting of 3-5 questions for each module. Most of the questions are basic ones to see if the participants understand the contents of each module. The questions in these mini-tests are categorized into 3 topics: 1) AUTP introduction and socialization, 2) loss adjustment and claim process, and 3) introduction of SIAP and PROTAN applications. The following chart summarizes the result of the comprehension mini-tests:

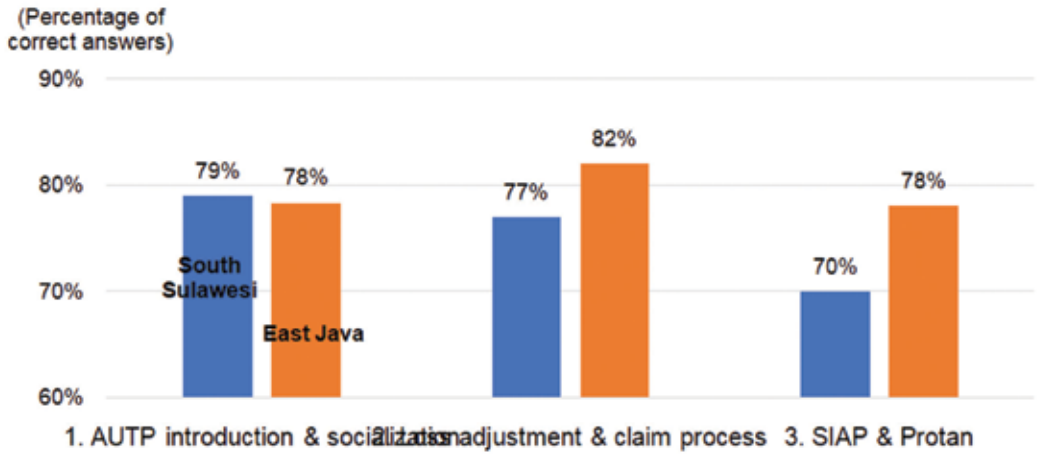


Figure 2.5.3 Understanding of TOT Topics

Source: JICA Consultant Team

Figure 2.5.3 shows the percentage of the correct answers for the comprehensive mini-tests. Nearly 80% of the TOT participants answered to the questions about AUTP introduction and socialization correctly. The correct answer ratios are almost the same as the questions about the loss adjustment and the claim process. However, the correct answer ratios in SIAP and PROTAN are slightly lower than those in other topics. This result indicates that the TOT participants' understanding of SIAP and PROTAN may be still limited.

Although most of the participants answered that they could acquire skills and knowledge in SIAP usage through the self-evaluation, there is a gap between the self-evaluation and the results of the comprehensive mini quizzes. It is noted that the difficulty of the questions is different in each topic, yet it still takes time to acquire skills in SIAP and PROTAN applications since the TOT participants have limited experience in these applications.

3) Feedback from TOT Participants:

One of the most common feedback items from the TOT participants in the 1st and 2nd TOT is the training modality. Most participants prefer off-line training rather than online training. This is because the connection of the internet is sometimes limited and slow. Also, it is difficult for the participants to concentrate on the training for a long time. Furthermore, most of the participants pointed out that they would like to spend their time on exercise and demonstrations such as SIAP and PROTAN applications. The main feedback items are summarized in the following table:

Table 2.5.4 Feedback from the TOT Participants

Category	1st & 2nd TOT (on-line)	3rd TOT (off-line)
Modality	It should organize off-line TOT rather than on-line because internet connection was unstable and slow.	
Training Contents	It should include more demonstrations how to use SIAP and PROTAN applications.	It's better to spend more time on practice and exercise sessions, particularly SIAP application practice
	It's better to spend more time on exercise (registration process including SIAP) and group works rather than lectures.	It's better to add case studies of AUTP, so that it becomes more practical.
	It's necessary to refresh the TOT contents regularly if there are any updates about SIAP & PROTAN applications.	
Materials	TOT materials should be given prior to the TOT.	TOT materials should be given prior to the TOT.
Lainnya	Others It could invite representative of farmers' group to the TOT.	It's better to increase the number of PPLs for participating the TOTs.
		It would be good if this TOT is organized at least twice a year.
		It's better to target all the Kabupatens to make socialization easier.

Source: JICA Consultant Team

2.5.4 Action Plan Follow-up

1) Outline of Action Plan Follow-up

The TOT participants prepared action plans during the TOTs. The action plans mainly consist of 3 items: 1) Implementation plan of AUTP socialization, 2) sharing or disseminating the TOT contents to colleagues and 3) target insured area. The follow-up of action plans was carried out to check the progress of these items after the TOTs through WhatsApp and telephone interviews. In addition to the action plan follow-up, the respondents shared the main challenges and inputs for the improvement of AUTP socialization based on their experiences.

The number of respondents is 60 staff/officers from East Java and South Sulawesi respectively. There are 6 target Kabupatens in each province. 10 respondents have been selected from each Kabupaten. The following table shows the summary of the respondents for the action plan follow-up:

Table 2.5.5 Summary of Action Plan Follow-up

	Kabupaten	ToT Year	No. of Resp		Kabupaten	ToT Year	No. of Resp
South Sulawesi	Maros	2020	10	East Java	Nganjuk	2020	10
	Bone	2020	10		Lamongan	2020	10
	Pangkep	2021	10		Tuban	2021	10
	Barru	2021	10		Jombang	2021	10
	Bantaeng	2022	10		Pasuruan	2022	10
	North Luwu	2022	10		Kediri	2022	10
	Total	-	60		Total	-	60

Source: JICA Consultant Team

2) Action Plan Progress in South Sulawesi

Table 2.5.6 indicates the result of the action plan follow-up in South Sulawesi. “Socialization to farmers” shows the percentage of the respondents who conducted the AUTP socialization based on their action plans. "Socialization to other PPLs" indicates the percentage of the respondents who disseminated the TOT contents to other extension staff (PPLs) based on their action plans. “Achievement of farmland insured" shows the percentage of the respondents who achieved their target insured areas after the TOTs.

Table 2.5.6 Result of the Action Plan Follow-up in South Sulawesi

Kabupaten	Year of TOT	Socialization to farmers	Socialization to other PPLs	Achievement of farmland insured
Maros	2020	90%	70%	40%
Bone	2020	80%	70%	60%
Pangkep	2021	80%	60%	50%
Barru	2021	50%	40%	50%
Bantaeng	2022	100%	100%	90%
North Luwu	2022	100%	100%	100%
Overall result		**83%**	**73%**	**65%**

Source: JICA Consultant Team

According to the action plan follow-up in South Sulawesi, more than 80% of the respondents conducted the AUTP socialization. The overall results reached 73% for “socialization to other PPLs” and 65% for “achievement of farmland insured”. Particularly, the achievement of these three items in 2022 were high as compared to TOTs in 2020 and 2021. The main difference between the TOT in 2022 and other years is training modality. Only the TOT in 2022 was an offline training gathering at the training venues. Therefore, the training modality could contribute to the progress of the action plans in South Sulawesi.

3) Action Plan Progress in East Java

Table 2.5.7 indicates the result of the action plan follow-up in East Java. According to the action plan follow-up, more than 83% of the respondents answered that they carried out the AUTP socialization based on their action plans. Also, nearly 60% of the respondents conducted socialization with other extension staff (PPLs) about the TOT contents.

The follow-up results show that the achievement of insured farmland area is still limited in East Java. Some Kabupatens reduced their budget for their premium subsidies because of the COVID-19 pandemic. For this reason, some of the respondents pointed out that it was difficult for them to convince farmers to join AUTP because farmers had to pay the premiums themselves. Therefore, the COVID-19 pandemic could have a negative impact on the achievement of their insured farmland, especially.

The 3rd TOT was held in March 2022. It has just been 3-4 months since the 3rd TOT was carried out. The TOT participants still have a chance to increase the achievement of insured areas as well as make progress on their action plans. It is important to follow up on the AUTP activities continuously and try to reflect their achievement for the target for the next year.

Table 2.5.7 Result of the Action Plan Follow-up in East Java

Kabupaten	Year of TOT	Socialization to farmers	Socialization to other PPLs	Achievement of farmland insured
Nganjuk	2020	70%	60%	20%
Lamongan	2020	90%	80%	40%
Tuban	2021	80%	30%	20%
Jombang	2021	100%	90%	70%
Pasuruan	2022	60%	20%	20%
Kediri	2022	100%	70%	40%
Overall result		**83%**	**58%**	**35%**

Source: JICA Consultant Team

4) Inputs for Improvement of AUTP Socialization

The respondents of the action plan follow-up also provide inputs for improvement of the AUTP socialization. These inputs include challenges and problems in the AUTP socialization as well as inputs for the improvement of AUTP socialization activities. The challenges that officers have been facing include a lack of farmers' awareness, a lack of budget and socialization materials as well as restriction on holding meetings because of the COVID-19 pandemic.

Inputs for improvement are mainly categorized into 3 areas: 1) TOT participants, 2) AUTP operation and 3) socialization participants and materials. Regarding the TOT participants, some of the participants recommended that farmers should also be invited to the TOT to increase the TOT impacts. The AUTP operation means that registration and claim requirements should be simplified. As for the AUTP socialization, some respondents pointed out that Jasindo staff should also join the socialization meetings and socialization materials should be provided timely. The following table summarizes inputs for improvement:

Table 2.5.8 Inputs for Improvement of AUTP Socialization

Socialization Problem	Input for Improvement
Farmers rarely have experience in crop failure. Therefore, it is difficult to raise farmers' awareness about agricultural insurance.	Jasindo staff should assist PPLs and join socialization meetings.
Some PPLs were transferred to another area, and some of them retired	AUTP training should be organized even for farmers.
There is not enough budget for socialization activities.	Registration and claim requirements should be simplified.

There are not enough socialization materials.	Jasindo and central government should provide more promotional tools for AUTP.
Farmers have bad experiences in AUTP before.	AUTP TOT should be continued in the future.
It was difficult to organize socialization meetings regularly because of the COVID-19 pandemic.	Even farmers should be invited to the AUTP TOTs.
Farmers are waiting for free premiums.	

Source: JICA Consultant Team

2.5.5 Focus Group Interview with Officers

1) Outlie of Focus Group Interview

The focus group interviews were carried out in June 2022 in East Java and South Sulawesi. The main participants of the focus group interviews are the TOT participants as well as non-TOT participants. The non-TOT participants did not join the TOT, yet they shared the TOT contents with the TOT participants. Approximately 6 staff/ officersjoined each focus group interview, and the total number of interviewees was 37 staff/ officers in East Java and South Sulawesi respectively.

Questions of the focus group interviews mainly include the following items:

- √ Understanding of AUTP
- √ Practical impact of the AUTP TOT
- √ AUTP socialization method and frequency
- √ Challenges and difficulties about the AUTP socialization
- √ AUTP socialization materials
- √ Comments and discussions on the AUTP TOT implementation

Table 2.5.9 shows the summary of the number of the participants for the focus group interviews. The total number of officers (participants) is 74 officers (37 in South Sulawesi and 37 in East Java). 37 officers out of 74 are the TOT participants and the remaining 37 officers are non-TOT participants. These non-TOT participants did not attend the TOT; yet they have been shared the TOT contents by the TOT participants.

Table 2.5.9 Summary of the Focus Group Interview Participants

Province	No. of officers	TOT participants	Non-TOT participants
South Sulawesi	37	12	25
East Java	37	25	12
Total	**74**	**37**	**37**

Source: JICA Consultant Team

2) Summary of Interview Results

According to the result of the focus group interviews, approximately 90% of the respondents (34 respondents) answered that their understanding of AUTP has been increased by TOT or cascaded training in South Sulawesi and 76% (25 respondents) in East Java. This result indicates that most of the participants found the AUTP TOT useful (Figure 2.5.4).

In addition, an interviewee asked a question “Do you think you can deliver more effective AUTP socialization after the TOT?” The result of this question is almost the same as the result in Figure 2.5.4. 90% and 76% of the respondents in South Sulawesi and East Java answered “Yes” to this question.

Figure 2.5.5 shows the useful aspects of the AUTP TOTs. Both in South Sulawesi and East Java, the largest number of the respondents answered that the AUTP TOT is useful to understand the claim process. Also, approximately 20% of the respondents (16 respondents) in South Sulawesi answered that they could increase their understanding of "loss assessment" through the AUTP TOTs.

The answer as "Others" includes the followings:

- √ It helped to identify specific problems in the field.
- √ It helped to understand how to use SIAP application.
- √ It helped to make the socialization more structured and detailed.

The focus group interview with participants also reveals whether the staff changed their way of the AUTP socialization. Approximately 73% of the respondents (27 respondents out of 37) in South Sulawesi mentioned that they changed their socialization after having participated in the TOT. In East Java, around 40% of the respondents (15 respondents out of 37) answered that they changed their AUTP socialization. Compared to the respondents in South Sulawesi, the number of respondents who changed their AUTP socialization in East Java is small.

The respondents pointed out the following things they specifically changed their AUTP socialization:

- √ Conducted more face-to-face socialization to farmers,
- √ Explained AUTP more clearly, structured and detailed,
- √ Provided brochures during the socialization meetings from own budget,

The respondents were also asked whether they have seen the AUTP TOT materials after the TOT. As a result, nearly 60% of the respondents (21 respondents out of 37) in South Sulawesi answered that they have seen the TOTs materials. On the other hand, in East Java, there are only 16% of the respondents (6 respondents out of 37)who have seen the TOT materials after the TOT.

3) Suggestions and Comments for AUTP Implementation

The participants of the focus group interviews also provided suggestions and comments on AUTP implementation. They discussed and exchanged their opinions about how the AUTP TOT could be

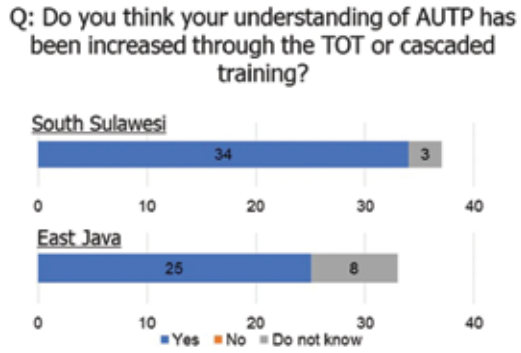


Figure 2.5.4 Understanding of AUTP through TOT

Source: JICA Consultant Team

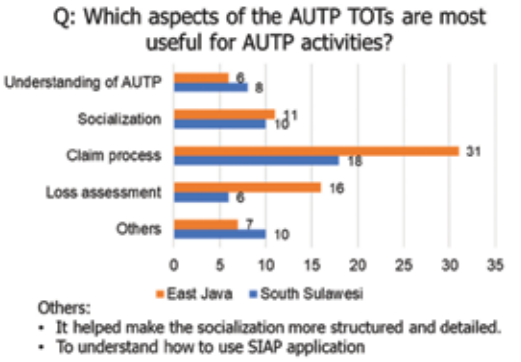


Figure 2.5.5 Useful Aspects of AUTP TOT

Source: JICA Consultant Team

Figure 2.5.6 Way of AUTP Socialization

Source: JICA Consultant Team

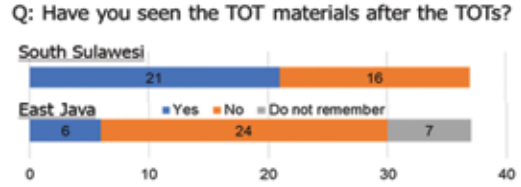


Figure 2.5.7 AUTP TOT Materials

Source: JICA Consultant Team

improved in the future. They shared their experiences on the AUTP TOT participation as well as the AUTP socialization. Table 4.1.1 summarizes the suggestions and comments for better implementation:

Table 2.5.10 Summary of Suggestions and Comments for AUTP Implementation

Category	Suggestions/ Comments
How do you think about the effectiveness of AUTP TOT?	√ The training really helps officers to understand about AUTP so that they can explain more clearly to farmers. √ As long as the training is off-line, it is easier for participants to understand. On-line training has many technical issues. √ The training should be held more frequently. √ The training materials could be improved more. √ The AUTP socialization tools should be provided during the training.
Suggestions for AUTP implementation method or materials?	√ The TOT should also be organized for farmers to spread the AUTP concept. √ The TOT helps to understand clearly about the requirements for AUTP registration. √ Farmers need more clarification for the claim process and loss assessment. √ The training materials should focus on the claim process, payout calculation and loss assessment. √ The TOT should be held off-line so that participants could ask questions smoothly. √ If the TOT topic includes plant diseases, that would be helpful. √ It is better to spend more time to explain the claim process and loss assessment.
Others	√ The Kabupaten officers provide premium subsidies for farmers; yet, it sometimes runs out of these quotas. In this case, farmers are not motivated to join AUTP. √ In some areas, the planting season has 3 times a year. It is not so clear how farmers can apply for AUTP in such areas. √ The most important thing is that farmers should get good experience in AUTP so that they can trust AUTP and the insurance company. √ The capacity of Jasindo should be strengthened. For example, they should more responsive when farmers need more clarifications. √ Jasindo officers are too far to visit from rural area. If they have more branches in rural area, that would be helpful. √ AUTP sum insured amount does not cover the production cost. It should be increased.

Source: JICA Consultant Team

2.5.6 Focus Group Interview with Farmers

1) Outline of Focus Group Interview

A series of focus group interviews with farmers was carried out in June 2022 in East Java and South Sulawesi. The farmers for the focus group interviews were selected randomly through agricultural DINAS officers. Both farmers who have joined AUTP and have never joined AUTP were selected for the focus group interviews. Approximately 20 farmers joined in each focus group interview. In total, around 115 farmers attended the focus group interviews.

The focus group interview started with a question about their recognition of AUTP and how much they know about AUTP. Based on their understanding of AUTP, facilitators explained the basic concept of AUTP to remind them how AUTP works. Other questions of the focus group interview include the following items:

- √ Farmers' willingness to buy AUTP and its reasons
- √ Comments on basic conditions of AUTP including premiums, payout amounts and damage level
- √ Preferences on AUTP socialization method
- √ Farmers' understanding of AUTP
- √ Evaluation on the AUTP socialization including contents, materials, frequency and venue
- √ Discussions on how the AUTP socialization should be improved or changed in the future

Table 2.5.11 shows the summary of the number of the participants for the focus group interviews with the farmers. The total number of farmers (participants) is 227 farmers (115 in South Sulawesi and 112 in East Java). 144 farmers out of 227 have experience in joining the AUTP socialization. Also, 108 farmers out of 227 have joined AUTP.

Table 2.5.11 Summary of the Focus Group Interview Participants

Province	No. of farmers	Joined socialization	Joined AUTP
South Sulawesi	115	87	55
East Java	112	57	53
Total	**227**	**144**	**108**

Source: JICA Consultant Team

2) Summary of Interview Results

Figure 2.5.8 shows respondents' understanding of AUTP. The respondents to this question are only farmers who have experience in joining AUTP socialization or at least know about the basic concept of AUTP. Hence, the number of respondents is 106 in South Sulawesi and 87 in East Java.

As a result, 65% of the respondents (68 respondents out of 106) in South Sulawesi answered that they understand AUTP "somehow" or "not at all". 56% of the respondents (49 respondents out of 87) in East Java also answered that they understand AUTP "somehow" or "not at all". Therefore, this result shows that the respondents' understanding of AUTP is still limited even though they have experience in joining the AUTP socialization meetings.

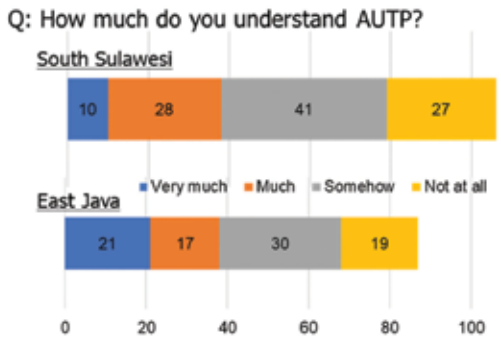


Figure 2.5.8 Understanding of AUTP

Source: JICA Consultant Team

As shown in Figure 2.5.9, the difficult parts of AUTP for the farmers to understand have concentrated on the "claim process" and the "loss assessment". In South Sulawesi, 109 respondents out of 115 selected these aspects of AUTP as the difficult parts of AUTP to understand. In East Java, 91 respondents out of 112 were also selected for these aspects as the difficult to understand.

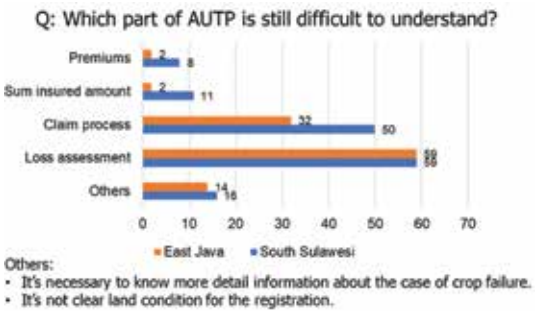


Figure 2.5.9 Difficult Part of AUTP

Source: JICA Consultant Team

Considering the interview results, it is still difficult for the farmers to understand the claim process and loss assessment of AUTP even if they have joined the socialization meetings. In other words, extension staff (PPLs) and other stakeholders should consider this situation when they conduct the AUTP socialization. In addition, the AUTP TOTs should also focus on these aspects to improve farmers' understanding, thereby it could be easier for the PPLs to convince farmers to join AUTP.

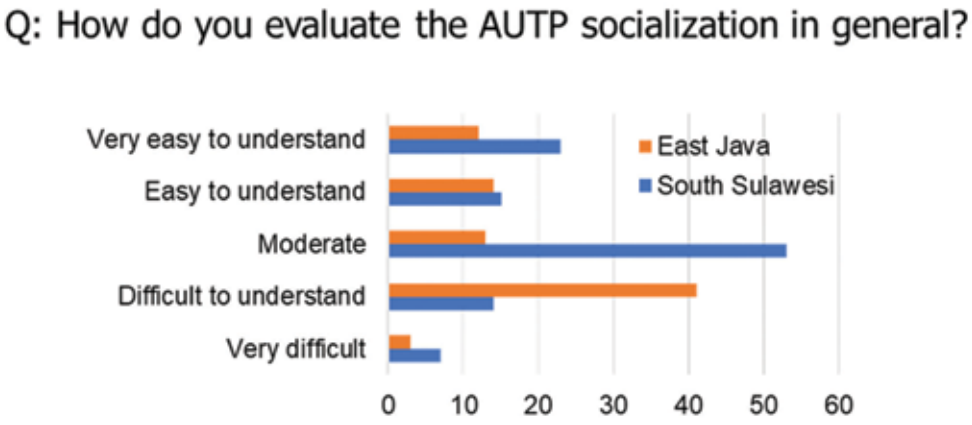


Figure 2.5.10 Evaluation of AUTP Socialization

Source: JICA Consultant Team

Figure 2.5.10, shows the result of the respondents' evaluation on the AUTP socialization. In South Sulawesi, almost half of the respondents (53 respondents out of 112) evaluated the AUTP socilization as "moderate". The percentage of the respodents for "very easy to understand" and "easy to understand" is around 34% (38 respondants out of 112). Approximately 30% of the respondents evaluated it as "very difficult to understand" or "difficult to understand".

In East Java, unlike South Sulawesi, half of the respondents (41 respondentas out out 83) anwered that the AUTP socialization was "difficult to understand". Yet, there are still 30% of the repsondents evaluated it as "very easy to understand" or "easy to understand". This result may have been affected by the level of the respondents' understanding of AUTP. Therefore, it is difficult to compare the result between the two provinces straightforwardly. Yet, in both provinces, it is still around 30 to 35% of respondentsevaluated the AUTP socialization as "very easy to understand" or "easy to understand". Thus, the AUTP socialization should be reviewed and improved in both provinces.

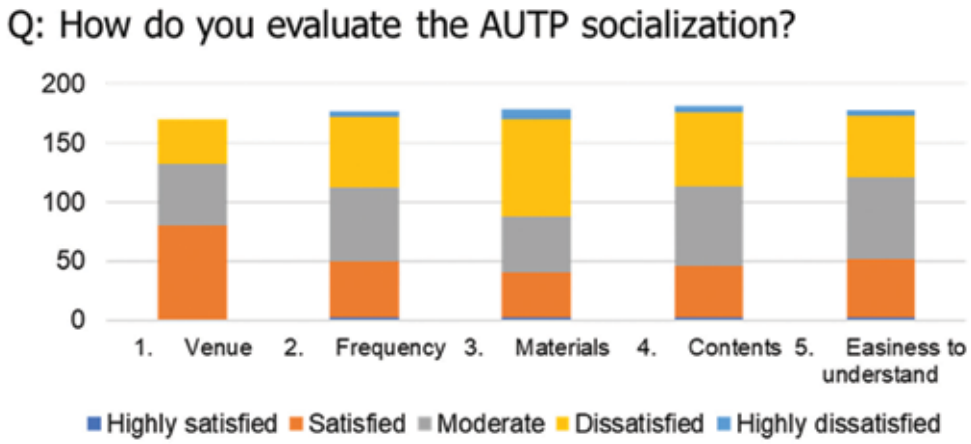


Figure 2.5.11 Evaluation of AUTP Socialization Aspects

Source: JICA Consultant Team

Figure 2.5.11 shows the AUTP socialization evaluation of each aspect. The following are the summary of the evaluation of each aspect:

1) Venue: almost half of the respondents (80 respondents out of 170) answered: "satisfied". Generally, most of the AUTP socialization meetings have been held at Kecamatan or Desa offices. They have meeting halls for many purposes. It is common for the farmers to attend a series of meetings at these halls. Thus, there are no specific comments on venues for the AUTP socialization.
2) Frequency: the largest number of the respondents choose "moderate" (approximately 35%) followed by "dissatisfied" with 34%. The number of socialization meetings could vary from area to area. It also depends on other activities as well as their budget. It might be difficult to evaluate the frequency of the AUTP socialization, yet approximately 34% of the respondents were dissatisfied with the frequency.
3) Materials: nearly half of the respondents evaluated materials as "dissatisfied" (approximately 46%). Some respondents even evaluated this item as "highly dissatisfied" (5% of the respondents). Compared to the other aspects, materials are one of the lowest evaluated items for the AUTP socialization.
4) Contents: the largest number of the respondents evaluated it as "moderate" (approximately 37%) followed by "dissatisfied" with 35%. According to the comments from the respondents, farmers are expected to learn more about the claim process and the loss assessment through socialization activities.
5) Easiness to understand: farmers were asked about the easiness of socialization contents. As a result, almost 40% of the respondents answered as "moderate". As shown in Figure 5.2.2, farmers felt that it was difficult to understand the claim process and loss assessment. In other words, they could easily understand the basic concept of AUTP including benefits, coverage risks and registration conditions. "Easiness to understand" could be improved if farmers could understand the claim process as well as the loss assessment.

The focus group interview also tried to reveal the impact of the AUTP TOT by asking "Do you think the way of AUTP socialization has changed since 2020 socialization?". The 1st AUTP TOT was held in 2020; hence, if farmers recognized that the way of the AUTP socialization changed since 2020, this could occur through the AUTP TOT.

As shown in Figure 2.5.12, In South Sulawesi, approximately 45% of the respondents (47 respondents out of 103) answered "No" and 18% (19 respondents out of 103) of the respondents answered "Yes". The remaining 36% (37 respondents) answered "do not know".

In East Java, unlike the result in South Sulawesi, the number of the respondents who answered "Yes" is slightly higher than that who answered "No". there are 43% (35 respondents) with "Yes" and 41% (34 respondents) with "No".

3) Suggestions and Comments for AUTP Socialization

The farmers who joined the focus group interviews also provided suggestions and comments on how the AUTP socialization should be carried out in the future. They also discussed how it could increase the number of AUTP participants. The following table summarizes these discussions:

Table 2.5.12 Summary of Suggestions and Comments for AUTP Socialization

Category	Suggestions/ Comments
How do you think about the importance of AUTP socialization?	√ The AUTP socialization is important to get information about how to pay the premium as well as understand how farmers can protect their crops. √ It is important to raise farmers' awareness about AUTP. √ The AUTP socialization is important so Jasindo staff as well as DINAS staff should join it.
Suggestions for increase of the number of AUTP participants.	√ The premium subsidies should be increased. √ It is important to conduct face-to-face socialization regularly. √ The important thing is to secure the budget for socialization. √ It needs to increase farmers who have good experience of AUTP so that they trust the insurance company and they are willing to join AUTP. √ It needs to provide effective materials during socialization such as distributing brochures and AUTP guidebook. √ It could be an idea to provide "Insurance Card". Insured farmers feel like they are a membership. √ If farmers could choose premium levels such as higher premium, medium premium and lower premium, that would be good. √ It needs more socialization tools such as brochures, banners and billboards.
Suggestions for increase of farmers' understanding of AUTP.	√ It is important to increase the availability of socialization materials. √ AUTP should be discussed more frequently during farmers' regular meetings. √ It needs to spread brochures so that farmers could read brochures over again.
Others	√ It is better, if Jasindo staff attend socialization meetings. This could increase assurance of AUTP for farmers. √ The AUTP sum insured amount should be updated based on the current production cost. √ It is better lower percentage of damage level such as 50 -60% because even these percentages could damage on crops. √ The registration process and the claim process should be more simplified. √ AUTP should be reviewed and evaluated from MOA, Jasindo, DINAS offices and other stakeholders. √ Individual farmers should be allowed to join AUTP not through farmers groups.

Source: JICA Consultant Team

2.6 Recommendations

2.6.1 Summary of AUTP TOT Review Results

The following table shows the summary of the AUTP TOT review results:

Table 2.6.1 Summary of the AUTP TOT Review Results

Review Contents	Main Results
1. Analysis and summarization of the 3 times TOT results.	• The AUTP TOT contributed to the increase of understanding of basic concept of AUTP. • Off-line TOT is preferable to understand AUTP. • Practical topics and exercise should be given priority. • Loss adjustment and claim process should be explained more intensively (these are the difficult parts to understand). • It still takes time to learn how to use SIAP and PROTAN applications. It needs to provide an opportunity to learn these applications continuously.
2. Interviews to the TOT participants to check how much the action plan on the socialization has been conducted.	• Most of the TOT participants conducted socialization as they planned. • In addition, more than half of the TOT participants conducted socialization to other PPLs. • Yet, achievement of insured area is still limited. This is because the AUTP socialization budget was reduced in many Kabupatens.
3. Interviews to the TOT participants and their colleagues who have been cascade-trained by the TOT Participants.	• The TOTs and cascaded training are helpful for the increase of AUTP understanding particularly the claim process. • Also, officers pointed out that the AUTP TOTs helped them understand how to use SIAP and PROTAN applications as well as how to deliver more structured explanation of AUTP scheme. • It should be improved accessibility of the AUTP TOT materials.
4. Interviews to the socialized farmers covering both 'joined the AUTP farmers' and 'not joined the AUTP'.	• More than half of the farmers answered that they understand AUTP "somehow" or "not at all". • Particularly, the claim process and loss assessment are the most difficult part for the farmers to understand. • Most of the farmers evaluated the AUTP socialization as "moderate". • The farmers dissatisfied with the AUTP materials most because PPLs did not use AUTP materials when conducing the AUTP socialization.

Source: JICA Consultant Team

2.6.2 Recommendations for AUTP TOT Implementation

- The AUTP TOT should be conducted every year regularly. The result of the AUTP TOT review survey indicates that there are positive impacts of the AUTP TOT on the increase of PPLs and other officers' understanding of AUTP. Yet, it still takes time to understand the claim process, loss assessment as well as SIAP and PROTAN applications. For this reason, it is important to continue to conduct the AUTP TOT regularly.
- To maximize the impact of the AUTP TOT, farmers or representatives of farmers' groups should also be invited to the AUTP TOT. The AUTP TOT could directly raise farmers' awareness on AUTP and it is expected to prevail the information about AUTP among the farmers effectively. In addition, farmers could have an opportunity to ask questions directly to Jasindo staff through participation for the AUTP TOT.
- The AUTP TOT materials should be simplified. According to the AUTP TOT review survey, the TOT participants pointed out that they should spend more time with practical topics such as the exercise on how to use SIAP and PROTAN applications. Therefore, the TOT training materials should also focus on practical topics. In addition, this AUTP TOT should be internalized into the regular agricultural training programs in the future. It has limited time and budget to implement the AUTP TOT. Considering this point, simplification of the training materials is important.
- AUTP socialization tools and materials should be more accessible for all the PPLs to conduct the AUTP socialization effectively. According to the interview with PPLs, they claimed that they do not have enough socialization materials. They could not even access the TOT materials. To solve these problems, it is necessary to create a mechanism to share socialization materials widely. For example, it could be shared through social network services or websites.
- It is important to establish a monitoring and evaluation system for the AUTP TOT. This monitoring and evaluation system could be utilized to update the AUTP scheme in the future. The monitoring is not only for the confirmation of the achievement of the target insured area, but also it should obtain feedback from the farmers and officers. Farmers who participated in the focus group interviews raised the point that the central, as well as the local government should review AUTP. Based on the monitoring and evaluation of AUTP, the AUTP scheme and its training materials as well as socialization materials should be updated periodically.

CHAPTER 3 AUTP IMPACT SURVEY

3.1 Outline of AUTP Impact Survey

The main objective of the AUTP Impact Survey is to understand the impact of the AUTP scheme on the farmers. The survey was carried out by the JICA Consultant Team together with the Indonesian counterpart organizations in November 2022. The survey was conducted in East Java and South Sulawesi provinces. Provincial and Kabupaten agricultural offices selected 5 target Kabupatens in each Province based on the number of AUTP participants. The following table shows the outline of this AUTP Impact Survey:

Table 3.1.1 Outline of AUTP Impact Survey

Province	Kabupaten	No. of Kecamatan	No. of Desa	No. of Sample
East Java	Lumajang	6	12	20
	Kediri	5	13	17
	Lamongan	2	13	20
	Bojonegoro	2	4	20
	Blitar	10	14	20
South Sulawesi	Maros	7	8	20
	Barru	3	10	20
	Pare-Pare	2	10	20
	Bantaeng	7	16	20
	North Luwu	2	11	19
Total	**10**	**46**	**111**	**196**

Source: JICA Consultant Team

There were 196 respondents in total from 111 Desas of 46 Kecamatans. The respondents were selected by Kabupaten officerscovering both AUTP and non-AUTP participants. The questionnaire survey was conducted to understand farming practices and farm management situations such as historical yield, farmland size, production cost, access to agricultural finance, farming risks, historical payouts, usage of payouts, the timing of damage and benefits of AUTP.

3.2 Summary of AUTP Impact Survey Results

1) Farmland Size

Figure 3.2.1 shows the distribution of the respondents by the paddy farming size. Approximately 70% of the respondents (142 out of 196 valid responses) cultivate paddy in an area less than 1.00 ha. 40 % of the respondents (80 respondents) concentrate on the farmland size between 0.80 and 1.00 ha. Although nearly 20% of the respondents cultivate paddy in an area more than 1.60 ha, the majority of the respondents are smallholder farmers with less than 1.00 ha of paddy land.

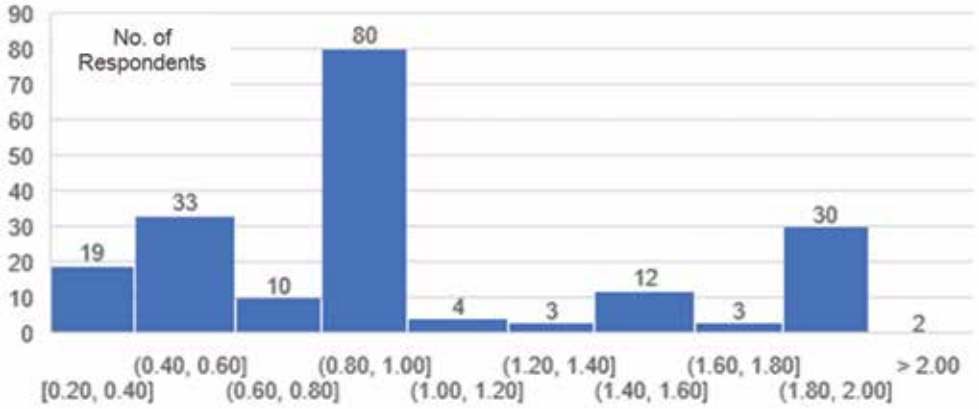


Figure 3.2.1 Distribution of Farmland Size

Source: JICA Consultant Team

The average farmland size is 0.97 ha in East Java and 1.15 ha in South Sulawesi respectively. The total average farmland size is 1.06 ha. The maximum farmland size is 5.00 ha in LamonganKabupaten in East Java. The minimum farmland size is 0.20 ha, and the median farmland size is 1.00 ha in total.

2) Paddy Yield

There are two main seasons in a year: the MT1 season and the MT2 season. The specific dates of the MT1 and MT2 seasons vary from place to place. In most cases, the MT1 season starts in September or October and ends in December or January of the following year. The MT2 season typically occurs between February and May.Figure 3.2.2 indicates the historical paddy yield per hectare of the respondents. The historical yield includes both MT1 and MT2 seasons in each year between 2017 and 2021. The average historical yield is 5.19 tons/ha in East Java and 5.40 tons/ha in South Sulawesi. The average historical paddy yield of South Sulawesi is slightly higher than that of East Java. Also, the historical paddy yield has more fluctuated in East Java than in South Sulawesi.

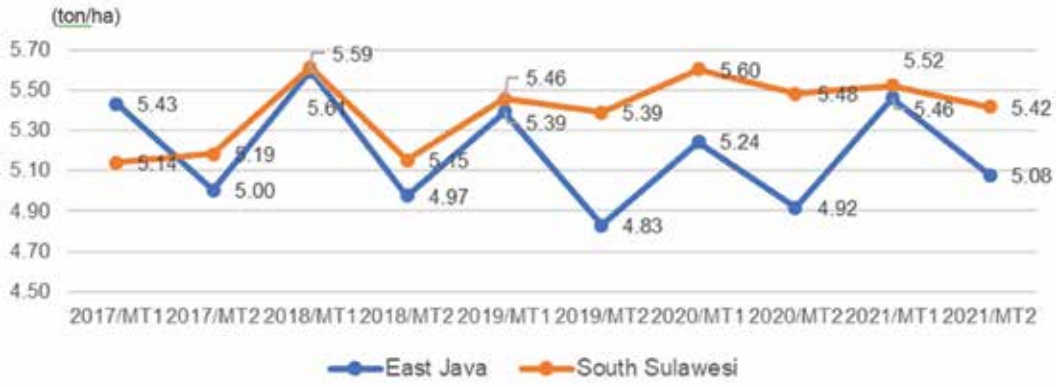


Figure 3.2.2 Historical Paddy Yield

Source: JICA Consultant Team

3) Production Cost

The average paddy production cost per hectare over the past 5 years (2017-2021) is 6.4 million IDR. In East Java, the historical average production cost is 7.4 million IDR per hectare. In South Sulaweshi, the historical average production cost is 5.4 million IDR per hectare. The result shows that the production cost of East Java is higher than the production cost of South Sulawesi. In other words, the respondents

in East Java spend more money on paddy production. The survey result also indicates that the production costs almost the same over the past 5 years between 2017 and 2021.

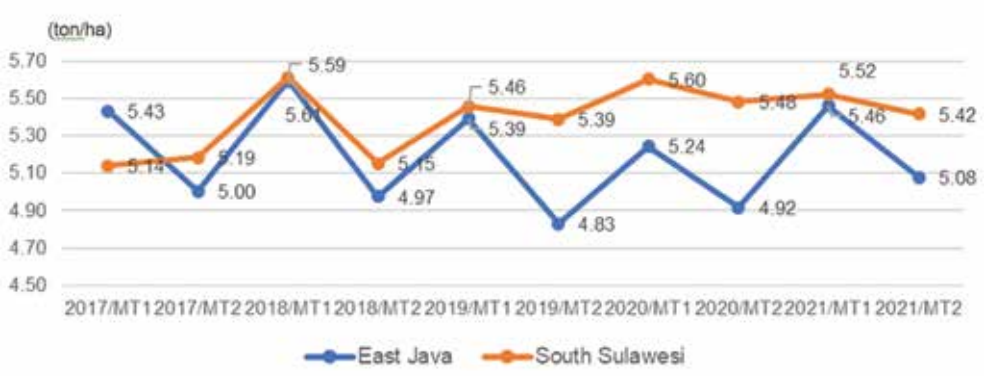


Figure 3.2.3 Historical Paddy Production Cost

Source: JICA Consultant Team

In Indonesia, subsidized fertilizer is available for farmers' group members. Almost all the respondents answered that they use subsidized fertilizer. This situation indicates that subsidized fertilizer is common for the farmers. The target farmers of the subsidized fertilizers and the AUTP participants overlapped at least in the survey areas. The average fertilizer cost is 1.9 million per hectare in total. The fertilizer cost accounts for almost 30 % of the total production cost per hectare.

4) AUTP Experience

On average, 20% of the respondents joined AUTP every year. In the 2021/MT2 season, there was the largest number of respondents who joined AUTP accounting for 30% of the respondents (58 out of 196). The fewest number of respondents who joined AUTP was in the 2017/MT2 season accounting for 8% of the respondents (16 out of 196). One of the main reasons for not joining AUTP is “no socialization”. In other words, non-ATUP respondents had no chance to know AUTP.

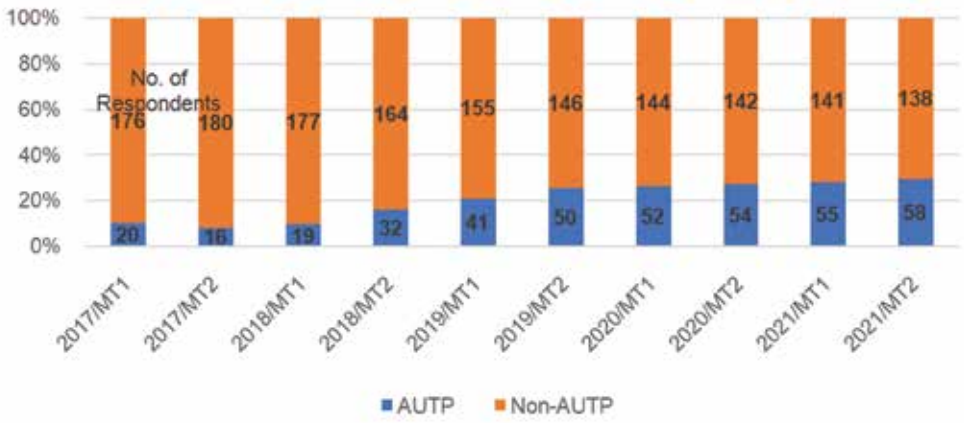


Figure 3.2.4 No. of AUTP Participants

Source: JICA Consultant Team

5) Payout Experience

Figure 3.2.5 shows the number of AUTP payout recipients. Approximately 20% of the AUTP participants have experienced the payout since 2017. There is no big difference between East Java and South Su-

lawesi. The ratio of the payout recipients in East Java is slightly higher than that in South Sulawesi: 25% in East Java and 21% in South Sulawesi. In 2019, the ratio of the payout recipients is more than 30% both in East Java (14 recipients out of 46 participants) and South Sulawesi (14 recipients out of 45 participants).

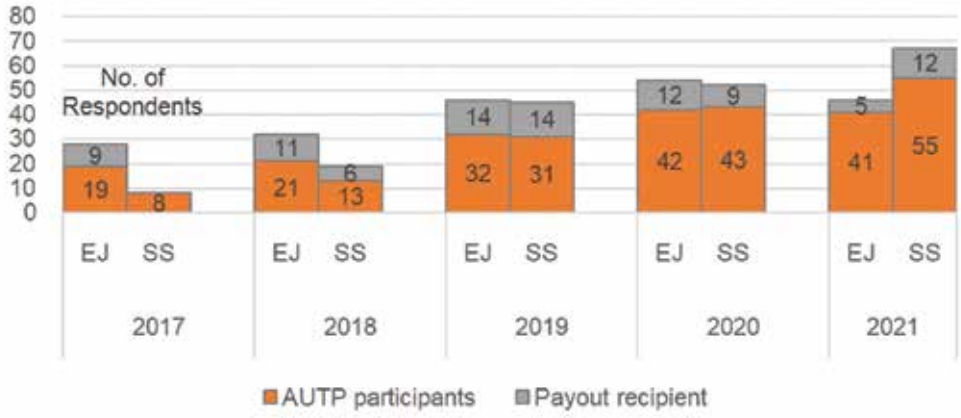


Figure 3.2.5 No. of Payout Recipients

Source: JICA Consultant Team

Figure 3.2.6 shows the main reasons for the claim payouts over the past 5 years (2017-2021). The most major claim reason is "flood" with 42% of the total claims followed by drought with 25% and pests/diseases with 18%. As shown in Figure 3.2.7, "flood" happens in every season in every year. Unlike floods, other risks such as drought and pests/diseases happen once every 3 or 4 seasons. Although drought happens less frequently comparing to floods, it affectsa large number of farmers in the 2019 season.

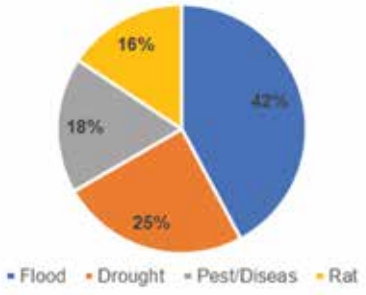


Figure 3.2.6 Reasons for Claim Payout

Source: JICA Consultant Team

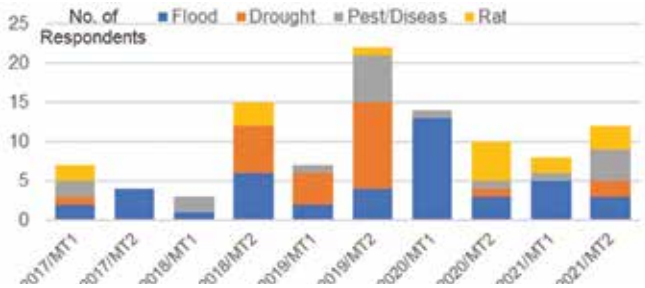


Figure 3.2.7 Claim Reasons by Season

Source: JICA Consultant Team

6) Timing of Damages

There are two main seasons in a year: the MT1 season and the MT2 season. The specific dates of the MT1 and MT2 seasons vary from place to place. In most cases, the MT1 season starts in September or October and ends in December or January of the following year. The MT2 season typically occurs between February and May. The survey results indicate that many farmers reported crop damage during January and February. This suggests that crops are susceptible to damage at the start or end of the seasons.

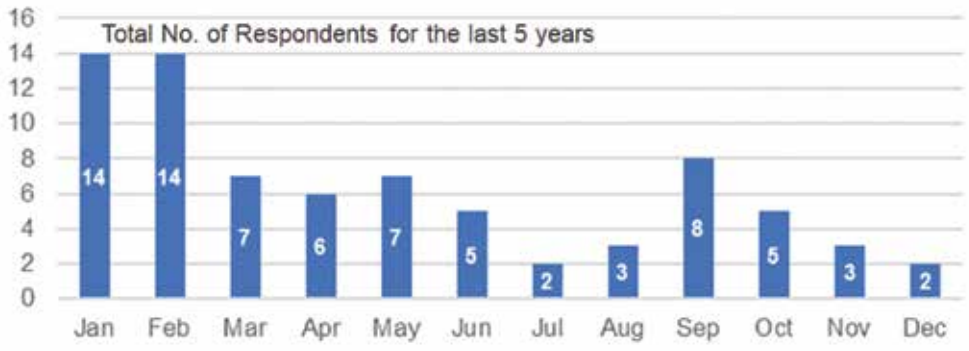


Figure 3.2.8Timing of Crop Damage

Source: JICA Consultant Team

7) Usage of Payouts

Figure 3.2.9 shows the payout usages. Nealy 60% of the respondents (52 respondents out of 90) answered that they used the insurance payout for planting cost for the next season. The respondents who used the insurance payout for planting cost for the same season accounted for 36% (32 respondents out of 90). The survey results indicates that more than one third of the payout recipients used the insurance payout for replanting within the same season.

It is noted that some farmers may use their own money for replanting because the payout of AUTP takes time. Hence, the number of farmers who did replanting could be higher than 36% of the respondents. There are 92 accumulated farmers with receiving the payouts of AUTP over the last 5 years while there are 53 accumulated farmers who joined AUTP and conducted replanting. The replanting ratio becomes around 58% of the total claim numbers. For this reason, more than half of the AUTP participants have replanted with the payout in their practice.

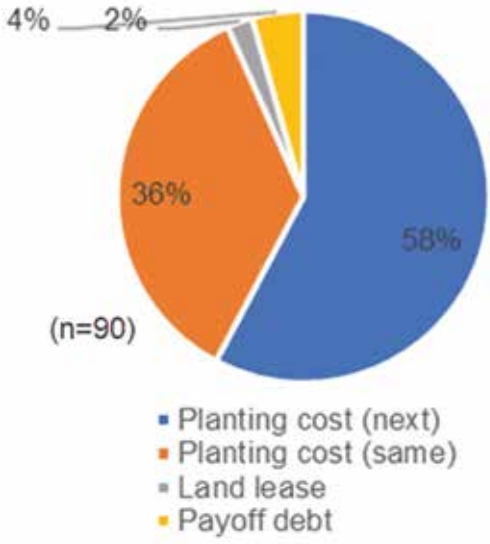


Figure 3.2.9 Usage of Payouts

Source: JICA Consultant Team

3.3 Impact of AUTP Scheme

1) Change the Cultivation Way

One of the expected impacts of the AUTP scheme is to change farming practices. The survey result indicates that the farmers who have joined AUTP are more likely to change their cultivation way. According to the survey, 12% of the respondents (24 respondents out of 196) changed their farming practices. All these 12% of the respondents are AUTP-experienced farmers.

98 respondents have an experience of joining AUTP at least once since 2017. 24% of these 98 AUTP participants answered that they changed their farming practices. These changes include “change the varieties”and “use better fertilizer”. In addition to these changes, some of the AUTP participants men-

tioned that they are willing to plant more paddy because of AUTP. Unlikethe AUTP participants, none of the non-AUTP participants respondents answered that they changed their farming practices.

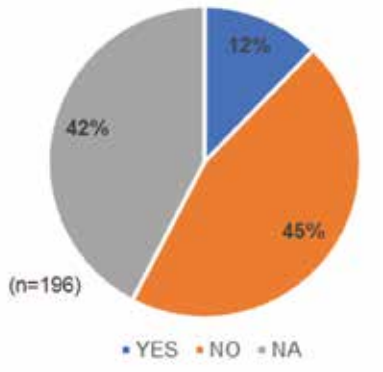


Figure 3.2.10 Change the Cultivation Way

Source: JICA Consultant Team

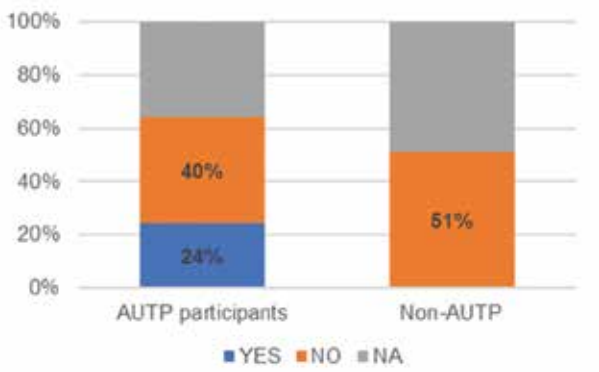


Figure 3.2.11 Change the Cultivation Way by AUTP Experience

Source: JICA Consultant Team

2) Difference between AUTP and non-AUTP farmers

Figure 3.2.12 compares AUTP and non-AUTP farmers in three key areas: paddy yield, production cost, and fertilizer cost. Unexpectedly, non-AUTP farmers perform better than the AUTP farmers in all three aspects. This seems to be due to the fact that more vulnerable farmers are more likely to join AUTP, leading to lower yields. In addition, non-AUTP farmers tend to use more fertilizer because of their lack of experience with crop failures. As AUTP is a voluntary insurance scheme, farmers with higher risks may choose to participate in the AUTP than non-AUTP farmers. This point should be studied further in the future.

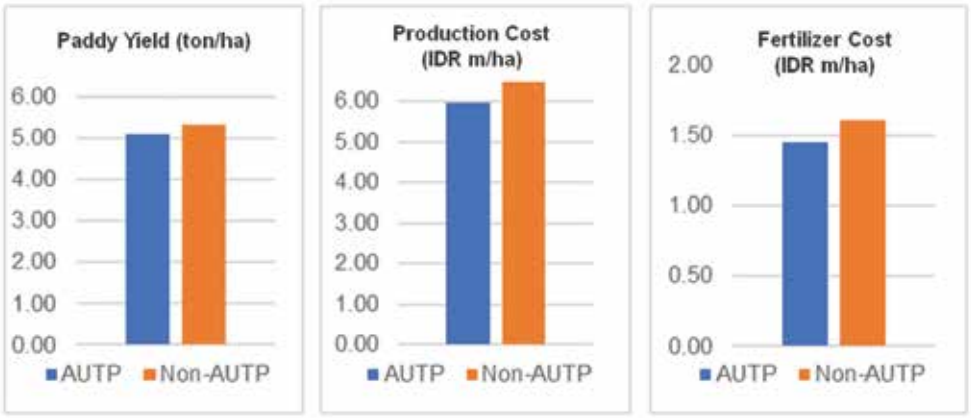


Figure 3.2.12 Comparison between AUTP and Non-AUTP Farmers

Source: JICA Consultant Team

3) AUTP should be continued or not

The respondents of the survey were asked "Do you agree to continue the AUTP program?". As a result, nearly 80% of the respondents answered that they think the AUTP program should be continued. One of the most frequent answers is that "it is helpful in case of crop failures."In other words, farmers understand the benefit of AUTP and they feel it is helpful. Even if non-AUTP farmers responded the same way.

One of the most common comments from non-AUTP farmers is that the number of socializations should be increased. This is because even though they are interested in AUTP, they may not have any chance to join AUTP because of no socialization in their areas. Therefore, increasing the socialization activities to get the involvement of these non-AUTP farmers is a key to promote AUTP in the future.

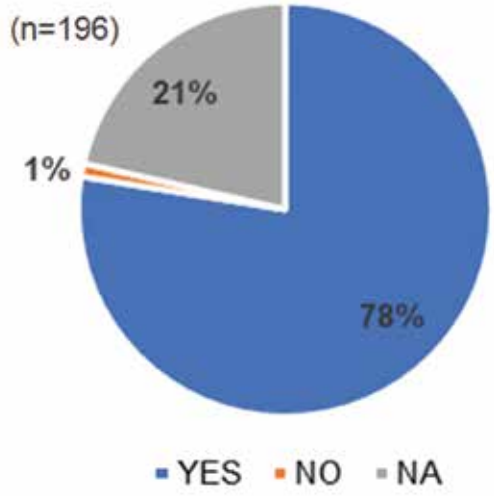


Figure 3.2.13 AUTP should be continued or not

Source: JICA Consultant Team

CHAPTER 4 ICT UTILIZATION TO PROMOTE AUTP

Presented in this chapter is the survey results and improvement plans for the utilization of ICT technology in the implementation ofAsuransi Usaha Tani Padi (AUTP).

4.1 Activities Undertaken for ICT Utilization

At AUTP, ICT technology is used because of the demand for accurate and long-term data accumulation and operational efficiency. For instance, SIAP is a web application1[1] that makes insurance operations as a whole more efficient, and PROTAN is a mobile application that supports damage assessment investigations.

In this activity, a survey of developers and users was conducted in order to analyze the current status of both applications and make recommendations for improvement.In the following, this report describes the outline of the applications and the results of the survey on its utilization status, presents issues and functional improvement plans, and makes recommendations regarding the prospects for utilizing ICT technology in AUTP.

4.2 Current Status and Challenges on the Utilization of SIAP

4.2.1 SIAP in General

SIAP is a web application developed by Jasindo, and operated by connecting to a dedicated URL with a web browser on a PC connected to the Internet.It has been used all over Indonesia since its release in 2019.

The purpose of the application is as follows;

√ Improve the efficiency of procedures by enabling online registration of AUTP participating farmers and application for damage assessment investigations,

√ Record contract information and damage assessment investigation history as electronic data, and

√ Analyze the accumulated data and use it to popularize AUTP and improve operational efficiency.

The main functions in SIAP are the following three;

√ Participating farmer registration function: Enter and register the information of the agricultural group participating in AUTP,

√ Damage assessment investigation application function: If damage occurs in a field, enter the damage status and apply for a damage assessment investigation, and

√ Dashboard function: Information such as the number of AUTP subscribers is displayed in a list.

SIAP can be used by logging in with a user account issued by Jasindo, but the available functions differ depending on the classification of the logged-in user account.For example, various applications such as participating farm registration and damage assessment survey can be used only with the account of the agricultural extension staff.The dashboard function is available for all user accounts, but the information displayed depends on the user's affiliation.The table below shows the categories of user accounts and the main available functions:

1 A general term for applications that run on WEB browsers on PCs, smartphones, and tablets.

Table 4.2.1 Available Features for Each SIAP User Account

User account classification	Available functions
Agricultural extension worker	Application for participating farmer registration, Application for damage assessment investigation, Dashboard reference
Regional Technical Implementation Unit	Primary approval of participating farmer registration, Dashboard reference
Jasindo officer	Secondary approval of participating farmer registration, Approval of damage assessment investigation, Dashboard reference
District officer, Plant pest and diseases inspector, Provincial officer, Ministry of agriculture staff	Dashboard reference, only reference is possible

Source: JICA Project Team

4.2.2 Usability Evaluation on SIAP

In order to evaluate the usability2[2] of SIAP, a structured questionnaire survey, confirmation of a series of operation procedures (walk-through), and interview survey were conducted for developers and users. Table below summarized the survey targets:

Table 4.2.2 SIAP Usability Survey Targets

Classification	Number	Breakdown
Agricultural extension worker	42 people	East Java (6 kabupaten): Kabupaten Pasuruan 6 people, Kabupaten Lamongan 10 people, Kabupaten Nganjuk 8 people, Kabupaten Tuban 5 people, Kabupaten Jombang 5 people, Kabupaten Kediri 5 people.
Jasindo officer	5 people	Headquarters 4 people, Branch in East Java 1 person.
District officer	1 person	West Java (1 Kabupaten) : Kabupaten Karawang 1 person
Total	**48 people**	-

Source: JICA Project Team

In analyzing the survey results, the three elements of usability are considered, which are,1) Effectiveness (If the application function work properly), 2) User's satisfaction, and 3) Efficiency (Efficiency of user interface of SIAP and efficiency of work usingSIAP).

1) Effectiveness perspective

As of June 2022, SIAP is operating normally, and there are no significant obstacles that interfere with operations. The background to that is that Jasindo has positioned two years after the release of SIAP in 2019 as the initial introduction period, and has made continuous improvements while receiving feed-back from users.

2 The term generally means "how easy to use", but here we specifically adopt the following definitions in ISO 9241-11: 2018. “Extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.”

However, although there are no problems with the functions, there are obstacles such as "Unfamiliar with SIAP operation" or "Not in an environment available with PC and the Internet" when actually using SIAP by agricultural extension staff who are the main users of SIAP. And, it was found that there are cases where agricultural extension staff do not use SIAP.Details of this case will be described later.

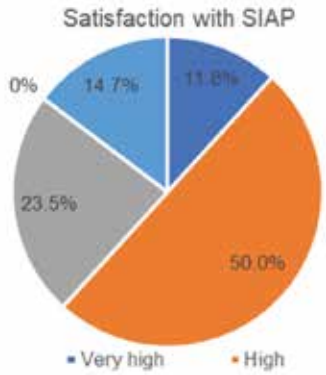


Figure 4.2.1 SIAP User Satisfaction Questionnaire Survey Results

Source: JICA Project Team

2) User satisfaction perspective

As a result of a questionnaire survey on the degree of satisfaction with SIAP, the percentage of users who answered "very high" or "high" was 61.8%.On the other hand, the percentage of users who answered "very low" was 14.7%, and the reasons were "complex operation" and "insufficient internet environment". Users who feel that the operation is complicated have also commented that "Carrying out SIAP user training is needed" and "Too much information is required for the damage assessment investigation application". Which means not only it needs the SIAP function improvement, butalso it suggests that there is room for improvement in user education after the introduction of SIAP and the damage assessment investigation process itself of AUTP.

3) Efficiency perspective

The results of a questionnaire survey are summarized below to see if each of the three SIAP functions (participating farmer registration function, damage assessment survey function, and dashboard function) contributes to improving the operational efficiency of AUTP.

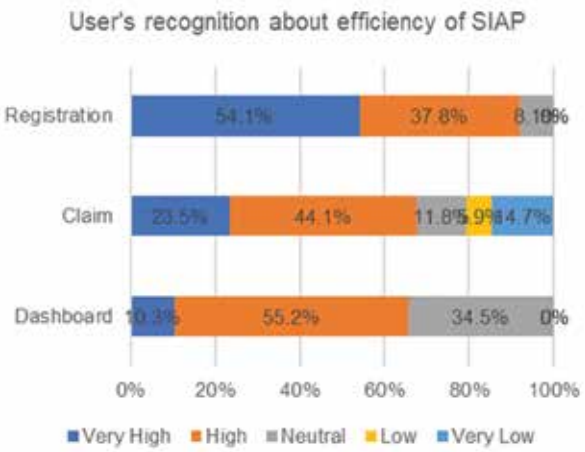


Figure 4.2.2 SIAP Efficiency Questionnaire Survey Results

Source: JICA Project Team

3.1) Participating farmer registration function

91.9% of users answered that the efficiency was "very high" or "high", and there was no response that "low" or "very low", which means a large number of users are feeling that SIAP has contributed to the efficiency of AUTP operation.

3.2) Damage assessment survey function

The percentage of users who answered that the efficiency was "low" or "very low" was 20.6%, which was the most negative opinion among the three functions.Specifically, there were opinions such as "the application process is complicated", "a lot of information needs to be entered", and "the damage assessment investigation takes too long".

3.3) Dashboard function

Although no negative opinions were seen, the percentage of respondents who answered that the efficiency was "very high" or "high" was also the lowest among the three functions. This couldbe due to the fact that the information displayed on the dashboard is not charted with only numerical values and is not an intuitive design.

4.2.3 Challenges and Issues in Using SIAP

Based on the survey results, SIAP issues that can be considered for further operational efficiency are described below.

1) The problem that the user does not notice that the application has been remanded and the procedure is delayed

First of all, as a premise, applications such as participation farm registration and damage assessment survey at SIAP will be examined by Jasindo after applying with the user account of the agricultural extension staff, and if there are any deficiencies, they will be remanded or rejected, and if there is no problem, they will be approved (The status of application procedures such as waiting for approval, approved, remanded, rejected, etc. is hereinafter referred to as "application status").In case of remand, it is necessary to correct the deficiency and reapply, but in order for the user to check the application status, actively checking of the corresponding data on SIAP (pull-type confirmation) is needed. Therefore, the user may not notice that the application has been remanded, and the procedure may be delayed.

As an improvement plan for this problem, it is considered to additionally implement a push-type notification function that displays a notification on the top menuof SIAP when the application status changes. Jasindo is positively considering implementing this application status change notification function.

2) About the case where the person in charge of application work is different from the original assumption of SIAP

The functions that can be used for each user account category of SIAP are as described above. Originally, it is assumed that agricultural extension staff apply for participation farm registration, damage assessment survey, etc. in SIAP.However, in reality, who performs the application work differs depending on the site such as each Kabupaten, Kecamatan, and village. The survey has shown that, in some areas, due to factors such as insufficient internet environment and agricultural extension staff who are unfamiliar with SIAP operations, Kabupatenofficers and Jasindo branch staffare using SIAP instead of agricultural extension staff (This case has been confirmed in multiple regions such as Karawang, Jombang, Kediri, and Nganjuk). Two issues of concern in this case are described below.

2.1) Challenges in terms of security and operation log recording

The first point is the issue from the viewpoint of security and accurate operation log recording.Currently, SIAP allows application operations only with a user account for agricultural extension staff.Therefore, in the above case, Kabupatenofficers and Jasindo branch staff are borrowing the ID and password issued for the agricultural extension staff in order to perform the application operation instead.This increases the possibility of internal tampering and leakage of ID / password to the outside, and because the user account recorded in the operation log inside SIAP is different from the actual user, it interferes with the situation investigation when analyzing data or when a bug occurs in the application.

The following can be considered as improvement plans.First of all, in actual operation, we should recognize that there are some situations where non-agricultural extension staff have to perform application operations due to insufficient internet environment etc. And, we need to implement a proxy operation function so that the application operation can be performed on behalf of the agricultural extension staff, and eliminate the situation where the ID / password of the agricultural extension staff is shared.Jasindo will also positively consider implementing this proxy operation function.

2.2) Challengesin terms of uneven distribution of workload

The second point is the issue of uneven distribution of workload to Kabupatenofficers and Jasindo branch staff.For example, it was found that one Jasindo branch staff is in charge of all SIAP application works in Kabupaten Kediri, and is also in charge of application work in the three neighboring prefectures under his jurisdiction. Current business flow is as follows:

I. Agricultural extension staff who have jurisdiction over each village collect information on participating farmers and information necessary for applying for damage assessment investigations from farmer groups.
II. Agricultural extension staff compile the collected information into an Excel sheet and send it to Jasindo branch officer by e-mail or WhatsApp.
III. The Jasindo branch officer inputs the information sent by the agricultural extension staff into SIAP.

Depending on the number of farmers participating in AUTP and the number of damage investigation applications in the area, it may be possible to operate according to the above flow, but considering the further spread of AUTP in the future, the amount of work would increase further and lead to delays in procedures.

The reason for adopting such a business flow is that "the insufficient internet environment of agricultural extension staff" and "Agricultural extension staff are unfamiliar with SIAP operations."The latter can be improved by strengthening SIAP trainings.This is because agricultural extension staff can often perform basic PC operations such as Excel and e-mail, and thus it is thought that they can also learn SIAP operations.

Further, there are many agricultural extension staff who have not been given the opportunity, although SIAP training is conducted by Jasindo so far.For this reason, in the situation where the workload is unevenly distributed, by taking measures to strengthen SIAP trainings, the number of agricultural extension staff who can perform SIAP by themselves will be increased, and the unevenly distributed workload will be dispersed. A possible business improved flow could be as follows:

I. Agricultural extension staff who have jurisdiction over each village collect information on participating farmers and information necessary for applying for damage assessment investigations from farmer groups.
II. Agricultural extension staff enter the collected information into SIAP (Jasindo branch officer does not have to perform application work, and the amount of work is distributed),

The measures to strengthen SIAP trainings for agricultural extension staff will be described from the viewpoint of the frequency and content of training as follows:

2.2.1) Measures to strengthen training from the perspective of implementation frequency

The SIAP training conducted so far is a practice (2 days) that the Jasindo headquarters conducted for each Jasindo branch office during the initial introduction period (2 years from 2019). After that, each Jasindo branch office regularly conducts training for agricultural extension staff (the operation is left to each Jasindo branch office, and in Kediri province, the Jasindo branch office provides training for agricultural extension staff once a year for one day).On the other hand, in an interview survey with agricultural extension staff, only a small number of agricultural extension staff answered that they had taken training, e.g., 1 in 5 in Kabupaten Jombang, 1 in 5 in Kabupaten Kediri, 2 in 5 in Kabupaten Nganjuk.

As an improvement plan, in order to increase the opportunities for agricultural extension staff to attend, it is desirable to enhance the content related to SIAP operation as the main topic of AUTP training conducted in each Kabupaten in addition to the training conducted by the Jasindo branch office.If online training can be conducted, it will be possible to participate from a remote location. Jasindo has considered conducting it, yet effective training may seem to be actually difficult.

2.2.2) Measures to strengthen training from the perspective of implementation content

The SIAP training conducted by Jasindo branch is a one-way lecture and does not include practical exercises.As a measure to strengthen the training, it is expected that the effect of the training will be increased by incorporating the practical exercise into the training content.In the practical exercises, in order to carry out effectively and efficiently, it is necessary to prepare PC terminals for exercises (at least one for every three students), and consider the placement of a sub instructors to follow the students in addition to the main instructor.

4.3 Current Status and Challenges on the Utilization of PROTAN

4.3.1 PROTAN in General

PROTAN is a native application3[3] that runs on Android OS smartphones, developed and maintained by a system development company commissioned by the Ministry of Agriculture, and its demo version was released in 2020.To use it, it needs an internet connection, and to log in with a user account (same as SIAP's) issued by Jasindo. According to Jasindo, as of June 2022, PROTAN has been partially introduced only in Kabupaten Surakarta, Central Java.

PROTAN aims to realize the following in the AUTP damage assessment investigation application.

√ Make it possible to apply on a smartphone,

√ Support the input of information required for application, and

√ Make the application status checkable on a smartphone.

In addition, the following functions are mainly implemented for supporting information input.

√ Information is automatically entered by scanning the farmer's ID card with the camera of the smartphone,

√ Measure the damaged area by walking around the damaged part of the field with a smartphone, and

√ When taking a photo to obtain a trail of damage status with a smartphone, the date and time of shooting and the latitude and longitude of the shooting location are recorded in the photo.

3 A general term for applications that can be used by installing them on a PC, smartphone, or tablet.

As at now, only agricultural extension staff are expected to use this application.

4.3.2 Usability Evaluation on PROTAN

As of June 2022, only the demo version of PROTAN has been released, and it has not been fully introduced nationwide. Therefore, feedback from the actual users could not be obtained, but questionnaire surveys and interview surveys were conducted on agricultural extension staff who are expected to be users in the future. The survey respondents are shown below:

Table 4.3.1 PROTAN Usability Survey Targets

Classification	Number	Breakdown
Agricultural extension worker	32 people	East Java (6 kabupaten): Kabupaten Pasuruan 5 people, Kabupaten Lamongan 7 people, Kabupaten Nganjuk 5 people, Kabupaten Tuban 5 people, Kabupaten Jombang 5 people, Kabupaten Kediri 5 people.
Total	32 people	-

Source: JICA Project Team

As a result of the questionnaire, all the respondents thought that it would be efficient if they could apply for a damage assessment survey on their smartphones, which means that there were very high expectations for PROTAN.The background is that there is dissatisfaction with a fact that the damage assessment investigation process of AUTP is currently taking a long time, and the situation is expected to improve due to the spread of PROTAN.

4.3.3 Challenges and Issues in Using PROTAN

While SIAP is used all over Indonesia, PROTAN is still in the introduction stage, and it is required to promote nationwide expansion first. One of the reasons why the nationwide expansion has not progressed is the COVID-19 pandemic.In other words, due to the function of PROTAN, it is highly necessary to demonstrate and explain how to use PROTAN when introducing it to the site, but it is not possible to hold user training offline because of pandemics. In the future, with the relaxation of behavioral restrictions, Jasindo plans to carry out offline user training and promote the spread of PROTAN.

In terms of the functionality of PROTAN, there is room for improvement regarding the damaged area measurement function (the function of measuring the damaged area by walking around the damaged part of the field with a smartphone).When applying for a damage assessment investigation with PROTAN, it is necessary to report the damaged area, and the damaged area measurement function is the one to support this.

Currently, PROTAN is so designed that it cannot proceed with the application unless always using the damaged area measurement function.However, in the interview survey, there were opinions that it is difficult to use this function depending on the damage occurrence situation and the terrain.For example, in a mountainous field, it may be dangerous to enter the field when damage occurs.Based on this opinion, when reporting the damaged area with PROTAN, there is an improvement plan that allows users to skip the use of the damaged area measurement function and enter the numerical value directly on the SIAP as an alternative.

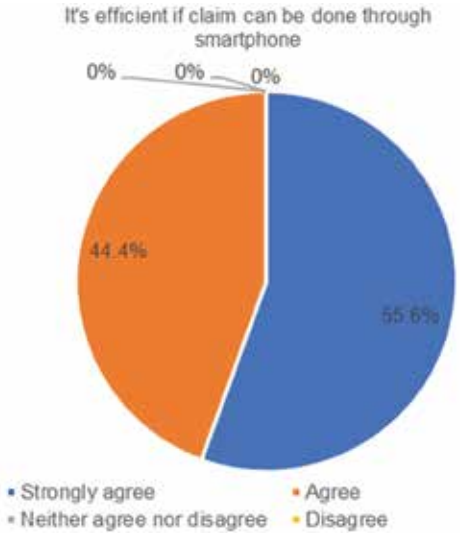


Figure 4.3.1 Questionnaire survey results of expectations for PROTAN

Source: JICA Project Team

4.4 An Example of Utilizing ICT in Japan: NOSAI

As a reference for SIAP and PROTAN in AUTP, there are ICT cases used at the time of various applications in Japanese agricultural insurance.

1) Ministry of Agriculture, Forestry and Fisheries common application service (eMAFF)

With regard to agricultural income insurance in Japan, it is possible to apply on the Internet through the Ministry of Agriculture, Forestry and Fisheries common application service (hereinafter, "eMAFF") from the insurance contract after January 2022.eMAFF is a web application that provides all administrative procedures under the jurisdiction of the Ministry of Agriculture, Forestry and Fisheries as a one-stop service, not limited to agricultural income insurance.

The user is the farmers, which is different from SIAP in AUTP (farmers do not use SIAP.)For users, there are favorable treatments such as discounting administrative fees by making an insurance contract through eMAFF, but on the other hand, due to the nature of agricultural income insurance, there are many things such as past agricultural income information and farming plans for the insurance period.

Thus, it is necessary to enter the information of the above, and it may be difficult for elderly users to enter the information by themselves.Compared to that, SIAP does not require information on income, etc., so there is very little information to enter at the time of registration, and it can be said that SIAP is a relatively easy-to-use interface for users.

2) MAFF app

Just as PROTAN is an application that enables some functions of SIAP to be used on smartphones, in Japan's agricultural income insurance, application procedures can be performed on behalf of eMAFF with a smartphone application called the MAFF app.However, the main purpose of the MAFF app is that it is a communication and networking tool between farmers, between farmers and private companies, and between farmers and the Ministry of Agriculture, Forestry and Fisheries.

The eMAFF / MAFF app are operated under the direct control of the Ministry of Agriculture, Forestry and Fisheries, and is a comprehensive platform that connects not only agricultural income insurance subscribers but also agriculture, forestry and fisheries staff with the Ministry.Since information on agri-

culture, forestry and fisheries is concentrated in one place, more efficient service provision and effective data analysis can be expected.On the other hand, SIAP / PROTAN is independent of other systems of the Ministry of Agriculture, and it is considered that there is room for improvement in terms of data linkage.

4.5 Recommendations to Improve SIAP and PROTAN

Regarding the improvement of SIAP and PROTAN and the prospects for utilization of ICT in AUTP, short-term (within 1 year), medium-term (1 to 3 years), and long-term (3 years or more) target periods are set and described below.

1) Short-term (within 1 year)

Regarding SIAP, it is expected that the usability of SIAP will be further improved by implementing functional improvement and training strengthening measures with the goal of a short period of about one year.SIAP does not have any serious obstacles that hinder business operations. Thus, as a function improvement plan, there could be implementation of "application status change notification function" which is considered to be a relatively minor repair, and implementation of "proxy operation function" which is considered to require development funds and personnel.

Since the functional improvement is carried out in the normal system maintenance work by Jasindo, the implementation plan is conducted by Jasindo in consideration of resources.On the other hand, there are two plans for strengthening training: "increasing opportunities to attend by implementing SIAP training in conjunction with AUTP training" and "making the training content more practical". It is expected that measures will be started and continuously implemented at an early stage in order to respond to the further spread of AUTP in the future.

2) Medium-term (1 to 3 years)

Regarding PROTAN, it is expected that it will be expanded nationwide with the goal of the medium term (1 to 3 years) and that continuous functional improvements will be made based on the feedback obtained from the increased number of users.One of the function improvements expected for now is to skip the use of the damaged area measurement function, which is essential when reporting the damaged area in PROTAN, and instead enable direct numerical input on the screen.In addition, regarding the work efficiency of AUTP's damage assessment investigation application, which is the purpose of PROTAN, there is an aspect that it is currently considered as an issue for agricultural extension staff that it takes a long time, andit is expected that the situation will improve with the spread of PROTAN.

3) Long-term (3 years or more)

Two points are mentioned as recommendations for the use of ICT in AUTP from a long-term perspective.The first point is data linkage/integration between SIAP/PROTAN and other systems of the Ministry of Agriculture.For example, if the farm/field data collected by the Ministry of Agriculture through the eReporting-Petugas application can be used in SIAP and PROTAN, it may be possible to significantly omit the information input work.

The second point is the operational improvement of the damage assessment investigation process, although it is different from the previous issues regarding the improvement of SIAP and PROTAN.Agricultural extension staff have commented that the damage assessment investigation process takes a long time, and it is considered that there are business issues.As a business improvement plan using ICT technology, damage assessment investigations are currently conducted by human eyes, but in order to improve fairness and efficiency,it is considered that there is a room for consideration of the introduction of advanced technologies such as "photographing fields using drones" and "automatic determination of damage level by image recognition technology".

PART III ACTIVITIES FOR OUTPUT 2 (AYII)

CHAPTER 1 PROCUREMENT OF A THIRD COUNTRY'S CONSULTANT

This Project engages a third county's consultant company in the design and pilot implementation of AYI insurance. The consultant company could be procured from India where there have been certain experiences concerning yield index-type insurance. The Team has produced TORs for the purpose of procuring an AYII experienced consultant company in late 2020, and conducted tendering. Following describe the work contents, which are the terms of references for the consultant company, and the process of procurement:

1.1 TORs for AYII Design and Pilot Implementation

One of the activities of this Project is to conduct pilot project for area yield index insurance as a part of the tasks specified under the Activity 2-2 "Conduct a feasibility study on AYI insurance at the pilot sites" in the Project Design Matrix. With regard to this, the Team planned to engage an AYII experienced consultant company in India as the country has already implemented index-based agriculture insurance.

The Team has drafted the TORs for the consultant company to be procured, and conducted procurement process as specified by a JICA HQs guideline. The TORs are mainly composed of five assignments as follows:

Assignment 1: Study on crop insurance scheme in India including 1) data collection on product design, terms and conditions of the crop insurance products, implementation structure, roles and responsibilities of stakeholders, usage of technologies such as mobile applications and 2) analyze achievements, pros and cons and lessons learned of the crop insurance scheme in India,

Assignment 2: Preparation for the AYII pilot activity including 1) data collection, 2) AYII product development, 3) preparation of technical guideline and manuals for AYII pilot implementation, and 4) study on potential usage of digital technologies,

Assignment 3: Support for AYII pilot implementation including 1) institutional arrangement, 2) assistance in operational activities, and 3) monitoring and evaluation of the AYII activity,

Assignment 4: Arrangement of study tour and logistics support for Indonesian relevant officers (approximately 10 members composed of 4 management positions and 6 practitioners) to the relevant institutions for agriculture insurance in India, including appointment arrangement, attendance to the tour, report production, etc.

Assignment 5: Preparation of policy recommendations to expand the AYII program by compiling all the results of aforementioned works and produce recommendations with required capacity building plans and cost estimation for realization of AYII in Indonesia.

Table 1.1.1 Major Terms of Reference for the Five Assignments

Assignment	Primary Tasks
Assignment-1 (Contract-A)	√ Data collection on crops insurance scheme in India including crop insurance product design, premium rates, insured amount, insurance eligibility, contract period, coverage area of threshold indices, targets farmers, target crops, other terms and conditions, implementation structure of the crop insurance scheme, roles and responsibilities of stakeholders, implementation method of Crop Cutting Experiments (CCE) and usage of technologies such as mobile applications, GPS and satellite information, and √ Analysis on achievements of the crop insurance scheme in India, major advantages and disadvantages and lessons learned from the crop insurance scheme in India.
Assignment-2 (Contract-A)	√ Paddy rice yield collection in West Java province in Indonesia over the last 10-20 years, (note: the required data for designing the AYII product, e.g. yield data for the last 10-20 years of the target areas, are to be provided by the Project Team. However, the validation for the data should be made by the contracted Bidder). √ Design of sustainable AYII product taking into consideration the Indonesian contexts including formulation of claim management process, institutional set up, AYII distribution arrangement, AYII product development, establishment of pricing methodology for AYII product, comparative analysis between AYII and indemnity-based insurance and assistance for AYII product approval process, √ Preparation of AYII guidelines and technical manuals for AYII pilot implementation and for the extension of AYII, and √ Study and recommendations on potential usage of digital technologies for agricultural insurance in Indonesia.
√ Assignment-3 (Contract-B)	√ Institutional arrangement for AYII pilot operation covering one paddy crop season, probably in 2021 to early 2022, √ Assistance for AYII pilot operation to be conducted probably in 2021 to early 2022, and √ Monitoring and evaluation of the AYII pilot activities.
√ Assignment-4 (Contract-B)	√ Arrangement of study tour and logistics support for Indonesian relevant officers (approximately 10 members composed of 4 management positions and 6 practitioners) to relevant institutions for agriculture insurance in India, including appointment arrangement, attendance to the tour within India, report production, etc.
√ Assignment-5 (Contract-B)	√ Preparation of policy recommendation documents to expand AYII program in Indonesia with capacity building plan and cost estimation for realization of AYII in Indonesia.

As indicated in the above-table, the five assignments are divided into two phases; namely 1) Contract-A: AYII Product Design Phase and 2) Contract-B: Pilot Implementation Phase. The Contract-A includes the Assignment-1 and Assignment-2, while the Contract-B covers the Assignment-3, Assignment-4 and the Assignment-5.

The procurement of the consultancy firm is made to cover all the above five assignments while the contract is firstly made only for the Contract-A and may be extended to include the works under Contract-B. The Contract-B is thus executed only after the Project Team has confirmed the fulfillment of the tasks

of Contract-A consisting of Assignment-1 and the Assignment-2, and the implementing agencies officially have decided to implement the AYII pilot activity after the AYII Product Design Phase (Contract-A).

1.2 Procurement of A Third Country's Consultant Company

1.2.1 Procedure and Invitation to the Bid

The procurement was conducted on basis of QCBS (quality and cost based selection) procedure for only short-listed companies. As the works need specific knowledge and experiences in the field of index-based insurance, open tendering was not applied but short-list procedure was employed. To identify index insurance experienced companies in India, JICA communicated Swiss Re Asia Pte. Ltd, a well-known re-insurance company, and provided a list which indicated five Indian consultancy companies as follows:

Table 1.2.1 Short-listed Companies for AYII Pilot Procurement

No	Company	General Information	Businesses	URL
1	Skymet	√ 2003 Establishment √ Weather monitoring and agri-risk solutions company √ Staff No.: 51~200	√ Weather monitoring & forecasting √ Agri insurance & reinsurance √ UAV & Remote sensing √ Crop surveillance √ Rural Lending Risk Management √ Agri Risk Solutions [buzzword]	https://www.skymetweather.com/
	Weather Risk Management Services (WRMS)	√ 2004 Establishment √ Smart Farming Company √ Multi-disciplinary research team (Financial Engineering, Computer Science and Electronics) √ Staff No.: 200~500	Leverages data, technology and financial services to provide holistic solutions that enhance agricultural productivity and secure farmers' income in an environmentally sustainable manner.	https://www.weather-risk.com/
	RMSI	√ 1992 Establishment √ GIS Consulting Company √ Provide Geospatial & Engineering Solutions √ Staff No.: 1,000~5,000	√ GIS Solutions for Electric Agriculture √ Forestry √ GIS Outdoor Mapping Services √ Climate Change √ Water Resources	https://www.rmsi.com/

	Zoom (Zoom Insurance Brokers)	√ 2008 Establishment √ Composite Insurance Broking House √ Staff No.: 70	√ Crop surveillance √ Instrumentation √ Agri Credit Risk √ Rural Lending Risk Management √ Agri Risk Solutions [buzzword],	http://zoominsurancebrokers.com/
	Niruthi	√ 2011 Establishment √ Agritech Startup √ Staff No.: 11~50	1) Local Weather 3) Crop Yield 3) Crop Insurance	https://www.niruthi.com/

Source: Summarized based on JICA provided data/information

On October 16, 2020, an invitation letter for the Request for Proposal (RFP) was issued to above 5 companies to submit, if interested, the following documents by the deadline of October 23, 2020 (this deadline was extended to November 12, 2020, in order to respond clarifications given by bidders):

√ Form 1:Submission Letter,
√ Form 2:General Information of the Applicant,
√ Form 3:Financial Statement of the Applicant,
√ Form 4:List of Major Experiencesin Agricultural Insurance in India,
√ Form 5:List of Similar International Experiences in Agricultural/Rural Sector,
√ Technical Proposal
√ CVs for the Experts to be assigned, and
√ Financial Proposal.

1.2.2 Proposal Evaluation, and Award of the Contract

The selection of the consultant companywas made based on QCBS: Quality-Cost Based Selection, and the Ratio was set to be Quality (80%) : Cost (20%) according to general practices, e.g., for consultant procurement under Yen Loan projects. Criterial, sub-criteria, and point system for the quality evaluation are as follows:

Particular Points

A. Adequacy/ experience of the Bidder (the firm) relevant to the assignment:.....20
B. Technical Proposal 40
B.1) Technical approach and methodology 30
B.2) Work plan, members deployment Schedule, etc. 10
C. Experts' qualifications and competence for the assignment:.....40
C.1) Team Leader (Key Expert) 14
C.2) AYII Design 1 (Key Expert).....10
C.3) AYII Design 2.....5
C.4) Monitoring and Evaluation for AYII 1 (Key Expert).....6
C.5) Monitoring and Evaluation for AYII 2.....3
C.6) Technical Assistant 2
Total score (S.quality) for the Technical Proposal based on the above three quality criteria: 100

On the other hand, the criteria of Cost evaluation is that the lowest evaluated financial proposal receivesthe maximum score of 100 points. The score for each other financial proposal is set to be inversely proportional to its Evaluated Total Price (ETP) and computed as follows:

Total score (S.cost) for Financial Proposal = 100 x Fm / F where:

S.cost is the financial score of the Financial Proposal being evaluated,

Fm is the Evaluated Total Price (ETP) of the lowest priced Financial Proposal, and

F is the ETP of the Financial Proposal under consideration.

Following the completion of evaluating the Quality (Technical) and Cost (Financial) proposals, final ranking of the proposals is determined. This is made by applying the weight of Quality 80% and Cost 20% respectively to the technical and financial scores of each evaluated qualifying Technical and Financial proposals, and then computing the relevant combined total score for each Bidder as follows:

Total score = S.quality x 80% + S.cost x 20%

Of the 5 companies invited to the tendering, 4 companies except for Zoom submitted their technical and financial proposals before the deadline date, November 12, 2020. The Team has evaluated the 4 companies' proposals with 80% weight for the technical proposal and 20% weight for the financial proposal, and finally arrived at the overall evaluation, namely, Weather Risk Management Services (WRMS) marked the highest overall point of 82.10.

Given the result of the proposal evaluation, the Team has entered into contract negotiation with Weather Risk Management Services Private Limited (WRMS). In fact, the company's proposed cost was more than the budget, and therefore both sides have negotiated by deleting some of the TORs while decreasing the offered cost. Finally, with some deletions of TORs, i.e., institutional set up and AYII distribution arrangement under Assignment-2, study and recommendations on potential usage of digital technologies for agricultural insurance in Indonesia under assignment-2, capacity building plan and cost estimation for realization of AYII under assignment-5, both sides agreed upon and entered into the Contract as at November 24, 2020.

Awarded	:	Weather Risk Management Services Private Limited
Date Contracted	:	November 24, 2020

CHAPTER 2 DATA COLLECTION AND ANALYSIS FOR AYII DESIGN

2.1 Data Requirements for AYII Design

Data collection is key to conduct proper AYII design and pricing. Particularly, yield data and weather data are important for the AYII product development. As for yield data, minimum 10 years of yield data is required for the product design. Also, yield data has to be checked for any anomaly in the recording and punching. The main usage of yield data is to calculate average yield values. In this pilot implementation, the average yield of last (latest) 7 years is calculated by each Desa (village) for the sake of arriving at "benchmark yield".

Weather data includes rainfall, temperature, and wind information. These weather data sets are mainly used for calculating the Probable Maximum Loss (PML) for the drought, floods and pests and diseases events. The following table shows the list of basic data required for the AYII design:

Table 2.1.1 Data Requirements for AYII Design

Data Type	Time Series Duration (Ideal Case)	Data Usage
Area Sown	10 years	To evaluate the risk exposure and estimate portfolio risk concentrations
Yield data for each season	10 years	For development of basic product design and pricing
Data of variety sown with normal yield potential	10 years	For validation of yield data and understanding the possible reasons for the losses
Area Insured in past years of AUTP Program	5 years	For understanding and evaluating the uptake and reasons for variations in the uptake
Premium and Losses (Desa-wise) for past years	5 years	For risk evaluation and causal analysis of the losses
Weather Data including rainfall, temperature and wind information	30 years	To get better understanding of Probable Maximum Loss For evaluating its utility for dispute resolution
Remote Sensing data of NDVI, EVI, VCI or flood or drought extent	10 Years	For validation of yield data and understanding the variation in the data For evaluating its utility for dispute resolution

2.2 Data Collected and Analysis for AYII Design

2.2.1 Data Collected

Yield data at Desa level was obtained from Kabupaten agricultural offices. Historical yield data is available since 2010, and some Desas have even longer historical yield data. In Indonesia, BPS is responsible for statistical data including yield data; however, they only have historical yield data at Kabupaten (district) level. Therefore, Kabupaten agricultural offices provided historical yield data at Desa level. The table below shows summary of the collected historical yield data:

Table 2.2.1 Collected Historical Yield Data in the Target Desas

No.	Kecamatan (District)	Desa (Village)	Yield Data	Kecamatan (District)	Desa (Village)	Yield Data
	Karawang Kabupaten			**Kendal Kabupaten**		
1	Kutawaluya	Sindangsari	2012 - 2020	Pageruyung	Surokonto Wetan	2010 - 2020
2	Kutawaluya	Sindangmukti	2012 - 2020	Pageruyung	Surokonto Kulon	2010 - 2020
3	Kutawaluya	Kutamukti	2012 - 2020	Pageruyung	Gebangan	2010 - 2020
4	Pedes	Sungaibuntu	2000 - 2020	Patean	Wirosari	2010 - 2020
5	Pedes	Payungsari	2000 - 2020	Patean	Pagersari	2010 - 2020
6	Pedes	Rangdumulya	2000 - 2020	Patean	Selo	2010 - 2020
7	Cibuaya	Jayamulya	2011 - 2019	Patebon	Wonosari	2010 - 2020
8	Cibuaya	Kertarahayu	2011 - 2019	Patebon	Pidodowetan	2010 - 2020
9	Cibuaya	Gebangjaya	2011 - 2019	Patebon	Pidodokulon	2010 - 2020
10	Telagasari	Pasirkamuning	2010 - 2020	Plantungan	Wadas	2010 - 2020
11	Telagasari	Kalibuaya	2010 - 2020	Plantungan	Bendosari	2010 - 2020
12	Telagasari	Cilewo	2010 - 2020	Plantungan	Mojoagung	2010 - 2020
13	Rawamerta	Sukapura	2012 - 2020	Rowosari	Parakan	2010 - 2020
14	Rawamerta	Gombongsari	2012 - 2020	Rowosari	Karangsari	2010 - 2020
15	Rawamerta	Kutawargi	2012 - 2020	Rowosari	Randusari	2010 - 2020

Note: Though yield data of No. 13-15 of Rowosari Kecamatan, Kendal Kabupaten was collected, the Kecamatan was not selected as pilot site at last.

Source: Karawang/ Kendal Kabupaten Agricultural Offices

The weather data is also collected through the international organizations and satellite data as follows:

√ Global Climate Observation System data from World Meteorological Organization (WMO)

- Daily data available for all the parameters. There are a total of 15 stations available. Out of 15 stations, 10 stations have more than 20 years of data.
- Most of the data for the stations are complete with few years' gaps. In few stations, significant gaps in data have been observed.
- WMO dataset is available for all the parameters received from weather stations include:
- Mean Temperature
- Maximum Temperature
- Minimum Temperature
- Precipitation

* Relative humidity
* Wind Speed

√ Global Precipitation Measurement (GPM) Data

* Rainfall data was available from the year 2016. Data from 1997 to 2015 is available under other mission of "Tropical Rainfall Measuring Mission (TRMM)" The resolution of this data is 0.1 degrees.

√ European Centre for Medium-Range Weather Forecasts - ERA5 (ECMWF) Weather Data

* Daily data was available for all the parameters of temperature, humidity, wind and rainfall.

2.2.2 Data Deduction and Analysis

√ Yield data

While the data gaps were minimal, the yield data across the Desas within a Kecamatan was repetitive. Yield data is provided at different levels, data is available at farmer group level for three Kecamatans and at Desa level for the rest two. Here, farming groups are one level below Desa and are formed by sub-village, farmer's domicile, and local harvested area/one stretch of paddy field within one Desa.

√ Weather data

To estimate the extreme flood events, storm rainfall (cumulative five-day rainfall) data have been collected to fit a parametric distribution. This led to the estimation of the one in a 100-year event storm rainfall which comes out at about 250 mm. As regards standing water in the pilot areas, we have estimated the maximum standing water possible which comes to about 0.5 m. With this standing water, loss is estimated to the Rice crop at various stages using empirical evidence. The analysis shows that loss to rice crop due to standing water depth of 0.5 m can be 10 - 15% of the Sum insured.

CHAPTER 3 AREA YIELD INDEX INSURANCE (AYII) DESIGN

3.1 Comparative Study between AUTP and AYII

Some key terms and conditions of insurance products are put as a comparison table between AUTP and AYII below (Table 3.1.1):

Table 3.1.1 Comparative between AUTP and AYII

	AUTP (Indemnity Based Insurance)	AYII (Index-based Insurance)
Premium rate	3% (as a portfolio rate, applied to all provinces)	2.65%
Expected premium amount	IDR 180,000/hectare /planting season. (Farmers' self-reliance is 20%, or as much as Rp.36,000/hectare/planting season.)	IDR 159,000/hectare /planting season. (Farmers' self-reliance is 20%, or as much as Rp.31,800/hectare/planting season.)
Risks covered	Flooding, Drought, Pests and diseases	Flooding, Drought, Plant Pest Organisms
Coverage (Sum insured)	The maximum payout amount (coverage level) is 6 million IDR/ha (about 410$), based on an estimated average production cost of paddy per hectare.	The maximum payout amount (coverage level) is 6 million IDR/ha (about 410$), based on an estimated average production cost of paddy per hectare.
Insurance period	Wet season: November 1 - March 31 Dry season: April 1 – October 31 Intermediary season: clarification required	Wet season: June – December 2021 (MT2 crop season)
Trigger (Benchmark yield, Threshold)	The current trigger point for an insurance loss is set at over 75% of the insured field (each original slot area) to sustain damage equal to or in excess of 75%of plants (=the intensity of damage was 75%).	The trigger in AYII is "benchmark yield" shown as a percentage of the 7-year historical average yield at the level of Desa. The benchmark yield value is set at 85% of the average yield for Desa.
Loss assessment (Loss survey)	Field loss assessment shall be made individually to check the actual paddy damages (triggered by a percentage damaged plants) to a portion of planted acreage.	One of the field sampling survey methods, Crop Cutting Experiment (CCE), shall be conducted to get the average area-yield.
Basis Risk	The basis risk is much smaller[1] than that of the index-based ones because of individual loss assessments.	Farmers may incur production losses but do not receive payouts. Basis risk is generally taken into account for index-based insurance products.

Source: JICA Consultant Team

1 Many insurance companies explain that there is no basis risk in indemnity-based insurances.

3.2 Design of Area Yield Index Insurance (AYII)

3.2.1 General Conditions of Area Yield Index Insurance (AYII)

There are two key aspects for the AYII design: 1) establishment of solid yield data collection system including an effective implementation method of the CCE, and 2) formulation of reproducible historical indices for premium calculation. It is also important to consider eligibility for insurance to minimize adverse selection. The following are major components of the AYII design:

Eligibility and requirements for insured croplands: eligibility for the insurance is limited to paddy farmers with less than 2ha. AYII product is only the agricultural insurance option for farmers in the target 15 Desas.

Risk coverage and exceptions on natural disasters:guaranteed risks in the AYII product will be floods, drought, and plant destruction organisms (OPT).Exceptions are prescribed in the policy. Concerning natural disasters, earthquakes, volcanic eruptions, tsunamis, and wild fires were excluded by the clauses of general exceptions and special exceptions.

Insurance period: the insurance period is designed for one planting season, a maximum of 6 months, which starts 15 days after the transplanting or 30 days after the sowing for the direct-sowing system.

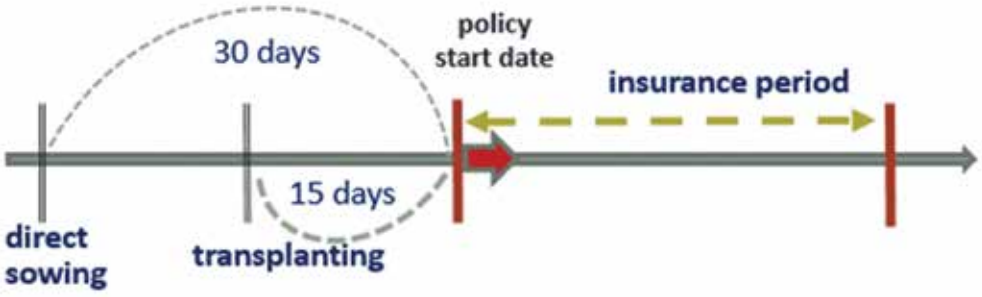


Figure 3.2.1 Insurance Period for AYII

Source: JICA Consultant Team

Basic mechanism of AYII and overview of proportion of the compensation: The AYII product triggers the losses based on a comparison of the actual yield (value) with yield benchmark (value) for the area. As the image diagram of AYII (Figure 3.2.2) illustrates, the benchmark yield value is set at 85% of the average yield for eachDesa. If the actual yield (current yield) is smaller than the benchmark yield value, the payout will be given. The actual yield (value) and the yield benchmark (value) are shown as a percentage of the average yield for a certain period of time in an insured Desa (an insurance unit) put in the policy.

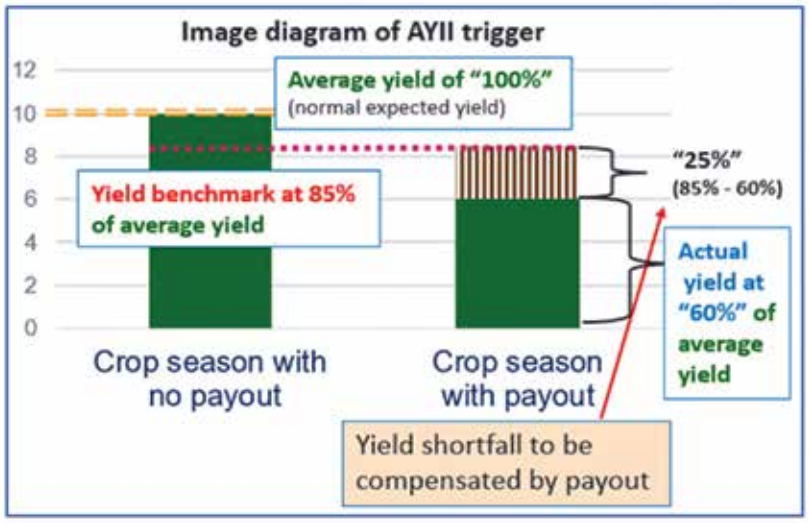


Figure 3.2.2 AYII Trigger Image

Source: JICA Consultant Team

Calculation of compensation in AYII: The calculation of the amount of compensation is the ratio on the relation between the benchmark yield and the actual yield, using the following formula.

$$\left[\frac{\textit{benchmark yield - actual yield for the year}}{\textit{benchmark yield}}\right] x \textit{"sum insured per ha" x "area insured"}$$

The insured expects to receive the following amount of compensation.As the sum insured per ha is 6,00,000IDR, if the benchmark yield value is set at 85% of the average yield and the actual yield value amounts to 60%, the result of the compensation amount will be 1,764,705IDR.

$$\left[\frac{85 - 60}{85}\right] x \text{“}6{,}000{,}000\ \textbf{IDR}\text{”} x \text{“}\ 1\ \textbf{hectre}\text{”} = 1{,}764{,}705\ \textbf{IDR}$$

3.2.2 Actuarially-sound Pricing and Calculation Method

Ratemaking process is a key step of thedesign after the determinations of indemnity level, the level of benchmark yield, the sum insured, calculation of historical payoffs expected payoffs etc. Based on the comprehensive data collection. A pure premium can be defined as loss costs in terms of frequency and severity in pure premium method.

As shown in the following formula, the pure risk premium is calculated through frequency multiplied by severity. Average severity is the amount of loss associated with a payout, and can be a key financial expenditure for an insurer. It is common for insurers to study how often losses (claims) arise. The frequency as probability of occurrence is important for grasping expenses, but it also influences contractual parameters such as deductibles and policy limits.

Pure risk premium = Frequency × Severity

(Probability of occurrence) × (amount of loss)

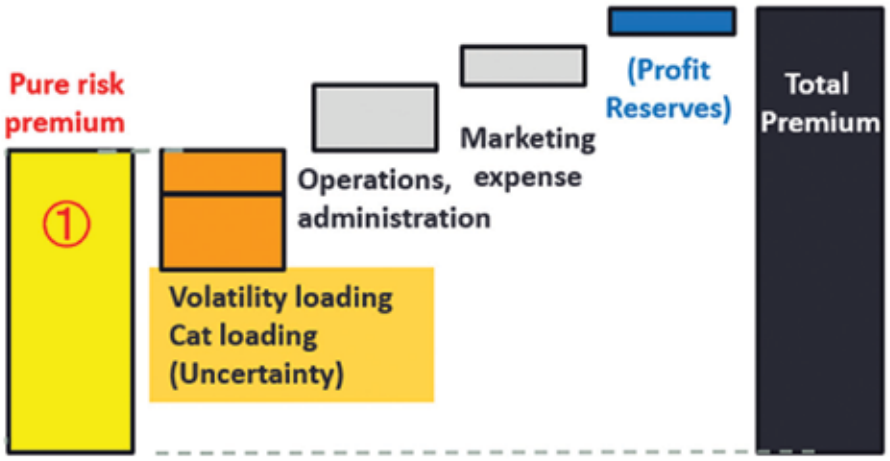


Figure 3.2.3 Pure Risk Premium Calculation

Source: JICA Consultant Team

As seen in Figure 3.2.3 above, the total risk premium is largely composed of pure risk premium, loadings such as volatility loading, catastrophic loading, uncertainty etc., operations and administration, marketing expense, and profit reserves (if we ignore taxes). To briefly grasp the appropriate level of the pure risk premium in proportion to the total premium, loss ratio can be of use. The loss ratio is the ratio of the sum of losses to the total premium, which is significant benchmark for the insured, not only from a management perspective but in this ratemaking process.

In general, the target loss ratio lies within the range between 50% and 80%. In this regard, it is stated that the premium rate of AYII program was previously and tentatively calculated on a basis of 70% target loss ratio[1] , which was accepted by JASINDO, and the figure will be one of benchmarks for this pilot implementation.Concerning loadings in the orange boxes in Figure 3.2.3, there are three types of loadings in ratemaking as below.

Pure (Expected) risk premium is sum of Expected Loss, Volatility Loading and Catastrophic Loading. All the figures are expressed in terms of percentage of sum insured.

Pure Risk Premium includes (① Expected Loss + ② Volatility Loading + ③ Cat Loading) + α

In the expected loss (①), the average payout (compensation) of the last 10 years (2011 to 2020, or 2010 to 2019) (or 7 years) was used. The volatility loading (②) is expressed based on loss estimates at various return periods and applying a capital charge on these loss estimates. The catastrophic loading (③) is concerning extreme events which may occur once in 50 years or 1 in 100 years and relevant data was collected. The Project team has taken weather data for past 20 to 30 years from the WMO's Global Observation System for available weather stations in the West Java region. "α" represents the other components except the loadings in the pure risk premium.

Calculation of expected loss (①): expected loss is average claim payout of the last 10 years (2011 to 2020, or 2010 to 2019). This value is shown as percentage of Sum Insured. The following formula will be used to calculate payouts of each year.

Max((Benchmark Yield – Detrended Yield) / (Benchmark Yield), 0) * Sum Insured
① ②

① Benchmark Yield for each Desa is the **de-trended Average Yield of the last 7 years multiplied by level of Indemnity**
② Cleaned data was checked for any trend and the data was adjusted for the trend **using linear detrending**

1 Agroinsurance Report

For de-trending, the Project Team has taken simple linear de-trending to identify and adjust the trend in the yield data. Wherever the yield data was suspect or not available, we have replaced the yield value with conservative yield value from the surrounding Desas to factor in the load on premium due to data inconsistency and/or non-availability.

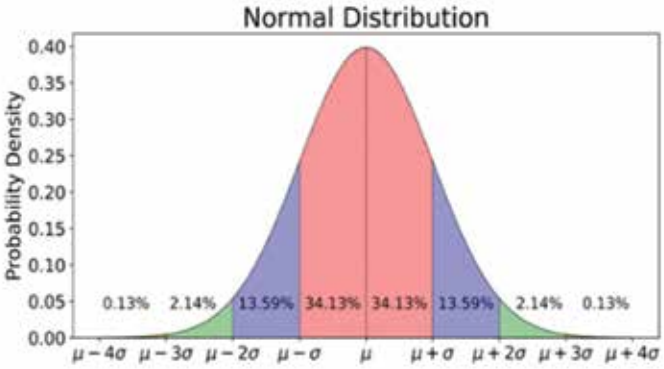


Figure3.2.4 Distribution of Probability Density

Source: WRMS AYII Product Development Report

Volatility loading (②) is based on loss estimates at various return periods and applies a capital charge on these loss estimates. Capital charge is based on available benchmarks but can be modified by the insurer suitably. It decreases as the return period increases and depends on the capital cost of the insurance company. Capital charge is basically cost of the capital that insurer is setting aside to underwrite this risk. This would depend upon the amount of capital set aside for underwriting this risk by the insurer and return on capital that insurer expects.

Return period of a loss is the inverse of probability (generally expressed in %) of loss, it gives the estimated time interval between events of a similar size or intensity. So, for the estimation of return period of a loss, the probability of the loss is estimated based on a parametric distribution fitted on the 10 to 20-year yield data (see Figure 3.2.4) and using the z-score of the fitted distribution (i.e., normal distribution). It is assumed that the parametric distribution fitted to the yield data can help in calculating losses up to a 50-year return period (i.e., chance of occurrence - 2%). Usually, 20-year data is accepted to estimate losses of a 50-year return period. For higher return periods (50-100%) extreme event analysis has been done.

Table 3.2.1 Return Period of a Loss

Source: WRMS AYII Product Development Report

Loss	Probability and return period	Loss as % of sum insured	Capital charge	Loading as % of sum insured
Losses between mu + 1.0 sigma	33.14% probability, or 1 in a 3year return period	0.0%	12.5%	0.00%
Losses between mu +1 sigma to mu + 1.5 sigma	10% probability, or 1 in a 10-year return period	4.7%	7.5%	0.35%
Losses between mu + 1.5 sigma to 2.0 sigma	4% probability or 1 in a 25-year return period	9.6%	5.0%	0.48%
Losses between mu + 2 sigma to mu + 2.5 sigma	2% probability or 1 in a 50-year return period	14.5%	2.5%	0.36%
			Total	**1.19%**

Catastrophic loading (③): in this AYII pilot, the Project Team has taken weather data for past 20 to 30 years from the WMO's Global Observation System for available weather stations in the West Java Province. This data has been primarily used for evaluating the catastrophe loading required to account for any adverse event that could have impact on yields in the past and that have not been reflecting in the 10-year yield data available for pricing.

Catastrophic risk loading has been calculated on Maximum Probable Loss scenario which is loss calculation on the basis of modelled events which have return period of 50 to 100 years. These events have been modelled using proxy indicators such as heavy rainfall from weather phenomenon which have higher availability of longer time series data compared to crop yield data. The Consultant Team has also considered the worst case yield scenario from the available yield data we have gotten to reach maximum possible yield loss.

Based on our calculations, a couple of values have been calculated:

a. Maximum Probable Loss based on proxy indicators – 40% (32%[2] + safety ratio 8%)

b. Maximum Probable Loss based on the worst case yield outcomes – 36%

The item b. is the assumption of the minimum historical yield of any of the target 15 Desas.2% of the values of two items above have been taken as loading for catastrophic risks (or extreme events causing high yield losses).

3.2.3 Premium Rate[3]

1) Karawang Kabupaten

As described in 3.2.2, the pure premium rates were calculated for the 15 Desas in Karawang Kabupaten as follows:

Table 3.2.2 The Pure Premiums in Karawang

Kecamatan	Desa	Area	Pure Premium (80%)		Pure Premium (85%)		Weighted Ave.	
		km2	MT1	MT2	MT1	MT2	80%	85%
Kutawaluya	Kutamukti	5.09	0.800%	0.800%	0.800%	0.800%	0.84%	0.91%
	Sindangmukti	6.14	0.800%	0.800%	0.800%	0.800%		
	Sindangsari	7.40	0.800%	0.800%	0.800%	0.800%		
Rawamerta	Gombongsari	2.90	0.800%	0.800%	0.800%	0.800%		
	Kutawargi	3.09	0.800%	0.800%	0.800%	0.800%		
	Sukapura	3.41	0.800%	0.800%	0.800%	0.800%		
Telagasari	Cilewo	3.67	0.800%	0.800%	0.800%	0.800%		
	Kalibuaya	4.44	0.800%	0.800%	0.800%	0.800%		
	Pasirkamuning	3.54	0.800%	0.800%	0.800%	0.800%		
Cibuaya	Gebangjaya	4.42	0.800%	0.800%	0.800%	0.800%		
	Jayamulya	7.56	0.800%	0.800%	0.800%	0.800%		
	Kertarahayu	5.62	0.800%	0.800%	0.800%	0.800%		
Pedes	Payungsari	6.92	1.369%	0.800%	2.873%	0.800%		
	Rangdumulya	3.95	1.384%	0.800%	2.137%	0.859%		
	Sungaibuntu	10.55	0.800%	0.800%	0.860%	0.825%		

Source: JICA Consultant Team

2 Yield difference between normal & 1 in 100 years worst yield divided by normal year yield (%) is 32%. …(21Qt./ha/65Qt./ha)*100

3 Premium rate indicates % of the total sum insured amount. The total sum insured amount is the maximum amount insured farmers can receive. For example, if the sum insured amount is 6 million IDR, and the premium rate is 2.65%. The premium is 159,000 IDR.

As shown in Table 3.2.2, the pure premium rates are largely consistent across the target 15 Desas with exception of Pedes Kedamatan. This Desa, located in a costal area, experiences higher agricultural risks during the MT 1 season due to its vulnerability to floods during the rainy season. Despite the variations in the pure premiums between Desas, a single premium rate was applied to all target Desas for the ease and efficiency of insurance operations, rather than having different rates for each Desa.

There are several options to set the single premium rate as shown in the following table:

Table 3.2.3 Options for Single Premium Setting

Method	Description
Maximum of the Premium taken as premium for all Desa	This would be extremely expensive product for the Desa that have better risk profile and more consistent yields over past year. It would result in larger outlay from the government towards the subsidy. In the absence of subsidy, this would result in skewed subscription with only farmers from more risky Desa finding it useful to subscribe for the insurance program.
Average of the Premium taken as premium for all Desa	This would result in increase in premium to be paid by less risky Desa's. Also, this would also result in product for Desas with high risk becoming really attractive. Hence, it is likely to result in much larger offtake of insurance in high risk Desas compared to any other option. This may cause loss to insurance company since total premium received would be less than the actuarial premium.
Weighted Average Premium with weights based on the Area Sown under each Desa	This would provide more equitable premium rate actuarially and would address the issue of making the product really attractive for Desas with high premium to some extent. However, product would still be more attractive for riskier Desas compared to Desas with low risk. Hence, skew of business towards riskier Desas and consequent losses to insurer is likely.
More equitable subsidy-based option	If there is any possibility of offering government subsidy for the program, it would be more prudent to keep the premium rate for each Desas at the actuarial levels. However, for farmers the premium rates can be kept as same. For instance, if two Desas have actuarial premium rates of 2.5% and 4.00% respectively, farmers of both the Desas can be asked to pay 1.5% as premium. Remaining amount would be subsidized by the government.
Kecamatan Level Premium Rate	Another option would be taken weightage average rates for each Kecamatan. Rather than keeping the same rates for all the Desas irrespective of Kecamatans they are in, we can have same rates for each Kecamatan. Rate for each Kecamatan can be calculate using area sown of each Desa as weight.

Source: JICA Consultant Team

After intensive discussions among the stakeholders, it was agreed to apply the benchmark yield of 85% and the weighted average pure premium rate of 0.91% for all target Desas. Jasindo considered their operational cost to finalize the premium rate, resulting in a final premium of 2.65% per ha, which is lower than the AUTP premium rate of 3.00% per ha.

2) Kendal Kabupaten

Jasindo has completed the premium calculation for Kendal Kabupaten. The method used awas the same as in Karawang, which consisted of applying 85% of the benchmark yield and the weighted average pure premium to the targeted Desas in Kendal. The table below shows the results of the pure premium calculation of Kendal:

Table 3.2.4 The Pure Premiums in Kendal

Kecamatan	Desa	Paddy Area (ha)		Pure Premium (85%)		Weighted Ave. (85%)	
		MT1	MT2	MT1	MT2	All	Except Rowasari
Pageruyung	Surokonto Wetan	80	80	0.806%	0.806%	1.36%	0.82%
	Surokonto Kulon	40	40	0.806%	0.806%		
	Gebangan	24	24	0.806%	0.806%		
Patean	Wirosari	69	39	0.806%	0.806%		
	Pagersari	57	32	0.806%	0.806%		
	Selo	68	69	0.806%	0.806%		
Patebon	Wonosari	57	32	0.806%	0.806%		
	Pidodowetan	69	42	0.806%	0.806%		
	Pidodokulon	39	46	0.806%	0.806%		
Plantungan	Wadas	121	121	0.845%	0.806%		
	Bendosari	170	170	0.851%	0.806%		
	Mojoagung	181	181	0.857%	0.808%		
Rowosari	Parakan	60	60	2.697%	4.434%		
	Karangsari	90	90	2.476%	4.104%		
	Randusari	85	85	3.082%	4.070%		

Source: JICA Consultant Team

As shown in Table 3.2.4, the pure premium rates in Rowasari are higher compared to those in other areas. This is due to the fact that Rowosari is located in a coastal region. Thus, farmers in the area face a higher risk of flooding than those in other Kecamatans. This results in a weighted average pure premium of 1.36%, which is significantly higher than the weighted average pure premium in Kendal, which is 0.91%.

The final premium rate for AYII in Karawang is 2.65% per ha. This rate will also be applied in Kendal. However, the pure premium of 1.36% is too high to reach the target rate of 2.65% given Jasindo's operational costs. Thus, Jasindo, MOA, and BAPPENAS agreed to exclude Rowosari from the target areas in Kendal during the pilot implementation stage. The weighted average pure premium rate than became 0.82% per ha without Rowosari. With Jasindo's operational costs added, the final rate reached 2.65% per ha.

3.2.4 Loss Assessment Mechanism using CCEs

Implementing CCEs are under the supervision of MOA[4] . Our team and MOA are still under discussion if agriculture extension staff handle 10 CCEs per Desa for the loss assessment without fail as the standard deviation on the CCEs data has been small[5] .Yield data gained by MOA extension staff is checked by

4 Before 2015, BPS and MOA extension staff had conducted CCEs collaboratively.

5 Standard division of 1.4 tons/ha with the average 9.4 tons/Ha (a/c to the 300 CCE results), even 9 number of sample yield can ensure around 5% error (68.3% confident level).

their supervisors. After the data is put together, they manage that data at the Kecamatan (sub-district) level and at the Kabupaten (district) level. Loss assessment through CCEs in Indonesia is technically briefed as below:

√ An example[6] of CCE size by "a seedling / planting (tile) for a spacing of 20 cm x 20 cm"(Other options like 25cm x 25 cm are not described here.)

* Plant population: plant population in 1 m x 1 m = 5 clumps x 5 clumps or 1 m2 = 25 clumps, or 1 ha = 10,000 / 1 x 25 clumps = 250,000 clumps
* CCE Size: the suitable size of the CCE is: 2.6 m x 2.6 m = 6.76 m2 or 13 clumps x 13 clumps = 169 clumps.
* CCE implementation steps:

1.	Choose a cropping area that can represent the appearance of the landscape, both in terms of growth, plant density, and the latest conditions in the field.
2.	Determine the area of the tile according to the planting system used.
3.	Threshing: mark the area to be measured using a stake.
4.	Carry out a harvest on the area of the tile, remove the grain, and clean it from dirt.
5.	Repeat the implementation of the tile using a minimum of 2 or more repetitions.
6.	Weigh the grain and measure the moisture content at harvest.

√ Statistical unit, yield unit, insurance registration unit, implementing agency for field surveys

* Insurance Unit is the geographical unit at which actual yield is ascertained. At the level of insurance unit, all the insured farmers would get the same amount of claim per hectare. Insurance Unit has been taken as a Desa (village).
* Statistical unit for paddy yield is by one Desa (village) which has a 2km x 2km square area.
* There are 15 units of target Desas in total (Kecamatan per 3 Desas each).
* On the other hand, to buy the insurance product(s) and handle their contracts are conducted by a farmer group in a Desa.
* The implementing agency of CCEs at the Desa-level will be Kabupaten DINAS (not yet fixed) who also has the responsibility of determination of the yield for the season in the Desa.

√ Setting level of indemnity (trigger point), calculation method

The benchmark yield is the de-trended average yield for 7 years multiplied by level of indemnity, setting appropriate "level of indemnity" (trigger value), is regarded as an important process for the product design. This time, different indemnity levels between 95%, 90%, 85%, and 80% were considered as design options. We prioritized to see lower indemnity levels like 85% and 80%as the one adopted in this pilot implementation in the following reasons.

* There may be errors in the Desa-level yield data reported in the settlement season.
* Hidden Volatility in yield may be noticed because there could be errors in the historical yield data.
* When it comes to volatility loading, the uncertainty of 85% indemnity level shows values between 0.1% and 0.3%, which was lower than that of 95% indemnity level representing between 0.4 and 2.5%. It is reasonable for us to take the one with the estimation of volatility loading equal or under 0.3%.
* Technically, the trigger point at 80% or 85% level is more affordable for insured farmers than those of 90% or 95%.

6 2017, Indonesian Center for Rice Research "CCE Techniques Estimation of Rice Productivity According to the Planting System",

Seen from the whole picture, some adjustments were considered. As the indemnity level of AUTP has been set at 75% level, in the next step of product development after AUTP, targeting slightly higher compensation level than 75% can be a good option. As a result, we selected 85% indemnity level in this pilot implementation.

√ Other general statements in the policy

* Claim reporting: to commence his/her claim processes, the Insured reports to the insurer (JASINDO) within 7 working days from the date of the public announcement on Desa-level yield given by Kabupaten DINAS, implementing agencies of CCEs.One of the representatives by Desa will report that in writing to the insurer up to maximum 14 working days if the insured cannot do this within 7 working days.
* Payment of compensation: the Insurer has an obligation to pay compensation completely within 14 working days after reaching a written agreement on the amount of compensation with the Insured. The Insurer processes the claim by means of the insured's bank account.

3.3 Stakeholders' Roles and Responsibilities in Introducing AYII

This program primarily has the following stakeholders (Figure 3.4.1). BAPPENAS, Ministry of Agriculture, and Jasindo Asuransi are the main implementers in this AYII project. Moreover, the regional government of West Java plays significant role in the AYII pilot activities. The projectprovides technical supports throughout this project and formulates policy recommendations etc. for the AYII program in line with the Indonesian government agencies.

Table 3.3.1 AYII Stakeholders

MOA	Central government; assisting and monitoring Provincial, Kabupaten and Kecamatan agricultural offices for the data collection, the pilot implementation etc.
BAPPENAS	Central government, Ministry of National Development Planning; preparing the budget for premium subsidies, facilitating procurement procedures, overall coordination.
OJK	Organization of central government, financial service authority, Ministry of Finance
BMKG	Central government, Indonesian Agency for Meteorology, Climatology and Geophysics;providing weather data for development of an insurance product.
BPS	Organization of central government; supporting CCEs, providing CCE methodology, receiving claim report from MOA staff, providing statistical (non-Desa) yield data.
LAPAN	Organization of central government; supporting to establish a model of estimating the paddy yield by satellite data.
Karawang Kabupaten	Regional government (district); DINAS (agriculture office) provides historical yield data
West Java Province	Regional government; assisting Kabupaten agricultural officeand monitoring the pilot activities.
Jasindo Asuransi	Insurance company; underwriter, issuing the AYII insurance policy, sharing the insureds' list with relevant organizations, managing the insureds' information etc.
JICA	Donor; technical advisor, monitoring and evaluating the AYII development activities.

Source: JICA Consultant Team

3.4 Extension Method to Clientele Farmers

The Consultant Teamcan say thatdisseminating knowledge of agricultural insurances in line with other financial products in the target areas and the neighboring regions is a matter. Further capacity buildings of financial literacy for the potential customers as well as insurance agent using technologies like smartphones will be significant in terms of establishing sound agriculture insurance market as insurance itself still may not bethat widely popularized in the country.

On the other hand, from an insurer's perspective, experiences that someone around the potential customers actually got compensation by AYII or similar index-based insurances would be an important driver to draw their interest. And this is depending on how the product can be found a well-balanced payout history through the product design and the improvement.

3.5 Planning of AYII Upscaling and Extension

Agricultural specialists who know microfinance including microinsurance products will be trained and allocated through establishing some training systems and this drives them to farm efficiently and penetrates AYII in the areas in collaboration with agricultural extension staff. Recently, appropriate management of microfinance products become a vital issue as multiple debts problems were reported[7] in West Java. The study showed that 169 interview sessions with 241 respondents across West Java and 54 % of the respondents had at least three loans. The adequate agricultural management and handling systematic financial programs are inseparable and local organizations should take care of them for the AYII extension in the long run.

In the case of PMFBY in India, district administration used multiple marketing tools to raise awareness among the farmers. Information on the scheme was distributed through papers and leaflets etc. and electronic media such as WhatsApp, Hike groups, Kisan SMS, and CROPSAP and so forth[8].

Bundled programs with other subsidized ones could also contribute to expansion of the AYII in the future. Agricultural insurance products target a large number of farmers who would join other state-supported programs. In this regard, the scale of a bundled product is significant. This is because smaller bundle programs may not be sustainable due to high administration costs[9] in both cases of AYII and AUTP.

3.6 Potential of Introducing Digital Technology in Implementing AYII

Firstly, field samplings using CCEs may be replaced by yield estimation using technologies such as drone or satellite by means of smartphone applications after the pilot phase. The remote sensing technologies (satellite/drones) also work with the smartphone applications. So far, we deal with remote sensing data primarily for grasping the cropping pattern and crop period, evaluating the area sown, and validating the accuracy of some yield datasets. In the future, the technologies can be connected to introducing vegetative index capability in form of a hybrid index-based insurance of vegetation index (NDVI) and area-yield index.

Furthermore, picture-based insurance would have the potential to be one of the alternatives for the current index-based insurance products by the use of the insured farmers' smartphones, for taking pic-

7 PAKINDO, 2016, "Indonesia Over-Indebtedness Study Why Microfinance Clients Take Multiple Loans"http://staging.microsave.net/files/pdf/Over_indebtedness_Study_Indonesia_2016.pdf

8 RK Sinha "About Pradhan Mantri Fasal Bima Yojana",Pithoragarh district (state of Uttarakhand) https://darpg.gov.in/sites/default/files/PMFBY%20-%20Best%20Practices.pdf

9 AgroInsurance, 2019, "Survey on Sustainable Agricultural Insurance in Indonesia", P.38

tures of insured plots. In this context, field boundaries identification as well as claim processes based on GPS coordinates and the camera functions will become its key elements in many cases.

Technologies using smartphone are not merely for the insured or potential insurance customers. In the case of PMFBY in India, for a transparent estimation of crop losses, Ministry of Agriculture & Farmers Welfare has developed an android app and harnessed satellite technologies. Seasonal monitoring was done through crops images with GPS coordinates by smartphones, and field staff collected yield data through CCEs at the harvesting time[10] .

Mobile application named "CCE Agri App[11] " gives real time data of the yields and enables various stakeholders to access the detailed information. In this application, the user can find the statistics of particular State, season and year. Moreover, "CCE Agri App" users are able to view the reports of different primary users etc. (see Figure 3.6.1).

Figure 3.6.1 Image of CCE Agri App

3.7 Gap Identification in Introducing AYII in Indonesia

As a country-specific circumstance, survey results pointed out that there may be no value belonging to a farm group in Indonesia[12] . This could lead to a supposition that increasing participation in agriculture insurance program can be a burden for the farmers if they must belong to a farm group, simply because of joining AYII or AUTP insurance program.

Secondly, in the case of PMFBY, an area-based yield-index insurance scheme in India, which has yield data through CCE processes like AYII, weather-index data was not well documented and the results were not trusted by farmers[13] . Likewise, Indonesia might confront the similar problem in terms of credibility of the results of the implementation.

Uncertainness of data reliability of our collection is another issue. The yield data that we collected in some Desas has been the same for few years[14] . It seems unlikely that multiple years could have the same yields at a village level even if it would be hard to make a definitive statement that her data was wrongly punched. Although the in-field surveys are supposed to be conducted independently and unbiasedly, allocation for limited human resource in the areas could be a hurdleto proceed with the pilot implementation.

Operational timeliness can be a problem in Indonesia in relation to the in-field assessments when we see the cases in India which showed delay in payments in many cases. In the AYII scheme, it is necessary to secure to test CCEs for a certain number of times per a Desawith limited human resources and to conduct the CCEs efficiently.In addition, all the data is functionally processed in a certain management system. We determined to fix 10 times of CCEs per Desa to fulfill the requirements of both the operational timeliness and limited human resources from a statistical point of view.

10 HM. Afsha et al., 2021, "Improving the Performance of Index Insurance Using Crop Models and Phenological Monitoring"
11 "Pradhan Mantri Fasal BimaYojana CROP CUTTING EXPERIMENT User Manual", Ministry of Agriculture & Farmers Welfare http://krishi.maharashtra.gov.in/Site/Upload/Pdf/District_CCE_User_Manual.pdf
12 The household survey in 2017 by BPS showed that only 56% of farmers belong to any farm group.
13 AgroInsurance, 2019, "Survey on Sustainable Agricultural Insurance in Indonesia", P.77,
14 All Desas in Cibuaya Kecamatan, Payungsari Desa Gombongsari desa, Kutamukti desa, Kalibuaya Desa

CHAPTER 4 GUIDELINES FOR AYII DESIGN AND ITS IMPLEMENTATION

4.1 Concept and Structure of the Guidelines for AYII Design and Implementation

Guidelines have been developed to assist agricultural extension staff and other relevant stakeholders in successfully implementing the AYII activity. The guidelines serve as a practical manual covering the basics of socialization, registration, claim procedures, and payouts. Additionally, the guidelines provide information on the key stakeholders involved, their responsibilities, the approval process for claims, and key features of the product. To simplify implementation, a checklist and an action flow chart are also included for easy reference.

4.2 Contents of the Guidelines: Socialization and Registration

1) Outline of the AYII product

√ Benchmark yield: 85% of the average yield over the last 7 years

√ Sum insured amount: IDR 6,000,000 / ha

√ Premium: 2.65%, IDR 159,000

- Farmers 20%, IDR 31,800 / ha
- Government 80%, IDR 127,200 / ha

√ Claim process: No filed loss assessment survey, instead yield sampling survey (CCEs) to estimate Desa-level actual yield. If the Desa-level actual yield is below the predetermined benchmark yield, there is a payout.

2) Main advantages

Lower premium rate: the premium rate of the AYII product is 2.65% of the sum insured (IDR 6,000,000). The premium amount is IDR 159,000 per ha. Just like the AUTP program, the government also subsidies the AYII pilot program with 80% of the premium amount. Hence, a farmer bears IDR 31,800 per ha to join the AYII pilot program. This premium is lower than that of the AUTP. This is because the AYII product could reduce the cost of field survey compared to the AUTP. The AYII product focuses on Desa-level actual yield, and there is no need to conduct field loss survey at each farmland. Instead, sampling survey (CCEs) is carried out to estimate the Desa-level actual yield. For this reason, the AYII pilot program could offer the lower premium insurance product.

3) Potential disadvantages

The AYII product is not a silver-bullet product to the farmers in Indonesia. It also has a potential disadvantage. The biggest potential disadvantage is basis risk. The basis risk means that there might be a gap between Desa-level actual yield and each individual yield. The payout of the AYII product is made based on the Desa-level actual average yield is above the benchmark yield, none of the farmers could receive the payout even if some of the farmers experience in crop loss.

Not only the advantages of the AYII product, but also this potential disadvantage should be delivered to the farmers. The extension staff is expected to convey both positive and negative aspects the AYII product clearly. The AYII pilot program is not compulsory program for farmers. Expanding the AYII program in the future, it is important to gain the trust from farmers towards the AYII product. Better understanding of the AYII product could avoid any trouble at the end of the season.

4) Socialization Period

Identifying planting date in each target Desa is very first step to plan socialization period. The AYII pilot program targets the MT2 season; yet specific planting date varies from Desa to Desa. This preparation is also important not only to identify the socialization period, but also to know the timing of the sampling survey (CCEs) at the end of the season. Hence, it is important to identify specific planting period of the target season in each Desa before the extension staff starts the socialization activity.

Farmers have to sign up for the AYII product within 30 days after planting. This means that the extension staff should not accept application from farmers who plant their crops after this specific period. Once the extension staff identify the specific plating date in the target Desas, they should carefully plan to complete the socialization activity as soon as possible until 15th day after transplanting or 30th day after direct sowing.

Checkpoints for Socialization Meetings

Socialization Item	Points to be checked Did you :
AYII Overview	❑ Deliver the main purpose of the AYII scheme?
	❑ Explain the basic concept of AYII and main differences between AYII and AUTP?
	❑ Explain the premium and the government subsidies?
	❑ Explain what the benchmark yield is and how the CCE is carried out?
	❑ Refer to advantages of the AYII product, e.g. lower premium.
	❑ Refer to disadvantages of AYII product, e.g. basis risk.
AYII registration and claim process	❑ Explain that the registration should be done within 30 days after planting?
	❑ Explain that farmers cannot join AUTP at the same time?
	❑ Explain how to fill in the Form 1?
	❑ Explain that insurance claim should be done based on CCE result?
	❑ Explain how the payout amount will be calculated?
	❑ Explain farmers cannot receive payouts until CCEs complete.
Others	❑ Take nots farmers' questions?
	❑ Enquiry Jasindo if there are any questions you cannot answer or explain during socialization meetings?

5) Registration Procedure

Basically, the AYII registration process is almost the same as AUTP. That is, farmers register themselves collectively through farmer groups accompanied by field officers (PPL).Then, the registered names are recapped by the technical implementation unit office (UPTD) at the Kecamatan level. Lastly, the registered list approved by the head of the Kabupaten Agriculture Dinas.

The following diagram shows the registration flow for the AYII pilot program:

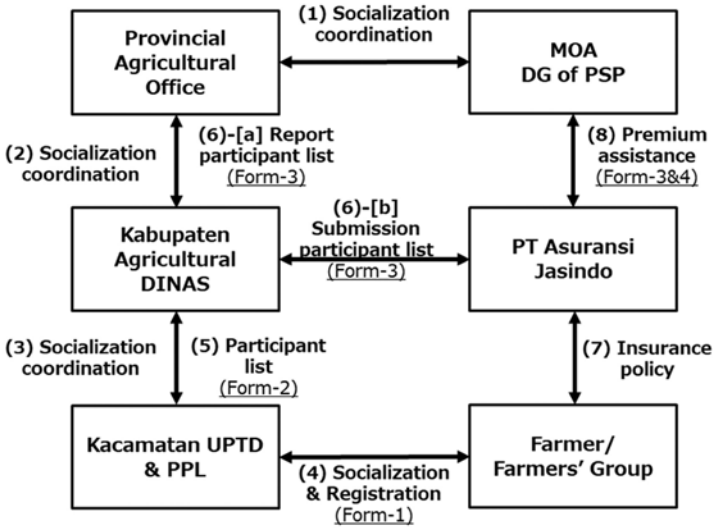


Figure 4.2.1 Registration Procedure

Table 4.2.1 Steps for Registration Procedure

Steps	Description	Timeline	Formats
(1)Socialization coordination MOAto Provincial office	MOA shares the target with each provincial office.	Beginning of fiscal year	n.a
(2) Socialization coordination Provincial office to Kabupaten office	Provincial office shares the target with each Kabupaten.	Beginning of fiscal year	n.a
(3) Socialization and coordination Kabupaten office - Kecamatan	Kabupaten office shares the target with each Kecamatan. Kabupaten office conducts socialization to BPP and farmers' groups.	Before planting period	n.a
(4) Socialization and registration Kecamatan to farmers' groups	PPLs socialize farmers' group and facilitates registration process. Kecamatan office collects the registration Form 1 (registration form) from each Desa including the premium payment.	Socialization: Should start at least 1 month before planting season Registration: Should be registered within 30 days after planting	Form 1 (registration form)

(5) Participants list Kecamatan - Kabupaten	Report farmers' names from Kecamatan to Kabupaten	After registration	Form 2 (participant list)
(6)-[a] Report definitive participants list Kabupaten - Provincial	Report definitive participants list to Provincial and MOA	After registration	Form 3 (SKDPD: Definitive participant list)
(6)-[b] Submit definitive participants list Kabupaten office - Jasindo	Submit definitive participants list to Jasindo from Kabupaten	After registration	Form 3 (SKDPD: Definitive participant list)
(7) Insurance policy Jasindo – farmers' groups	Send insurance policy to farmers' group from Jasindo	Within 14 working days after the submission of Form 2 (participant list)	Policy certificate
(8) Premium payment MOA - Jasindo	Jasindo requests 80% of the premium to MOA based on the participants list. MOA issues Director decree for approving definitive participant list.	After receiving of Form 3 & 4 from Kabupaten	Form 3 (SKDPD: Definitive participant list) Form 4 (Director decree)

Checkpoints for Registration Formats

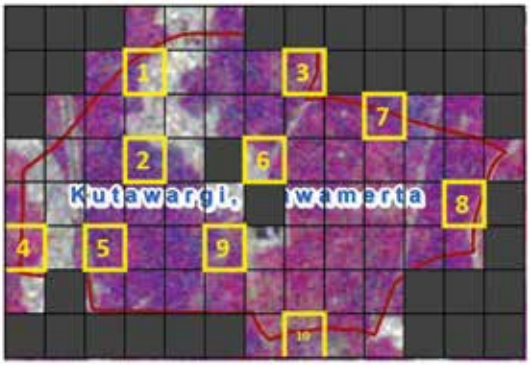
Form	Main User	Points to be checked Did you :
Form 1 (registration form)	PPLs and Kecamatan officers	❑ Confirm all the items are filled in?
		❑ Check each farmer's name, MIK and phone number are correct?
		❑ Make sure actual planting period of each farmer filled in correctly?
		❑ Make sure names and signatures are the exactly same as their ID cards?
		❑ Confirm date filled in correctly?
Form 2 (participant list)	Kecamatan and Kabupaten officers	❑ Confirm that there is no missing information?
		❑ Make sure the number of farmers of each group is the same as the number of farmers in the Form 1?
		❑ Make sure all the information is the same as the information on the Form 1?
		❑ Confirm the date filled in correctly?

Form 3 (SKDPD: Definitive participant list)	Kabupaten and Provincial officers	❑ Confirm that there is no missing information? ❑ Make sure the amount of premiums filled in correctly? ❑ Check the total numbers of insured farmers, land area, policy numbers and premiums filled in correctly?
Form 4 (Director decree)	MOA and Jasindo	

4.3 Contents of the Guidelines: CCE Implementation Procedure

4.3.1 Claim Trigger: Desa Level Area-Yield

The insurance payout is triggered by the Desa-level actual yield under the AYII pilot program. The Desa-level actual yield is calculated through the results of crop cutting experiments, hereinafter referred to as the CCEs. Agricultural DINAS randomly selects at least 10 sampling plots for the CCEs in each Desa. The Desa level yield is average yield of the sampling plots in each Desa.



(Example)

CCE Result	CCE points (minimum 10 samples)										Ave., kg	Yield, ton/ha
	1	2	3	4	5	6	7	8	9	10		
Weight: kg	4.30	3.74	4.36	3.53	3.05	3.19	4.15	2.82	4.73	5.45	3.93	6.29

Desa-level actual yield

Average of 10 CCE Results (kg) × 1.6 = Area Yield (ton/ha)

× 1.6

Figure 4.3.1 Calculation of Desa-level Actual Yield

Source: JICA Consultant Team

Sampling survey, the CCEs, will be carried out at the end of the season even if there is no crop loss or claims from farmers. After completion of the CCEs, Kabupaten agricultural office officially announces the Desa average yield.

4.3.2 Sampling Survey for Yield Assessment (CCE)

The CCE is carried out for the purpose of yield assessment. It is required to obtain sample paddy yields in target Desa for determining an average paddy yield of the Desa. The survey is mainly composed of i) the selection of survey target paddy plots and ii) implementation of the CCE in each paddy plot.

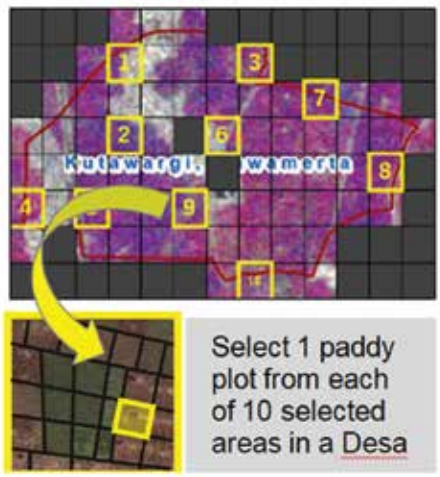


Figure 4.3.2 CCE Plot Selection

Source: JICA Consultant Team

i. Selection of Survey Target Paddy Plots in Desain the AYII Registration Period

1). Random selection of 10 areas in Desa

Considering areas outside the Desa, artificial areas, e.g residential areas and roads, and other no-paddy field areas such as coastal mangrove areas, forest areas, and plantation areas, 10 areas need to be chosen arbitrarily in Desa.Following the KSA method of BPS, the step below is considered as the selection procedure.

i) To locate 300 m x 300 m grid over the target Desa

ii) To eliminate the grids in which land is fully covered by the no-paddy areas (areas outside the Desa, artificial areas, other no paddy areas)

iii)To give serial numbers to the grids with paddy area, which are not eliminated in step ii).

iv To generate 10 random numbers within the serial numbers

v) The 10 grids with the randomly selected numbers are targeted for selecting 10 sampling fields of the Desa

2). Random selection1 paddy plot in each selected grid

1 paddy plot is chosen randomlyin each of 10 selected grids in the Desa considering paddy cropping progress of the area. Finally, in total 10 paddy plots in different 10 gridsin the Desa are selected for sampling yield survey.

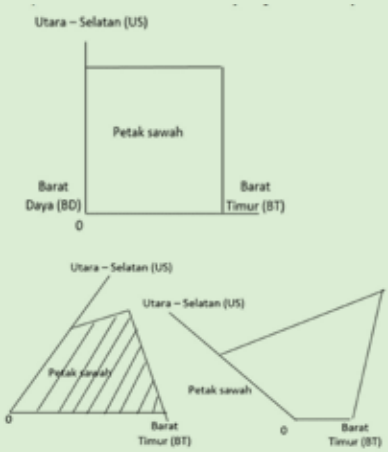
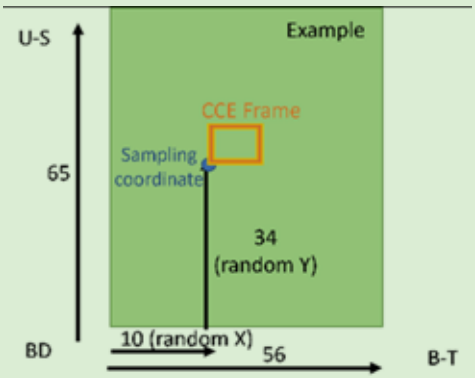
3). Installation of CCE flags

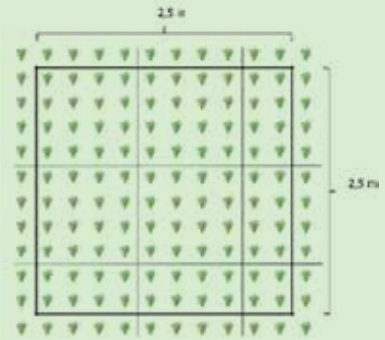
For avoiding the case that the target paddy is harvested before CCE is implemented, a flag or any other sign should be putin the target paddy field. 10 flags or signs should be prepared and set by each Desa. The steps from 1) to 3) above need to be completed at the AYII registration period.

ii. Implementation of CCE in Each Paddy Plot

Yield survey, namely the CCE, is carried out in the randomly selected 10 paddy plots in Desa. The average of 10 yield samples are to be the area yield of the Desa, which is regarded as the actual yield of the Desa in the target season. Described herewith are the elements of the CCE procedure which is implemented in each paddy field:

Table 4.3.1 Procedure of CCE Implementation

No.	PROCEDUR	POINTS
1.	Locating the CCE Frame in paddy plot	√ To decide the coordinate origin of the sampling paddy field * Square paddy: set the southwest end as the origin  * Other irregular shape paddy: set a point at around southern west ridge as the origin  √ To measure the length of two sides (X: east-west/ Y: north-south) of the paddy field by regular footsteps and record the results √ To generate random numbers for X and Y respectively using a free mobile app or BPS's app √ To locate the CCE frame at the sampling coordinate 

2.	Preparation of CCE tools	√ 16 pipe sticks, includes: 4 end pipe rods, 8 central pipe rods, 4 pipe rods at the base, and 4 square rods √ 4 pegs made of iron √ Tripod and digital weight scale 
3.	Crop Cutting	√ To locate sides of the CCE frame (2.5m x 2.5m) between hill lines. (Example) In case of 25cm×25cm spacing and 2.5m x 2.5m CCE frame, 100 hills are included. No need to take samples from outside of the frame to obtain in total 100 hills. 
4.	Threshing	√ To thresh paddy on a tarpaulin sheet
5.	Removing Immature Grain and dirt	√ To remove immature grains and dirt by winnowing
6.	Weighing	√ To weigh paddy by weight scale √ To record the weight in kilogram (kg) The tool comprises tripod and digital weight scale. Weight of paddy bag need to be eliminated before weighing paddy.
7.	Calculating yield of Desa	√ In a Desa, 10 results are obtained √ To take average weight of 10 samples in kilogram (kg) (Sample No.1 + No. 2 + … + No. 10) / 10 = average weight (kg) √ To convert the average weight (kg) to yield (ton/ha) Average weight (kg) x 1.6 = Actual area yield (ton/ ha) Note: 1.6 is the unit conversion constant calculated by 100m x 100m / (2.5 m x 2.5 m) / 1000 √ To report the result to Kabupaten DINAS Head by Form 5: CCE Result Report,Form 6: Actual Yield Report, and Form 6 Attachement: CCE Survey Result Recapitulation using the Authorized Excel Format

4.3.3 Claim Procedure

The basic steps for the claim procedure as follows:

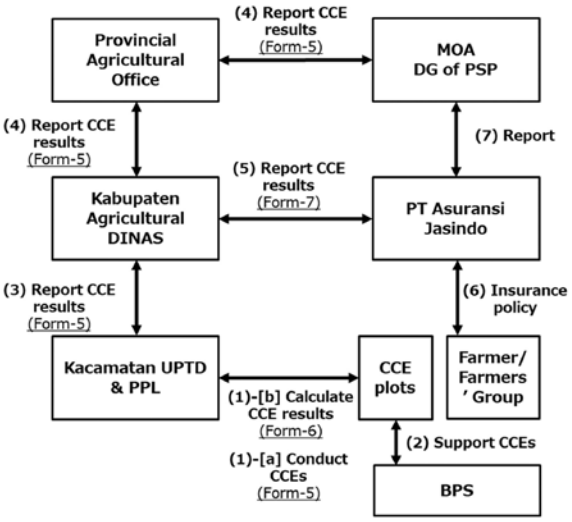


Figure 4.3.3 Claim Procedure

Table 4.3.2 Steps for Claim Procedure

Steps	Description	Timeline	Formats
(1)-[a]: Conduct CCEs Kecamatan	√ Identify specific CCE plots √ Conduct CCEs	Identify plots: Within the registration period CCEs: Harvesting period	CCE equipment Form 5 (CCE result form)
(1)-[b]: Calculate CCE result Kecamatan	Collect CCE result and calculate actual yield per Desa	After CCE implementation	Authorized Excel file (Form 6)
(2): Support CCEs BPS office	Provide technical support for CCE implementation	Plot selection: Within the registration period CCE implementation: harvesting period	n.a
(3) Report CCE result Kecamatan – Kabupaten office	Report actual yield to Kabupaten	Within 5 working days after the completion of CCEs survey	Form 5 (CCE result form) Form 6 (actual yield) Authorized Excel file
(4) Report CCE result Kabupaten office – Provincial Agri office	Report actual yield to Provincial and MOA	After calculation of actual yield	Form 5 (CCE result form) Form 6 (actual yield) Authorized Excel file

(5) Report CCE result Kabupaten office – Jasindo	Report actual yield to Jasindo If actual yield is lower than the benchmark yield, Kabupaten office makes a claim to Jasindo	Within 7 working days after receiving the CCE results from Kecamatan office	Form 7 (claim letter)Form 5 and 6 should also be attached Authorized Excel file
(6) Insurance payout Jasindo – Farmers' group	If claim is approved by Jasindo, Jasindo sends the notification to farmers' group Farmers' group have to respond the notification to Jasindo After Jasindo confirms the response from farmers' groups, they provide insurance payout	Within 14 working days after receiving the claim from Kabupaten	n.a

Checkpoints for Claim Formats

Formulir	Main User	Points to be checked Did you :
Form 5 (CCE result form)	PPLs and Kecamatan officers	❑ Confirm that all the items are filled in?
		❑ Confirm that the coordinate (latitude and longitude) is recorded in decimal decree to 7 places of decimals?
Form 6 and the attachment (actual yield) Authorized Excel file	Kecamatan and Kabupaten officers	❑ Confirm that all highlighted cells are filled up (no missing information) on the authorized excel format?
		❑ Confirm that the CCE locations (latitude and longitude) is written in decimal degree and the figures are same as those of Form 5?
		❑ Confirm that the unit symbol of decimal degree (°) is NOT put in the cells?
		❑ Confirm that the figures of CCE sample weight (kg) are same as those on Form 5?
		❑ Confirm the figure of benchmark yield is correct?
		❑ Confirm the dates of CCE implementation on Form 6 are same as dates on Form 5?
		❑ Confirm that the dates of planting period on Form 6 are same as dates on Form 1?
		❑ Confirm the date of signature is written above the signature of head of UPTD?

Form 7 (claim letter)	Kabupaten and Jasindo	❑ Confirm that all ID card copies of claim farmers have been prepared?
		❑ Confirm that the bank account book copy of claim farmer group has been prepared?
		❑ Confirm that complete Form 5 and Form 6 are prepared?
		❑ Confirm that all the documents above, namely ID copies, bank account book copy, Form 5, and Form 6 including attachment, are attached to Form 7?
		❑ Confirm that all the items are filled in on Form 7?
		❑ Confirm the policy number and ID numbers of farmers are recorded correctly on Form 7?
		❑ Confirm the insured areas on Form 7 are same as those on Form 1?
		❑ Confirm the signatures of farmers on Form 7 is completely same as those on the ID card copies?

4.3.4 Payout Calculation and Payment

An insurance payout is made if the Desa-level actual yield is below the benchmark yield. Once the insurance payout is triggered, Kabupaten agricultural office makes a claim to Jasindo. The maximum payout amount is IDR 6,000,000 per ha under this AYII pilot program. Jasindo proceeds the payouts to policy holders after they receive the claim from Kabupaten agricultural office.

The following table shows the example of the payout calculation:

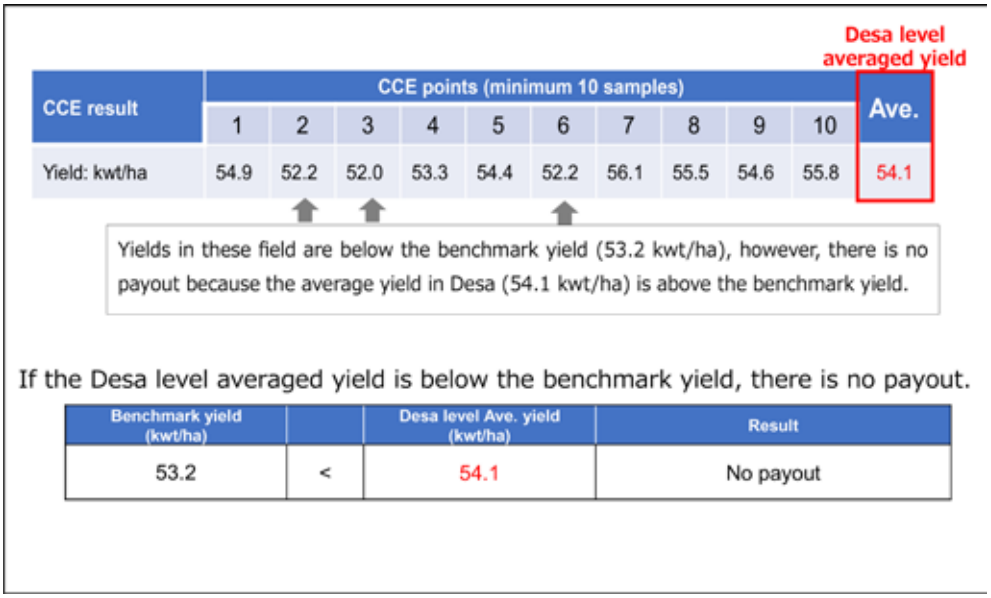
Example of Payout Calculation

Kecamatan	Desa	Benchmark yield (kwt/ha)		Desa level Ave. yield (kwt/ha) [EXAMPLE]	Payout amount (IDR)
Kutawaluya	Kutamukti	53.2	<	54.1	0
	Sindangmukti	61.3	<	63.0	0
	Sindangsari	61.5	<	61.6	0
Rawamerta	Gombongsari	66.2	<	67.9	0
	Kutawargi	63.2	<	64.4	0
	Sukapura	66.1	<	66.9	0
Telagasari	Cilewo	63.9	<	64.8	0
	Kalibuaya	63.7	=	63.7	0
	Pasirkamuning	64.8	<	66.0	0
Cibuaya	Gebangjaya	62.4	>	61.9	48,077
	Jayamulya	65.0	>	61.2	350,769
	Kertarahayu	63.5	<	64.3	0
Pedes	Payungsari	61.5	>	61.4	9,756
	Rangdumulya	54.4	>	53.7	77,206
	Sungai Buntu	54.4	>	54.0	44,118

Note 1): 1 kwt (Quintal) = 100 kg

Source: JICA Consultant Team

Note that the payout calculation is always made based on Desa-level actual yield rather than yield of individual farmland or yield of each CCE plot. This means that some farmers, who have loss experience, might not be able to receive the payout if the Desa-level actual yield is above the benchmark yield. This is called "Basis Risk", a gap between individual farm yield and Desa-level actual yield. Basis risk is one of the potential disadvantages of the AYII product.



Checkpoints for Claim Calculation

Item	Points to be checked Did you :
CCE verification	❑ Confirm the figures of CCE sample weight (kg) on the authorized excel format (Form 6 attachment) are same as those on Form 5?
	❑ Check the calculation of average CCE sample weight (kg) on the authorized excel format (Form 6 attachment) by pocket calculator?
	❑ Check the calculation of converting weigh (kg) to yield (ton/ha) on the authorized excel format (Form 6 attachment) by pocket calculator?
	❑ Confirm that the figure of benchmark yield on the authorized excel format (Form 6) is correct?
Payout calculation	❑ Confirm that the figures of payout calculation sheet on the authorized excel format are same as those on Form 6?
	❑ Check the calculation of payout on the authorized excel format by pocket calculator referring to the payout calculation formula on the General Guideline?

CHAPTER 5 AYII PILOT IMPLEMENTATION

5.1 AYII Target Area

Area Yield Index Insurance (AYII) is first tried in Indonesia targeting the crop season of MT2 2021 in selected 15 Desas in Karawang Kabupaten, West Java Province.Following the first trial, additional pilots are implemented for MT-1 and MT-2 2022 of Karawang Kabupaten and MT-2 2022 of Kendal Kabupaten, Central Jawa Province. The implementation guideline, which has been developed by the JICA consultant team, aims at having the pilot implementation of AYII successful by supporting the relevant players, especially the extension staff and JASINDO field staff, to extend the AYII product to their clientele farmers.

The AYII pilot implementation targets the 15 Desas located in 5 Kecamatans of Karawang Kabupaten, West Java province and 12 Desas located in 4 Kecamatans of Kendal Kabupaten, Central Jawaprovince. Three Desas each have been selected from each of the five Kecamatans within the Karawang Kabupatenand four Kecamatans within Kendal Kabupaten, making the total number of Desas to be 27. The 15 Desas of Karawang Kabupaten have been so selected as to taking into account geographical distribution covering from relatively upper elevation area to lower coastal area.In addition to the geographical distribution, the aggressiveness of Kabupaten Dinas officewas considered when selecting Kendal Kabupaten.Though another one Kecamatan, namely RowosariKecamatan, was also proposed by MOA as a pilot area, Jasindo rejected the Kecamatan based on the analysis of the historical yield record. The Desas are summarized as below:

Table 5.1.1List of the Target 15 Desas, Karawang Kabupaten and 12 Desas, Kendal Kabupaten

No	Kecamatan	Desa	Major Varieties			Desa
			1	2	3	Area, km2
Karawang Kabupaten						
1	Kutawaluya	Kutamukti	Impari 32	Ciherang		5.09
2		Sindangmukti	Ciherang	Impari 32	Mikongga	6.14
3		Sindangsari	Impari 32	Ciherang		7.40
4	Rawamerta	Gombongsari	Ciherang	Impari 32		2.90
5		Kutawargi	Ciherang	Impari 32	Mikongga	3.09
6		Sukapura	Ciherang	Impari 32		3.41
7	Telagasari	Cilewo	Ciherang	Impari 32		3.67
8		Kalibuaya	Impari 32	Ciherang	Mikongga	4.44
9		Pasirkamuning	Ciherang	Mikongga		3.54
10	Cibuaya	Gebangjaya	Ciherang			4.42
11		Jayamulya	Ciherang	Impari 32	Mikongga	7.56
12		Kertarahayu	Ciherang	Impari 32		5.62
13	Pedes	Payungsari	Ciherang	Impari 32	Mikongga	6.92
14		Rangdumulya	Ciherang	Impari 32		3.95
15		Sungaibuntu	Ciherang	Impari 32	Mikongga	10.55

No	Kecamatan	Desa	Major Varieties			Desa
			1	2	3	Area, km2
Kendal Kabupaten						
1	Pageruyung	Surokonto Wetan	IR 64	Ciliwung	Ciherang	0.90
2		Surokonto Kulon	IR 64	Ciliwung	Ciherang	0.47
3		Gebangan	IR 64	Ciliwung	Ciherang	0.60
4	Patean	Wirosari	IR 64	Ciherang	Merauke	0.61
5		Pagersari	IR 64	Ciherang	Merauke	0.93
6		Selo	IR 64	Ciherang	Merauke	2.51
7	Patebon	Wonosari	IR 64	Ciherang	Merauke	1.75
8		Pidodowetan	IR 64	Ciherang	Situbagendit	1.25
9		Pidodokulon	IR 64	Ciherang	Situbagendit	1.37
10	Plantungan	Wadas	Umbul/ Local	Ciherang	Ciliwung	1.21
11		Bendosari	Umbul/ Local	Ciherang	Ciliwung	1.69
12		Mojoagung	Umbul/ Local	Ciherang	Ciliwung	1.81

Source: JICA Consultant Team based on the satellite data and interview with Kecamatan officers

Note: The 'Desa area' means administratively extended area including residential area, forest area, road, wetland, fishery pond, etc., and therefore the paddy areas are smaller than the Desa area indicated in above.

5.2 Implementation Schedule

The first AYII pilot implementation in Karawang Kabupatenis conducted covering the second paddy season (MT2) in year 2021. Thus, the planting season was expected to start as early as in June 2021, and the planted paddy was expected to be harvested from latter days of 2021 up to early 2022 in cases. The milestone schedules were as follows:

June-July 2021:	Farmer socialization (have a series of meetings with the farmers, and explain what the AYII is, making them familiar to the AYII product),
July-Sep. 2021:	Sales of the AYII product to the farmers (Sales should be completed by the time of 15th day after the transplanting, that is called CUT-OFF date. Also, this sales of the product can be conducted in parallel with the socialization, taking the opportunity for the farmers to gather).
Aug.-Nov. 2021:	Follow-up and monitoring of the insured crop, that is paddy, with attentions to such events as drought, heavy rainfall and flooding, extensive scale of pests and diseases, and covered risk events (floods, drought, plant destruction organisms) and non-covered risk events as well (fire, theft intentional destroy, willful mistake, explosions, earthquakes, volcanic eruptions, tsunami, government acts for the greater public interest, etc.)
Oct.-Dec. 2021:	Sampling survey by Crop Cutting Experiment (CCE) in order to establish Desa-level actual Area-Yield, which is to be compared with Desa-level Benchmark yield (trigger yield for the insurance), for the purpose of loss assessment.
Dec.-Feb. 2021/22:	Establishment and public announcement of Desa-level actual yield, that is loss assessment, based on which payout should be calculated and made accordingly in case that the Desa-level actual Area-Yield is blow the Desa-level Benchmark yield.
Dec.-Feb. 2021/22:	Evaluation of the AYII pilot implementation including insured and non-insured farmers' views/opinions on the AYII, from which lesson learned should be obtained that are to be fed-back to an extension of AYII in 2022.

Following the first pilot for MT-2 2021 in Karawang Kabupaten, additional pilots for MT-1 and MT-2 2022 in Karawang Kabupaten and MT-2 2022 in Kendal Kabupaten have been implemented. Table 5.2.1 shows the activity record of AYII pilot program in Karawang and Kendal Kabupatens in years of 2021 and 2022.

Table 5.2.1 Monthly Activity Record of AYII Pilot in Karawang and Kendal Kabupatens

Month, Year	Karawang			Kendal	
Jun, 2021	MT-2, 2021	MT-2, 2022	Socialization & Registration		
Jul, 2021			Socialization & Registration		
Aug, 2021			Monitoring		
Sep, 2021			Monitoring		
Okt, 2021			CCE		
Nov, 2021			CCE		
Des, 2021			Claim		
~					
Mei, 2022	MT-1, 2022		Socialization & Registration (Hanya Cibuaya)	MT-2, 2022	Socialization & Registration
Jun, 2022			CCE for MT-1		Socialization & Registration
Jul, 2022			CCE for MT-1, and Socialization for MT-2		Socialization & Registration
Aug, 2022			Claim for MT-1, and Socialization & Registration for MT-2		CCE
Sep, 2022			Ditto		CCE
Okt, 2022			Claim payment process for MT-1		CCE
Nov, 2022			CCE		CCE
Des, 2022			CCE		CCE
Jan, 2023			CCE		
Feb, 2023					
Mar, 2023					

Source: JICA Consultant Team

5.3 Implementation Structure

5.3.1 Major Stakeholders

The AYII pilot program involves in a wide range of stakeholders from an insurance company to agricultural extension staff in the field. The main implementers of the AYII pilot program are BAPPENAS and Ministry of Agriculture as well as JasindoAsuransi, an insurer of the AYII product. The regional governments of West Java and Central Java, particularly Karawang and KendalKabupatenagricultural officesare one of the key stakeholders under the AYII pilot implementation. In addition, Japan International Cooperation Agency (JICA) supports technical aspects of the AYII pilot activities through the coordination with Indonesian counterpart organizations. The following are the roles and responsibilities of the major stakeholders:

BAPPENAS

* Overall coordinate with the project counterpart organizations and related stakeholders,
* Prepare the budget for premium subsidies and organize distribution to Jasindo(through MOA), and
* Facilitate procurement procedures related to AYII pilot activities such as socialization and monitoring and evaluation activities.

Ministry of Agriculture (MOA)

* Coordinate with relevant agencies and organizations to implement AYII pilot activities,
* Assist the Provincial, Kabupaten and Kecamatan agricultural offices in the implementation and monitoring of AYII pilot activities,
* Assist Provincial, Kabupaten and Kecamatan agricultural offices for thecollection of relevant data for evaluation and carry out the evaluation of AYII pilot implementation,
* Provide technical supports to the stakeholders through providing training sessions and preparing technical materials, and
* Monitor the performance of Provincial, Kabupaten and Kecamatan agricultural offices.
* Provincial Agricultural Office in West/ Central Java
* Coordinate with related agencies and organizations under the provinces,
* Provide guidance on socialization and registration activities of the AYII pilot program in the target Desas of Karawang Kabupaten,
* Finalize the participant list for the AYII program in the target area and report to Jasindo and other related organizations,
* Carry out monitoring of the performance of the AYII pilot activities in the target Desas of Karawang Kabupaten, and
* Verify historical yield data, threshold yield data and the results of the Crop Cutting Experiments (CCE) data and report to Jasindo and MOA/BAPPENAS.

Kabupaten and Kecamatan Agricultural Offices

* Communicate with farmers' groups/ farmers to disseminate the AYII product,
* Carry out socialization and registration activities in the target Desas,
* Generate the participant list of the AYII program and report to the Provincial office,
* Monitor the performance of the AYII pilot activities in the target Desas,
* Conduct the CCEs through coordination with BPS and surveyors,
* Estimate average yield at Desa level and approve the result,
* Make an announcement of the CCE results to the public, and
* Calculate the payout amount and make a claim to Jasindo.

Jasindo (Insurance Company)

* Confirm eligibility of participants for the AYII product,
* Issue an insurance policy for the AYII product and share the insured farmers list with relevant organizations,
* Manage the participants' information under the AYII pilot program including insured areas, premium collection status and payout amounts,
* Prepare necessary documents such as application formats, claim sheets and policy certificate, and
* Distribute insurance payouts in case if it is triggered.

Japan International Cooperation Agency (JICA)

* Provide technical assistance to the AYII product development,
* Assist the preparation of the AYII implementation guides, technical guideline and other related materials,
* Support implementation of the AYII pilot activities including the implementation of the CCEs,
* Conduct monitoring and evaluation on the AYII product and its operation, and
* Formulate policy recommendations for the AYII program implementation.

5.3.2 AYII Operation

The following diagram shows the operational flow for the AYII pilot program:

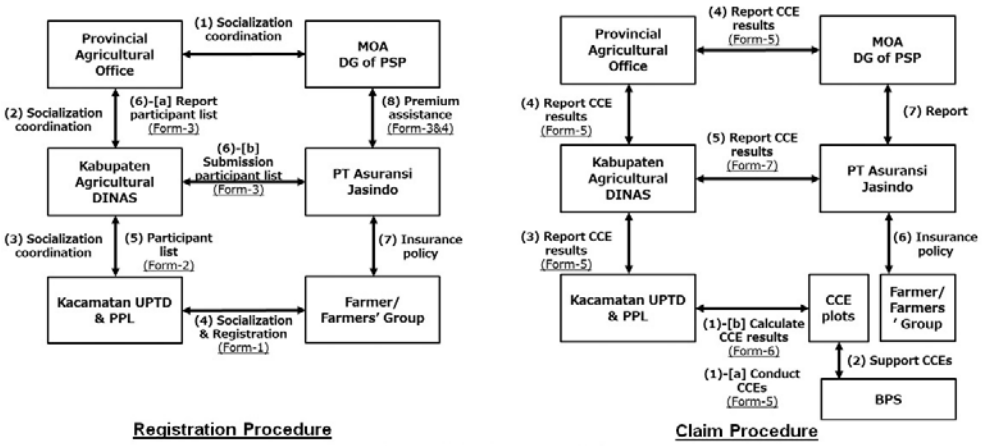


Figure 5.3.1 Operational Flow

Source: JICA Consultant Team

The AUTP program isnot offered in the target area of this AYII pilot program. The government subsidies the AUTP program as well as the AYII pilot program. Farmers are not allowed to join both programs to avoid the dual subsidies of the agricultural insurance programs. Implementing the AYII pilot program smoothly, the AYII product is only the option for farmers in the target 15 Desas in Karawang Kabupaten and 12 Desas in Kendal Kabupaten. The extension staff should clearly explain it to the farmers that the AUTP is not available during the AYII pilot program period.

5.4 Training of Trainers (TOT) for AYII

The first AYII pilot implementation is conducted covering the second paddy season (MT2) in year 2021 in Karawang Kabupaten. Thus, the planting season wasexpected to start as early as in June 2021, and the planted paddy wasexpected to be harvested from latter days of 2021 up to early 2022. One of the milestones within the schedule that starts in June-July 2021 wassocialization. The purpose of socialization is to explain what the AYII is, making the farmers more familiar to the AYII product.

Then, before going to the stage of socialization, as the main implementers of the AYII pilot program, BAPPENAS, Ministry of Agriculture, and Jasindo must first have a deep understanding of AYII scheme and product; starting from the concept of AYII, technical implementation, loss measuring method, and claim processes. Therefore, the Consultant Team as a technical supporter needed to hold a Training of Trainers (TOT) for those implementers, especially the Ministry of Agriculture (MOA) and JASINDO.

5.4.1 Outline of AYII TOT

Objective: the objective of the AYII Training of Trainers (TOT) is: 1) To make necessary arrangement for the Extension Staff Training (set on June 17-18, 2021) to be fully ready, and 2) To obtain necessary knowledge/skills for the trainers (MOA and Jasindo) to implement the Extension Staff Training.

Time and Place: the AYII TOT was held on Thursday-Friday, May 27-28, 2021 at Royal Hotel Bogor, Bogor City, West Java.

TOT Program:the following table shows the detailed TOT program:

Table 5.4.1 The AYII TOT Program

Time	Activity / Session	PIC	Remarks
Thursday, May 27th 2021			
09.15 – 09.45	Opening remarks from Bappenas, MOA, and JICA representatives	Committee	-
09.45 – 12.30	Preparation for Karawang extension staff TOT	Sanyu Consultant Inc.	Confirmation of schedule and several forms to be given
	Scope of AYII pilot implementation		Confirmation of schedule and targeted location/ area
	AYII in General	SOMPO Risk Management	Presentation, Q&A
12.30 – 13.15	Lunch break	Committee	
13.15 – 16.00	AYII Product Design	SOMPO Risk Management	Presentation, Q&A
Friday, May 28th 2021			
08.30 – 11.30	AYII Pilot Implementation	Sanyu Consultant Inc.	Presentation, Q&A
11.30 – 13.30	Lunch break	Committee	
13.30 – 15.30	AYII Pilot Implementation (continue)	Jasindo and MOA	Presentation, Q&A
	Finalization of Karawang TOT plan	All participant	Discussion
15.30	Closing remarks	Committee	

The first day training began with the brief opening remarks by the representatives of participating institutions. It continued with the first and second topics (Karawang TOT preparation & pilot implementation scope), in which the Team from Sanyu Consultant Inc. explained the arranged plan and some forms that have been prepared for participants before and after the training program, also reviewing the pilot plan (targeted timeline and location).

All participants agreed with the plan and gave additional comments that the schedule of Karawang TOT might have to be postponed from the initial plan as the general guideline for pilot AYII has not yet been approved by the General Directorate in charge (MOA). Otherwise, there is no problem for the overall piloting plan.

The next module which is AYII in General was delivered by Mr. Tadahiro Maeda from SOMPO Risk Management. The presentation covered common schemes and operation of AYII and its difference with

indemnity-based agriculture insurance, which has been implemented in Indonesia for a few years. This module is related to the next topic of AYII product design, which compared the concepts of key terms of indemnitybased and AYI insurance programs, the mechanism and risks (basic risks, moral hazard, and adverse selection), and AYII product development including the set up of premium rate.

The second day training first topic was delivered by Mr. Hirayama (Sanyu Consultant Inc.) discussing AYII pilot implementation's institutional arrangements of national counterparts and their responsibilities, piloting operational timeline from May 2021 until February 2022, details on socialization, registration, claim, and pay-out procedures, and evaluation by the AYII participants, field officers, and counterparts (required).

The discussions were followed by the explanation of Mr. Eguchi (Sanyu Consultant Inc.) regarding details of how crop cutting experiment (CCE) should be implemented during the pilot project. The next discussion was to confirm the pay-out or compensation calculation for any claim made due to decreasing productivity in the piloting areas (villages). Lastly, all participants decided the plan for Karawang TOT, which included the timeline proposal and names of speakers from MOA and Jasindo.

5.4.2 Main Discussions

The following are the main discussion including questions and answers during the AYII TOT:

√ Clear (and preferably interesting) socialization and briefing should be given by extension officers and also by the insurance staff when promoting the AYII product. Special attention should be given to the issue of when explaining the part of average yield of village decreasing and becoming below the benchmark, all participating farmers will get compensation.

√ Regarding the moral hazard of agricultural extension officers, it is a part of operational concerns which should be managed by the institution in charge of the extension staff. One way to help is to clearly explain how AYII works, then emphasize how the proper CCE should be done to the extension staff during the upcoming TOT. Also, involving BPS in confirming the CCE practice could be another (additional) option.

√ Consultants (Sanyu& SOMPO) only calculated the pure risk premium which includes volatility loading, CAT loading, and uncertainty loading for the total premium rate. The decided premium rate, 2.65%, and the pure risk premium is around 0.8%. The remaining 1.85% was calculated by the insurance company (Jasindo), so please refer to their calculation for the distribution of operational and administration, marketing expense, and profit reserves.

√ Premium rate value is a result of statistical analysis of the high-risk area damage frequency and the assumption based on the historical data which were then averaged. Therefore, the calculation made for AYII in Indonesia, of course, follows or is adjusted to Indonesia's condition to decide the target ratio of 50-85%. Should there be any changes, another analysis must be conducted to recalculate.

√ There is no problem in putting the calculation in the manual guideline if you see fit. However, as mentioned in previous meetings and discussions, the Team strongly recommended a flat pay-out of IDR 6 million and not the proportional scheme.

√ In Japan, the CCE result is published around 3 months after the completion of sampling survey and the shortest pay-out period is 2-3 weeks after the report of CCE result and the longest is 2 months. Please note that the condition of rice farming in Japan is very much different from Indonesia, thus it cannot actually be a fitting comparison.

√ The institution responsible for reporting the result may publish it one village at a time (village by village), thus no need to wait for all 15 villages as it will take more time. By taking more time, it automatically violates the principle of 'faster procedure' which AYII offers as one of the selling points that differs from indemnity-based insurance.

√ As the historical data used as the base of benchmark uses GKP, the unit to be used for claim should also be GKP. However, GKG or measuring the water content is needed by the reasons of; 1) conducting a proper CCE by the world standard, and 2) requirement for the additional information and data for future study.

5.5 AYII Training for Agricultural Extension Officers

Agricultural extension officers, UPTD, and DINAS officers who will be the key players of the AYII pilot program are expected to be able to well-socialize the AYII product to farmers. Therefore, they need to be prepared with materials and adequate understanding regarding the concept and implementation technicality of AYII from the stakeholders which are BAPPENAS, MOA, and Jasindo. The stakeholders themselves had been trained by the Consultant Team as technical supporter. Therefore, MOA and Jasindo acted as the trainers during this training program.

5.5.1 Outline of AYII Training in Karawang Kabupaten

Objective : the objective of this training is: 1) To give the overall concept and deeper understanding related to the technical implementation of AYII piloting in Karawang Kabupaten, West Java, and 2) To get the participants (extension officers, UPTD, and DINAS officers) fully ready for the pilot implementation.

Participants : 51 participants on 17th June and 42 participants on 18th June.

Time and Place : the training of implementing officers of AYII piloting was held on Thursday-Friday, June 17-18, 2021 at Brits Hotel Karawang, Karawang Kabupaten, West Java.

TOT Program : the following table shows the detailed TOT program:

Table 5.5.1 The Detailed Training Program (Karawang)

Time	Activity / Session	PIC
Thursday, June 17th 2021		
08.00 – 08.30	Re-registration, pre-training survey (online)	Committee
08.30 – 09.00	Opening remarks from Head of Karawang Agricultural Dinas, JICA, MOA, and BAPPENAS	Committee
09.00 – 09.30	Introduction of the training program	Committee
09.30 – 10.00	Module 1: AYII Product Design √ Comparison of concept between AUTP and AYII √ Common practice √ Basis risk, adverse selection, and moral hazard	Jasindo
10.00 – 10.15	*Coffee Break*	Committee
10.15 – 11.30	Continue: √ Flow of product development √ Premium rate calculation	Jasindo
11.30 – 12.00	Q&A Session – Module 1	Committee, Jasindo
12.00 – 13.00	Lunch break	Committee

13.00 – 14.15	Module 2: AYII Operational √ Socialization, registration √ Introduction of AYII brochure √ Claim and payout procedure Jasindo	Jasindo
	Module 3: Example of Forms and Insurance Policy	
14.15 – 15.30	Q&A Session – Module 2 & 3	Committee, Jasindo
Friday, June 18th 2021		
08.00 – 08.30	Re-registration	Committee
08.30 – 09.15	Module 4: Scope of AYII Pilot Implementation √ Piloting timeline / schedule √ Piloting target of area √ AYII (pilot) official manual guideline	MOA
09.15 – 09.45	*Coffee Break*	Committee
09.45 – 11.00	Module 5: CCE Implementation √ How to conduct CCE for the pilot implementation √ How to calculate yield and productivity (in Excel)	SCI
11.00 – 11.30	Q&A Session – Module 4 & 5	Committee, SCI
11.30 – 13.15	Lunch Break	Committee
13.15 – 14.00	Module 6: CCE Implementation of BPS	BPS
14.00 – 14.30	Q&A Session – Module 6	Committee, BPS
14.30 – 15.15	Making Action Plan for AYII Pilot	Participants, Committee
15.15 – 15.30	Training program evaluation (online), closing remarks	Committee

The first training day started with brief activity report by Sanyu Consultant Inc. as the committee and continued with opening remarks from Head of Karawang Agricultural Dinas and representatives of each program stakeholders. The first two training topics of AYII product design and operation were delivered by Jasindo team. Jasindo officers explained the scheme and main concept of AYII, how the product was designed, and how the product mechanism would be implemented. On the second material (AYII Operational), the trainers explained the flow of socialization and promotion up to AYII registration period. There were also examples of brochure given to the participants which could later be relayed to the farmers, re-printed, and use as promotion material.

The second day of training covered the topics of AYII piloting scope, achievement target, and official manual guideline. Those topics were delivered by a trainer from MOA. The manual guideline had been printed and distributed to the participants. There was also an explanation of legal foundation as to why AYII piloting should be conducted, and it covered the benchmark yield of each targeted village as well.

The next topic was about the implementation of CCE survey that has to be properly conducted during the piloting. This topic was delivered by a representative of the consultant team while emphasizing once again on the data that need to be recorded on the CCE form and on how to calculate the yield both with and without considering the water content level, as the yield result will be compared to the benchmark yield as claim trigger. Within this topic, a representative from Karawang BPS delivered their method in conducting CCE and introducing their own application and their implementation of KSA (Area Sampling Framework) to determine the land use of selected points to observe.

As additional information, the committee invited one of the Japanese experts to share how AYII scheme is implemented in Japan and its success. The expert explained that all paddy farmers in Japan are obligated to guarantee their paddy crop by agricultural insurance program, and the AYII scheme implemented in Japan is still recent (less than five years), thus the progress must be observed by three to five

more years. However, there had been no problem or big challenges in designing and implementing the scheme in Japan.

5.5.2 Pre-Training Survey in Karawang Kabupaten

Before the training sessions started, all participants (especially extension officers) were asked to complete an online survey regarding the experience and knowledge of regular AUTP and how they socialized the product to the beneficiary farmers.

Most participants answered that they have been involved directly in the regular AUTP implementation. Within the five Kecamatan, the officers covered a total of 22 villages for AUTP. Starting from less than 20 hectares per village in 2015, the insured area increased—balanced between village with less and more than 20 hectare insured area—in 2020. The total of insured farmers also increased with more than 15 per village each year, even though there are still some villages with less than the said number of participants. There were some variations of answer for claim area (both less and more than 10 hectares per village) and claiming farmers, dominated by the answer of more than 15 farmers doing claim per village especially in 2018 until 2020.

The main issues faced by extension officers are the response and reception from farmers themselves towards insurance program. A lot of farmers do not understand the concept of insurance, they do not feel necessary to guarantee their crop because they always get good yields, they do not feel any benefit from insurance, and their awareness of agricultural insurance is still low. Extension officers have tried to overcome those obstacles by giving materials related to agricultural insurance as detailed and intensive as possible, especially on the selling points and benefits, and trying to sound more persuasive.

5.5.3 Main Discussions in Karawang Kabupaten

The following are the main discussion including questions and answers during the AYII training:

√ IDR 6,000,000 as maximum sum insured was designed with farmer's mindset of wanting to be successful in their cultivation. If you are too focused on the amount of sum insured, that is the mindset of farmers who want to fail (on a big scale) or farmers who cultivate only to receive compensation. Moreover, the number was decided by referring to the one and only agricultural insurance in Indonesia which is AUTP (indemnity based), which estimates the minimum production cost per hectare.

√ This AYII program is still a pilot program and the relatively low premium is still subsidized by the government. If the sum insured is high, the premium itself will also be higher; making it harder to persuade farmers to join the insurance program, moreover to pay their self-paid premium. After the piloting, there will be an evaluation and the amount of sum insured is one of the aspects to be discussed.

√ At the beginning of product design, there were options offered by the consultant team on deciding the sum insured amount and pay-out calculation. The decision makers decided not to take the options of seeing the on-going yield price as well as giving a flat rate of IDR 6,000,000 of compensation regardless of the gap as long as there is a decrease. For the piloting scope, it has been decided that the gap will be multiplied by the designated sum insured (based on AUTP reference) and this scheme has been approved by OJK, thus it cannot be changed.

√ There will be further studies after this piloting including seeing whether the pay-out scheme of this AYII pilot is suitable to be implemented further. Then, if the sum insured is raised, the premium rate will also be higher by calculation 2.65% (premium ratio)multiplied by sum insured amount.

- √ Talking about AYII concept, its scheme is to see the productivity or yield after harvest. If the flood occurred causes a decrease in the average yield of village, there will be a compensation given. However, farmers cannot individually apply for claim like in AUTP scheme.
- √ The manual CCE survey is still relevant in other countries in the world and the implementation is indeed manual, in which the surveyors (extension officers) must go to the field themselves. What could be upgraded perhaps is the quality of tools or the ease of set up the frames for faster survey at each plot. In this program, there is an approach using satellite image designed by the consultant team, yet this is still not common or agreed upon to be used in CCE survey, thus it cannot be accounted for. This approach is only for study purposes as for now.
- √ The consultant team has reminded the stakeholders and decision makers (Indonesian government) regarding this program that the upcoming challenges if expansion is to be conducted are data availability, collecting, and processing. Indonesian side must have an independent team to collect and process the data to come up with the benchmark yield as an update for the 15 villages as well as to make benchmark yield for other villages.
- √ JASINDO has also made the no-claim scenario with some back up countermeasure plans if it ever happens. Yet, logically speaking, if there is no claim, then the paddy cultivation in the area is very well conducted. A high or good yield value during that crop season will contribute in benchmark update (it could be higher in the future). The benchmark yield made from previous data is the foundation of knowledge and design set up of insurance product, as well as base of decision making by the stakeholders. The number also becomes an assessment aspect for the credibility of agricultural data issued by responsible institution. If the data is consistent with situation on field, it could be used as measuring tool for recent events (better or worse).
- √ In the budget design of BAPPENAS and MOA, there is an allocation for field operational cost, but neither Jasindoand consultant team could state the exact amount because the one who arranges is MOA. If the extension officers propose that Jasindo should spend for the operational cost, the company requires a base of study for budgeting. Yet, there has never been any experience of regular CCE survey involving Jasindo, thus the company does not know the exact amount of AYII operational cost.
- √ During both piloting and its (possible) continuation, there must be farmers' involvement so that they have a sense of responsibility and ownership over their paddy crop and insurance policy; that they want to protect their crop result and be prepared for the possible decrease of yield (AYII) or damage on their crop (regular AUTP).
- √ AYII scheme in Japan does not face many hardships and obstacle because agricultural data is easily collected from each municipality. Agricultural insurance program using AYII scheme has only been implemented for less than five years in Japan, so they still need to see the next three to five years for its success progress. The premium rate could be different for each region, but the benchmark yield of paddy crop is for 90% from average yield of preceding years.
- √ KSA is scheduled and the raw data can be obtained from central BPS, only released once a year. The processed data is only released on Kabupaten (district) level and not village. KSA is only used to determine total area and the land use of the selected coordinate. The use of KSA in AYII should be reassessed by each stakeholder while involving central BPS. Perhaps the raw KSA data (observation point coordinate) could be a reference of CCE point for AYII, but it should be discussed further.

5.5.4 Outline of AYII Training in Kendal Kabupaten

Objective : the objective of the training is: 1) To give the overall concept and deeper understanding on the technical implementation of AYII piloting in KendalKabupaten, Central Java, and 2) To get the participants (extension officers, UPTD, and DINAS officers) fully ready for the pilot implementation.

Participants : 30 participants on 13thApril and 27 participants on 14thApril

Time and Place : the training of implementing officers of AYII piloting was held on Wednesday-Thursday, April 13-14th 2022 at Tirto Arum Hotel & Resort, Kendal Kabupaten, Central Java.

TOT Program : the following table shows the detailed TOT program:

Table 5.5.2 The Detailed Training Program (Kendal)

Time	Activity / Session	PIC
Wednesday, April 13th 2022		
08.00 – 08.30	Re-registration, pre-training survey (online)	Committee
08.30 – 09.00	Opening remarks from Head of Karawang Agricultural Dinas, JICA, MOA, and BAPPENAS	Committee
09.00 – 09.30	Introduction of the training program	Committee
09.30 – 11.00	Module 1: AUTP-IHPPBA Product Design √ Comparison of concepts between indemnity-based and index-based insurance √ General mechanism √ Comparison of the main parameters of AUTP with AUTP-IHPPBA (AYII in Indonesia) √ Basic risk, adverse selection, and moral hazard √ Product development flow to the pricing process √ Introduction to premium calculation	Jasindo
11.00 – 12.00	Q&A Session – Module 1	Committee, Jasindo
13.00 – 14.00	Module 2: AYII Operational √ Socialization, registration √ Introduction of AYII brochure √ Claim and payout procedure	Jasindo
11.30 – 12.00	Module 3: Example of Forms and Insurance Policy	Committee, Jasindo
14.00 – 14.30	Q&A Session – Module 2 & 3	
14.30 – 15.00	Sharing session: √ AYII Implementation in other countries √ AYII Pilot Implementation in Karawang Kabupaten	Committee, SCI, Karawang Agricultural Dinas
Thursday, April 14th 2022		
08.00 – 08.30	Re-registration	Committee
08.30 – 09.15	Module 4: Scope of AYII Pilot Implementation √ Piloting timeline / schedule √ Piloting target of area √ AYII (pilot) official manual guideline	MOA
09.15 – 09.30	Q&A Session – Module 4	Committee

09.30 – 10.30	Module 5: CCE Implementation √ How to conduct CCE for the pilot implementation √ How to calculate yield and productivity (in Excel)	SCI
10.30 – 11.00	Q&A Session – Module 5	Committee, SCI
11.00 – 11.30	Making Action Plan for AYII Pilot	Participants, Committee
11.30 – 12.15	Training program evaluation (online), closing remarks	Committee

The first day of training started with opening remarks from Kendal Agricultural Dinas, Ms. IkaPurwani from Ministry of Agriculture, Mr. Noor Avianto from BAPPENAS, and Mr. Kota Hirayama as the representative of the JICA consultant team. It was emphasized that the challenges in farming activities can be solved by providing agriculture insurance to farmers. The insurance covers not only harvest compensation but also security of farming land of Indonesiaas a duty of the government.

The first module on the first day was presented by Jasindo. The trainer, i.e.Jasindo officer, explained that Kendal Kabupaten is covered byJasindo Semarang office. Jasindo officer also explained the scheme and main concept of AYII, how the product was designed, and how the product mechanism would be implemented.Jasindo then continued to explain procedure of claim and payout, as well as showing the example of AYII brochures, forms, and insurance policy/ certificate.

In the sharing session on the afternoon of first day, the JICA consultant team sharedinformation about examples of AYII scheme in other countries, namely Japan and India. Also, an officer of Karawang Kabupaten shared the experiences of AYII pilot implementation in MT-2 2021.

The second day of the training continued with the discussion of General Guideline, registration terms and conditions, scope and target of AYII pilot implementation in Kendal, and the schedule/ timeline, which were delivered by MOA. The consultant teamtook charge of the other module on CCE implementation and calculation of yield.

5.5.5 Pre-Training Survey in KendalKabupaten

Before the training sessions started, all participants (especially extension officers) were asked to complete an online survey on experiences and knowledge of regular AUTP and how they socialized the product to the beneficiary farmers.

Two third of the participants answered that they have been involved directly in the regular AUTP implementation. In year of 2015, there was no paddy field insured by AUTP. However, the area increased from year 2016 and reached to approximately 10 ha to 50 ha per Desa.The number of insured farmers in each Desaarrived at around 10 to 50 from year of 2016 to 2019. The claim area reached to only less-than-10-ha per Desa in most of Desa. However, the claim area sometimes exceeded 10 ha per Desa.43% of respondent answered that the main issue of AUTP implementationis the lack of interest and awareness on AUTP of farmers, being followed by difficulty of socialization (28%).

5.5.6 Main Discussions in KendalKabupaten

The following are the main discussion including questions and answers during the AYII training:

√ In WonosariKecamatan, there is a potential of flood due to high tide which resulted in increasing salt level on the paddy soil.The flood due to high tide is one of the risks that are covered by AYII. However, the loss resulting from salt damage is not covered by AYII since the loss should be managed and prevented by the farmland owners.

- √ In case that AYII claims occur in two consecutive cropping seasons in a Desa, the implementing agencies will assess the target area and gather information on the reason and the cropping practices.
- √ Duty seal is attached on each policy certificate which will be given to the farmer group that purchase the insurance.Every farmer (group) needs to pay the duty seal.
- √ CCE target paddy fields should be determined in the planting season.The implementing agencies need to make agreement on CCE implementationwith the farmers in advance. It is also better for Dinas to have list of back up lands of which location are not far from the pre-set lands. Even if a targetpaddy field is damaged due to somedisaster and the harvest is limited,extension officerscan just continue the CCE.
- √ Regarding WonosariKecamatan, in casethat flood damage turned out to be a permanent disasterdespitefarmers have put lots of efforts, it can be said that the land cannot be used for farming. The damages willcomeagain and again. Under the situation, the area cannot be covered by the insurance as the insurance is to be prepared for the unknown possible damages or loss.
- √ AYII registration will be processed manually by hard copies, not by SIAP application. Regarding the claim document submission, there is no need to wait for completion of documents of every farmer group in one village.Kecamatan can proceed to submit the ones of early claim group those who have completed their documents.
- √ AYII is also a new scheme of insurance in Japan. There were difficulties for the government in promoting AYII program to the farmers. Before AYII appeared in Japan, there was also an insurance like AUTP, so that the government should have changed the understanding of farmerson AYII.
- √ In India, there was a challenge on CCE implementation.It took time to implement CCE and get the result. India tackles this issue by development of smartphone application. In India, CCE activities are carried out by an organization like Central Bureau of Statistics (Badan Pusat Statistik / BPS) of Indonesia because the CCE and benchmark yield data need to be updated every year. The large scale of AYII registration in India must have resulted from the rule thatIndian farmers must have registeredto agriculture insurance in case that they purchase loans from banks. However, this program was changed in the end of year 2020 and insurance companies started todo socialization now.
- √ The CCE must be carried out even though no Jasindo staff accompanies the field works. However, Jasindo has made an internal rule statingthat Jasindo staff must joinat least two CCEs in one season. In case that Jasindodoes not follow the rule, the responsibilityshould be taken by Jasindo staff, not by extension officers.
- √ BPS only takes the yield data for national statistics and the smallest unit area isKabupaten. BPSonly gathers the data from one or two sample paddy fieldsin one Desa.In the AYII trial, Dinas has to work on data gathering by themselves because the data of BPS cannot cover the Desa-level yield survey.

5.6 Premium Collected and Compensation Paid under the AYII Pilot

Table 5.6.1 shows the summary of premium collected and compensation paid under the AYII pilot in Karawang and Kendal Kabupaten.In the first pilot targeting 2021 MT-2 in Karawang Kabupaten, the premium accounted for approximately 68.9 million IDR. Compared to the premium, 368.5 million IDR of compensation was paid.The following cropping season, i.e., 2022 MT-1 in Karawang, could cover only CibuayaKecamatan because of the delay of official approvement of the pilot in the season.The compensation of the 2022MT-1 season also exceeded the premium collected, namely 12.5 million IDR of premium vs 59.8 million of compensation.

Kendal Kabupaten was added on the pilot area from the 2022 MT-2 season. There was no claim of com-

pensation in Kendal as the average yield of each target Desa exceeded the benchmark yield. The total amount of premium collected in KendalKabupatenreached 24.8 million IDR. On the other hand, the results of CCEs in Karawang Kabupaten has not been officially compiled by Jasiondoas of February 20th, 2023, so that the compensation amount has also not yet announced. The amount shown on the table is calculate by the JICA consultant team for reference. Though in total 102.7 million IDR was collected as premium, 435.7 million IDR is expected as compensation of the 2022 MT-2 season in Karawang Kabupaten.

Table 5.6.1Summary of Premium Collected and Compensation Paid under the AYII Pilot

Kecamatan	Desa	Premium, IDR	Compensation, IDR	Kecamatan	Desa	Premium, IDR	Compensation, IDR
Karawang, 2021 MT-2				**Karawang, 2022, MT-1**			
Cibuaya	Gebangjaya	0	0.00	Cibuaya	Gebangjaya	3,498,000	40,292,527.77
	Jayamulya	7,632,000	4,888,888.82		Jayamulya	8,983,500	19,567,862.65
	Kertarahayu	10,653,000	30,830,551.16		Kertarahayu	0	0.00
	Sub-Total	18,285,000	35,719,439.98		Sub-Total	12,481,500	59,860,390.42
Pedes	Payungsari	14,047,650	207,730,243.74	Pedes	Payungsari	0	0.00
	Randumulya	4,452,000	43,929,352.53		Randumulya	0	0.00
	Sungaibuntu	1,431,000	10,494,699.57		Sungaibuntu	0	0.00
	Sub-Total	19,930,650	262,154,295.84		Sub-Total	0	0.00
Kutawaluya	Kutamukti	5,294,700	70,669,999.93	Kutawaluya	Kutamukti	0	0.00
	Sindangmukti	5,962,500	0.00		Sindangmukti	0	0.00
	Sindangsari	4,293,000	0.00		Sindangsari	0	0.00
	Sub-Total	15,550,200	70,669,999.93		Sub-Total	0	0.00
Telagasari	Cilewo	2,385,000	0.00	Telagasari	Cilewo	0	0.00
	Kalibuaya	2,385,000	0.00		Kalibuaya	0	0.00
	Pasirkamuning	2,544,000	0.00		Pasirkamuning	0	0.00
	Sub-Total	7,314,000	0.00		Sub-Total	0	0.00
Rawamerta	Gombongsari	2,623,500	0.00	Rawamerta	Gombongsari	0	0.00
	Kutawargi	2,035,200	0.00		Kutawargi	0	0.00
	Sukapura	3,180,000	0.00		Sukapura	0	0.00
	Sub-Total	7,838,700	0.00		Sub-Total	0	0.00
Total		**68,918,550**	**368,543,735.75**	**Total**		**12,481,500**	**59,860,390.42**
Karawang, 2022, MT-2[1)]				**Kendal, 2022, MT-2**			
Cibuaya	Gebangjaya	0	0.00	Pageruyung	Surokonto Kulon	0	0
	Jayamulya	7,075,500	32,138,888.89		Surokonto Wetan	1,030,638	0
	Kertarahayu	0	0.00		Gebangan	1,590,000	0
	Sub-Total	7,075,500	32,138,888.89		Sub-Total	2,620,638	0
Pedes	Payungsari	47,668,200	207,666,341.46	Patebon	Wonosari	6,360,000	0
	Randumulya	23,373,000	180,763,250.88		Pidodowetan	1,590,000	0
	Sungaibuntu	6,519,000	0.00		Pidodokulon	3,180,000	0
	Sub-Total	77,560,200	388,429,592.35		Sub-Total	11,130,000	0
Kutawaluya	Kutamukti	7,950,000	0.00	Plantungan	Wadas	2,385,000	0
	Sindangmukti	0	0.00		Bendosari	795,000	0
	Sindangsari	0	0.00		Mojoagung	795,000	0
	Sub-Total	7,950,000	0.00		Sub-Total	3,975,000	0
Telagasari	Cilewo	2,385,000	0.00	Patean	Selo	2,385,000	0
	Kalibuaya	1,590,000	0.00		Wirosari	3,180,000	0
	Pasirkamuning	1,590,000	0.00		Pagersari	1,590,000	0
	Sub-Total	5,565,000	0.00		Sub-Total	7,155,000	0
Rawamerta	Gombongsari	2,226,000	18,223,298.03	**Total**		**24,880,638**	**0**
	Kutawargi	2,408,850	0.00				
	Sukapura	0	0.00				
	Sub-Total	4,634,850	18,223,298.03				
Total		**102,785,550**	**438,791,779.27**				

Source: Jasindo

5.7 AYII Review Survey

The AYII review survey was conducted both in Karawang and Kendal. The objectives of the survey were to obtain the farmer and officers' perspectives towards the AYII product and scheme and to know the level of their understanding regarding this new agricultural insurance. Also, this survey aimed to produce insights on how to improve AYII product design and implementation in Karawang and Kendal Kabupatens, and in other Kabupatens if expanded further throughout Indonesia.

The farmers' feedback on the AYII product is key to improving the AYII product in the future to maximize the impact of the AYII scheme. Also, the AYII product is still a new product in Indonesia. It is necessary to understand how the AYII actually benefited farmers as well as how the AYII actually worked well or not well.

5.7.1 Methodology

The AYII product review survey was carried out in April 2022 for the target 15 Desas in Karawang Kabupaten, West Java and in November for the target 12 Desas in Kendal Kabupaten, Central Java.

The survey was carried out as a semi-structured questionnaire survey with face-to-face interviews. In Karawan, 46 farmers and 13 officers were interviewed. In, Kendal, 41 farmers and 15 officers were interviewed. The following table summarizes the respondents of the survey:

Table 5.7.1 Inteview Respondent in Karawang

Kecamatan	Total	Registered AYII	Non-AYII
Kutawaluya	15	11	4
Rawamerta	9	5	4
Telagasari	6	4	2
Cibuaya	8	3	5
Pedes	8	5	3
Total	46	28	18
Dinas officers	13	-	-

Source: JICA Consultant Team

Table 5.7.2 Interview Respondent in Kendal

Kecamatan	Total	Registered AYII	Non-AYII
Pageruyung	9	2	7
Patean	9	6	3
Patebon	11	6	5
Plantungan	12	5	7
Total	41	19	22
Dinas officers	15	-	-
Dinas officers	13	-	-

Source: JICA Consultant Team

Multiple choices questions and open-ended questions were given to the respondents. The questions are categorized into 4 parts: 1) Basic questions, 2) Statements and understandings of AYII, 3) Interest and satisfaction with AYII products, and 4) Willingness to buy AYII products.

Basic questions include the respondent's identity, information about agricultural insurance products especially AYII, whether the respondent has ever joined AYII, and the reason for buying AYII products. The statements and understandings of AYII include respondents' participation in socialization and promotion, AYII materials they received during socialization, understanding of the registration process, loss assessment, and the claim process.

The questions related to interest and satisfaction with AYII Products include respondents' feedback on the AYII product designs, and the experiences of AYII registered respondents. Finally, to find out the willingness to buy AYII products in the future, the surveyors asked questions regarding premiums and compensation amount, and also allowed respondents to provide input regarding reasonable premiums and compensation amount.

5.7.2 Findings and Results in Karawang

1) AYII Participation

Of a total of 42 farmer respondents, 19 were registered in the AUTP in 2020, and 28 were registered in AYII in MT-2 2021. Mostly, the reasons for farmers joining agricultural insurance are to prepare for crop failures. Then, the second reason is that farmers want to succeed in the government programs as presented in Figure 5.7.1. In addition, Figure 5.7.2 shows that the majority of reasons for farmers do not join the agriculture insurance program are due to the lack of information they received.

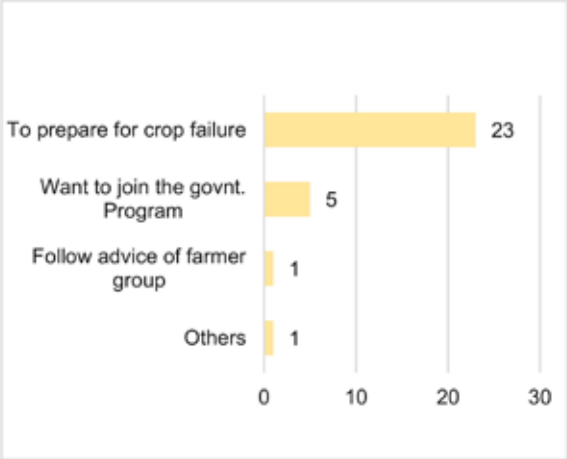


Figure 5.7.1 Reasons for Joining AYII

Source: JICA Consultant Team

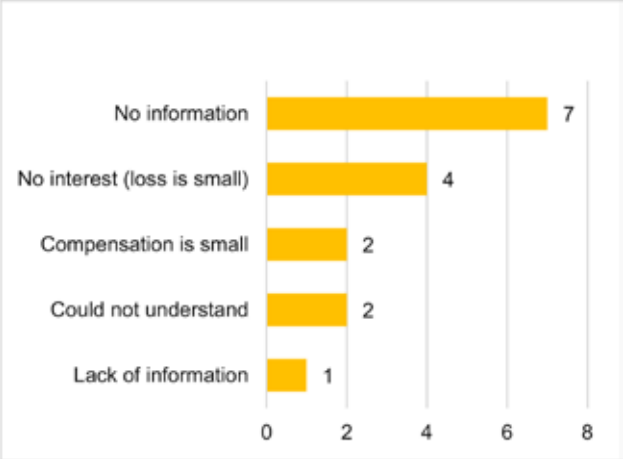


Figure 5.7.2 Reasons for not Joining AYII

Source: JICA Consultant Team

2) Socialization and Understanding of AYII Product

As implementing institutions, the Ministry of Agriculture and Jasindo assisted by the JICA team have provided socialization and promotion tools such as general guidelines, implementation guides, modules, brochures, leaflets, videos, as well as radio broadcasts. Of all the socialization and promotion tools, based on the survey, the brochure is the major promotion material. Meanwhile, direct socialization carried out by officers is the key to increasing farmers' understanding of AYII.

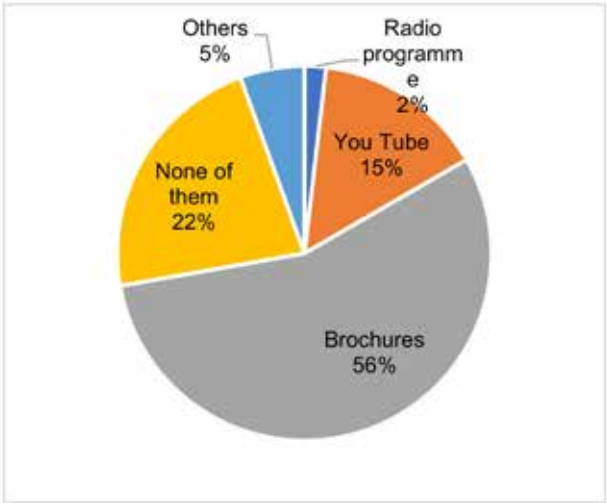


Figure 5.7.3 AYII Promotional Materials

Source: JICA Consultant Team

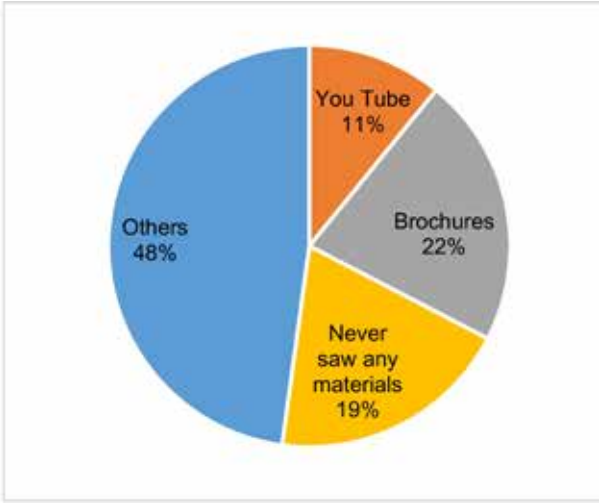


Figure 5.7.4 Effective Materials to Understand AYII

Source: JICA Consultant Team

Furthermore, almost 50% of farmers who participated in the socialization understood the AYII product design, but only about 30% of respondents understood the claim process, loss assessment, and compensation amounts (see Figure 5.7.5).

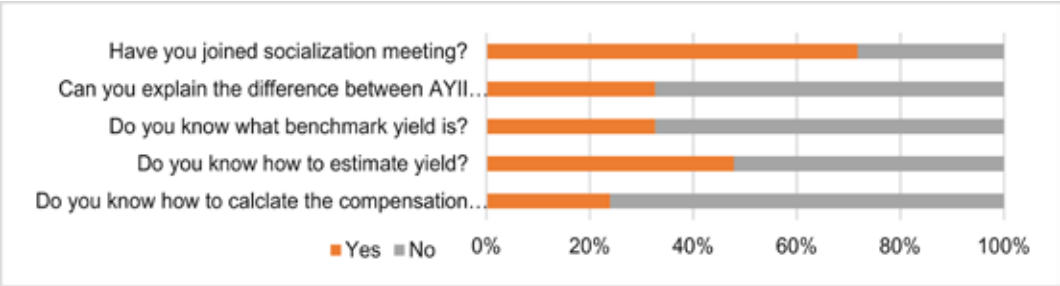


Figure 5.7.5 Understanding of the AYII Product

Source: JICA Consultant Team

3) Satisfaction of the AYII Product

To measure the level of farmers' satisfaction with AYII products, surveyors asked several questions related to product design, such as the insured amount, premium, benchmark yields, payout calculation method, CCE results, also claim and payment procedures.

From these questions, of the 28 farmers who registered for AYII, around 60%, said they were satisfied with the premium (after 80% of subsidies from the Government). However, there are about 53% of the farmers are dissatisfied with the insured amount. Farmers' dissatisfaction with the amount insured is closely related to production costs. Currently, the production cost of rice farming reaches 10 to IDR 15 million per ha while the maximum insured amount is IDR 6 million per ha.

Furthermore, of the 13 officers interviewed, 7 of them said they were satisfied with the premium amount, but 8 officers said they were not satisfied with the benchmark yield. The officers have an opinion that the percentage of loss ratio used as the benchmark yield calculation is too low, where the percentage of loss ratio chosen is 85%. With this, the officers proposed 90% or 95% as the benchmark yield. In addition, according to the officers, the 7-year historical data that were used to calculate the benchmark yield is too long, suggesting that 5 years could be enough as applied in Japan and India.

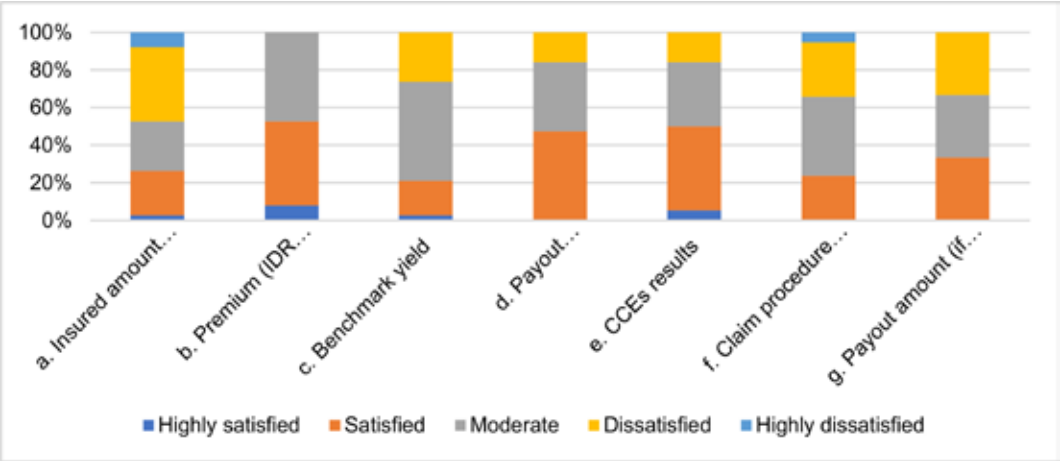


Figure 5.7.6 Satisfaction of the AYII Product (Farmers)

Source: JICA Consultant Team

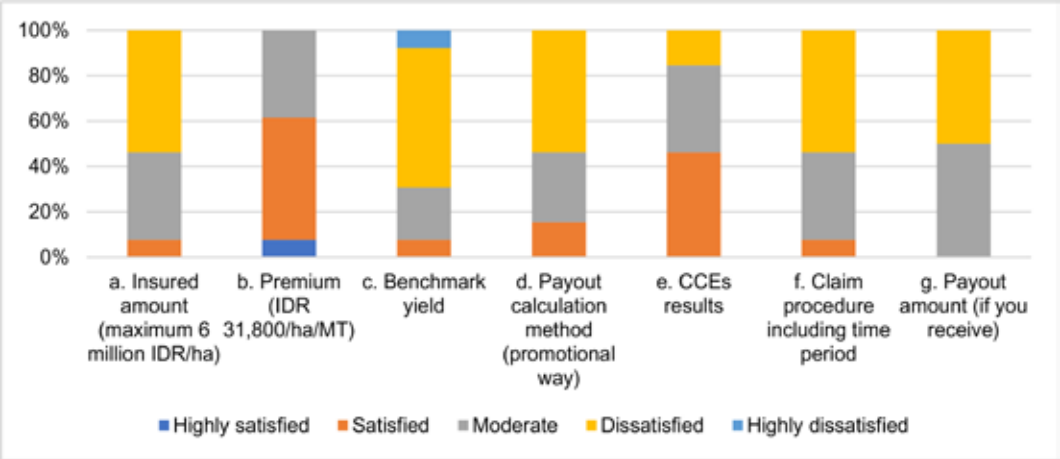


Figure 5.7.7 Satisfaction of the AYII Product (Officers)

Source: JICA Consultant Team

In addition to the premium, insured amount, and benchmark yield, the CCE process also has an important note. Based on the officer's input through open answers, there are too many attachments (forms) to the CCE process that must be completed by the extension staff (PPLs).

An interesting case happened in villages that have a decline in yield based on CCE results. It turned out that the decline in yield was very extreme, which was far below normal years as happened in 3 villages in Pedes sub-district, and one village in Kutawaluya sub-district in Figure 5.7.8.

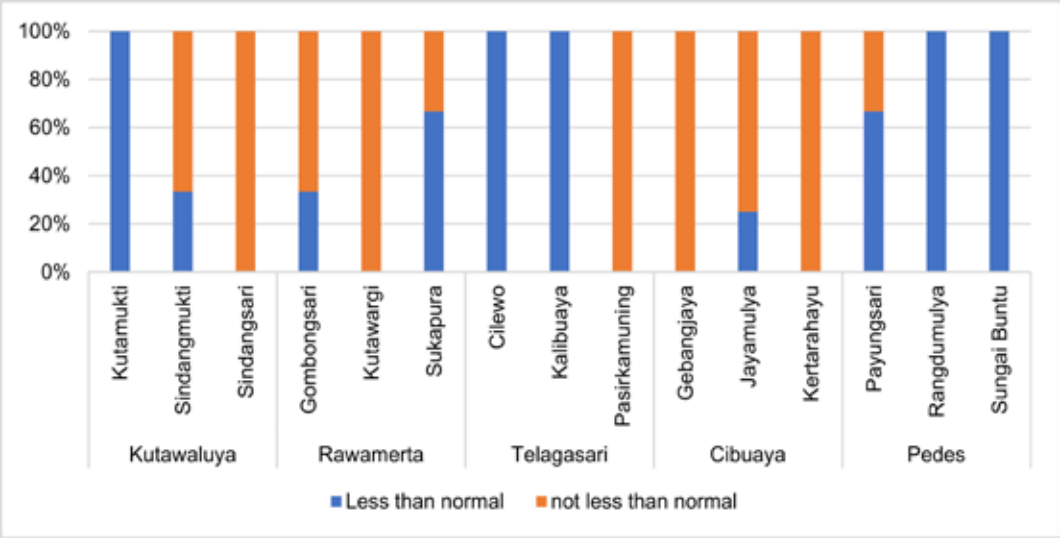


Figure 5.7.8 Yield Result based on Farmers' Experience

Source: JICA Consultant Team

4) Willingness to Buy for the AYII Product

The respondents prefer higher compensation amounts even if they have to pay more. By considering the increase in the compensation amount, the surveyor asked the question about the affordable AYII premium. There are three premium scenarios proposed to the respondents: high, medium and low. From the three scenarios, a meeting point is taken at IDR 50,000 to IDR 70,000 per ha. This amount is still affordable for the farmers. Furthermore, by considering the premium shown in Figure 5.7.10, it is possible

to increase the maximum insured amount to 8 to 10 million per ha as compared to the current amount of IDR 6 million ha.

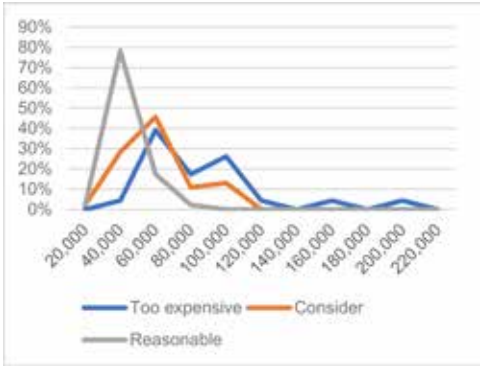


Figure 5.7.8 Yield Result based on Farmers' Experience

Source: JICA Consultant Team

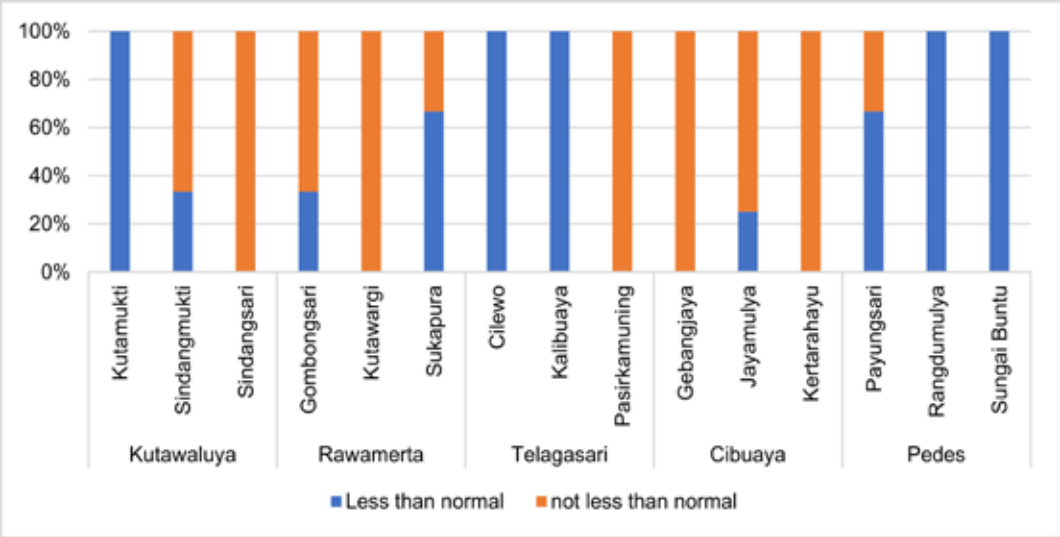


Figure 5.7.9 Farmers' Perception on the AYII Premium

Source: JICA Consultant Team

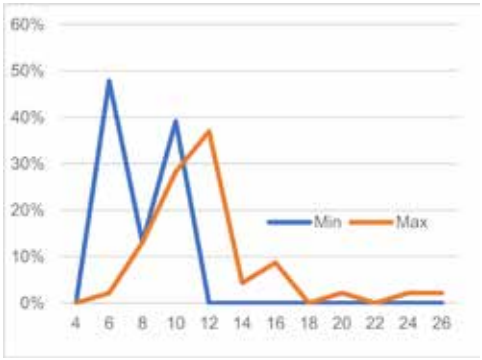


Figure 5.7.10 Farmers' Perception on Min & Max Payouts

Source: JICA Consultant Team

5.7.3 Findings and Results in Kendal

1) AYII Participation

Approximately 40% of the respondents (17 respondents out of the total 41 respondents) joined the AYII pilot. One of the main reasons for joining the AYII pilot was "preparation for crop failure" followd by "recommendation by PPLs". On the other hand, the most popular answer for not joining the AYII pilot was "no information" followed by "no interest" and "cannot understand". The following figures show the main resons for joining AYII and not joining AYII:

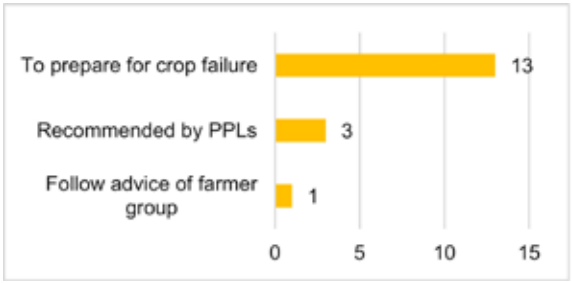


Figure 5.7.11 Reasons for Joining AYII (Kendal)

Source: JICA Consultant Team

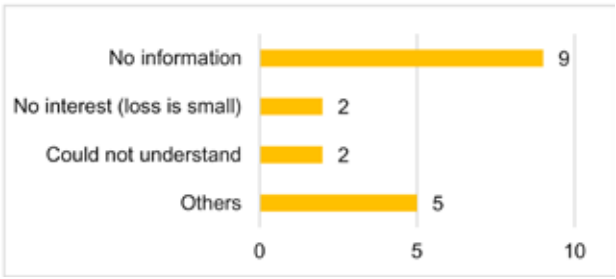


Figure 5.7.12 Reasons for Not Joining AYII (Kendal)

Source: JICA Consultant Team

2) Socialization and Understanding of AYII Product

As implementing institutions, the Ministry of Agriculture and Jasindo assisted by the JICA team have provided socialization and promotion tools such as general guidelines, implementation guides, modules, brochures, leaflets, videos, as well as radio broadcasts. Of all the socialization and promotion tools, based on the survey, the brochure is the major promotion material in Kendal. On the other hand, utilization of "YouTube" is still limited, however, 34% of the respondents answered that the most useful socialization material was "YouTube". This indicates that "YouTube" could have the potential to utilize for socialization further:

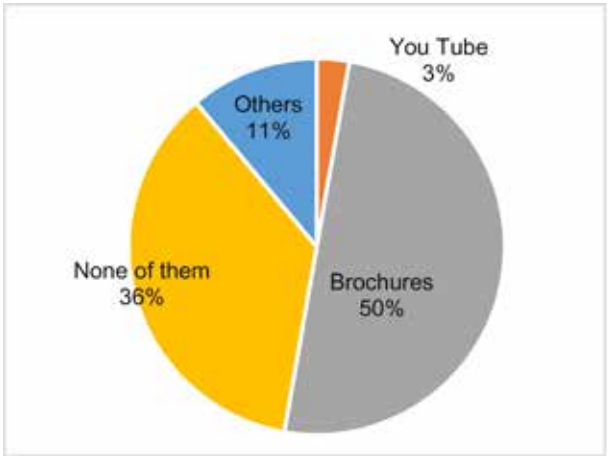


Figure 5.7.13 AYII Promotional Materials (Kendal)

Source: JICA Consultant Team

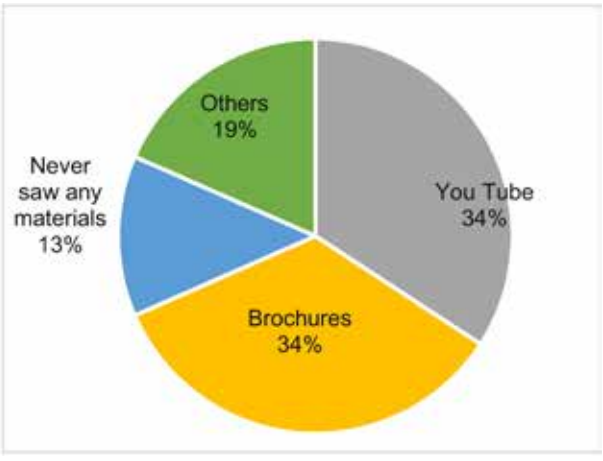


Figure 5.7.14 Effective Materials to Understand AYII (Kendal)

Source: JICA Consultant Team

The survey result shows that around 55% of the respondents answered they understood the AYII product "much" or "somehow". Yet, it is still 43% of the respondents answered that they could not understand the AYII product at all. Particularly, only 5 respondents answered "yes" to the question "Do you know how to calculate the compensation amount?". Therefore, the calculation of compensation amount is the most difficult part for farmers to understand.

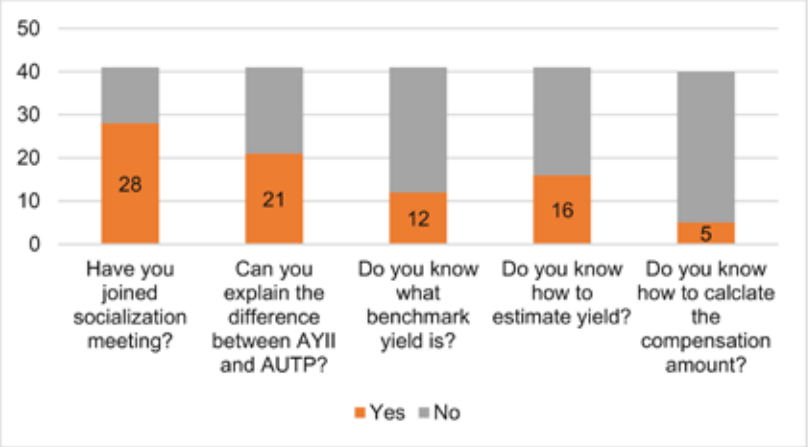


Figure 5.7.15 Understanding of the AYII Product in Detail

Source: JICA Consultant Team

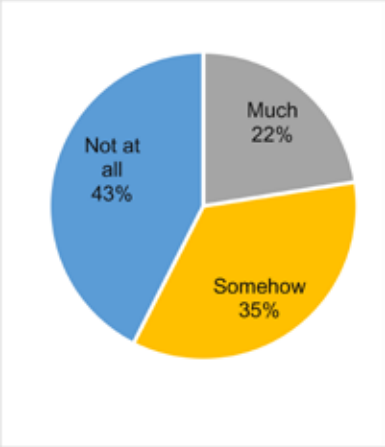


Figure 5.7.16 Understanding of the AYII Product in General

Source: JICA Consultant Team

3) Satisfaction of the AYII Product

To measure the level of farmers' satisfaction with AYII products, surveyors asked several questions related to product design, such as the insured amount, premium, benchmark yields, payout calculation method, CCE results, also claim and payment procedures.

The most satisfied aspect of the AYII product is "CCE s results" with 35% of the respondents. Although there was no payout in Kendal, the CCE results seemed not so far from farmers' experience. The premium rate is also one of the highly satisfied aspects with 27% of the respondents. On the other hand, the dissatisfied aspects of the AYII product include "Claim procedure" with 45% followed by "Payout calculation method" with 33% of the respondents. Please note that there was no payout in Kenda. Hence, it seems that this result came from farmers' experience in previous AUTP rather than the AYII itself.

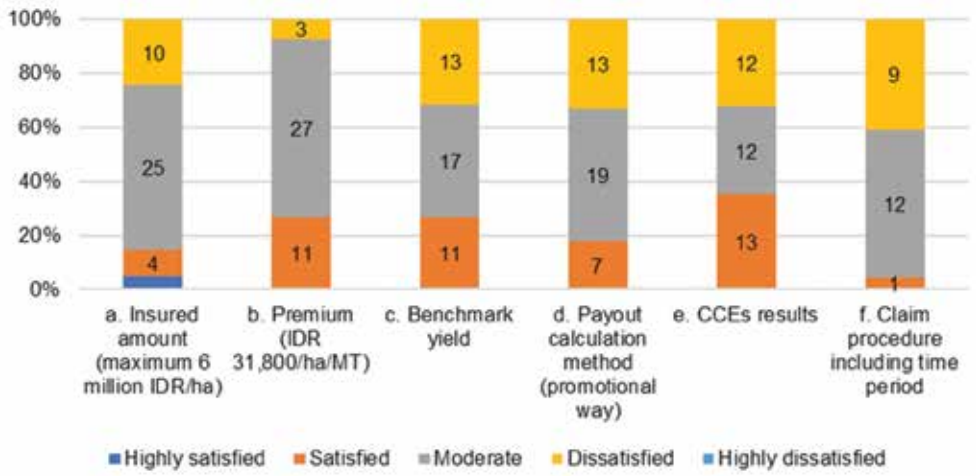


Figure 5.7.17 Satisfaction of the AYII Product (Farmers)

Source: JICA Consultant Team

In addition to the farmers, the survey team interviewed officers about their satisfaction with the AYII product. As a result, the officers were satisfied with almost all the aspects of the AYII product except "Benchmark yield". Approximately 27% of the respondents answered that they were dissatisfied with "Benchmark yield". Some of the officials pointed out that the benchmark yield should be reflected in more recent years, and it should be updated every year.

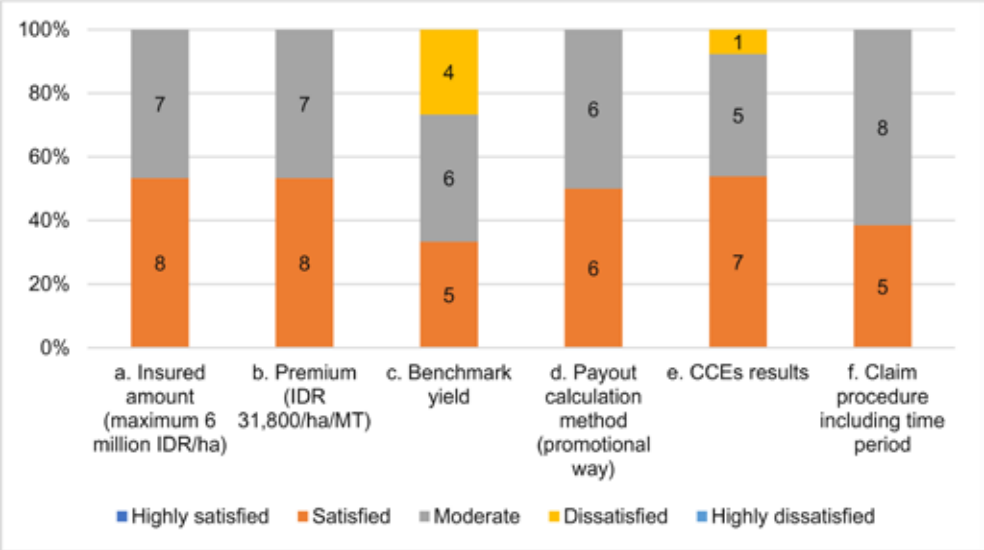


Figure 5.7.18 Satisfaction of the AYII Product (Officers)

Source: JICA Consultant Team

4) Willingness to Buy for the AYII Product

The surveyor asked the question about the affordable AYII premium. There are three premium scenarios proposed to the respondents: high, medium and low. From the three scenarios, a meeting point is taken at IDR 45,000 to IDR 50,000 per ha. This amount is still affordable for the farmers. Furthermore, by considering the premium shown in Figure 5.7.19, it is possible to increase the maximum insured amount to 8 million per ha as compared to the current amount of IDR 6 million ha. These results are similar to the results in Karawang. Therefore, increasing the premium rate and compensation amount could be considered in the future.

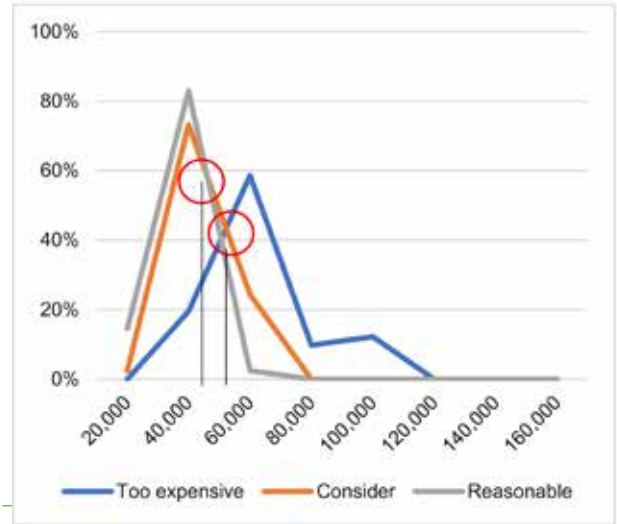


Figure 5.7.19 Farmers' Perception on the AYII Premium

Source: JICA Consultant Team

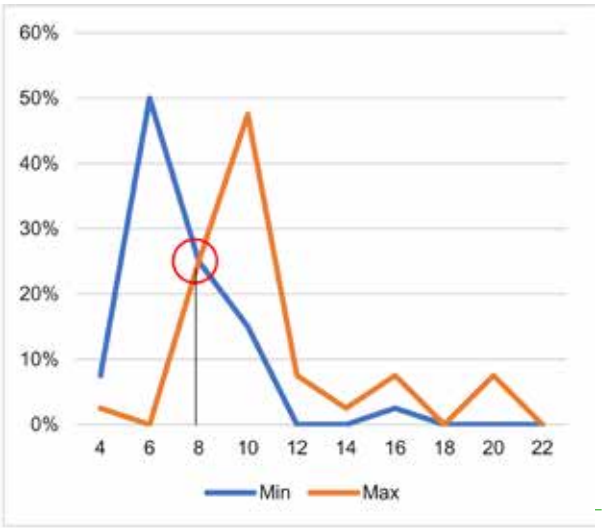


Figure 5.7.20 Farmers' Perception on Min & Max Payouts

Source: JICA Consultant Team

5.7.4 Conclusions

Based on the series of results of the AYII product review survey above, several summaries can be concluded as follows:

1. The AYII product is a bit complicated for the farmers to understand as compared to AUTP. It is necessary to conduct intensive face-to-face socialization.
2. The premium of AYII is accepted. It seems not a significant impact on their willingness to buy the AYII product. The premium amount still could be increased to 50,000 IDR/ha (after being subsidized by the government).
3. The compensation amount should be reviewed and considered to increase up to 8 million IDR/ha.
4. Benchmark yield and quality of CCE results should be reviewed to minimize the basis risk. For the CCE, BPS involvement should be considered.
5. Farmers show their interest in the AYII product if the Government supports the AYII officially.

CHAPTER 6 REMOTE SENSING TECHNOLOGY UTILIZATION IN AYII

Presented in this chapter is an exploration result of utilizing remote sensing(RS) technology in the implementation of Area Yield Index Insurance (AYII). To date, some insurance companies and donor projects in other countrieshave tried RS technology for the purpose of, e.g.,precise and cost-effective loss assessment in the field of non-life insurance, and thus, under this Project yield estimation with RS technologyisalso tried.

6.1 Case Studies Utilizing Remote Sensing Technology in Estimating Crop Yield

6.1.1 RIICE Project

There is a project, called RIICE project[1] , which promotes agriculture insurance utilizing remote sensingtechnology in Southeast Asia. The project is supported by Swiss Agency for Development and Cooperation (SDC), International Rice Research Institute (IRRI), sarmap[2] , and Swiss Re. In target countries, the project has produced paddy cultivation area maps, observed paddy growth in the areas, and developed paddy yield estimation modelwith RS techniques. As the environment of using RS technologies in Indonesia is similar to that of the countries, results of the RIICE project may help the Project.

Underthe project, such products as paddy cultivation maps, paddy growth observation, and yield estimation model, which are derived from RS analysis, have been provided to the relevant governmental institutions, which take responsibility of promotion and sales of agriculture insurance. The target countries of the project are Indonesia, Cambodia, Philippines, Thailand, Vietnam, and India. For all these countries, in the first phase of the project from year 2012 to 2014, trials on paddy cultivation area mapping and paddy growth observation by satellites-based RS were carried out.

In the second phase of RIICE from year 2015 to the present, pilot trials of yield estimation with RS technology have been implemented in those countries except Indonesia.Several studies about paddy growth monitoring by RS were reported as outcomes of RIICE project. In the studies, researchers have utilized SAR products for estimating start of cropping season (SOS), and succeeded in monitoring paddy growth stages. The study areas were Subang Kabupaten, West Java province.

During the second phase, researchers evaluated accuracy of yield estimation model in Cambodia, Vietnam, Thailand, India, and Philippines. In the studies, combination of x-band or c-band SAR and MODIS[3] product, of which spatial resolution is 250mx 250m, were used. Researchers estimated the SOS and LAI (leaf area index) of early reproductive phase by SAR products, and combined the LAI data with LAI data of MODIS products. The all pieces of LAI data are input to ORYZA[4] , a growth simulation model developed by IRRI, and expected yields are then obtained fromthe ORYZA. One of the studies showed that the accuracy of yield estimation was around 0.30 to 0.46 ton/ha of root mean square error in the Red River Delta, Vietnam.

1 Remote sensing-based Information and Insurance for Crops in Emerging economies (http://www.riice.org/)
2 sarmap is a Swiss company founded in 1998, engaged in developing and providing customized Earth Observation solutions and digital information of Earth system (https://www.sarmap.ch/wp/).
3 Moderate Resolution Imaging Spectroradiometer
4 https://sites.google.com/a/irri.org/oryza2000/

6.1.2 Rice Crop Growth Simulation Model: ORYZA

Crop simulation models utilized in the world can be roughly classified into 3 groups, i.e. Wageningen Univ. group, IBSNAT[5] group, and APSRU[6] group. The ORYZA is one of the models, developed by Wageningen Univ. group. The ORYZA was designed by the university and IRRI for the purpose of simulating paddy growth in tropical Asian countries. The core of ORYZA model is the paddy crop database, in which data of growth parameters of paddy varieties in several environments, e.g. Nitrogen-stress, water-stress, and temperature-stress environments, are stored. For estimating yield of a paddy variety, crop database of the variety need to be developed and stored in the database in advance.

ORYZA requires inputs of meteorological data (temperature, precipitation, etc.), soil characteristics, cropping period, level of irrigation water management, and applied fertilizer amount when estimating the yield of a paddy variety. Though the meteorological data and soil data are available on web, e.g. on database of NASA (National Aeronautics and Space Administration, USA), the other pieces of local information for the crop cultivation need to be collected on grounds.

6.1.3 Other Researches and Practices

In other areas in Indonesia, Prima et al. (2017) studied land cover classification by ALOS PALSAR of JAXA in Central Java province. Further, Yoshida et al. (2012) reported possibilities of growth monitoring and yield estimation by using aerial hyper spectral images. The latter work targeted at parts of Karawang Kabupaten, and showed that there were differences of cropping period between coastal area and inland area of Karawang Kabupaten, and the yield of coastal areas is relatively higher than that of inland areas.

Also, Hongo et al. (2009 to 2011) carried out researches on the paddy yield estimation in Cianjur Kabupaten, West Java province. The research discussed correlation between yearly producedpaddy volume (ton) and total LAI derived from MODIS products (multispectral image, 250m spatial resolution), and correlation between yield (ton/ha) and NDVI[7] derived from SPOT-5[8] products (multispectral image, 10m spatial resolution).

Hongo has continued to studying RS-based paddy loss analysis with Bogor Agricultural University under a SATREPS[9] project, for which the period covers years from 2016 to 2022. The research group is working on the establishment of RS-based methodologies to analyze paddy losses caused by draught, flood, and insect attack. In case of loss analysis after floods, SAR is utilized for detecting the SOS since there is a high correlation between paddy growth stages and loss scales. In case of draught, the loss analysis is conducted by UAV (Unmanned Aerial Vehicle)-based RS and yield estimation which is derived from calibration of NDVI through detection of SOS by SAR analysis.

Aside from the above example in Southeast Asia, there is another trial conducted in Africa. AKenyan insurance company, PULA[10] , has marketed AYII product for small-scale maize farmers in Sab-Sahara Africa. PULA has attempted to reduce costs for yield survey, i.e. crop cutting experiment (CCE), by combining RS technique swith machine learning.PULA clustered a target area in northern central Nigeria by the technique, and reduced number of CCEs, resulting in cost cutting of CCE by 43%. Likewise, Indian government utilizes RS techniques as supplementary mean to AYII implementation. In case that RS analysis indicates a trend of yield decrease of an area, the Indian government pays a part of payout in advance.

5 International Benchmark Sites Network for Agrotechnology Transfer
6 Agricultural Production System Research Unit
7 Normalized Difference Vegetation Index
8 Sattellite Pour l'Observation de la Terre (French satellite)
9 Science and Technology Research Partnership for Sustainable Development
10 https://www.pula-advisors.com/

As mentioned above, there are already cases that insurance companies and/or relevant institutions have practically applied the RS technique to assess crop yield required under AYII implementation. Yet, it is noted that uses of RS technology are still at a stage of supplementing the implementation of AYII, for example in India, and also considered as research/study or trial stages.Considering future implementation and extension of AYII, there is a possibility that the satellite-based RS technology could be utilized for the purpose of reducing the cost of CCE implementation required for yield surveys. In Japan, yield estimation of paddy by optical satellite images was first studied in 1980s - 1990s, which was the era of beginning of RS research in Japan. After 1990s, lots of satellites were launched by several countries and research institutions, and researches not only about optical image but about the Synthetic Aperture Radar (SAR) were carried out.

6.2 Yield Estimation Trial by Utilizing Remote Sensing Technology

6.2.1 Pre-conditionof the Yield Estimation Trial

1) Target Area

AYII pilot implementation is conducted in Karawang Kabupaten, West Java province, and accordinglythe yield estimation trials by utilizing remote sensing technology are also conducted in Karawang Kabupaten. The target Kecamatans in the Kabupaten were determined depending on paddy cultivation environment in the area. As DINAS of the Kabupaten categorizes paddy areas into 5 groups from the viewpoint of irrigation wateravailability and the level of yield, one Kecamatan from each group was selected, resulting in total 5 Kecamatans, i.e. Cibuaya (Category V),Pedes (Category IV), Kutawaluya (Category III),Telagasari (Category II), and Rawamerta (Category I).From each Kecamatan, 3 Desas were selected as the trial areas of yield estimation with remote sensing technology (See Figure 6.2.1).

Kecamatan	Desa (Village)
Cibuaya (V)	Gebangjaya, Jayamulya, Kertarahayu
Pedes (IV)	Rangdumulya, Sungaibuntu, Payungsari
Kutawalya (III)	Sindangsari, Sindangmukti, Kutamukti
Telagasari (II)	Pasirkamuning, Kalibuaya, Cilewo
Rawamerta (I)	Sukapura, Kutawargi, Gombongsari

Figure 6.2.1 Location and List of Target Desa in 5 Kecamatan, Karawang Kabupaten

Source: JICA Consultant Team

As discussed in the past researches, cropping pattern of the target areas is not simple, rather complicated (Tri et al. (2017), Yoshida et al. (2012)). The whole target areas are covered by an irrigation system, Jatiluhur irrigation system, and the paddy fields where farmers work for transplanting to harvesting are distributedside-by-side continuously from inland area to the coastal area. Even in one Kecamatan, however, different growth stages of paddy are observedduring one season period. Therefore, the detection of SOS is necessary when estimating paddy yields.

Sinceseasonal change of temperature in the area is small, paddy can be cultivated throughout a year as far as water is available. Therefore, variety of cropping patterns are observed in the area. Considering the extension of AYII to whole Indonesia in future, it is necessary to detect cropping patterns within a smaller area,e.g. Desa, than the area of Kecamatan, and estimate paddy yield bysuch small area.

2) Pre-analysis

To understand changes of land cover in the target areaduring June to October 2020,the Team applied GRD (Ground Range Detected) product of Sentinel-1, which is c-band SAR satellite operated by European Space Agency (ESA). The SAR images were captured by Interferometric Wideswath mode and the spatial resolution of raw image is 5 m x 20 m.The raw image is converted into 10 m x 10 m in GRD product.

The GRD product contains values of backscattering coefficient (dB) in each 10 m x 10 m pixel. The backscattering coefficient decreases on such flat surface as water body since the radar does not scatter on flat surfaces. On the other hand, high backscattering coefficient is observed on rough surfaces, e.g.artificial buildings, forest, and vegetation, on whichthe radar scatters. The backscattering coefficient is illustrated as σ0 (sigma naught).

In case that land cover is paddy field, low σ0 is observed during the transplanting season because of agricultural flooding, and σ0 increases following paddy growth. The σ0 reaches maximum value at heading stage of paddy, and decreases after flowering stage through ripening phase (Inoue et al. 2001).

Figure 6.2.2 depictsdifferences of land cover and paddy growth of the target areas in the period of June to October 2020. The red (R), green (G), blue (B) bands are allocated to averageσ0 of June to July, average σ0 of August, and average σ0 of September to October respectively. In the figure, red polygons show the target Desa.

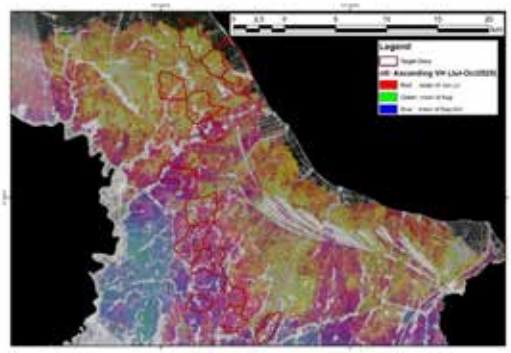


Figure 6.2.2 Variation Map of Backscattering Coefficient in the Target Desas (R: ave. Jun-Jul, G: ave. Aug, B: ave. Sep-Oct, 2020)

Source: JICA Consultant Team

Mangrove areas are observed as black areas along the northern coastal area in the figure, where σ0 shows low values throughout June to October. Since the mangrove area is continuously flooded, σ0 is low in all RGB bands. On the other hand, white areas, namely high σ0 in all RGB bands, show residential areas and roads, which scatter the radar through the period. Regarding paddy fields, red and yellow color areas are observed in northern coastal area. Southern inland area is mainly covered by purple color, though small yellow areas are scattered. The differences of colors of paddy fields distinguish paddy cropping period in the area.

Figure 6.2.3 describes seasonal change of σ0(ascending VH polarization) from November 2019 to October 2020in some sampling points in the yellow and purple paddy areas shown in Figure 6.2.2. There were 31 images captured by Sentinel-1during the period. For both areas of yellow and purple, two peaks are observed, so that Paddy-Paddy cropping in a year is expected.However, comparing each other, the timing of peaks and bottoms are slightly different. The figureindicates that the paddy cropping patterns of target Desa inKarawang Kabupaten move slightly forward or backward each other.

In accordance with interviews with DINAS officers, most of the farmers in the area apply Paddy-Paddy cropping through a year. There are few cases that farmers adopt the Paddy-Paddy-Parawija pattern. Regarding the Paddy-Paddy cropping, Karawang DINAS calls the first paddy cropping of a year, which

starts in April and ends in September, as 'Gadu', and the second paddy cropping, in which transplanting/ sowing begins in October and harvesting is carried out in March, as 'Rendeng'[11] . DINAS uses the categorization just to identifythe double cropping pattern.Farmers move actual cropping periods forward and backward every season depending on the availability of rainfall and/or irrigation water.

Figure 6.2.3 Seasonal Change of Backscattering Coefficient (ascending VH, dB) in the Target Desas during November 2019 – October 2020

Source: JICA Consultant Team

6.2.2 Methodology of 1st Trial: December 2020

1) Yield Survey: CCE

The CCEs were carried out in target 15 Desas from November 20th to the end of December 2020. The yield surveyors of Karawang DINAS commenced the CCEs from Kutawaluya Kecamatan, where farmers harvest paddy earlier than those of other areas. Following the Kutawaluya, surveyors implemented the CCEs in order of Rawamerta, Telagasari, Cibuaya, and Pedes.Table 6.2.1 shows the transplanting/sowing and harvesting periods for the target cropping of the target Desas.

The target cropping season of the trial, 'Gadu' of year 2020, began later than those of other years as rainy season started late. The transplanting/ sowing was carried out between July and August 2020, and harvesting started around November to December 2020. Because of late cultivation of 'Gadu', the coming cropping 'Redeng' was expected to start in December 2020 and end in February to March 2021. Thus, the cropping pattern in the area differs depending on water availability, so that the detection of SOS is a must for knowingaccurate cropping period of the target areas.

11 By taking the first words of cropping months, 'Gadu' and 'Redeng' are sometimes called 'ASEP' and 'OCMAR' respectively.

Table 6.2.1 Transplanting/Sowing and Harvesting Periods of Target Cropping Season in Target Desa (1st Trial)

No	Kecamatan	Desa	Transplanting / Sowing	Harvesting
1	Kutawaluya	Sindangsari	13-19 August	18-25 November
2	Kutawaluya	Sindangmukti	13-19 August	18-25 November
3	Kutawaluya	Kutamukti	13-19 August	18-25 November
4	Rawamerta	Sukapura	11-17 August	10-25 November
5	Rawamerta	Gombongsari	15-16 August	10-25 November
6	Rawamerta	Kutawargi	18-30 August	10-25 November
7	Telagasari	Pasirkamuning	August	24-30 November
8	Telagasari	Kalibuaya	16 August	24-30 November
9	Telagasari	Cilewo	19 August	24-30 November
10	Pedes	Rangdumulya	August	24-30 November
11	Pedes	Sungaibuntu	Early September	7-11 December
12	Pedes	Payungsari	Early September	7-11 December
13	Cibuaya	Jayamulya	Early September	7-11 December
14	Cibuaya	Kertarahayu	Early September	7-11 December
15	Cibuaya	Gebangjaya	August	24-30 December

Source: Karawang DINAS

As a preparation for CCEs, the Team simplified the yield survey form which is usually used by BPS. Field surveyors of Karawang DINAS recorded results of CCEsinto the simple form prepared by the Team. 20 yield samples were taken in each of 15 Desas, namely total 300 samples were collected.Surveyors collected information about location of the sampled paddy (latitude/ longitude), farmerprofiles, paddy plot size, cultivation practices (transplanting or sowing/ date of transplanting or sowing/ applied fertilizers/ paddy variety/ use of certified seed) , irrigation availability, yield by CCE, and whole production volume in weight.

2) RS Analysis

Prior tothe analysis of correlation between-yields and RS-based values, mapping of paddy cultivation area is necessary. The cropping areas aredelineatedout of land uses by tracing the change of σ0 in the season. Comparing the transplanting/ sowing dates indicated in Table 6.2.1 with the GRD images of Sentinel-1, it was confirmed that VV polarization well reflects agriculture flooding than VH polarization does. In addition, there are more images of ascending orbit available than those of descending orbit in the cropping period.Therefore, the paddy cropping areas were identified by series of ascending VV polarization images.

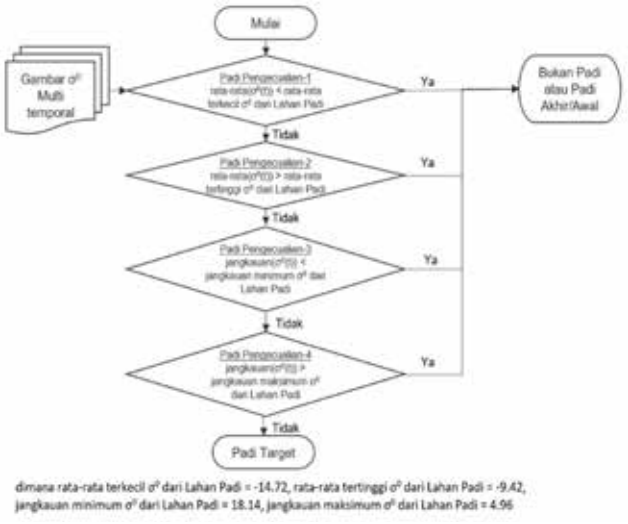


Figure 6.2.4 Flow of Paddy Cropping Area Detection

Source: JICA Consultant Team

The paddy area detection was carried out referring to a method developed by Nelson et al.

(2014)[12] . Average and range of fluctuation of σ0during August 1st to December 15th, 2020 were computed in each pixel, and the values were judged by thresholds.The thresholds were compared with the average or range of fluctuation to assess whether a pixel is covered by paddy or not. The values of threshold were determined by sampling ofσ0at the paddy fields. The samples for thresholds making were taken from 100 points on paddy fields,which are selectedby visual checks of Google Earth images. Figure 6.2.4 describes the flow of paddy area detection.

Figure 6.2.5 Paddy Cultivation Area Detection in Target Desa

Source: JICA Consultant Team

Figure 6.2.5 depicts the result of paddy area detection. Mangrove in thenorthern coastal area and artificial buildings/roads are well excluded, and basicallyonly paddy fields areidentified. Though some farm roads and open canals were identified as paddy fields, and could not be excluded[13] , the result can be judged in an acceptable range.

For analyzing correlation between yields by CCEs and RS-based data, three RS-based values are considered; i) LAI in the panicle initiation to the booting stage in early reproductive phase/ in the flowering stage in late reproductive phase, which are derived from c-band SAR of Sentinel-1, ii) LAI in the flowering stage in late reproductive phase, which is obtained from MODIS Collection 6 (LAI/ fPAR[14] product), and iii) LAI in the flowering stage, which comes from Sentinel-2 optical image conversion. Table 6.2.2 shows paddy growth stages defined by IRRI, and expected days after planting of each stage of two major paddy varieties in the target Desas.

Table 6.2.2 Growth Stages of the Rice Plant and Days after Planning of Major Varieties

Phase	Stage	Days after planting	
		Ciherang	Inpari 32 HBD
Vegetative	Seedling	2-7	3-7
	Tillering	8-20	8-20
	Stem elongation	21-27	21-30
Reproductive	Panicle initiation to booting	28-55	31-57
	Heading	56-65	58-67
	Flowering	66-75	68-77
Ripening	Milk grain	76-85	78-87
	Dough grain	86-92	88-95
	Mature Grain	92-115	95-120

Source: IRRI and Karawang DINAS

The LAI is one of the distinctive indexes to understand paddy growth, which is defined as the one-sided green leaf area per unit ground surface area (leaf area / ground area, m2 / m2). It is reported that the LAI of flowering stage is correlated with the total dry matter weight of maturing stage, and the dry matter

12 Nelson et al. (2014) carried out paddy cropping area detection by using SAR in southeast Asian counties including Indonesia under RIICE project, which resulted in 85% to 97% accuracy.

13 This is because SAR captures side oblique images of land surface from satellite vehicle, and pixels of raw image (spatial resolution = 5 m x 20 m) include backscattering of several land covers such as paddy crop, soil, trees, farm roads, and open canals.

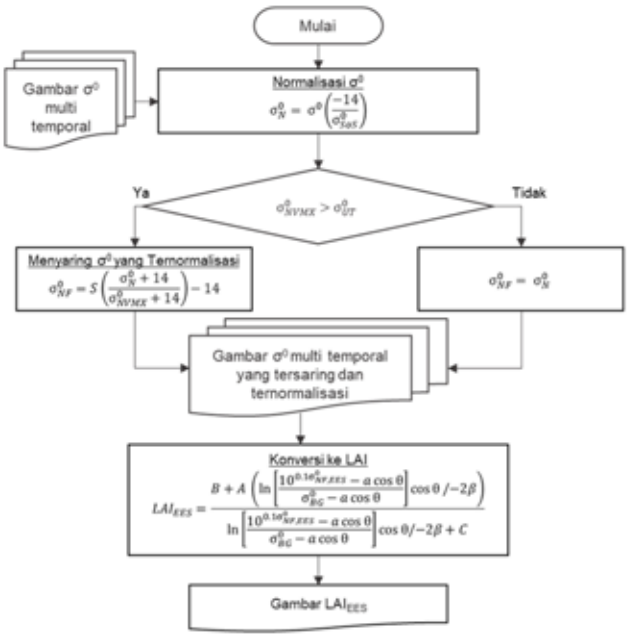
14 Fraction of Absorbed Photosynthetically Active Radiation

weight has a higher correlation with grain yield (Hirooka et al. 2017[15]). Therefore, there is a possibility that the yield can be estimated by the LAI.

The LAI derived from c-band SAR isobtainedby conversion of σ0in early reproductive phase.First, the detection of SOS was conducted by identifying minimum σ0 in the target cultivation period. Then, period of early reproductive phase of each pixel is identified.Applying water cloud model[16] to paddy canopy, σ0 is converted to the LAI of early reproductive phase. Figure 6.2.6illustrates the flow of the conversion.On a trial basis, the conversion flow for obtaining early-reproductive-phase LAI is also applied to gaining of LAI of flowering stage.

MODISis an optical sensor, which is mounted on satellite Terra and Aqua of NASA.An advantage of MODIS is high temporal resolution of imaging. MODIS captures an area twice a day while the spatial resolution of raw image is only 250 m x 250 m. Due to the high temporal resolution, the product is applicable even in tropical Asian countries where clouds often show up to cover lands. The MODIS Collection 6, which is applied in this trial of yield estimation, has two bands, i.e. LAI and fPAR, and the spatial resolution is converted to 500 m x 500 m. A system of NASA selects one image with less cloud cover among8 images covering 4 days, and computes LAI from reflectance of land surface of the best image.

Sentinel-2 satellite is also equipped with an optical sensor, Multispectral Imager (MSI), of which spatial resolution is 10 m x 10 m. The satellites revisit an area every 10 days and capture the area by the MSI. Although the MSI has relatively high spatial resolution, the images are not worth analyzing in case that cloud cover is dominant over target areas on imaging dates. For the analysis, the availability of clear images, i.e. cloud-less imageries, which are captured during target cropping season is examined. In case a clear image which is obtained during flowering stage of paddy in any target areas is found, the image is utilized for the analysis. By a free image processing software, SNAP, which is developed by ESA, the multispectral image of Sentinel-2 is converted to LAI image.The LAI values are compared with the yield of target paddy fields.



Term	Description
σ^0	Koefisien *Backscattering*
σ^0_N	Koefisien *Backscattering* yang Ternormalisasi
σ^0_{SoS}	Koefisien *Backscattering* pada SOS
σ^0_{NMX}	Maksimum Koefisien *Backscattering* yang ternormalisasi pada fase awal reproduksi
σ^0_{UT}	Batas atas Koefisien *Backscattering* yang ternormalisasi pada fase reproduksi awal (konstan) = -8.5
σ^0_{NF}	Koefisien *Kackscattering* ternormalisasi yang tersaring
S	Parameter untuk penyaringan (konstan) = 5.5
$\sigma^0_{NF,EES}$	Koefisien *Backscattering* ternormalisasi yang tersaring pada fase awal reproduksi
LAI_{EES}	LAI pada fase awal reproduksi
θ	Sudut datang radar
σ^0_{BG}	*Backscattering* dari tanah (konstan) = 0.04
α	(konstan) = 0.246
β	(konstan) = 0.336
A	(konstan) = 10.19
B	(konstan) = 0.1534
C	(konstan) = 1.511

Figure 6.2.6 Flow of Conversion of Backscattering Coefficient to LAI at Early Reproductive Phase

Source: JICA Consultant Team

Thetable below shows summary of trial cases of RS technology utilization. There are in total 4 cases,

15 Hirooka et al., Evaluation of the dynamics of the leaf area index (LAI) of rice in farmer's fields in Vientiane Province, Lao PDR, Journal of Agricultural Meteorology 73 (1): 16-21, 2017

16 Attema et al., Vegetation modeled as a water cloud, Radio Science, Volume 13, Number 2, p357-364, March-April 1978

namely case RS1/ RS2 for SAR analysis and case RS3/ RS4 for optical data analysis. Both data types have advantages and disadvantages. For instance, though the LAI of early reproductive phase can be obtained by applying the water cloud model to SAR data, the conversion of LAI of flowering stage is not covered by the model. The practical model for the flowering stage has not yet been developed. On the other hand, the analysis of optical data is simpler than that of SAR data. However, cloud covers always restrict the use of optical images in tropical monsoon areas.

Table 6.2.3 Trial Cases of Remote Sensing Technology Utilization

Case	RS data	Applied LAI (Leaf Area Index)	Remark
RS1	Sentinel-1 C-band SAR	Panicle initiation to booting stage in early reproductive phase	Applying the Water Cloud Model
RS2		Flowering stage in late reproductive phase	Applying the Water Cloud Model as trial
RS3	MODIS Collection 6 (LAI/ fPAR) (optical data)	Flowering stage in late reproductive phase	Spatial resolution: 250m x 250m is converted to 500m x 500m High temporal resolution: 2 imaging/ day
RS4	Sentinel-2 multispectral imagery (optical data)	Flowering stage in late reproductive phase	Spatial Resolution: 10m x 10m Low temporal resolution: 1 imaging /10days

Source: JICA Consultant Team

6.2.3 Results of the 1st Trial: December 2020

1) Result of Yield Survey: CCE

Table 6.2.4 shows the result of yield survey by CCE. The average yields do not differ much across the target Kecamatans, resulting in 9.0 to 9.7 ton/ha. Both highest yield and lowest yield among all the samples were obtained in Sindangsari Desa, Kutawaluya Kecamatan; 13.3 ton/ha vs 5.8 ton/ha. Sample standard deviationsat Desa level were smaller in Cibuaya and Pedes than those of Desa in Kutawaluya, Telagasari, and Rawamerta. The sample standard deviation of all samples comes to 1.43 ton/ha.

Table 6.2.4 Result of Yield Survey by CCE by Kecamatan and Desa, ton/ha (1st Trial)

Kecamatan, Desa	Max	Min	Average	Sample Standard Deviation
Cibuaya	11.6	8.2	9.7	0.83
Gebangjaya	10.1	8.2	9.6	0.64
Jayamulya	10.3	8.2	9.3	0.85
Kertarahayu	11.6	8.4	10.3	0.70
Pedes	12.0	7.4	9.2	1.03
Payungsari	9.5	7.4	8.5	0.63
Randumulya	10.8	8.2	9.0	0.65
Sungaibuntu	12.0	7.8	10.2	0.93
Kutawaluya	13.3	5.8	9.0	1.94

Kutamukti	8.7	6.0	7.3	0.88
Sindangmukti	12.5	7.4	10.6	1.22
Sindangsari	13.3	5.8	9.2	1.88
Telagasari	12.6	6.0	9.6	1.23
Cilewo	12.5	8.2	10.2	1.17
Kalibuaya	10.4	8.2	9.1	0.65
Pasirkamuning	12.6	6.0	9.4	1.53
Rawamerta	12.9	6.8	9.5	1.72
Gombongsari	11.5	8.6	10.1	0.77
Kutawargi	9.0	6.8	7.6	0.61
Sukapura	12.9	8.3	10.9	1.38
Whole Sample	13.3	5.8	9.4	1.43

Source: JICA Consultant Team

Paddy varieties cultivated in the sampling plots are summarized in Figure 6.2.7. Out of300 samples,155 samples (52%) and 122 samples (41%) are Ciherang variety and Inpari32 HBD variety respectively. The Ciherang variety is the majority in Cibuaya, Rawamerta, and Telagasari Kecamatans. The Inpari32 HBD is popular in Kutawalya and Pedes Kecamatans. Both varieties originate in IR64 variety[17] . The box plot in Figure 6.2.7 shows that median of Ciherangyield is approximately 10 ton/ha and higher than that of Inpari32 HBD (8.7 ton/ha). The difference between lower quantile and higher quantile of Ciherang is smaller than that of Inpari32 HBD. It is observed that the yield of Inpari32 HBD ranges wider than that of Ciherang.

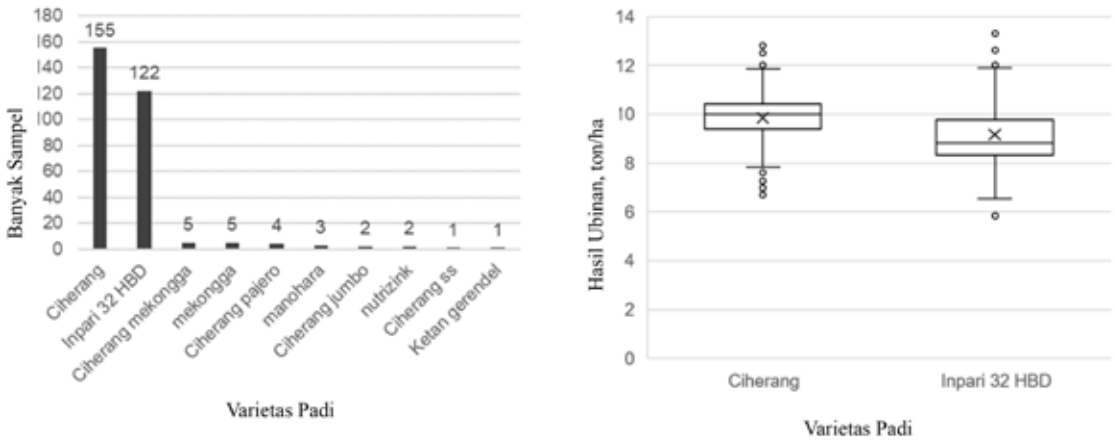


Figure 6.2.7 Number of Samples and Result of CCE by Paddy Variety

Source: JICA Consultant Team

2) Result of RS Analysis

The left figure of Figure 6.2.8 depicts the result of SOS (start of season)detection by c-band SAR product. In the figure, the period from August to December 2020was divided by every two weeks and colored. It is observed that farmers in inland area (light purple to purple, SOS = August) started transplanting earlier than thefarmers in coastal area (blue to green, SOS = second half of September).Comparing to the results of interviews with farmers about date of transplanting, it is observed that the RS analysis well captures the SOS of the area (refer to Table 6.2.1 for comparison).

17 Source: Indonesian Agency for Agricultural Research and Development

The result of conversion of σ0 to LAI at early reproductive phase is shown in the right figure of Figure 6.2.8.To remove the noises on raw LAI image, a lowpass filter was applied to the raw image. In Desas of Cibuaya and Pedes Kecamatanslocated in coastal area, higher LAI (brown to yellow color) is observed, presenting 3.0 to 5.0 m2/m2of LAI. On the other hand, inland Desas indicate lower LAI of 1.0 to 3.0 m2/m2 which is shown by blue to green colors.

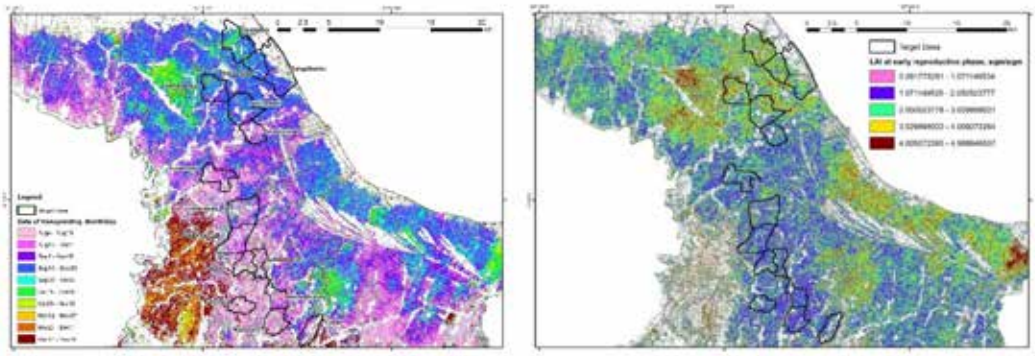


Figure 6.2.8 Maps of the SOS and LAI at Early Reproductive Phase Converted from σ0

(Left: SOS, Right: LAI)

Source: JICA Consultant Team

For the comparison of the spatial resolution of Sentinel-1 (GRD 10 m x 10 m) with MODIS Collection 6 (500 m x 500 m), a LAI image of MODIS is shown in Figure 6.2.9 for reference.The MODIS image is of course grainy. However, it is observed that the spatial resolution of MODIS is acceptable considering the area of Desas (See black solid line polygons in the left figure of Figure 6.2.8).

For the analysis of Sentinel-2 optical images, only one imagery captured on Nov. 15th, 2020 contains less cloud over the target area, and the others cannot be applied because of lots of clouds. Out of 300 CCE locations, paddy of 105 plots reached flowering stage in middle of November, which lie in Desa Jayamulya, Gebangjaya, Sungaibuntu, Kertarahayu, Payungsari, and Randumulya, namely in coastal area. The right figure of Figure 6.2.9 depicts the LAI of November 15th, 2020 and the target Desas.

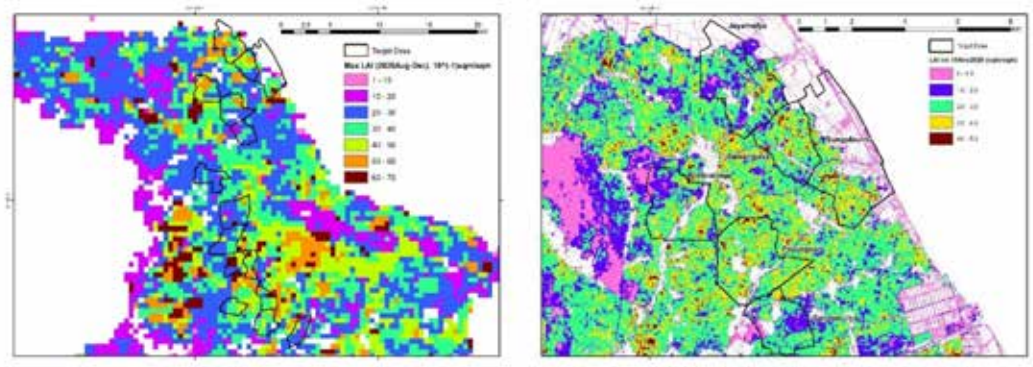


Figure 6.2.9 Maps of Max LAI during Aug-Dec, 2020 (MODIS Collection 6)(Left) and LAI of November 15th, 2020 (Sentinel-2 image conversion) (Right),

Source: JICA Consultant Team

2.1) Case RS1: Sentinel-1 C-band SAR | LAI at panicle initiation to booting stage

Figure 6.2.10 shows correlation between LAI at the early reproductive phase (m2/ m2) which is derived from σ0of Sentinel-1 and the yield obtained by CCE (ton/ ha). The upper left figure covers all 300 results of samples, which indicates that there seems no correlation between the CCE yield and the LAI. Examining the correlation at Desa level, even in Desa Sukapura which earned the highest coefficient of determination, the value of R2is only 0.13 (see upper right figure of Figure 6.2.10).By variety, in which the major 2 varieties namely Ciherang and Inpari32HBD are examined, no correlation is observed either (refer to the two figures at the bottom of Figure 6.2.10).

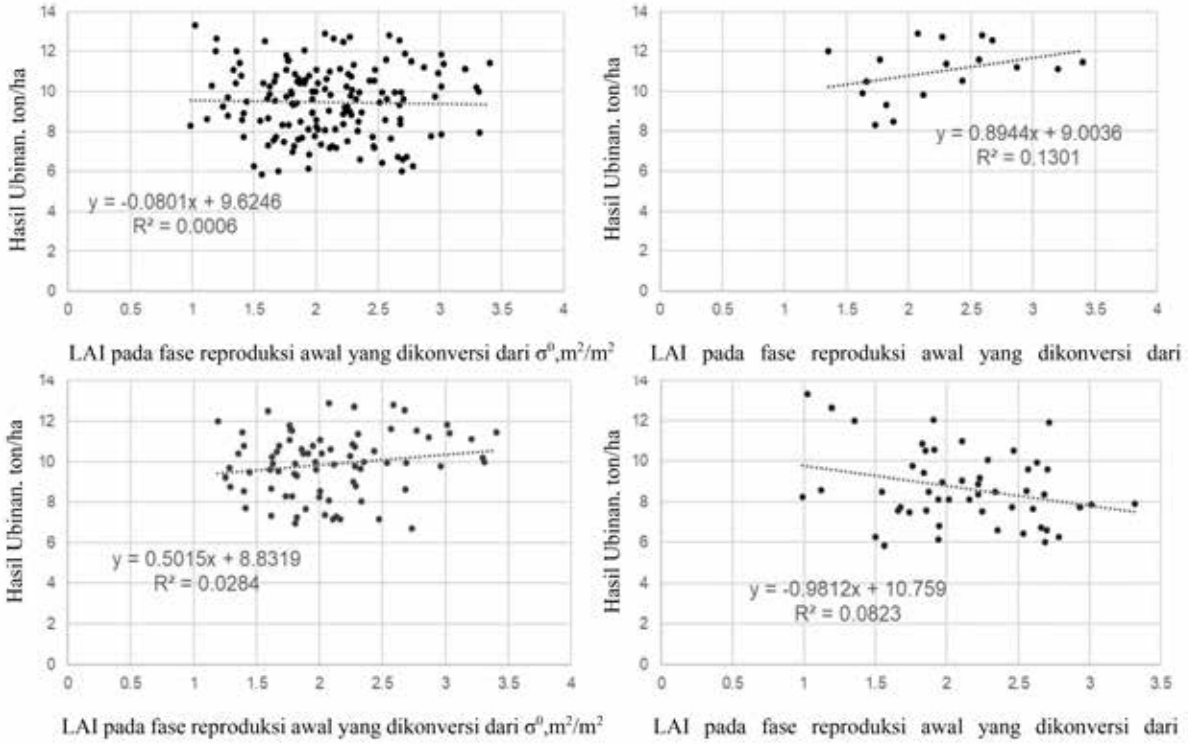


Figure 6.2.10 Comparison between LAI at Early Reproductive Phase Converted from σ0 and CCE Yield of All samples, by Desa, and by Paddy Variety

(Upper Left: All Samples, Upper Right: Sukapura, Rawamerta Kecamatan, Bottom Left: Ciherang – all samples, Bottom Right: Inpari32 HBD- all samples)

Source: JICA Consultant Team

2.2) Case RS2: Sentinel-1 C-band SAR | LAI at flower

On a trial basis, σ0 was also converted to the LAI of flowering stage by the flow in Figure 6.2.6. Although, when comparing Desa-wise correlation between the LAI and the yield data, highest R2 is obtained in Desa Kutawargi, the value is only 0.13(see Figure 6.2.11). In case that all 300 pieces of yield data are applied to make the regression model, the coefficient of determination is only 0.008.

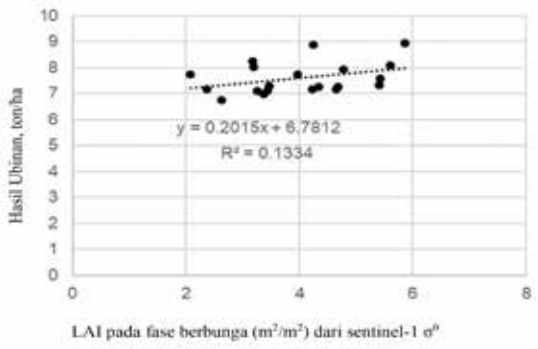


Figure 6.2.11 Comparison between LAI of flowering stage from σ0 and CCE Yield in Desa Kutawargi

Source: JICA Consultant Team

correlation. As the advantage of radar (SAR) remote sensing is penetration of clouds over target areas, it is expected that SAR products is adopted

Thus, the trial conversion does not result in high

for yield estimation of paddy in tropical Asian countries where clouds often cover lands. However, the SAR image processing for yield estimation and/or LAI conversion is still considered as a study phase technology.

2.3) Case RS3: MODIS Collection 6 (LAI/fPAR) | LAI at flowering stage

With regard to the comparison between the LAI at flowering stage in late reproductive phase, which is obtained from MODIS Collection 6, and CCE yield, the correlation for the2 major varieties isstill low when all samples are considered (see upper figures of Figure 6.2.12).Seeing Desa-wise correlation by paddy variety, KutawargiDesa of Rawamerta Kecamatan gave the highest R2 (= 0.59) for Ciherang variety. However,the coefficient of determination does not exceed 0.30 in case of Inpari32 HBD variety. The highest value is only 0.29 obtained at Radumulya Desa, Pedes Kecamatan.

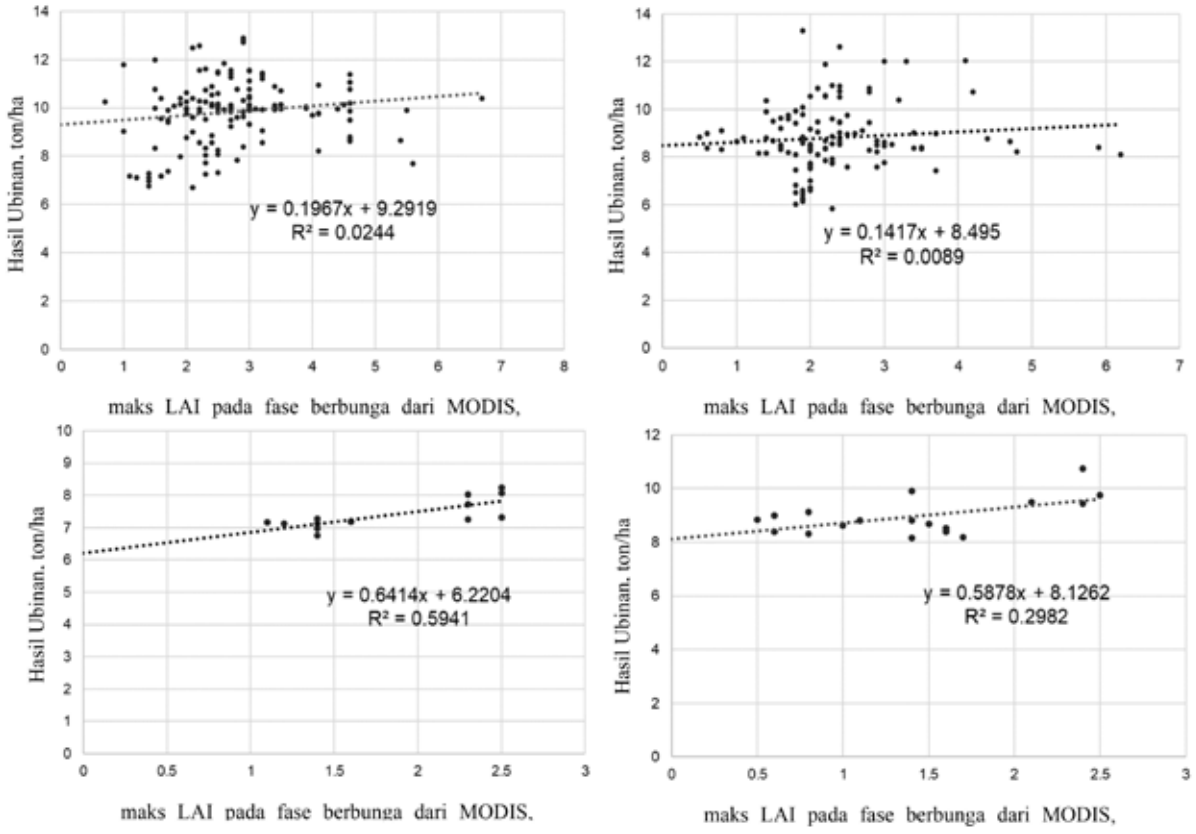


Figure 6.2.12 Comparison between max LAI during flowering stage from MODIS and CCE Yield of All Samples, by Paddy Variety, and by Desa

(Upper Left: Ciherang – all samples, Upper Right: Inpari32 HBD – all samples, Bottom Left: Ciherang – Kutawargi, Rawamerta Kecamatan, Bottom Right: Inpari32 HBD – Randumulya, Pedes Kecamatan)
Source: JICA Consultant Team

2.4) Case RS4: Sentinel-2 Multispectral Image | LAI at flowering stage

Figure 6.2.13 shows the result of comparison between the LAI of 105 paddy plots, where clouds do not cover at flowering stage, which is derived from Sentinel-2 optical image conversion and the CCE yield. The left figure depicts the comparison of Inpari 32 HBD variety. As is observed, there is no correlation between the LAI and the yield. The analysis of Ciherang variety also resulted in low correlation. As for Desa-wise comparison, Desa Jayamulya gives higher coefficient of determination than the others. However, the R2 is only 0.22.

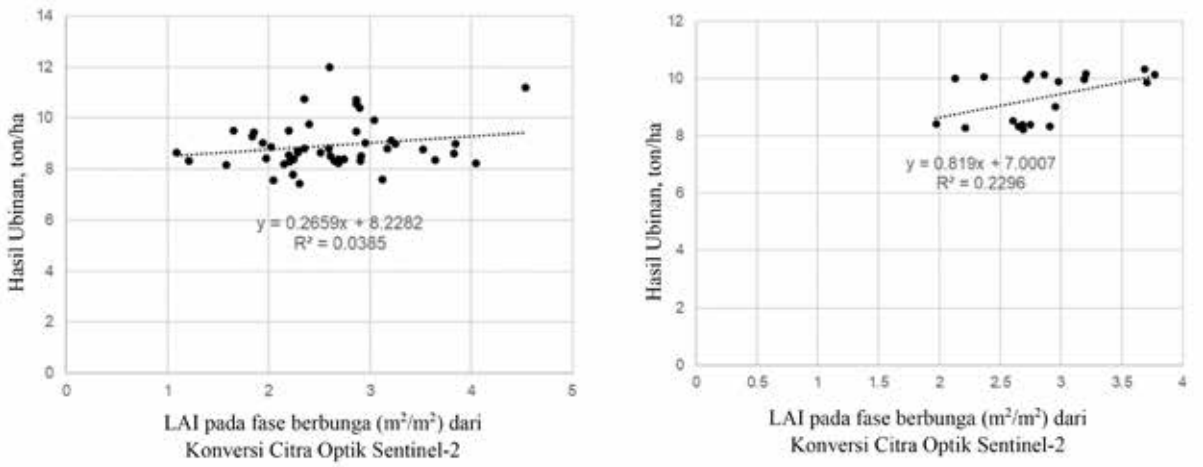


Figure 6.2.13 Comparison between LAI at flowering stage from Sentinel-2 and CCE Yield

(Left: Inpari 32 HBD – all samples, Right: all variety – Jayamulya, Cibuaya Kecamatan)

Source: JICA Consultant Team

6.2.4 Findings from the 1st Trial: December 2020

1) The c-band SAR of Sentinel-1 is able to detect paddy cultivation area and start of season (SOS), which is necessary before estimating yield of the area considering diverse cropping patterns in Indonesia. As Sentinel-1 product is available on the web for free and covers whole Indonesia, the methodology is expected to be applied to other areas beyond the trial areas of the Project[18].
2) The LAI at panicle initiation to booting stage and flowering stage which areconverted from the backscattering coefficient of c-band SAR did not show any correlations with the yield obtained by CCEs.Considering the yield estimation by RS technology in Indonesia where cloud very often covers lands, most ofthe optical satellite images are difficult to apply.Therefore, more case studies of researches towards yield estimation by SAR products should be required.
3) Though simple regression models with slightly higher coefficient of determination were obtained in a few Desascomparing CCE yields with the LAI at the flowering stage obtained from MODIS, the R2 values are still low, namely,at most 0.59 for Ciherang variety and only 0.29 for Inpari32 HBD variety. The analysis of Sentinel-2 multispectral images also resulted in low coefficient, i.e. at most 0.22 of R2 value by Desa-wise comparison. Therefore, at this stage, it implies that there is a difficulty of utilizing the RS technology in estimating the paddy yield at an accurate and practically usable level. For obtaining higher R2, it seems necessary that regression models should be made by paddy variety and by small area, e.g. by Desa. Therefore, in case that RS-based yield estimation is carried out in future, information about paddy variety ofthe target areas need to be collected from the farmers.
4) As is mentioned above, there is a possibility that the LAI, which is one of indicators showing paddy growth, at flowering stage has high correlation with yield. For obtaining LAI from satellites in Indonesia where clouds always cover the lands, the use of SAR can be considered effective. However, the methodology for converting SAR data to the LAI has not been developed yet. In case that the conversion method is established based on a series of analysis of correlation between actual LAI value obtained on fields and backscattering coefficient of SAR, it is expected that SAR is utilized for paddy yield estimation.
5) To obtain precise estimation of yield by RS technology, it may berecommended to combine with paddy growth simulation model. As is being implemented by the RIICE project in other Asian

18 Note that, however, the paddy area detection by the same method might not be applicable in such steep areas as terraced paddy fields around mountains since the radar, which is transmitted from diagonally above the earth surface, does not reach backside of mountains/ hills.

countries, the simulation model 'ORYZA' of IRRI, which is designed for tropical paddy cultivation, is one ofthe candidates. The model itself is free to use through the web site of IRRI. However, the model requiresthe establishment of crop database on the target varieties in Indonesia in advance. As several factors related to paddy growth including weather condition, soil condition, fertilizer application, and irrigation water availability are considered in such simulation models, more accurate yield estimation could be expected.

6) It was found that water content of paddy grain was not measured in the CCEs during the first trial. It is planned as of April 2021that water content and weight of paddy grain before/ after drying are measured in the second trial. The CCEs for second trial is carried out from the end of May to middle of July 2021.

6.2.5 Methodology of 2ndTrial: April - July 2021

1) Yield Survey: CCE

The 2nd CCE was carried out from April to July, 2021 in 15 Desa of Karawang Kabupaten, where the Team implemented 1st CCEs in December, 2020 (refer to Table 6.2.5). Although the paddy fields of which yield the Team surveyed in 1st CCE were also targeted in the 2nd CCE, 4 farmers (4 paddy fields) rejected the surveyof 2nd CCE. The Team eliminate the 4 paddy fields and looked for the replacements.

The Team conducted the CCEs basically in 20 fields in one Desa. However, since the locations of 1st CCEs in Cilewo Desa, Telagasari Kabupaten concentrated in west part of the Desa, additional 10 samples were taken from other parts of the Desa (in total 30 samples in Cilewo Desa). As a result, total sample sizecomes to 310 in the 2nd trial.

Table 6.2.5 Transplanting/Sowing and Harvesting Periods of Target Cropping Season in Target Desa (2nd Trial)

No	Kecamatan	Desa	Transplanting/Sowing	Harvesting
1	Kutawaluya	Sindangsari	14 Feb – 14 Mar	17 May – 16 June
2	Kutawaluya	Sindangmukti	27 Jan – 27 Mar	21 April – 10 June
3	Kutawaluya	Kutamukti	5 Feb – 25 Feb	23 May – 28 June
4	Rawamerta	Sukapura	6 Feb – 23 Feb	4 May – 23 May
5	Rawamerta	Gombongsari	16 Jan – 13 Mar	27 April- 25 May
6	Rawamerta	Kutawargi	1 Jan – 28 Feb	1 May – 19 May
7	Telagasari	Pasirkamuning	6 Feb – 11 Mar	6 May – 10 June
8	Telagasari	Kalibuaya	6 Feb – 13 Feb	7 May – 27 May
9	Telagasari	Cilewo	25 Jan – 14 Feb	5 May – 3 June
10	Pedes	Rangdumulya	5 Mar – 22 Mar	10 June – 25 June
11	Pedes	Sungaibuntu	30 Mar – 27 Apr	29 June – 28 July
12	Pedes	Payungsari	14 Feb – 24 Apr	26 May – 18 July
13	Cibuaya	Jayamulya	5 Apr – 29 Apr	8 July – 25 July
14	Cibuaya	Kertarahayu	7 Mar – 7 Apr	4 June – 5 July
15	Cibuaya	Gebangjaya	29 Mar – 30 Apr	1 July – 27 July

Source: JICA Consultant Team

The survey form which was used in the 1st CCE was revised for the 2nd CCE implementation, on which the water content of paddy grain is recorded. As the water content of paddy grain was not measured

and was not considered in the 1st trial, the Team procured moisture content meters before 2nd CCE. Surveyors measuredthe moisture content of grain by the meters. 14 % water content based grain weight, which is usually applied in world-wide CCE method,can be obtained by using the record.

2) RS Analysis

The methodology of 1stanalysis is also applied in the 2nd analysis (refer to Section 6.2.2).

6.2.6 Results of 2ndTrial: April - July 2021

1) Result of Yield Survey: CCE

Table 6.2.6 shows the result of 2nd CCE which were carried out in April to July, 2021. There is the difference of average yield among target Kecamatan, resulting in range from 6.6 ton/ha to 8.2 ton/ha. Both of maximum yield and minimum yield are observed in Telagasari Kecamatan, namely 12.1 ton/ha in Pasirkamuning Desa and 4.1 ton/ha in Kalibuaya Desa. Lower sample standard deviation is observed in Pedes Kecamatan and Cibuaya Kecamatan. On the other hand, the deviation of Telagasari Kecamatan is higher than others. The sample standard deviation of all samples accounts for 1.3 ton/ha.

Table 6.2.6 Result of Yield Survey by CCE by Kecamatan and Desa, ton/ha (2nd Trial)

Kecamatan, Desa	Maks	Min	Average	Sample Standard Deviation
Cibuaya	9.0	4.2	6.6	0.9
Gebangjaya	7.4	4.2	5.9	0.8
Jayamulya	9.0	6.3	7.4	0.6
Kertarahayu	8.1	5.1	6.6	0.8
Pedes	10.0	6.5	8.0	0.8
Payungsari	9.3	6.5	7.5	0.7
Randumulya	8.9	7.4	8.3	0.4
Sungaibuntu	10.0	6.7	8.3	0.8
Kutawaluya	10.7	4.7	7.2	1.1
Kutamukti	8.8	4.7	6.5	1.1
Sindangmukti	7.9	6.6	7.1	0.4
Sindangsari	10.7	6.7	8.1	1.1
Telagasari	12.1	4.1	8.2	1.6
Cilewo	11.7	5.5	8.3	1.5
Kalibuaya	11.0	4.1	8.0	1.9
Pasirkamuning	12.1	5.6	8.2	1.5
Rawamerta	9.3	5.5	7.5	1.0
Gombongsari	8.2	6.3	7.4	0.6
Kutawargi	8.5	5.5	6.8	0.8
Sukapura	9.3	6.4	8.3	0.9
Whole Sample	12.1	4.1	7.5	1.3

Source: JICA Consultant Team

Table 6.2.7 shows the comparison of average yield between 1st trial and 2nd trial. Note that the water content of grain is not considered in the 1st trial (see Section 6.2.4). Comparing the cases in which water content is not considered, the average yield of 2nd CCE of each Kecamatan and all samples is lower or almost equal to that of 1st CCE.

Table 6.2.7 Comparison of Average Yield of 1st CCE and 2nd CCE by Kecamatan and Desa, ton/ha

Kecamatan, Desa	1st CCE	2nd CCE	
	Yield (not considering w.c.)	Yield (not considering w.c.)	Yield (14%w.c.)
	Harvest: Nov-Dec, 2020 (MT2)	Harvest: Apr-Jul, 2021 (MT1)	
Cibuaya	9.7	7.8	6.6
Gebangjaya	9.6	6.9	5.9
Jayamulya	9.3	8.7	7.4
Kertarahayu	10.3	7.7	6.6
Pedes	9.2	9.2	8.0
Payungsari	8.5	9.0	7.5
Randumulya	9.0	9.0	8.3
Sungaibuntu	10.2	9.5	8.3
Kutawaluya	9.0	8.4	7.2
Kutamukti	7.3	7.8	6.5
Sindangmukti	10.6	8.3	7.1
Sindangsari	9.2	9.3	8.1
Telagasari	9.6	9.6	8.2
Cilewo	10.2	9.7	8.3
Kalibuaya	9.1	9.3	8.0
Pasirkamuning	9.4	9.8	8.2
Rawamerta	9.5	8.9	7.5
Gombongsari	10.1	8.6	7.4
Kutawargi	7.6	8.0	6.8
Sukapura	10.9	9.9	9.2
Whole Sample	9.4	8.8	7.5

Note: w.c. = water content

Source: JICA Consultant Team

The left figure of Figure 6.2.14 depicts the sample number of paddy varieties in the 2nd CCE. Of all 310 samples, 194 samples (62%) and 108 samples (35%) are Ciherang variety and Inpari32 HBD variety respectively. Major farmers in Rawamerta and Telagasari Kecamatan cultivate Ciharang variety. On the other hand, most farmers in Pedes Kecamatan prefer Inpari32 HBD variety. In Cibuaya and Kutawaluya Kecamatan, the variety of samples are split fifty-fifty.As is shown in the box plot of Figure 6.2.14, the median of sample yield of Ciherang variety and Inpari32 HBD variety accounts for 7.4 ton/ha and 7.6 ton/ha respectively, resulting in insignificant difference. However, comparing the range between lower quantile and higher quantile,the yield of Ciherang is bit lower than that of Inpari32 HBD.

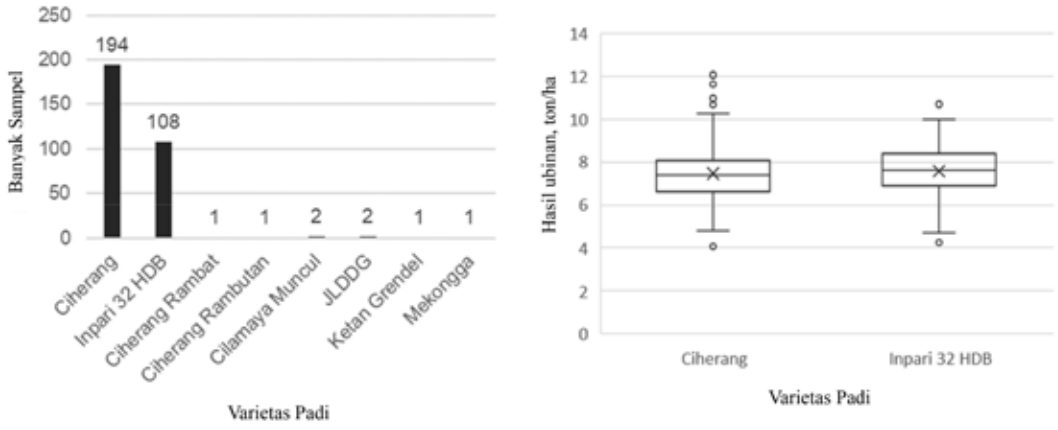


Figure 6.2.14 Number of Samples and Result of CCE by Paddy Variety (14% w.c.)

Source: JICA Consultant Team

2) Result of RS Analysis

The results of analysis cases which are shown in Table 6.2.3 are as follows:

2.1) Case RS1: Sentinel-1 C-band SAR | LAI at panicle initiation to booting stage

Figure 6.2.15 depicts the correlation between LAI at the early reproductive phase (m2/ m2) which is derived from σ0 of Sentinel-1 and the yield obtained by CCE (ton/ ha). The correlation is not observed between the yield and LAI of 310 samples (see upper left figure). Examining Desa level correlation, the maximum coefficient determination (R2) is obtained in Gebangjaya Desa, Cibuaya Kecamatan, accounting for R2 = 0.085 only (see upper right figure). The comparison by major 2 varieties, i.e. Ciherang and Inpari32 HBD, results in no correlation between yield and LAI (see lower figures).

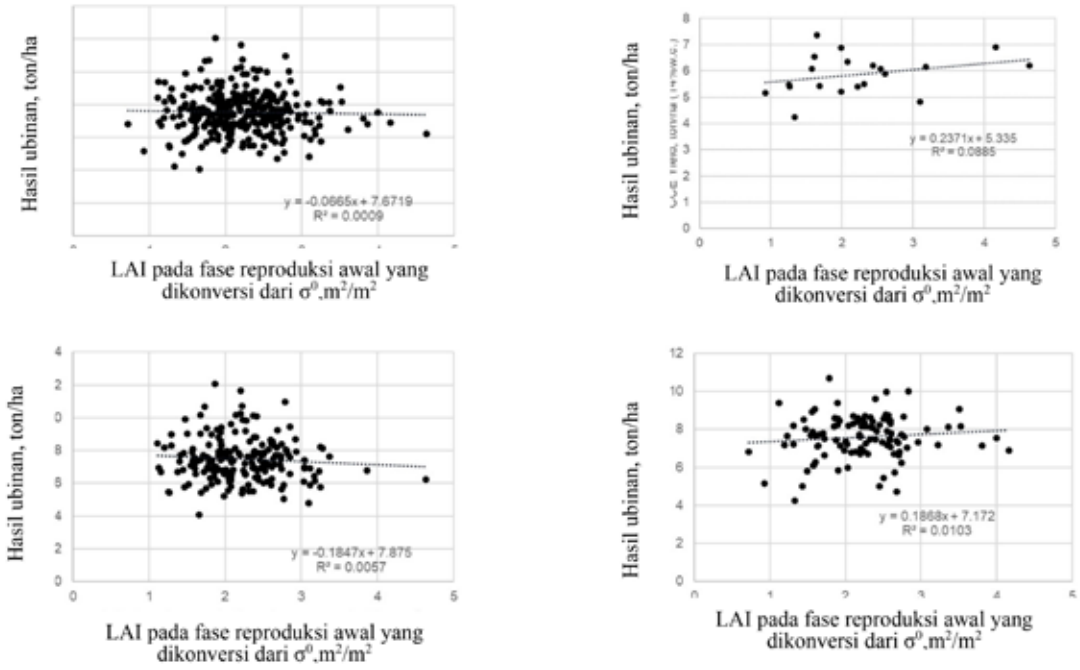


Figure 6.2.15 Comparison between LAI at early reproductive phase from Sentinel-1 and CCE Yield

(Upper Left: All samples, Upper Right: Gebangjaya Desa, Cibuaya Kecamatan, Lower Left: Ciherang – all samples, Lower Right: Inpari32 HBD - all samples)

Source: JICA Consultant Team

2.2) Case RS2: Sentinel-1 C-band SAR | LAI at flowering stage

Following the conversion flow in Figure 6.2.6, the Team implemented a trial conversion of σ0 at flowering stage to LAI (m2/ m2), which is compared with yield (ton/ha). The R2 of Cilewo Desa, Gebangjaya Desa arrives highest value among analysis cases, but counts only for 0.09. The Desa level examination results in low correlation. When considering all 310 samples, the R2 shows only 0.0018.

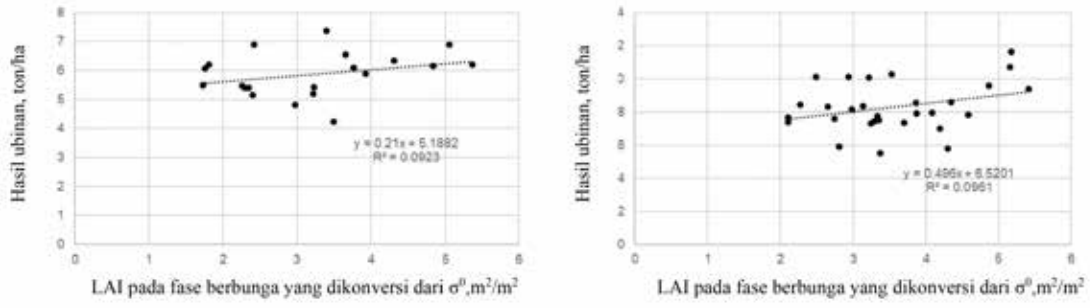


Figure 6.2.16 Comparison between LAI at flowering stage from Sentinel-1 and CCE Yield by Desa

(Left: Gebangjaya Desa, Cibuaya Kecamatan,Right: Cilewo Desa, Telagasari Kecamatan)

Source: JICA Consultant Team

2.3) Case RS3: MODIS Collection 6 (LAI/fPAR) | LAI at flowering stage

Comparing the LAI at flowering stage (m2/m2) which is obtained from MODIS Collection 6 with yield (ton/ha), the correlation of Ciherang variety case and Inpari32 HBD case comes to low R2 value (see upper figures of Figure 6.2.17). As is depicted in lower figures,the Desa-wise correlation is still low, e.g. R2 = 0.18 (Ciherang variety in Gebangjaya Desa, Cibuaya Kecamatan) and R2 = 0.18 (Inpari32 HDB variety in Randumulya Desa, Pedes Kecamatan)

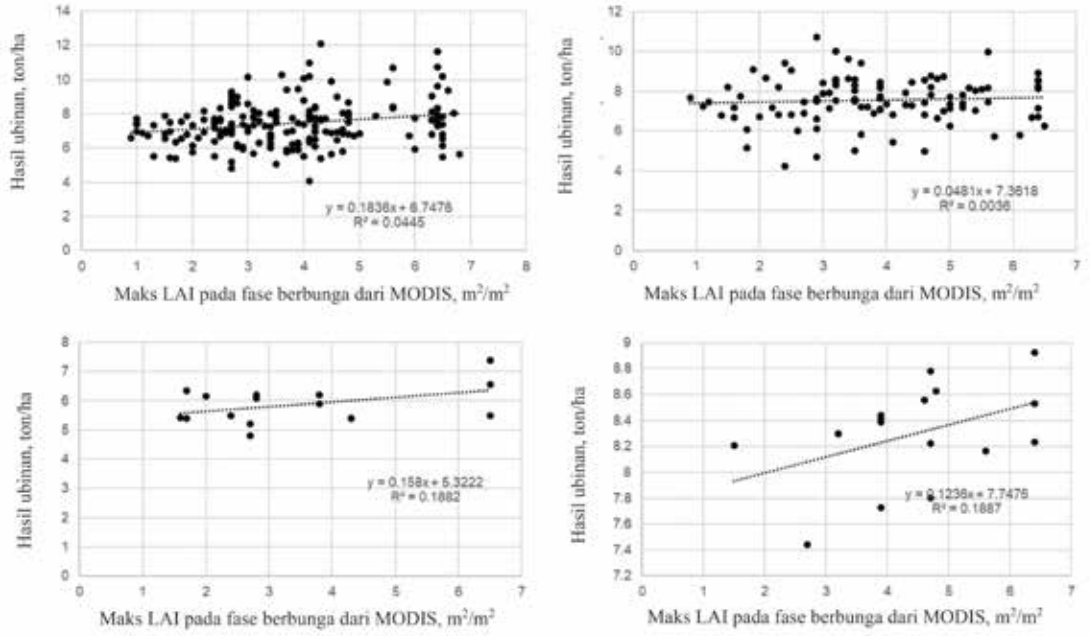


Figure 6.2.17 Comparison between LAI at flowering stage from MODIS Collection 6 and CCE Yield

(Upper Left: Ciherang variety - all samples, Upper Right: Inpari32 HBD variety – all samples, Lower Left: Ciherang variety – Gebangjaya Desa, Cibuaya Kecamatan, Lower Right: Inpari32 HBD variety - Randumulya Desa, Pedes Kecamatan)

Source: JICA Consultant Team

2.4) Case RS4: Sentinel-2 Multispectral Image | LAI at flowering stage

The Team explored series of Sentinel-2 multispectral images available in the target cropping season, i.e. from January to July 2021. As a result, only 3 scenes which were captured on April 29th, June 13th, and July 3rd contain less cloud cover over target Desa. Of them, the number of target paddy of which growth stage reaches flowering period is 40 fields on April 29th, 4 fields on June 13th, and 32 fields on July 3rd. Since the number of sample on June 13thaccounts for 4only, discussed herewith is the correlation of yield and LAI of April 29th/ July 3rd.

Figure 6.2.18 shows the comparison between LAI at flowering stage (m2/m2) and yield (ton/ha). Although upper figures and lower figures depict the result on imagery of April 19th and July 3rd respectively, high correlation is not observed even if Desa and variety are considered.

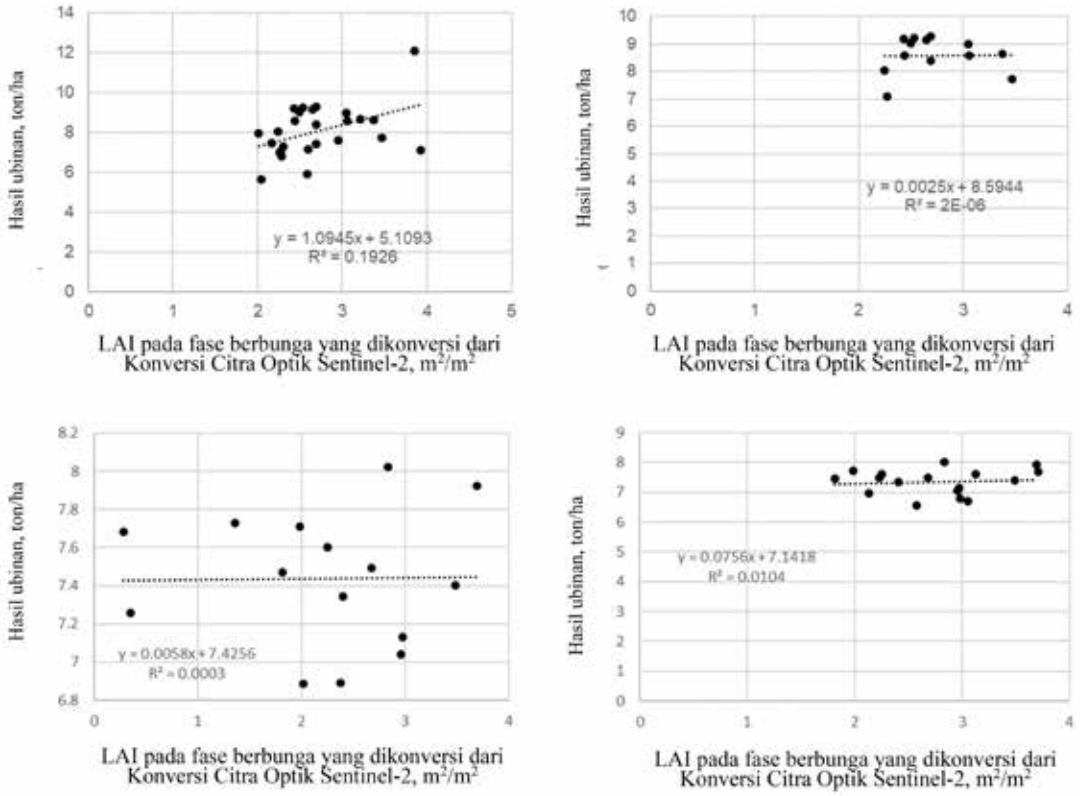


Figure 6.2.18 Comparison between LAI at flowering stage from Sentinel-2 and CCE Yield

(Upper Left: Ciherang variety - all samples (April 29), Upper Right:Ciherang variety – Sukapura Desa, Rawamerta Kecamatan (April 29), Lower Left: Inpari32 HBD variety –all samples (July 3), Lower Right: Inpari32 HBD variety -Jayamulya Desa, Cibuaya Kecamatan (July 3))

Source: JICA Consultant Team

6.3 Discussions on the Trials

6.3.1 Comparison between the Trials and Remote Sensing Use Cases

As is discussed in Section 6.1, though the RS technology is partly deployed in insurance system in such countries as India and Kenya, the yield estimation of target crop by RS techniques is not realized. It is noted that uses of RS technology arrive still at the stage of supplementing the implementation of AYIIand also is considered as research/study or trial stages. In this section, the trial implemented in the

project is compared with other RS technology use cases and studies in agriculture insurance system and yield estimation.

Practical Use	PULA https://www.pula-advisors.com/		
Country	Kenya, Ethiopia, Rwanda, etc	Crop	Maize
RS Technology Use: PULA estimates low growth area by monitoring growth of target crop by RS and machine learning. Referring to the low growth area, PULA conducts CCEs. Also, PULA divides target areas into similar growth environment area by utilizing RS-based weather data of past 30 years and machine learning. PULA focuses not on administrative boundary but on similar environmental area, so that the cost of CCE can be reduced. The method is considered in year of 2018. It is unclear whether the method is practically applied in the insurance system or not.			
Comparison with the project: PULA does not directly estimate the target crop yield by RS technology but use the technology supplementarily for operating AYII. The purpose of RS technology use of PULA is to reduce the cost of CCE, which is different from that of the trials of the project trying to estimate the crop yield.			

Practical Use	PULA https://www.pula-advisors.com/		
Country	India	Crop	Cereals, Millet, and Pulses
RS Technology Use: In case of dispute on yield survey result, PMFBY utilizes precipitation data and NDVI which derives from RS technology for inspecting the survey result. PMFBY also improves CCE cost efficiency by developing "smart sampling" method, in which PMFBY optimizes the number of CCE by overlaying cropping area map and yield proxy index map. PMFBY mentions that the smart sampling method reduce 30% to 75% of CCE cost. Though the guideline of PMFBY shows that the use of RS for improving accuracy of yield survey is must in future, only implementation of pilot is mentioned in the guideline.			
Comparison with the project: Like PULA, PMFBY utilizes RS technology supplementarily in the insurance system and does not apply the technology to estimation of crop yield itself.			

Study Case	Hirooka et al., 2017, Evaluation of the dynamics of the leaf area index (LAI) of rice in farmer's fields in Vientiane Province, Lao PDR https://www.jstage.jst.go.jp/article/agrmet/73/1/73_D-14-00021/_article/-char/en		
Country	Lao PDR	Crop	Rice
RS Technology Use: In the research, RS technologies are not applied to yield estimation. The research focuses on correlation among paddy growth parameters which are measured on ground. The researcher measured LAI, total dry weight (TDW), yield, etc. It is reported that LAI at flowering stage has correlation with TDW at maturing stage (R2 = 0.48) and the TDW is correlated to yield (R2 = 0.52).			
Comparison with the project: In accordance with the report, though the Team tried to estimate the paddy yield from LAI which can be obtained from satellite, no trial cases show better correlation between LAI and yield. Since the research does not describe the comparison between in-situ LAI and yield, it is considered that use of LAI derived from satellite based RS cannot just applied to yield estimation.			

Trial Case	Project for Profitable Irrigated Agriculture in Western Bago Region (Satellite Data Analysis)		
Country	Myanmar	Crop	Rice

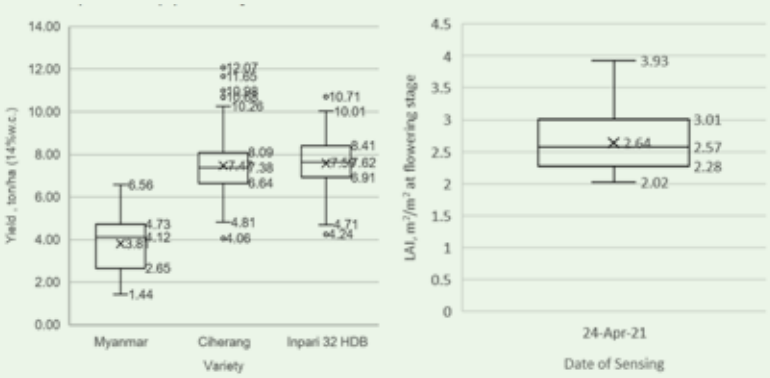
RS Technology Use:

The correlation between yield obtained by CCE and LAI/ NDVI at flowering stage derived from Sentinel-2 data (multispectral image, 10-m spatial resolution) is examined. There are 4 images available in/ among flowering stage in the target cropping season. Of them, LAI of an image which is captured from heading to flowering period gives high correlation with the yield (R2 = 0.76). When taking an average between the LAI and 10-day before LAI, R2 is improved to 0.87.

Comparison with the project:

In the RS4 case of the trial (refer to Table 6.2.3) , LAI obtained from cloud-less Sentinel-2 imagery is compared to yield. However, R2accounts formaximum 0.2 only in 2 times trial.

Local varieties targeted in the Myanmar project produce lower yield than Ciherang variety and Inpari32 HBD variety which are popular in Karawang Kabupaten and derived from an IR variety (see left figure below). Regarding LAI, the Myanmar case shows a range from 1.6 to 2.4 m2/m2. On the other hand, the most samples of the project account for a range from 2.2 to 3.0 m2/m2. It is observed that the LAI of samples in Indonesia is slightly higher than that of Myanmar case (see right figure below). It is considered that yield estimation by LAI may be applied to low yield local varieties, but not applicable for higher yield varieties such as IR derived varieties which produce stable yield andbroad leaf area at flowering stage.



Study Case	RIICE Project http://www.riice.org/		
Country	Cambodia, Philippines, Thai, etc	Crop	Rice

RS Technology Use:

RIICE tries to estimate yield by combining rice crop growth model (ORYZA) with RS techniques. The LAI and start of cropping season are detected by optical satellite image and SAR data, which are input to ORYZA. One of the studies showed that the accuracy of yield estimation was around 0.30 to 0.46 ton/ha of root mean square error in the Red River Delta, Vietnam.

Comparison with the project:

The core of yield estimation trial of RIICE is the ORYZA. In the ORYZA, such parameters related to paddy growth as LAI, weather, soil, N-stress, water stress, and temperature stress need to be saved in the crop database, which are accumulated by series of field experiment. In the system, weather and LAI monitored by RS revises growth of target paddy in the ORYZA model. Thus, RIICE project does not estimate yield only by RS data, but simulates crop growth based on crop database for which RS-based data corrects actual growth of target paddy. It takes approximately 2 years to develop the crop database of target paddy variety.

Study Case	Yoshida et.al, 2012, A Sparse Regularization Approach to Hyperspectral Image Analysis : An Application for Rice Growth Monitoring and Yield Prediction in Indonesia https://ci.nii.ac.jp/naid/10031129834		
Country	Indonesia	Crop	Rice

RS Technology Use:

Paddy growth monitoring and yield estimation are carried out by use of airplane-based hyperspectral data (spatial resolution: 4.2 m) and sparse regularization approach (a machine learning approach).

The accuracy of yield estimation model is RMSECV = 0.602 ton/ha. The average R2 of 1000 times trial of the model is 0.693 against training data and 0.580 against test data.

The researchers compare produce (ton) derived from the estimation model with statistical data of 8 Kecamatan, Karawang Kabupaten (ton) for inspecting validity of the model. As a result, the error of all 8 Kecamatan cases is 6.4 % (12,130 ton), and maxima and minima are 17.5 % (4,950 ton) and 1.55 % (510 ton) respectively. In the research, yield survey is carried out in some sample paddy fields. The researchers conclude that variation of yield (ton/ha) in each Kecamatanis a factor of error of produce estimation.

Comparison with the project:

Airplane-mounted hyperspectral sensor is deployedin the study, which is not mounted on satellite vehicle to date. The hyperspectral data has an advantage of higher wavelength resolution than that of multispectral imaging sensor which is generally mounted on satellites. The width of wavelength of the study is only11 – 18 nm. On the other hand, the resolution of multispectral image accounts for ±50nm from central wavelength. The high resolution of wavelength enables the researchers to select proper wavelength for developing high accuracy model.

The estimation of yield (ton/ha) by the model is not carried out in the research. The researchers compare estimated produce (ton) with statistical production data (ton). Though it is reported that the accuracy of yield estimation model is RSMECV = 0.6 ton/ha, it is necessary to consider whether the error can be acceptable in AYII or not. Note that the error, i.e. 0.6 ton/ha, is not obtained when estimation result is compared to in-situ yield. The research evaluates the accuracy by statistical method.

Study Case	Hongo et.al., 2011, The study on rice yield prediction through the scale-up approach using satellite data https://kaken.nii.ac.jp/ja/grant/KAKENHI-PROJECT-21380160/		
Country	Indonesia	Crop	Rice

RS Technology Use:

A paddy yield prediction model of which target area covers Cianjure Kabupaten, West Java is developed. Correlation between accumulated LAI derived from MODIS (spatial resolution: 250m) and yearly production (ton) is reported ($r = 0.664, p < 0.01$). Also, the researchers develop a regression model for yield estimation using near infrared band and NDVI of SPOT 5 satellite (spatial resolution: 10 m) and yield, resulting in error of 0.7 ton/ha.

Comparison with the project:

It is expected that the regression model of the study is applied to AYII. SPOT 5 is a commercial satellite equipped with a multispectral imaging sensor which captures land surface based on customer's requests.

Though the team explored series of Sentinel-2 images captured in the trial period, there is only 1 or 2 cloud less images available in one cropping season. Paddy yield might be predicted by quality multispectral imagery which is taken under better weather condition by such commercial based satellites.

Note that no report about the research is published, so that details, e.g. which index of which period of image need to be applied, are unclear.

6.3.2 Conclusion: Yield Estimation Trial by Remote Sensing Technology

1) In the two times trial in the project, the Team tried to develop a linear regression model based on relationship between LAI (m2/m2) derived from some types of satellite data and yield (ton/ha) obtained by field survey (CCE). As a result, no correlation between LAI and yield was observed. It is concluded that the linear regression model cannot estimate yield accurately and cannot be applied to practical use.
2) Conceivable causes of low correlation model between LAI and yield are as follows;
   i. In Karawang Kabupaten, crop growth parameters other than LAI, e.g. temperature, precipitation, solar radiation, soil nutrient, agriculture input, water management, etc., affect the yield, which need to be measured and/or estimated by RS and should be considered in the analysis.
   ii. The major two paddy varieties in Karawang Kabupaten, i.e. Ciherang and Inpari32 HBD, are derived from an IR variety which has been developed and improved by IRRI. Such IR varieties express relatively stable yield under various growth environment. The growth of LAI is also hardly affected by environment, so that the value of LAI does not reflect the yield.
   iii. In paddy cropping areas in Java island including Karawang Kabupaten, seasonal change of temperature is small, and constant rainfall is observed. In addition, the target area is irrigated, so that paddy growth environment is stable, and better yield is produced in general. The difference of paddy yield in an area (Desa) is also minor.
3) Since lots of cloud cover always appear on optical satellite images over Indonesia, there is a possibility that SAR technology is deployed to conversion of σ0to LAI.However, the methodology of conversion is still being developed by researchers and publication of the research papers are limited. In case that the relationship between σ0 and LAI is revealed by researches and the conversion method is developed in future, the SAR data may be deployed in satellite-based paddy yield estimation.
4) In case that no or few cloud covers target area, optical satellite images can be utilized in analysis. However, there were only 1 image in 1st trial and 2 images in 2nd trial available in the project. The usability of optical satellite image is still low in Indonesia. It might be considered that clear images captured by commercial satellite on required time and date under better weather conditionare applied to the analysis.
5) It is necessary for accurate estimation of yield by RS to apply the multiple regression analysis and/ordevelop crop database which is used in crop growth model. For conducting the multiple regression analysis, the field survey not only on yield but also on such crop growth factors as variety, temperature, precipitation, solar radiance, soil nutrients, agri-input amount, and water management, must be carried out. In the analysis, best explanatory variables are identified from the factors. Regarding the development of crop database, series of cultivation experiment on target variety under several crop stressed environment must be conducted. These surveys and experiments should be implemented by research institutions.

CHAPTER 1 RECOMMENDATIONS ON THE DESIGN OF AGRICULTURE INSURANCE

This chapter presents policy recommendations towards further implementation and extension of agriculture insurance in Indonesia. The discussions dose not limit only on the AUTP-indemnity type insurance but also index type insurance (AYII) with the latter more emphasis. The recommendations are all based on the experiences obtained through the pilot project implementation.

1.1 Summary of the Recommendations on Design

Table 1.1.1 shows the summary of the recommendations for AYII while Table 1.1.2 presents the recommendation for AUTP. Further, Figure 1.1.1 indicates the timeline of each recommendation when to implement, either as soon as possible or sometime after. As shown in the tables, there are 8 recommendations for AYII, of which the last 2 recommendations may be considered and implemented in future, e.g., from 3 years later, while there is only one recommendation for AUTP.

Table 1.1.1 Summary of Recommendations for AYII

Step	Recommendations	Contents
1	Strengtheningof CCEs	1) Involve BPS in the areas of; i) random selection of CCE points based on Area Sampling Method (3 stages of random selection), and ii) training of PPLs for the CCE methods, 2) Recruitment of CCE implementors, e.g. from local people, 3) Exploration of utilizing remote sensing technology, including SIScrop (2.0)
2	Setting of premium ratio by Kecamatan	As cultivation condition differs from area to area, the premium ratio should be set by Kecamatan (the current arrangement is all same within Kabupaten). Note that benchmark yields are set by Desa.
3	Increase of risks covered	In addition to the risks covered currently, others such as Strong wind (typhoon/ cyclone) should preferably be covered as AYII is a kind of multi peril crop insurance by nature.
4	Increase of the max. payout, and the premium	Increase the max. payout from the current 6 million Rp to 8-10 million Rp, and accordingly, same increment ratios should be applied to the premium.
5	Update of benchmark yields	Every year, benchmark yields should be updated based on the CCE results, and the latest 5 years average yield should be taken as the base of the benchmark yield, or latest 7 years yields excluding the highest and lowest yields be employed to decide the benchmark yield.
6	Setting up of a Task Force Team	To follow up and data storing for CCE results, whereby update of benchmark yield, there should be a Task Force Team, composed of Directorate of Agricultural Finance and Jasindo.

7	Introduction of an Exit for the max. payout (future)	Introduce an exit level for the maximum payout instead of the current full proportional payout, e.g., at the level of 30% of the benchmark yield, full payout be done (currently, full payment is made at the zero production).
8	Introduction of a hybrid type AYII (future)	In addition to the yield reduction by which the insurance is triggered, early stage damages which need re-plantation should be considered, so-called 'failed planting'. This insurance trigger is very similar to the current situation of AUTP indemnity insurance, and be applied by plot not by area basis.

Source: JICA Consultant Team

Table 1.1.2 Summary of Recommendations for AUTP

Step	Recommendations	Contents
1	Introduction of different levels of premium, preferably, by Kabupaten, or by Province, or otherwise by island	Based on the last 6 years (2015-2020) experiences of AUTP, the average payout ratio by province shows an obvious trend, i.e., higher payout ratios show up in the provinces of Sumatra and Kalimantan islands while lower payout ratios in Jawa, Bali, Nusa Tenggara, and Sulawesi (except Sulawesi Selatan). Therefore, different levels of premium should be introduced taking into account the different actual payout ratios.

Source: JICA Consultant Team

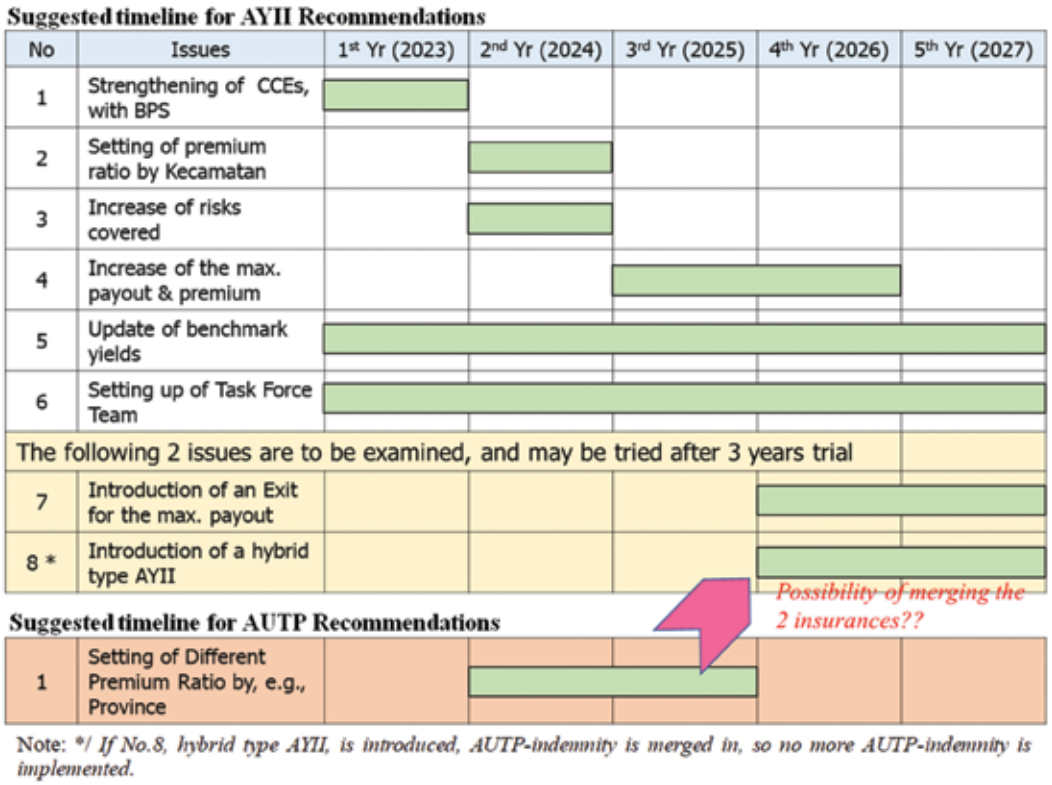


Figure 1.1.1 Proposed Timeline to Implement the Recommendations

Source: JICA Consultant Team

1.2 Reasons for Each of the Recommendations on Design

Following are the detail and content of the recommendations with the background of why JICA consultant team presents those recommendation:

1.2.1 Strengthening of CCEs (AYII)

CCE, crop cutting experiment, should be an essential mean to not only design and implement the Area Yield Index type insurance. Design of the AYII is made based on the past yield data, based on which benchmark yield is decided. Also, this benchmark yield should be updated according to the latest yield data. Futher, CCE is the only mean to judge if the insurance is triggered or not. Note that in future remote sensing technology may be utilized in estimating the yield, yet as of now, there is a difficulty to estimate the yield by the satellite data as exampled in this pilot project (refer to the Part III, Chapter 6).

Under this recommendation,strongly suggested is to involve the BPS in the areas of; 1) random selection of CCE points based on Area Sampling Method, and 2) training of PPLs (extension staff) for the CCE methodology and practice, and 3) assist and monitor the implementation of CCEs in the field. In addition, following should also be undertaken:

1) A simple application form for calculating CCE results, prepared by JICA team, should be distributed to the Agriculture DINAS/PPLs, and explained well to prevent any miss-calculation of converting the CCE results to the actual yields per hectare.
2) Technical manual for CCE implementation should be distributed to the CCE implementing staff (the manual was already produced, as an annex to the MOA general guideline).
3) In order not to miss the CCE implementation at the pre-determined points, it is better to make markers/flags at the CCE sample points from the start of registration.
4) Relevant stakeholders should jointly carry out regular monitoring of CCE both online and offline to minimize adverse selection and moral hazard.
5) The government, especially the regional government, should be able to allocate a special budget for the operational costs of CCE.
6) Consider the utilization of remote sensing technology, e.g., satellite image data, for the yield estimation in the future.

1.2.2 Setting of Premium Ratio by Kecamatan (AYII)

Even within one Kabupaten area, there are specific high-risk areas depending on the location where the area is located as exampled by both Karawang and Kendal Kabupatens. As shown in Table 1.2.1, Pedes Kecamatanin Karawang Kabupatenshows high net premium ratio for the MT1 cropping season and same can be seen in bothMT2 and MT2 seasons of RowosariKecamatan in Kendal Kabupaten. These 2 Kecamatans are located in lowland area within the Kabupaten near seashore, thus very prone to flooding.

Table 1.2.1 Net Premium Ratios for Karawang and Kendal

Karawang Kecamatan	Weighted Net Premium (85%)			Kendal Kecamatan	Weighted Net Premium (85%)		
	MT1	MT2	Average		MT1	MT2	Average
Kutawaluya	0.80%	0.80%	0.80%	Pageruyung	0.81%	0.81%	0.81%
Rawamerta	0.80%	0.80%	0.80%	Patean	0.81%	0.81%	0.81%
Telagasari	0.80%	0.80%	0.80%	Ptebon	0.81%	0.81%	0.81%
Cibuaya	0.80%	0.80%	0.80%	Plantungan	0.85%	0.81%	0.83%
Pedes	1.75%	0.82%	1.28%	Rowosari *	2.75%	4.18%	3.46%
Total pembobotan rata-rata			0.91%	Total Weighted Ave.			1.36%

Note: */ excluded from the pilot project due to its high premium ratio.

Source: JICA Consultant Team

During the pilot project implementation, overall weighted average of the net premium was applied in the design of AYII for the Karawang Kabupaten while Rowosari in the Kendal Kabupaten was excluded from the design of average net premium due to its very high ratio. Considering simplicity of applying same designed insurance within one Kabupaten, no different premium was applied regardless of where the Kecamatan is located within the Kabupaten through the pilot project implementation.

However, this arrangement caused high payout ratio in case of Pedes of Karawang Kabupaten while Rowosari could not join the insurance though the Kecamatan really needed insurance to protect their paddy cultivation.Taking into account the above situation and also to avoid the adverse selection, it should be an option to set up the premium ratio by each Kecamatan, not by Kabupaten, depending on how much the risk is. With this arrangement, high risk area should pay higher premium, while,on the other hand, low risk area could pay lower premium.

1.2.3 Increase of the PerilsCovered (AYII)

The perils covered by the current design of AYII are only such three events as; flood, drought, and pest & diseases, which are the same as AUTP-indemnity insurance. However, as the AYII is of a multi-peril type insurance , other perils should also be included as practiced in other countries. Table 1.2.2 summarizes perils covered in case of India (PMFBY) and Japan (NOSAI). As shown, PMFBY covers, in addition to the basic three events, storm, typhoon, hailstorm, and landslide as well. NOSAI covers weather related disasters, and also fire, animal damages.

Taking into those examples, AYII in Indonesia should cover such perils as strong wind including typhoon and cyclone, as well as bird attack in addition to the current three events. In other words, perils that cannot be covered should be such events not happening under normal risk situation, e.g., war &similar perils, nuclear risks, riots, malicious damage, theft, act of enmity, grazed and/or destroyed by domestic and/or wild animals.

Table 1.2.2 Risks Covered by Crop Insurance

AYII / AUTP	PMFBY (India)	NOSAI (Japan)
Flood (inundation)	Flood (inundation)	Flood (inundation)
Drought	Drought	Drought
Pest & Diseases	Pest & Diseases	Pest & Diseases
	Natural fire and lightning	Fire
	Storm, Typhoon, Hailstorm	Strong Wind, Typhoon
	Landslide	Cold and snowfall
		Other weather-related disasters
		Animal damages

Source: JICA Consultant Team

1.2.4 Increase of the Max. Payout, and the Premium (AYII)

As of the current setting of the payout, it is set to cover the production cost of paddy. Yet, the production cost was decided at the commencement of AUTP-indemnity insurance, already 7 years ago. During interviews to farmers by JICA team, there were a lot of voices from the farmers, that is 'production cost of 6 million Rp is very small and nowadays it can reach at least 8 million Rs to as much as 10-12 million Rs'. If we need to increase the payout ratio, of course, the premium should be increased proportionally.

With above background, JICA team has conducted a farmer questionnaire interview, in which how much payout should be reasonable and how much premium the farmers be ready to pay. Following charts show the payout that the farmers want to obtain after the damage to their paddy, and also how much premium they can be ready to bear. Farmers answerers are:

√ The maximum sum insured (compensation amount) should be considered at between 8,000,000 and 10,000,000 IDR/ha, instead of current 6,000,000 IDR, and,

√ The farmer paid premium of the AYII could possibly be increased to around 50,000 IDR/ha to 70,000 IDR/ha (current premium is 31,800 IDR/ha).

With above farmers' view, there should be an opportunity of increasing the payout amount as well as the premium that the farmers must pay in a proportional way:

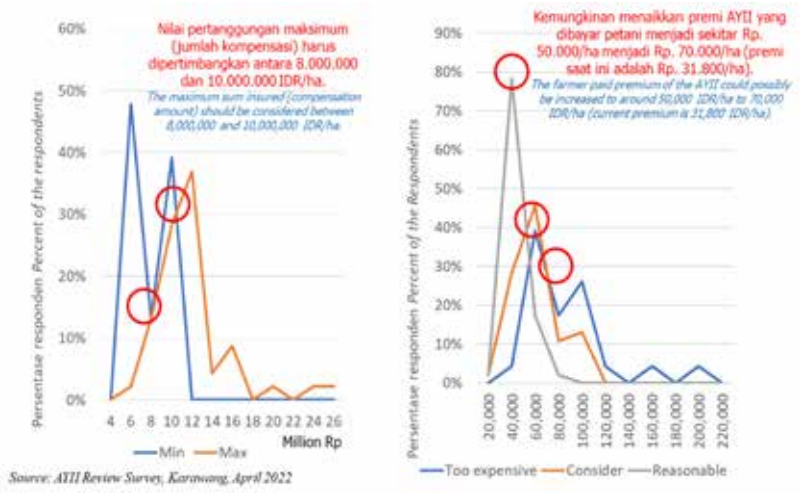


Figure 1.2.1 Paddy Production Cost (Left) and premium that the Farmers are ready to Pay

Source: JICA Consultant Team

1.2.5 Update of the Benchmark Yield (AYII)

According to the 10 years historical yield for the 15 Desa(village) in Karawang (see the chart below left), there is a trend to increase for the yield in some Desa. Therefore, CCE should be conducted every year, and based on the CCE results, the benchmark yields should be updated. Examples of updating the benchmark yield in Japan and India are as follows:

√ Example in Japan: Latest 5 years production data are examined, and take the average after excluding the highest and lowest yields (average of 3 years data).

√ Example in India: Latest 5 years production data are utilized to set the benchmark yield.

Further, the CCE results, as example of MT-2 (2021) of Karawang Kabupaten, show a very different trend as compared to the previous years' yield trend, distributed in a wide range from very low yield to very high yield (see the chart below right). Therefore, benchmark yield should be updated preferably every year by incorporating the latest CCE results, or otherwise, if the lower yields are not reflected in the benchmark yield, insurer would continuously lose, while, on the other hand, if the higher yields are not reflected in the benchmark yield, farmers would not be covered continuously by the insurance.

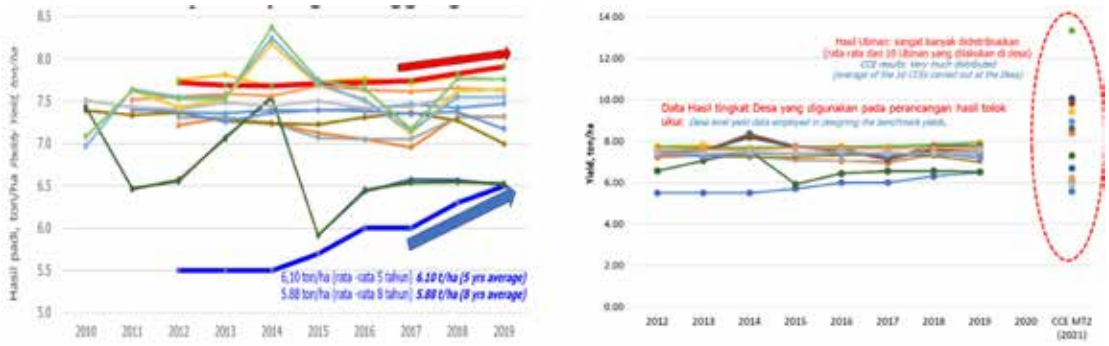


Figure 1.2.2 Paddy Yield Trend employed in the AYII Design (Left) and Together with the 2021 MT1 CCE Results (Circle in the right chart)

Source: JICA Consultant Team

1.2.6 Setting up of a Task Force Team (AYII)

CCE should be conducted every season as afore-mentioned, and accordingly the update of benchmark yields by incorporating the latest CCE results every season. To make this possible, CCE results should be well organized and stored, and then referred to in updating the benchmark yields.

CCE results come from Kabupaten Agriculture Dinas, while update of the benchmark yield should be done by the Insurer (Jasindo).Therefore, there should be a Task Force Team to be in charge of CCE data management, composed of officers in the Directorate of Agricultural Finance of MOA and the Insurer (Jasindo).

1.2.7 Introduction of an Exit for the Max. Payout (AYII in Future)

To get the maximum payoutunder the current design of AYII, the actual yield should be NIL, but this situation over a whole Desa will not happen. For example, the Figure 1.2.3 below shows the 10 years historical yields for the 15 Desa in Karawang Kabupaten, which indicates relatively stable yield trend with about 12% drop only at the maximum from the average yield. Therefore,if we introduce an Exit Level for the maximum payout,more practical insurance arrangement could be made.

The introduction of Exit Level works as shown in Figure 1.2.4, namely, with the exit level of 50%, the full payout is made at the yield of 50% of the benchmark yield, and with the exit level of 30%, the full payout is made at the yield of 30% of the benchmark yield, unlike at the NIL yield in case of full proportional payout mechanism. The payout ratio between the benchmark yield and each of the Exit Levels should be made proportionally.

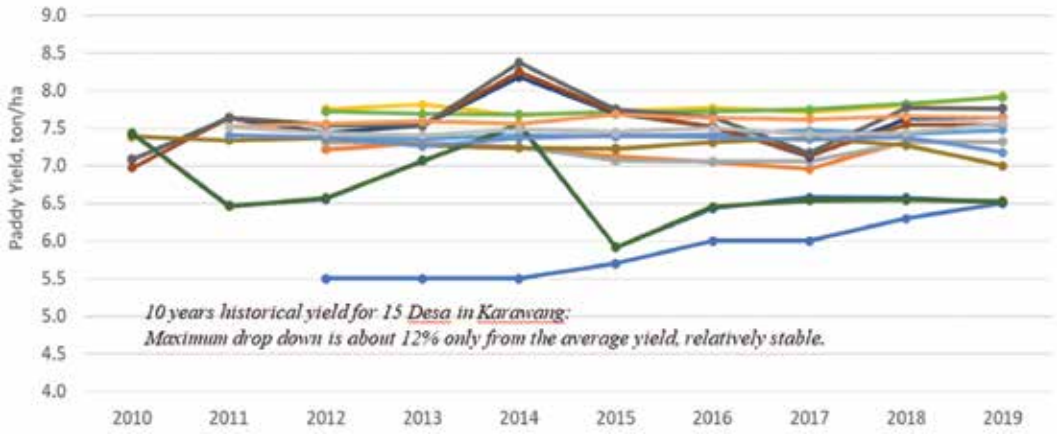


Figure 1.2.3 10-year Paddy Yield Trend Referred to in the AYII Design for Karawang Kabupaten

Source: JICA Consultant Team

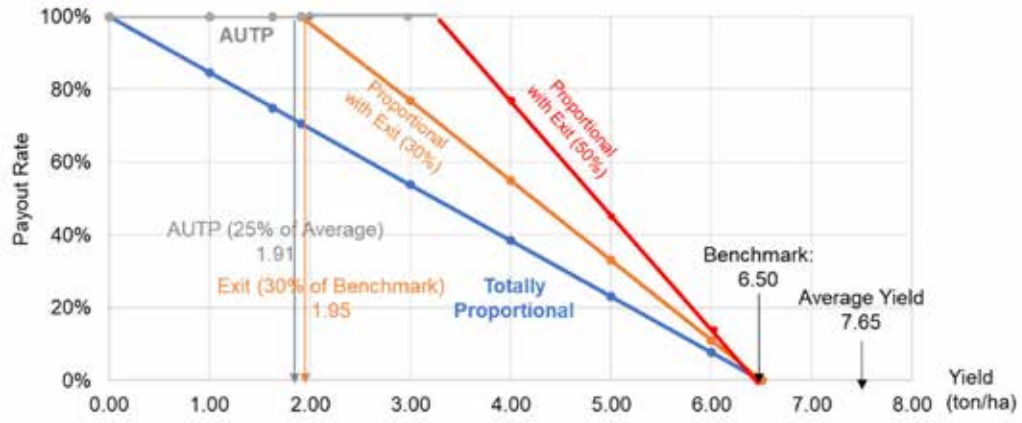


Figure 1.2.4 Schematic Diagram of How the Introduction of Exit Level Works

Source: JICA Consultant Team

Table 1.2.3 summarizes the advantages and disadvantages between the current proportional payout and proportional payout with the introduction of Exit Levels. The disadvantage associated with the introduction of Exit Levels is in fact the increase of the premium ratio. So, introduction of Exit Level leads to an increase of Cat Loading (catastrophic loading), andas a result, the net premium will increase by 0.34 – 0.38 percentage points for 30% Exit Level and by 0.80 – 0.89% for 50% Exit Level as indicated in Figure 1.2.5. Therefore, the introduction of Exit Level incurring the increase of premium ratio should be well discussed and agreed upon among the stakeholders beforehand.

Table 1.2.3 Advantages and Disadvantages between the Two Payout Methods

Item	Proportional	Proportional with Exit
Advantages	Payout calculation is simple enough.	Farmers can receive bigger payouts, thereby farmers can invest enough even after bad season.
Disadvantages	The payout is not enough when the impact of natural disaster is big.	The premium will increase.

Source: JICA Consultant Team

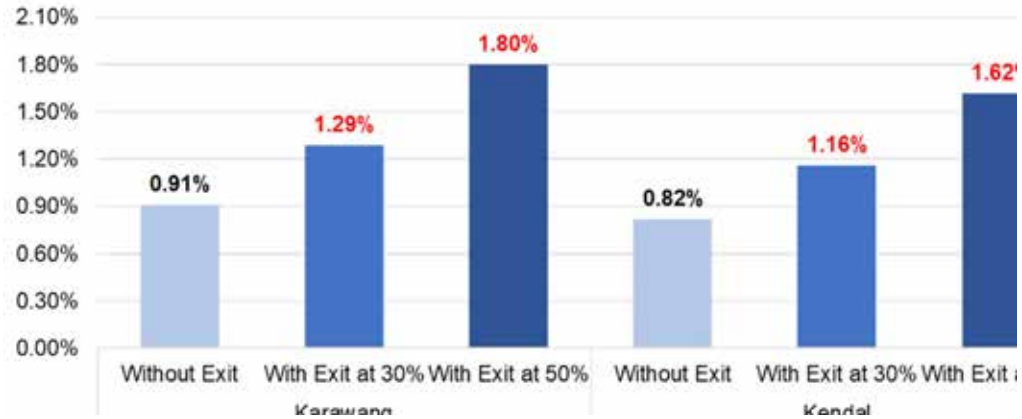


Figure 1.2.5 Increase of the Premium Ratio Associated with the Introduction of Exit Levels

Source: JICA Consultant Team

1.2.8 Introduction of a Hybrid Type AYII (in Future)

According to the experiences of AUTP, PPLs reported that AUTP is very often triggered for the damages, which take place during early stage of cultivation. Following pie charts show there are considerable number of farmers who have had early stage damages and had to do re-planting as:

1) Pie chart left: 36% of the AUTP respondents answered that they used the payout for replanting within the same season,
2) Pie chart center: 43% of the AUTP claims had been made in the early stage of the season, which would have required re-plantation, and
3) Pie chart right: Out of all the 350 claim cases, 55% replied they spent some amount for replanting within the same season.

Figure 1.2.6 Responses for the Utilization of AUTP Payout

Source: Questionnaire survey conducted in East Jawa and South Sulawesi, in November 2022 by JICA Consultant Team

When the early stage damage, called failed planting, happens, the farmers have to replant within the same planting season. When such farmers are insured by AUTP, the payout of AUTP enables this re-planting, or farmers may have to do the replanting with his/her money first and at a later stage, the payout may come as there is a time lug between the claimed time and actual payout time. On the other hand, AYII compensates yield reduction below the benchmark yield. Thus, without a provision of covering early-stage planting failure, AYII does not enable re-planting within the same season.

In sum, it could be said that,probably, AUTP may better apply to covering the risks for the 'early stage of the plantation', while the AYII should cover the risks for the 'latter stage of the cultivation'. With this working mechanism for the 2 insurance schemes in mind, there should be an option of introducing a hybrid type insurance, which can cover both early-stage damage (failed planting) and latter-stage damage (yield reduction); namely,

1) Indemnity (e.g. AUTP-like insurance) applies to the early-stage cultivation, which enables re-planting by plot basis (not area basis), and the loss assessmentcould be the same as the current AUTP and there should be a chance of reducing the max. payout of 6 million Rp to, say, one-third to half of the max. payout as the production cost up to the planting should be smaller than the max. payout of 6 million Rp. Also, if this payout is made, no more payoutshould be made, meaning that the following AYII trigger should no longer be considered, and
2) For the risk coverage in the latter-stage of cultivation, Desa-level AYII could be applied, same as the current AYII arrangement. Thus, a hybrid type agriculture insurance should be considered in future in Indonesian paddy cultivation.

1.2.9 Introduction of Different Levels of Premium, Preferably, by Kabupaten, or by Province, or Otherwise by Island (AUTP)

AUTP has been implemented since 2015 to date, and there have been improvements during the past years, e.g., introduction of SIAP application for the smooth registration of the participating farmers. Therefore, there is not much recommendation to further improve the AUTP on the design, yet,just one that is the introduction of different levels of premium ratio.

The chart below shows the last 6 years (2015-2020) average payout ratio of AUTP by province, and there is an obvious trend, i.e., higher payout ratios show up in the provinces of Sumatra and Kalimantan islands while lower payout ratios in Jawa, Bali, Nusa Tenggara, and Sulawesi (except Sulawesi Selatan). Therefore, it could be logical that higher premium ratio should be introduced in such provinces of Sumatra and Kalimantan islands, and instead, the premium ratio in Jawa, Bali, Nusa Tenggara, and Sulawesi could be reduced, keeping the overall payout ratio to be from 55% - 60% to the past average of 68% (see the most right side bar in the chart).The different levels of premium should be recommended to introduce by Kabupaten, or by Province. If administrative burden is thought to be big, at least different premium ratio by island should be tried.

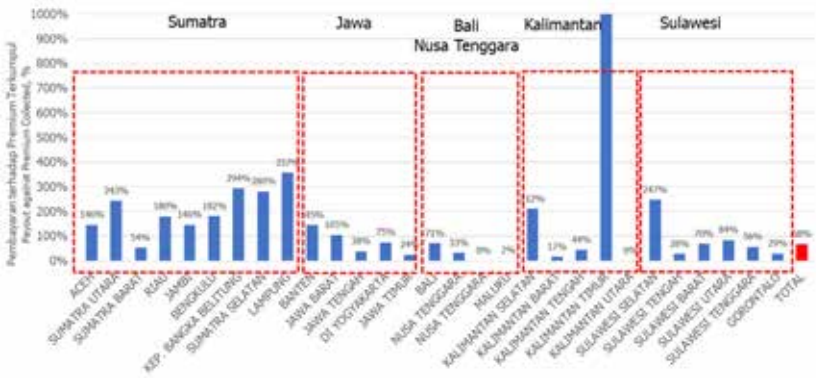


Figure 1.2.7 AUTP Payout Against Premium Collected by Province

Source: MOA, and JASINDO

CHAPTER 2 RECOMMENDATIONS ON THE IMPLEMENTATION OF AGRICULTURE INSURANCE

Following are the recommendations in the stages of socialization, registration, and claim and payout with an emphasis on the AYII:

2.1 Socialization and Registration of the Farmers

It should be the time to consider that the AUTP/AYII be bundled with subsidized fertilizer program as; 1) nowadays, almost all the small scale farmers access the subsidized fertilizers, and 2) farmers usually access the subsidized fertilizers through their farmer group (Poktan), which is also the Registration/ Claim/Payout base of the insurances. In fact, agriculture insurance in other countries had mostly started by budling with other government programs e.g. agriculture loan program, subsidized fertilizer program, etc. Therefore, budling with subsidized fertilizer program should be considered in Indonesia too.

Socialization for and invitation to the AUTP/AYII should be done alongside with other agricultural programmes such as 'Maximum Regular Program' of Puslatan/ BPPSDM, or any other local government programs. Further, key opinion leaders, such as village leaders, farmer leaders, Bupati (mayor), etc. should be involved in promoting AUTP/AYII. In addition, social media should be utilized including the-distribution of such soft data materials as brochure, banner, etc. and also radio broadcast be considered.

For the AYIIRegistration, a web-based registration system should be developed, like SIAP applied under AUTP.In fact, by using SIAP for the AUTP registration, not much problem takes place, while AYII registration iscurrently made by manual, so that it takes time and also causes human errors. Note that SIAP should have at least the following improvements: 1) notification function, and 2) proxy operation function.

2.2 Claim and Payout for both AUTP and AYII

Claim and payout procedure has a lot of challenges as of now for both insurances of AUTP and AYII. In fact, farmers' voice concerning the claim and payout is often that,once, they made a claim, and then there had been many back & forth correspondences/ paper transactions, and at last the payout came that they felt not commensurate to what they had to do all the effort to meet the requirement, so they felt too much cumbersome works for the claim and payout procedure.

Following table compares the current procedure of claim and payout and a procedurerecommended by the JICA consultant team; total 7 steps for the current one vs. only 2 steps for the recommended one respectively:

Table 2.2.1 Comparison of Current Claim and Payout Procedure and Improvement

Stage	Current Procedure: long procedure	Recommended: Short-cut:
Claim & Payout	Dinas confirms if there is a claim or not by comparing the Desa-yield with the benchmark yield, and if triggered, sends the claim documents, including ID photos, to Jasindo branch office by post/ hand.	Dinas confirms if there is a claim or not by comparing the Desa-yield with the benchmark yield, and if triggered, sends the claim documents (without ID photos) to Jasindo HQs office and CC to the Jasindo branch office as well as to the farmer group by online.
	Jasindo branch office checks the claim document, then if completed, will send to Jasindo HQ, but if not completed, will send back to Dinas by post/hand.	Jasindo HQs office, upon approval by the OIC, transfers the payout to the bank account of the farmer group. *OIC: Officer in charge
	Jasindo HQs will make the approval on the claims upon the checking and scrutinization (it takes time).	
	After the approve by Jasindo HQ, Jasindo HQs will issue the bill to the Jasindo branch office, then Dinas office, then to the farmer group by post/hand. Note that this bill needs to be signed by all the farmer group members who made the claim (it takes long time).	
	The farmer group leader has to collect all the claim-made members to obtain their signatures one by one (it takes time).	
	The farmer group leader will send the signed bill to the Dinas, then to the Jasindo branch office, and then to the Jasindo HQs by post/hand.	
	Jasindo HQ now transfers the payout to the bank account of the farmer group.	

Source: JICA Consultant Team

PART V COVID-19 IMPACTS ON FOOD VALUE CHAIN

CHAPTER 1 SURVEY OF COVID-19 IMPACTS ON FOOD VALUE CHAINS (FVC)

1.1 Objective of the Survey

The COVID-19 pandemic started to have spread to Indonesia in March 2020. In April 2020, the Large -Scale Social Restrictions (Pembatasan Sosial Berskala Besar, hereinafter refers to as "PSBB") was enacted. As of June 2021, PSBB takes place to respond to the COVID-19 pandemic in Indonesia. The PSBB is implemented by the local governments with the approval by the Ministry of Health.It takes measures such as closure of public places, restriction of social activities and public transportation, restrictions of movement between the restricted regions and others.

The status of coping with the COVID-19 pandemic in Indonesia is shown in Table 1.1.1. In Indonesia, the first case of COVD-19 confirmed on 2nd March 2020. The Indonesian Government takes several measures for the COVID-19 pandemic after confirmed the first case. The PSBB has extended in some areas till now, but most of the city and regencies were implemented the PSBB from the middle of April 2020 to June 2020.

Table 1.1.1The Measures for COVID-19 Pandemic in Indonesia

Date	Contents
2nd March, 2020	Confirmed the first case of COVID-19 First COVID-19 infected person confirmed in Indonesia
20th March, 2020	[Jakarta]The government declared that the emergency response phase will be from the same day toApril 2nd. The declaration required companies to limit their business activities and all offices were required to temporarily suspend their activities from April 23rdand switch to working from home. (The measure was extended until April 19th)
3rd April 2020	[Indonesia Nationwide] Large-Scale Social Restrictions(Pembatasan Sosial Berskala Besar: PSBB)was enacted.
10th April, 2020	[Jakarta]Following the central government's decision on social restriction, the Special State of Jakarta implemented PSBB throughout the capital from April 10th to 14 days(It was extended until June 4th).
12th April 2020	West Java] In Bogor, Depok and Bekasi region, implementation of PSBB was announced, and it was extended until November 25th at Bogor, Depok and Bekasi in the metropolitan area.Measurement according to the infection alert level in each region was taken (It was also extended in other areas but ended on June 26th).

24th April, 2020	[Indonesia Nationwide] A movement restriction order was issued by Indonesian Ministry of Transport. The movement of people in areas where the infection has spread, such as the Jakarta metropolitan area, and other areas has been banned (It was extended until June 7th. [South Sulawesi]PSBB were implemented in Makassar City, South Sulawesi Province, Goa Province, etc. (then ended on May 24th)
27th April 2020	[East Java]East Java announced that Surabaya, Sidoarjo and Gresik will implement PSBB for two weeks starting April 28th. (After that, it was extended until May 25th, and the Surabaya area was extended until June 8th, after which the large-scale social restriction ended).
4th June, 2020	[Jakarta]Jakarta announced the transition of PSBB to Phase 1 of the transition period from June 5th. During June, sectoral economic activity resumed sequentially with maximum 50% of the number of employees and the capacity of visitors during June. (Then it ends on September 10th).
9th September, 2020	[Jakarta] Jakarta announced that PSBBwill be strengthenedagain by returning to the original regulation from September 14th. It was decided that business activities other than the 11 basic fields should be conducted at home in principle. If it is difficult to work from home,it was allowed to come to work up to 25% of the number of employees and the number of people that can be accommodated. Eating and drinking in the restaurant was prohibited, and public transportation was restricted. It ends October 11th.
11th October,2020	[Jakarta] They announce mitigation of PSBBfrom October 12th and they will make it transition period to resume economic activity.The period was set to October 25th, but then extended to November 22nd.
12thJanuary,2021	[Jakarta]PSBB was reintroduced in Jakarta Special State from January 11st to January 25th.Designated industries in the 11 basic fields can carry out activities in the office / field without limit on the number of people as needed. Other companies are allowed to commute up to 25% of the maximum capacity. (PSBB was also reintroduced in a number of regions/ cities on the islands of Java and Bali from 11-25 January 2021.)
8th February, 2021	[Indonesia Nationwide]Instructed the governor, mayor to implement restrictions on small-scale community activities (Micro-based PPKM). Activities will be restricted at a small level such as RT and RW. Work-at-home rate (50% (Note)), allowable number of people eating and drinking in the store (50%), shopping center business hours (until 9 pm), etc. The target area is all states (34 states) in Java including major areas such as Java Special Region and Metropolitan Area, Surabaya, East Java, Semarang, Central Java, and Yogyakarta Special Region, Bali, and Northern Sumatra. The period of restriction is until June 28th. (Note) The telecommuting rate is 25% in areas where the spread of infection is serious (red zone).

Source : JICA Consultant Team based on the websites of WHO, Government of Indonesia, Embassy of Japan in Indonesia, JETRO, etc.(Accessed June, 2021)

The COVID-19 pandemichas significant impact on the Indonesian economysuch as import suspension, restriction of movement, disruption of logistics and others.In agriculture sector, the COVID-19 has imposed shocks on all segments of food value chains (FVCs), delay or stop distribution, labour shortage due to restriction of movement, suspension of business in the food service industry and changes in consumer's demand.

This survey aims to reveal the impact of COVID-19 on the FVCs. The Project Teamis to suggest pilot projects for recovery of disruptive value chains under the COVID-19 pandemic based on the survey results.

Regarding the pilot projects, the Project Teamis to suggest recovery of disruptive food value chains as well as revitalizing local agribusiness companies to collaborate with farmers' groups, distributors, other local businesses and to facilitate further agriculture insurance promotion. The Project Team further proposes pilot activities including capacity building for local administrations and local consultants to create a support system to develop regional brands. Furthermore, the Project Team is to take into consideration the agriculture insurance operation and proposed support system to expand Japanese companies' businesses in Indonesia.

1.2 Survey Area

Considering the COVID-19 pandemic situation in Indonesia, the Project Teamis to conduct a study to reveal the impacts of COVID-19 on FVCs for rice and other important crops in the target areas, i.e. East Java, West Java and South Sulawesi provinces.

1.3 Methodology

Figure 1.1.1 describes the implementation process of the survey. The implementation process includes; (1)conduct literature survey and collect information published to identify the major challenges on FVCs,(2)conduct the filed survey using questionnaire in the target area to identify the specific challenges of target crops including rice, (3) analyze the survey results and examine countermeasures for coping with COVID-19, (4)formulate the pilot projects based on proposed countermeasures.

Figure 1.1.1 Survey Procedure of COVID-19 Impact Survey on Food Value Chain

Source : JICA Consulant Team

CHAPTER 2 MAJOR CHALLENGES ON FVC CAUSED BY COVID-19

2.1 Economic Impact Caused by COVID-19 Pandemic

The GDP growth from 2017 to 2021first quarter in Indonesiais shown in Figure 2.1.1. In 2020 second quarter, the GDP contracted by 5.3% year-on year. This is the lowest since the aftermath of the Asian Financial Crisis in 1999 .After that, the GDP shows gradually recovering e.g., -3.4% (2020 third quarter, year-on-year), -2.1%(2020 fourth quarter), and -0.9% (2021 first quarter), but the GDP growth is still in negative territory.

In addition, the GDP growth for each sector is shown in Figure 2.1.2. The several sectors namely the transportation and storage (-30.8%), the accommodation, food and beverages (-22%), the wholesale and retail, trade, repair of motor vehicles and motorcycles(-7.5%) contracted year-on yearin 2020 second quarter. On the other hand, the agriculture, forestry, and fishing sector (+2.2%) and the information and communication sector experienced a positive growth year-on-year.The several sectors which contracted in 2020 secondquarter, it is still in the negative territory but gradually recovering.

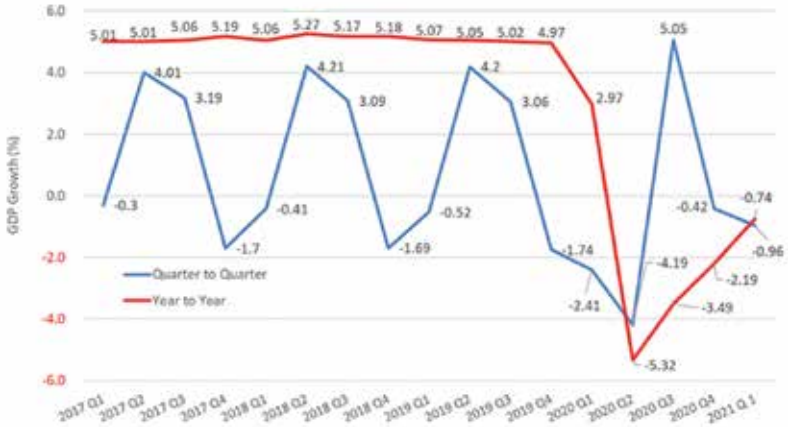


Figure 2.1.1GDP Growth (2017 1st Quarter – 20211st Quarter)

Source : JICA ConsultantTeam based on BPS - Statistics Indonesia website(Accessed May 2021)

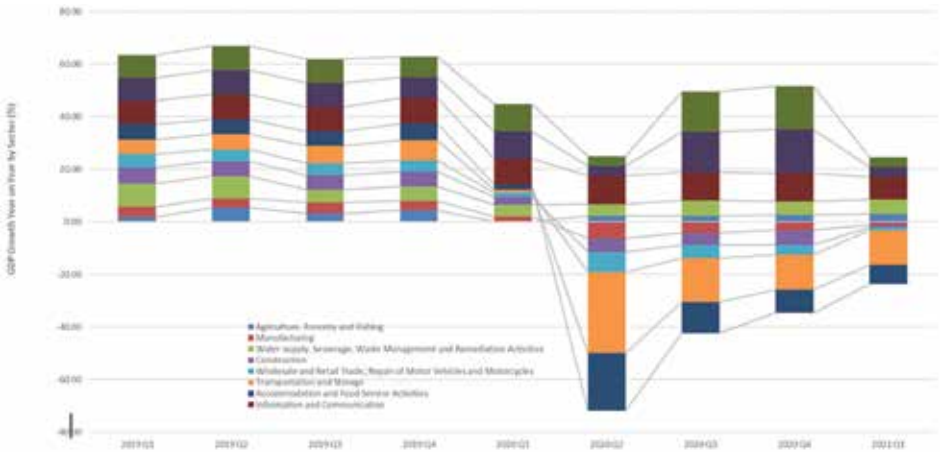


Figure 2.1.2 GDP Growth by Sector (2019 1st Quarter-20211stQuarter)

Source :JICA Consultant Team based on BPS - Statistics Indonesia website(Accessed May 2021)

2.2 Impact of COVID-19 from the Literature Survey

To clarify major challenges for preventive measures against such COVID-19 in Indonesia, the Consultant Team conducted literature surveys and collectedinformation published.The main points of literature and publicly available information are shown in Table 2.2.1. In addition, Figure 2.2.1shows the major concerned points on the existing FVCs in Indonesia and key impacts of COVID-19 on the FVCsbased on literature survey.

Firstly, the process of value chainclassified namely “Input”, “Production”, “Processing”, “Distribution” and “Market/Consumption” in Figure 2.2.1. Secondly, the characteristics and major challenges on existing FVCs in Indonesia summarized in upper part (it is shown by yellow). Thirdly, the major concerned points caused by COVID-19 on the FVCs in Indonesia stated in lower part (it is shown by blue).

Table 2.2.1 Major Concerned Points of Agriculture Sector in Indonesia and COVID-19 Impact (from the reference)

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
1	Indonesia Data collection survey on the possibility and issues of industrial promotion with high international competitiveness	JICA Nomura Research Institute	2019	O	O		O	**Current status in agriculture and FVC** √ Food processing industry in Indonesia is divided into 2 types: 1) Globally competitive products group that can receive imports of high-quality raw material and supplied by large companies that control the quality of the entire supply chain taking advantage ofeconomies of scale.2)Products that are not internationally competitive and supplied by low quality domestic raw materials. Regarding 2), most of these foods/ ingredients are produced mostly by smallholder farmers and collected by different middlemen,manufactured from agricultural products that are exported with limited processing or added value. √ Weak competitiveness of the food processing industry is due to no economies of scale because of the production of small scale and non-standard low quality agricultural/ marine productsand due to high transportation cost including underdeveloped cold chains. (For example, in the case of pineapple, importing from Philippines is cheaper than buying from the Indonesian domestic market.) √ Considering that Indonesia has a large domestic market that consume a large amount of food such as noodles,Indonesian food processors are easy to gain economies of scale and having no competitive upstream industry/ agriculture itself is not a serious issue in itself. However, if the goal is to increase production and increase supply in the highly competitive global food market, the current chain is uncompetitive. √ To help food companies control supply chain and row material quality, leverage economies of scale in the domestic market, and produce more standardized high-quality products, if economies of scale can be utilized in coordination with farmers, it will be possible to strengthen food security by improving the efficiency of production and distribution while increasing competitiveness in the export market.

2.	Consumer Report – Indonesia – Report of Indonesian middle-income group's diets	YAMADA Consulting Group Co., Ltd	2019		O			**Current status in FVC** √ Traditional trade (TT) is still the mainstream of eating out channels in the middle-income group. √ With the rapid spread of the Internet, online purchasing channels are beginning to spread to middle-income diets. √ Online delivery services can be an important channel for the middle-income group.
3.	Support of the establishment of Agricultural / Rural DX Smart Food Chain by JICA (Seminar document)	JICA Economic Development Department	2019.12 -2020.3 (Survey Period)		O		O	**Trends in establishment of DX Smart Food Chain (SFC)** √ The Indonesian government has launched an "Industry4.0" policy, and theIndonesian Agency for Agricultural Research and Developmentof the Ministry of Agriculture is also working on the development of self-driving tractors, remote sensing, pesticide and fertilizer spraying by drones, etc. √ Digital Economy Promotion Agency (DEPA) was officially established in 2020 and it targets agricultural and marine products. **Challenges faced by farmers** √ Stabilization of production volume and price by adjusting the production time of agricultural products in a vast land area. √ Improving the efficiency of agricultural product distribution and raising the income of farmers with the intervention of many middlemen. √ In Indonesia, many start-up companies are working no improving rural finance and distribution because of inadequate functionality of agricultural cooperative organization. Possibility of SFC establishment √ As a possibility of future development, t introducing Japanese smart technology and collaboration with local resourceswill be considered while assessing local needs in Indonesia.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
4	Latest status of Indonesian Agriculture (Seminar document)	Ichiro TSURUSAKI (Indonesia Ministry of Agriculture, Individual expert)	2019	O	O			**Current status in agriculture and FVC** √ In Indonesian agriculture, there are various issues in each aspect such as production and distribution. Especially, in terms of value chain, there are issues such as the inability to produce high- quality products and insufficient efforts for post harvest management and processing. **Challenges in production aspect** √ Farmers are less interested in introducing new technologies. √ High quality seeds are not available in a timely manner and their quality is unstable. √ Limited/ unstable supply of high-quality products to meet the demands of the modern market. √ Need to organize farmers' group. **Challenges in processing and distribution aspect** √ The purchase price of the assembler is low. Farmers can not determine the price. √ Strong bargaining power on the modern market side √ Limited connection to the modern market √ Insufficient post harvest management results in poor quality/ significant loss. √ Underdeveloped efforts for processing agricultural products. √ The value chain is long and freshness is lost in the meantime.
5.								**Current status in FVC** √ There is also the problem the contents of agricultural extension have not caught up with the times. Nowadays, farmers also connect to the Internet through their smartphones to obtain information, and some of them even import seedlings directly through the Internet. √ As economic growth progresses, the weight of the agricultural sector in the overall domestic economy is gradually declining. Similarly, the working population engaged in agriculture is also on the decline.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
	Production / Distribution/ Investment Environment Survey Report for creating framework of FVC establishment in Indonesia (Ministry of Agriculture, Forestry and Fisheries)	Ministry of Agriculture, Forestry and Fisheries/ International Development Center of Japan	2018	O	O			√ Crop storage is possible if you have a warehouse at a well-capitalized collector or rice mil. If it is not available, they will be stored in a warehouse in consumption area such au Jakarta. However, it is generally shipped daily in the suburbs of the city and immediately transported to the place of consumption without being stores. √ Food and beverage industry of Indonesia is divided into the field of highly competitive SMEs engaged in modern food manufacturing and the field of micro and small business that easily produce for the local market in the cottage industry using the kitchen of the house, and they are not interfered. Farmers who produce food crops and horticulture crops can deal with the latter (micro and small business). √ The distribution/ sales rout for both food crops and horticulture crops basically traces a route in whichfarmer sells agricultural products to assembler, sells them to large merchants, then goes to wholesaler and reach to consumers. √ In Indonesia, there is not yet a clear differentiation between wholesale and retail business like in Japan. **Challenges in FVC** √ Most of the agricultural product processing at the rural level is for private use. Although some areas have made traditional sweets and are now famous as local specialties, the production processing site is the kitchen of the home and does not exceed the level of the cottage industry. √ Although the ration of distribution cost to Indonesia's GDP has gradually declined, it is still about twice ad high as that of Thailand, Malaysia, Singapore, etc. √ In general, the bottleneck in Indonesian distributionis that the amount of distribution greatly differs between the outward trip and the return trip, and one of them tends to be empty. √ Chronic traffic congestion caused by low levels of transportation infrastructure has contributed to low delivery levels and rising distribution costs such as fuel and labor costs

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
								√ Vegetables and fruits are mainly delivered at normal temperature, and they do not appear in consumer markets other than the production area, and it seems that about 40% of them will spoil even within the production area. √ Regarding the distribution of agricultural products, distribution in which perishables are processed while they are fresh is still the basis, and the distribution system along that is in place. However, as demand for stable supply to modern markets such as supermarkets and hotels increase in the future, it will be necessary to establish a cold chin as seen in Japan. √ Looking at the Indonesian government's agricultural policies and ODA projects, they are still centered on FVC upstream. √ In order to establish a value chain, it is necessary to connect production, processing, distribution and upstream production areas to downstream consumption areas. Cooperation to connect the upstream production area and the downstream consumption area side has not been supported by either the public sector or private sector, and the upstream and downstream are not connected. √ In Indonesia, the food market centered on middle-income groups or the large cities such asJakarta has become more sophisticated, and the market for higher quality and better products is expanding, such as need shifting from traditional markets to supermarkets. However, domestically produced agricultural products have not been able to cope with this, and especially for perishables, imported products from Chine, Australia, New Zealand, etc. are lined up in supermarkets. In rural areas near agricultural production sites, there are problemswith the technology to produce and deliver such products to the market.Therefore, first of all, know-how and technology for producing, processing and distribution better quality agricultural products for the growing huge domestic market are required.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
6	Current status and issues of Indonesian rice distribution (JBIC Research Paper No. 5)	Japan Bank for Inter-national Corporation, Research Institute for Development and Finance	2020	O				**Current status of rice distribution** √ In Indonesia, rice is distributed from farmers who are producers to consumers mainly via private distribution. On the other hand, in the government sector, the BULOG (State-owned enterprise) is trying to stabilize rice prices by purchasing rice and releasing it to the market, and is supplying it to civil servants and the poor.
7.	Social Demographic Survey of the Impact of COVID-19, 2020 (Hasil Survei Sosial Demografi Dampak Covid-19 2020)	Statistic Indonesia (BPS)	2020			O		**Impact of COVID-19** √ Totally 70% of respondents admit that "Always Work From Home (WFH) since it is regulated", and "WFH is applied, but still have office shifts. √ 40% of respondents admit that heir income is affected by COVID-19 pandemic and especially respondents in low income (≤ IDR 1.8 million) group admit that they are undergoing income deficiency. √ Respondents who are working in Wholesale and Retail; Vehicle Reparation,Accommodation and Food-Beverage Service faces income deficiency. √ On the other hand, more than 50% of respondents experience escalation of expenses by COVID-19. Especially, respondents state that food is the prominent reason of expense changes. This is still under government suggestion to stay at home and improving body immunity with cooking by themselves. √ About 30% of respondents experience escalation in online shopping activity during COVID-19. Also, during April 2020, about 40% of respondents who go shopping online escalated mostly because of foodstuff shopping escalation.
8.	Result of JICA Questionnaire of COVID-19 Impacts on agriculture and food system COVID19 (Seminar document)	JICA Economic Development Department	2020			O		**Impact of COVID-19 on agricultural activities** √ Increased spending due to rising market prices for food and goods. √ Undernourishment and hindrance to next crops due to adverse effects on farmers' livelihood. √ Decreasing in productivity due to decrease in agricultural input and laborforce. √ Decrease in income due to decrease in selling price (especially perishables)

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
9.	COVID-19 and the risk to food supply chains: How to respond?	FAO	2020		O	O		**Impact of COVID-19** √ Restrictions on movement are curbing farmers' access to markets to buy inputs and sell products. Fresh produce is accumulating at farms, resulting in food loss. √ It is causing labor shortages as migrant seasonal workers are unable to travel. The food value chain can be broadly divided into two groups: the staple commodities (wheat, maize, corn, soybeans and oil seeds) and the high-value commodities (fruits, vegetables and fishery). The staple commodity production is capital intensive, and the labor shortage issue resulting from the coronavirus-related restrictions on movement has less impact on their production. However, the logistics to distribute the commodities is affected, as it hampers food transportation across cities, provinces, regions and countries. √ The high-value commodities, on the other hand, require a large amount of labor to produce. So they are substantially affected when employees get sick or local and migrant laborers are not able to travel due to lockdowns. √ The high-value supply chain includes food processing plants, which are also labor intensive. Currently, most of the sorting and packing lines do not comply with the social distancing requirements. **Recommendations** √ The following are specific recommendations √ Expand and improve emergency food assistance and social protection programs √ Give smallholder farmers support to both enhance their productivity and market √ the food they produce, also through e-commerce channels √ Keep the food value chain alive by focusing on key logistics bottlenecks √ Address trade and tax policies to keep the global trade open

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
10.	COVID-19 and the Food and Agriculture Sector: Issues and Policy Responses	Japan Bank for Inter-national Corporation, Research Institute for Development and Finance	OECD		O	O		**Impact of COVID-19** √ Enough food is available globally, but COVID-19 is disrupting supply and demand in complex ways √ Limits on the mobility of people across borders and lockdowns are contributing to labour shortages for agricultural sectors in many countries, particularly those characterized by periods of peak seasonal labour demand or labour-intensive production. √ Disruptions downstream from the farm gate are in some cases causing surpluses to accumulate, putting a strain on storage facilities and, for highly perishables, increasing food losses. √ This significant change in the composition – and for some commodities, the level – of demand will put whole value chains under pressure. Manufacturers are adjusting production and distribution, for example, to shift from producing bulk items for food service to smaller packages for home use. However, some will have difficulties keeping their businesses viable. There is also a need to adapt and deliver food through different channels (for example, via supermarkets or direct home delivery, as opposed to open markets or direct to restaurants and catering businesses). This will be particularly challenging for smaller and specialized farmers – who are more likely to rely on open markets, restaurants and catering – and who may struggle to identify new outlets and buyers √ Lockdowns and limits on the mobility of people are also affecting the provision of key food safety, quality and certification checks, including those that are required to facilitate trade, such as physical inspections of goods to certify compliance with sanitary and phytosanitary requirements (SPS). Moreover, additional checks may be required in response to new biosecurity arrangements for the sector, implemented in response to COVID 19. √ Measures to contain the spread of the COVID-19 are causing delays and disruptions to transport and logistics services. Border closures and additional procedures and checks have led to congestion and delays, affecting the transit of perishable products. For example, social distancing requirements have reduced the numbers of import and export inspectors at borders, increasing the time needed for customs clearance.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
								√ The COVID-19 pandemic may also affect the availability of key intermediate inputs for farmers. √ Closing borders or slowing down the transboundary movement of seeds could potentially hamper seed supply chains and on-time delivery of seed with negative impacts on agriculture, feed and food production over the next season and further into the future. √ The collapse in consumption of food away from home will have a particularly large impact in developed countries. The closure of restaurants and food service providers in schools, hotels and catering businesses has shrunk the market for some commodities √ Demand also appears to have shifted away from higher value items and towards staple and ready-to-eat foods that can be stored. √ There has also been a strong increase in e-commerce.
11.	Food Supply Chains and COVID-19: Impacts and Policy Lessons	OECD	2020		O	O		**Impact of COVID-19** √ Farm production has been affected by bottlenecks for inputs, most notably labour. Some farm sectors are more dependent on (seasonal) labour than others: fruits and vegetables are more labour-intensive, while cereals and oilseeds typically require less labour. √ COVID-19 has led to disruptions in food processing industries, which have been affected by rules on social distancing, by labour shortages due to sickness, and by lockdown measures to contain the spread of the virus. √ Transport and logistics problems have thus been most pronounced for perishable high-value products, such as fruits and vegetables. The fruits and vegetables sector is also affected by quarantine measures and delays in border inspections (including as the number of import/export inspectors has fallen). By contrast, cereal supplies have not faced major disruptions: bulk transport has been less affected, and cereals can be loaded, shipped and handled with minimal labour input.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
								√ A first bottleneck relates to the availability of inputs for farming, notably labour for harvesting fruits and vegetables. A second relates to plant shutdowns in the food processing sector, notably in meat processing. A third relates to the ongoing disruption of air freight, which affects high-value perishable products, again notably fruits and vegetables. What these bottlenecks have in common is that they are difficult to overcome in the short run. √ The biggest risk for food security is not with food availability but with consumers' access to food.
12.	Indonesia HRI Update - Covid-19 Impacts	USDA (United States Department of Agriculture)	2020		O	O		**Impact of COVID-19** √ Indonesia's once thriving Hotel, Restaurant(incl. Large chain restaurant, Cafe, Mid-high-level dining, Street food and stalls) and Institutional food service sector has seen a sharp decline in sales as a result of social distancing measures implemented to mitigate the spread of COVID-19. The once booming tourism industry has seen travel nearly cease as domestic and foreign travelers stay home and airlines and hotels drastically reduced operations.
13.	Impact of COVID-19 Pandemic on Households in ASEAN Economics	ADB	2020			O		**Impact of COVID-19** A total of 8,000 households were surveyed by phone between May-July 2020 in samples of 1,000 in each of the following developing Association of Southeast Asian Nations (ASEAN) countries: Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. √ Key Findings in Indonesia: √ 81% of households reported income decline √ 90% of Farmer/Fisherman households reported income decline √ 85% of households experienced Financial difficulties √ 13% of household lost jobs/temporarily lost jobs, and 17% of households reduced their workload

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
14.	Indonesia COVID-19: Economic and Food Security Implications (3rd Edition)	WFP	2020	O		O	O	**Impact of COVID-19** √ In the second quarter of 2020, the Indonesian GDP contracted by 5.32% year-on-year (Y-o-Y), the most significant decline since 1999. The GDP dropped by 4.19% compared to the first quarter of 2020. √ The poverty rate in Indonesia increased in March 2020 to 9.78% from 9.41% in September 2019, primarily in urban areas. An additional 1.63 million people fell into poverty, returning the poverty rate close to the September 2018 level (9.82%). The Government predicts the poverty rate to reach around 10.6% in 2020 with an estimated additional 4 million people falling below the poverty line. √ In the first semester of 2020, Indonesia's food trade continued to grow despite the country's overall trade indicating a negative growth. Compared to the same period last year, Indonesia's overall trade value shrank by 5.5% for exports and by 14% for imports--however, the country's food exports rose by 9.5%, while imports grew by 4%. √ Restrictions for sea, freight, and land transports created a bottleneck for the food supply chain and other manufacturing sectors. As Indonesia depends on imports for certain essential commodities from the global or inter-islands trade, the movement restrictions caused delays and a reduction in the quality of the products due to longer storage time. √ Indonesia's digital economy remains a growing market. Several Government initiatives have encouraged producers to shift business activities online during the pandemic, accelerating usage of e-commerce platforms as an alternative option by many food and service providers.
15.	Food Supply Chain and COVID-19: Impacts	Bob Ferguson (Food Safety Magazine)	2020		O	O		**Impact of COVID-19** √ Getting the raw materials, they need to produce their product was the clear number one concern. The processors' concerns were certainly about the shortages of critical raw materials and getting what they need on time and in sufficient volume. √ The processors also reported significant concerns and negative experiences regarding product quality—not only the quality of products available but particularly the quality of potential product substitutes as well.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
								√ Another category of concern involved transportation and delays. Some delays were due to COVID-related complexities affecting infrastructure. Several companies mentioned that they were seeing significant delays due to the "closing of ports owing to COVID" because of either the availability of labor to work at the ports or import/export restrictions implemented by local jurisdictions. √ Another critical supply issue identified was obtaining operating supplies, those non-raw materials needed for production, such as food contact packaging materials and nonfood contact materials such as personal protective equipment, gloves, face masks, hairnets, hand soap and sanitizers, cleaning chemicals, sanitizers, and similar essential materials.
16.	What is the impact of COVID-19 on Indonesian agriculture?	Dadang Gusyana, S.Si, MP Member of the America Society of Agronomy (ASA) Mellienial Farmer Activist	2020	O	O	O	O	**Impact of COVID-19** √ On the input side of agricultural production, 40% fertilizers and pesticides whose active ingredients are 70% dependent on imports, the existing stocks are only sufficient for the next four to six months. On the farmer's side, there is confusion, especially in access to information that is uncertain, which makes them confused. √ Farmers in the villages also face challenges accessing markets to sell their products or buy agricultural raw materials such as fertilizers, seeds and pesticides due to limited supplies and transportation because of city lockdown policy/Restrictions on large-scale social activities policy. A food supply chain is a complex network involving producers, consumers, agricultural and fishery inputs, processing and storage, transportation and marketing. **Recommendations** By supporting key markets for farmers in various regions to reduce the negative impact of covid-19 handlers on farmers. Helping farmers provide correct information. By supporting key markets for farmers in various regions to reduce the negative impact of covid-19 handlers on farmers. Helping farmers provide correct information regarding the agricultural marketplace so that farmers can sell their produce online and monitor prices, there are at least 5 applications that farmers must have to sell their products:1) Agromaret, 2). TaniHub, 3). Farmers, 4). Monitor prices, 5). LimaKilo.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
17.	Impact of COVID-19 on Agriculture - Farmer Shop Perspective.	RISMA (The Australia-Indonesia Partnership for Promoting Rural Incomes through Support for Markets in Agriculture)	2020	O	O	O	O	**Impact of COVID-19** The study conducted a qualitative survey in mid-April 2020 to farmers and ranchers and was followed by a survey of farmer shops or agricultural shops at the end of April 2020. The farmer shop survey was conducted in the 4 provinces (Central Java, East Java, NTB, and NTT) at 50 shops / store. 1. The main decline occurred in store revenue * The shop / store began to reduce the purchase of agricultural input products, such as: seeds, crop protection, fertilizers, and agricultural tools from suppliers. * Shops / stores selling poultry feed have suffered heavy losses as the poultry sector has decreased significantly due to lower demand from the tourism industry (hotels, restaurants and events). * The shop / store began to reduce the purchase of agricultural input products, such as: seeds, crop protection, fertilizers, and agricultural tools from suppliers. 2. More than 50% of shops have difficulty in buying and selling * Several cases occurred at the store level, such as: limited amount of subsidized fertilizers, expeditions began to experience delays (especially for inter-island transactions) and resulted in delays in product acceptance. * Farmers are no longer able to buy agricultural production inputs because of rising prices. 3. There was an increase in supplier prices between 10% - 30%. * Some suppliers allow the use of payment schemes later, but some suppliers change from credit payments to cash. * Products that have experienced price changes are pesticide and herbicide products, spray equipment, and the price of corn kernels has also started to rise. 4. Some of the products are not available in the market due to COVID-19, There are several challenges in purchasing multiple agricultural production inputs because: * No supply from China and Japan for sprayers * Some farmers who chose a brand of rice seeds were not available in the market due to lockdown in West and Central Java.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
								* Delay in supply from distributors due to limitations of transportation access * 30% of respondents said that the marketing agents of supply companies change the frequency they visit the shops. Some still manage contacts via phone calls or WhatsApp. 5. About 26 respondents said that there was an increase in loan requests from farmers. Most farmers wanted to pay for products after harvesting but the shops had not changed their payment methods. 6. Half of the shops surveyed had problems with loans.
18	President Jokowi shows growth in the agricultural sector, farmers: 'I lose hope'	Indonesian Policy Study (CIPS), Felippa Amanta, Indonesian Farmers Union, Agus Ruli Ardiansyah	2020	O	O			**Impact of COVID-19** √ The price of farmers' production has increased, such as the purchase of fertilizers, pesticides and seeds, on the other hand, the selling price has collapsed because the market is also affected by the pandemic. Due to the lockdown, many hotels, restaurants, caterers are closed, market operating hours are also limited, people's purchasing power is also reduced, so people tend to shift their consumption to cheaper foods. √ vegetable farmer from Wonosobo, Central Java. Since the Covid-19 pandemic hit, up to 60% of the mustard vegetable harvest has been wasted, because they are not absorbed by the market, the price is cheap, as is the case with chilies. √ Prices for agricultural production, particularly horticulture or vegetables, have fallen on the market. The price is not comparable to production costs such as buying seeds, fertilizers, pesticides, land cultivation, maintenance and harvesting. For the production of mustard greens, for example, it costs Rp. 6 million, but the selling value price is only Rp. 2 million - Rp. 3 million. Not all of them were sold, which in the end were left on the land/soil to turn back into fertilizer. √ it is difficult for corn farmers to get subsidized fertilizers. On the other hand, the price of corn has never increased since the pandemic. √ The price of shallots in the current harvest season is IDR 18,000 per kilogram, lower than the previous harvest season which reached IDR 23,000 per kilogram at the farmer level, in Giyono village, Central Java, October 6, 2020.

No.	Title / Seminar Title	Author / Presenter	Year	Category				Main Points
				Agriculture	FVC	COVID-19	Others	
								Recommendations √ General Secretary of the Central Executive of the Indonesian Farmers Union, Agus RuliArdiansyah, asked the government to pay attention to the horticulture sub-sector, especially vegetables whose prices have fallen on the market, hoping the government would intervene in the price of vegetables so that farmers would not suffer losses. √ Deputy Chairman of Commission IV of the Indonesian House of Representatives, Hasan Aminuddin, assessed that the government needs to change the way it provides assistance to the community in the midst of a pandemic. One of them is changing the direct cash assistance policy, replaced by buying agricultural products.
19.	The Impact of the Covid-19 Pandemic, the Agricultural Sector Needs Insurance and Stimulus	Dr. Ir. I Gusti Bagus Udayana, Warmadewa University	2020	O	O			**Impact of COVID-19** √ Farmers are faced with an increasingly negative competitive market. The selling price of products from farmers has fallen, causing large losses of Profit and unstable prices for agricultural products. **Recommendations** √ The government and stakeholders must also work together to allocate resources optimally in dealing with health problems, the spread and control measures for COVID-19, especially for actors engaged in agriculture. Without this, various agricultural development policies and programs will not be able to anticipate the impact of COVID-19. √ The government needs to ensure the availability of food in the midst of the current pandemic. A stimulus for the agricultural sector is a necessity to maintain socio-economic resilience and accelerate economic recovery. In addition, the Government can intervene in agricultural production inputs that have a relatively large contribution, namely fertilizers, superior seeds, and pesticides. Another possible intervention is to provide unsecured loan programs to farmers and to assist farmers in mentoring and in the process of marketing their agricultural products. √ The government needs to provide a stimulus for the agricultural sector with the aim of increasing the production of main food crops. This is done simultaneously with an increase in the number of agricultural insurance beneficiaries through additional allocation of agricultural insurance premium subsidies, with insurance guarantees, farmers will be comfortable, because when the harvest fails due to natural disasters or like the current Covid-19 pandemic, farmers will remain safe. because insurance will guarantee agricultural products that are not fulfilled due to the disaster.

	Inputs/ Machinery	Production	Processing	Distribution	Consumption/ Market
Major Stakeholders	Input suppliers, Machinery company, Service providers	Farmers' organizations	Processing companies, rice millers	Traders, wholesalers, Carriers, STA, BULOG	Retailers, hotel/ restaurant, market, supermarket
Major concerned points for AVC in Indonesia	• Quality of inputs • Availability of high-quality inputs • Using ICT tools	• Quality of product • Knowledge/ skills for farming • Lack of Labor • Labour cost • Low farm gate price	• Quality of product • Knowledge/skills for food processing • Lower in quality of raw material • waste/loss due to insufficient of post-harvesting system • Strengthening of competitiveness of food processing	• High distribution cost • Long value chain in general • Waste and loss during the distribution	• Consumer's interest (ex; health problem, food safety) • Changes in the food market (from traditional market to modern marker) • Traditional business custom • Strong bargaining power of buyers in the modern market • Increase the using of on-line service
Cross cutting issues	Human resource development. Improvement of accessibility of financial service. Food safety. Cold chain logistics, Cross ministerial collaboration for strengthening of AVC				
Key Impact of COVID-19	• Spike in input price • Limited access to inputs • Low demand from farmers (inputs & service) • Delays of quarantine procedures and inspections(import)	• Spike in production cost • Lack of labour • Reduction of productivity • Delay of planting period • Spike in waste & loss • Changes in the consumer demand	• Limited/unstable access to raw materials • Lack of labour • Spike in operational cost • Spike in waste/ loss • Reduction of productivity	• Restrictions on distribution channels • Spike in operational cost • Delays at the border	• Changes in consumer lifestyle & preference Increase in demand for delivery service. • Increase the using of on-line service to purchase the daily necessaries and groceries
Cross cutting issues	Disruption of value chain, Infection control (ex; Hygiene control, rule of social distance etc..,). Changes in social lifestyle. Food safety				

Figure 2.2.1 Major Concerned Points for Existing FVC in Indonesia and

Probable Key Impacts of COVID-19 on FVC

Source : JICA Consultant Team

2.3 Major Challenges on the FVCs in Indonesia Caused by COVID-19

2.3.1 Major Concerned Points and Challenges before the COVID-19 Pandemic

Some concerned points and challenges have been already stated in the relevant past surveys for FVCs, i e.

1) Limited availability/ unstable supply of high-quality inputs in the inputs stage (Reference No.1,4,5 in Table 2.2.1)
2) Labour shortage in agriculture sector due to declining the working population in agriculture sector and high labour demand in another sector. (Reference No.5)
3) Food processing being still an early stage as business in the rural areas / Necessity of strengthening competitiveness in food processing sector. (Reference No.4,5)
4) Processedfood is divided broadly into two categories such as high-quality product and low-quality product. Most of the product is categorized into low-quality product. (Reference No. 1)
5) Long value chain in general due to the intervention by several middlemen. Therefore, a large quantity of food loss occurred, and the products lose in freshness on product distribution. (Reference No.3,4,5)
6) The distribution cost being higher as compared with neighboring countries. For example, in the case of pineapple, the imported product could be cheaper price than the domestic product.(Reference No. 1,3,4,5)

7) The market channel which trade/process while the product is fresh has been developed. However, the cold chain system has not fully developed yet. (Reference No. 4,5)
8) The online shopping fordaily necessaries and groceries isincreasing due to the growth of the internet uses and middle-income householdsin urban area. (Reference No. 2,3,4)
9) The middle-incomehouseholds and residents in urban area are shifting to modern market such as supermarket. However, the domestic agricultural productsdo not meet their needs and standard. Therefore, the imported products especially perishable itemsare stored in the supermarket. (Reference No.2,4,5)

2.3.2 Expected Key Impacts of COVID-19 on the FVCs

In addition, some major impacts due to the COVID-19 prevention have been already stated in the studies, i e.,

1) The value chain is disrupted due to the measures of COVID-19 prevention such as restriction of movement for goods and human resources. (Reference No.10,11,12 in Table 2.2.1)
2) Limited access to farm-input in farmer's sideis happened due to logistics stagnation. (Reference No.8,9,10)
3) The farm production and productivityhas been affecteddue to labour shortage caused by restriction of movement. Especially, the horticulture production faced the labor shortage issue. (Reference No.8,10,11,13)
4) Stagnation of distribution of processed products and agricultural products due to movement restrictions, as a result food waste and losshas been occurred. (Reference No.9,10,11,15)
5) As well as farmers, the food processing industry also has been affected the access to raw material due to the restriction of movement. (Reference No. 10,11,15)
6) The workers face declines theincome or lost the jobs/temporally lost the jobs due to temporary closure, shortening of working hours and employment adjustment especially in Wholesale/ Retail Trade, Motor Vehicles and Motorcycles, Transportation and Storage, Accommodation and Food Service sectors. (Reference No. 7,12,13)
7) The consumer preference for food is changed due to lifestyle changes i.e.increase in health consciousness, demand for high nutritious food, using the online-shopping and delivery services, and opportunity for self-cateringby the announcement from the government. (Reference No. 7,10,14)
8) Spikein the household expenses especially food cost due to the work and stay at home, and the announcement for health care by the government. (Reference No. 7)
9) Manufacturers need to adjust the production and distribution due to changes in consumer preference, for example, 1) to shift from producing bulk items for food service to smaller packages for home use, 2) to use the different channels for the distribution. (Reference No. 10, 11, 14)

CHAPTER 3 IMPACTS OF COVID-19 ON FVC IN THE TARGET AREAS

3.1 Selection of the Target Crops Affected by COVID-19

Selection of Target Crops is depicted in Figure 3.1.1. The selection of the target crops started with the confirmation of statistical data. From the BPS statistical data, around 90 crops are grown in each target province. The selection of the target crops isthe following steps;

1) The first step is to identify the dominant crops (around 30 crops) in each of the target areas referring to the planted areas and the production volumes.
2) From the dominant crops, 5 important crops including rice have been selected based on the planted area, the production volume in each target area, agricultural policies which indicate strategic crops and the market environment under the COVID-19 pandemic.

Regarding the target crop selection, the horticulture crops are expectedto be more affected by the COVID-19 pandemic than the food crops such as rice and beans. Hence, the horticulture crops are also included as one of the target crops. The Consultant Team conducted the filed survey to collect the further information of COVID-19 impacts on the target crops in the respect provinces namely, West Java, East Java, and South Sulawesi.

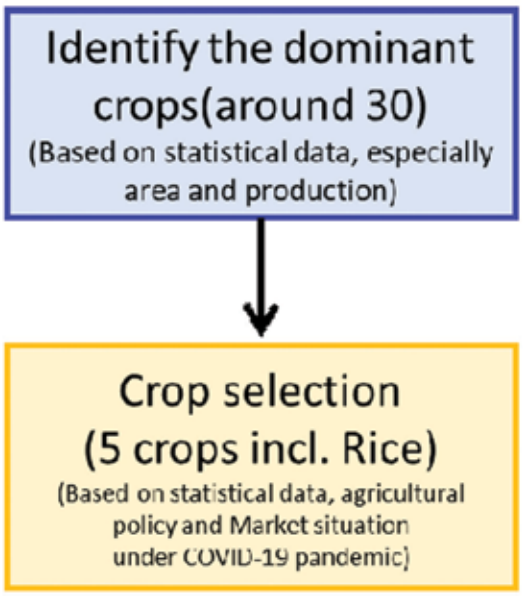


Figure 3.1.1 Procedure of the Target Crop Selection

Source : JICA Consultant Team

3.1.1 Examination of Target Crop Selection based on Statistical Data

The basic information of the target provinces (West Java, East Java, and South Sulawesi Provinces) is shown in Table 3.1.1. Also, Table 3.1.2 and 3.1.3 shows the harvested area and the production volume in the target area. In Table 3.1.1, the basic information includes an administrative section, annual rainfall, population, harvested area, and production volume. Main Crops in the target area are selected top ten crops fromthe harvest area and the production volume, respectively.The following are main characteristics in each target area.

√ Regarding the harvested area, Paddy is the largest in each province. Other food crops, soyabeans and estate crops such as coconuts are also ranked high in the statistics data.

√ Regarding the production volume, Paddy, Maize, and Cassava are ranked high in each province. Also, Banana and Mango are high among the other fruits.

√ In West Java, the horticulture crops such as Tomato, Cabbage, and Mushrooms are also actively cultivated. This is because West Java is located near Jakarta.

√ In East Java,Coconuts, Sugarcane, Banana, and Mango are also cultivated a lot

√ East Java is the largest production area of Banana(accounts for 30% ofthe total production) and Mango (account for 40% of the total production) in Indonesia. Also, West Java is third largest

production area of Banana (accounts for 17% of the total production) and Mango (account for 15% of the total production) in Indonesia. Both provinces are active production area of horticulture crops nationwide.

√ In South Sulawesi, the estate crops such as Coconut, Cacao, and Oil Perm are also actively cultivated.

√ In addition, according to "Horticultural statistics 2019", the following points can be given as additional characteristics (Table 3.1.4).

√ Tomato production in West Java Province accounts for 30% of the total production. This is the largest production in Indonesia.

√ Chiliproduction in East Java Province accounts for 25% of the total production. West Java Province is second largest production area in Indonesia. The production volume accounts for 15%. It means 40% out of the total production volume of chili has been cultivated in East Java and West Java Province.

√ East Java is the second largest production area for Shallot. Around 26% out of the production volume has been cultivated in East Java Province.

√ East Java Province is most active to produce of Banana in Indonesia. Around 40% out of the total production has been cultivated in East Java Province. Also, West Java Province is the second largest production area for Banana. Around 15% of Banana has been cultivated in West Java Province.

√ Also, East Java province has the largest production of Mango in Indonesia. Around 30% out of total production has been cultivated in East Java Province. West Java Province has the second largest production, and around 17% of Mango has been cultivated in West Java Province.

Table 3.1.1 Basic Information of the Target Provinces

Contents / Province	West Jawa	East Jawa	South Sulawesi
Number of Kota/Kabupaten (City/ District)	38	20	24
Number of Kecamatan (Sub-District)	666	627	307
No. of Villages	8,501	5,963	3,054
Area (km2)	35,378 km2	47,800 km2	46,718 km2
Population	48,037,000	29,293,000	8,690,000
Population Density (Person/ km2)	1,394	831	189
Annual Rainfall (mm/yr)	2,458mm/yr (Java Islands)	2,458mm/yr (Java Islands)	2,530mm/yr (Sulawesi Islands)
Altitude (m)	Maximum : 3,603m Average : 50m	Maximum : 3,344m Average : 66m	Maximum : 3,362m Average : 187m
Top 10 Agricultural Production (Harvested Area in the 3 years average from 2016-2018/ha)	1. Paddy 2. Maize 3. Coconut 4. Tea 5. Cassava 6. Rubber 7. Soyabeans 8. Clove 9. Coffee 10.Peanuts	1. Paddy 2. Maize 3. Coconut 4. Sugar Cane 5. Soyabeans 6. Peanuts 7. Cassava 8. Coffee 9. Tobacco 10.Mango	1. Paddy 2. Maize 3. Cocoa 4. Coconut 5. Coffee 6. Clove 7. Oil Palm 8. Cashewnut 9. Soyabeans 10.Mushrooms

Top 10 Agricultural Production (volume in the 3 years average from 2016-2018/ton)	1. Paddy 2. Cassava 3. Maize 4. Mushrooms 5. Banana 6. Sweet Potatoes 7. Mango 8. Cabbage 9. Tomatoes 10.Potatoes	1. Paddy 2. Maize 3. Cassava 4. Banana 5. Sugar Cane 6. Orange 7. Mango 8. Mushrooms 9. Coconut 10.Apple	1. Paddy 2. Maize 3. Cassava 4. Banana 5. Coconut 6. Oil Palm 7. Cocoa 8. Shallots 9. Mango 10.Sweet Potatoes

Source : Statistical Yearbook of Indonesia 2018 (BPS, 2018) Database Agricultural Statistics-Ministry of Agriculture Website (Accessed November 2020) Topographic-map.com (Accessed November 2020)JICA F-IDAMS

Table 3.1.2 Harvested Area in the Target Provinces (3 years Average 2016-2018)

Jawa Barat (West Java)			Jawa Timur (East Java)			Sulawesi Selatan (South Sulawesi)		
Order	Crop name	Area(ha)	Order	Crop name	Area(ha)	Order	Crop name	Area(ha)
1	Paddy	2,081,247	1	Paddy	2,281,846	1	Paddy	1,159,016
2	Coconut	321,689	2	Maize	1,247,864	2	Maize	389,382
3	Maize	188,442	3	Coconut	569,607	3	Cocoa	243,436
4	Tea	85,498	4	Sugar Cane	192,400	4	Coconut	210,554
5	Cassava	70,073	5	Soyabeans	157,702	5	Coffee	73,429
6	Rubber	62,463	6	Peanuts	120,413	6	Clove	62,460
7	Soyabeans	41,521	7	Cassava	112,527	7	Oil Palm	60,103
8	Clove	34,776	8	Coffee	105,221	8	Cashewnut	47,025
9	Coffee	33,890	9	Tobacco	81,509	9	Soyabeans	29,070
10	Peanuts	32,382	10	Mango	80,686	10	Mushrooms	29,057
11	Mango	23,805	11	Cocoa	57,948	11	Mungbeans	18,587
12	Sweet Potatoes	21,682	12	Cashewnut	46,018	12	Pepper	17,697
13	Oil Palm	17,357	13	Clove	45,863	13	Peanuts	15,055
14	Sugar Cane	16,486	14	Mungbeans	42,344	14	Cassava	13,586
15	Banana	15,322	15	Shallots	38,279	15	Sugar Cane	13,308
16	Shallots	15,204	16	Rubber	25,403	16	Shallots	10,490
17	Cabbage	13,067	17	Orange	22,860	17	Mango	9,369
18	Mustard Greens	12,977	18	Banana	19,969	18	Rubber	7,935
19	Leeks	12,756	19	Durian	13,846	19	Nutmeg	6,761
20	Potatoes	12,725	20	Rambutan	13,634	20	Sagu	3,854
21	Rambutan	10,662	21	Potatoes	12,462	21	Sweet Potatoes	3,772
22	Tomatoes	9,901	22	Cabbage	10,906	22	Cotton	3,535
23	Tobacco	9,750	23	Jackfruits	10,530	23	Rambutan	3,522
24	Mungbeans	8,655	24	Sweet Potatoes	9,817	24	Tomatoes	3,478
25	Cucumber	8,505	25	Leeks	8,411	25	Swamp Cabbage	3,362
26	Cocoa	8,477	26	Water Melon	8,009	26	Durian	3,085
27	Kidney Beans	8,303	27	Pepper	7,686	27	Lanzon	3,002

28	Nutmeg	8,004	28	Avocado	6,861	28	Cabbage	2,733
29	Carrots	7,851	29	Mustard Greens	5,231	29	Tobacco	2,662
30	String Beans	7,594	30	String Beans	4,769	30	Spinach	2,659

Food Crops Vegetables Fruits Estate Crops

Note : No data for Chili

Source : Database Agricultural Statistics-Ministry of Agriculture Website (Accessed November 2020)

Table 3.1.3 Production Volume in the Target Provinces (3 years average 2016-2018)

Jawa Barat (West Java)			Jawa Timur (East Java)			Sulawesi Selatan (South Sulawesi)		
Order	Crop name	Production (Ton)	Order	Crop name	Production (Ton)	Order	Crop name	Production (Ton)
1	Paddy	12,420,126	1	Paddy	13,347,083	1	Paddy	5,891,243
2	Cassava	1,847,075	2	Maize	6,306,758	2	Maize	2,203,231
3	Maize	1,527,583	3	Cassava	2,916,675	3	Cassava	392,494
4	Mushrooms	1,344,358	4	Banana	1,961,941	4	Banana	156,110
5	Banana	1,152,883	5	Sugar Cane	1,045,631	5	Coconut	118,373
6	Sweet Potatoes	535,540	6	Orange	888,069	6	Oil Palm	109,515
7	Mango	330,035	7	Mango	871,204	7	Cocoa	107,334
8	Cabbage	294,404	8	Mushrooms	631,823	8	Shallots	105,944
9	Tomatoes	281,051	9	Coconut	393,833	9	Mango	101,358
10	Potatoes	277,030	10	Apple	375,990	10	Sweet Potatoes	61,806
11	Pineapple	212,282	11	Shallots	325,956	11	Cabbage	60,963
12	Mustard Greens	203,647	12	Sweet Potatoes	272,727	12	Tomatoes	60,562
13	Leeks	166,474	13	Potatoes	260,714	13	Orange	50,198
14	Shallots	158,718	14	Papaya	246,356	14	Potatoes	45,247
15	Carrots	150,260	15	Soyabeans	237,617	15	Papaya	42,694
16	Cucumber	136,307	16	Cabbage	237,000	16	Sugar Cane	41,617
17	Chayotte	117,438	17	Durian	235,355	17	Soyabeans	39,078
18	Tea	98,615	18	Peanuts	164,571	18	Rambutan	32,760
19	Coconut	96,060	19	Water Melon	125,597	19	Coffee	31,901
20	Papaya	89,612	20	Jackfruits	120,726	20	Durian	30,005
21	String Beans	87,786	21	Rambutan	114,103	21	Carrots	28,277
22	Egg Plant	86,031	22	Pineapple	110,433	22	Jackfruits	27,838
23	Green Beans	80,942	23	Leeks	91,217	23	Mungbeans	26,969
24	Avocado	79,186	24	Salacia	90,949	24	Cashewnut	24,201
25	Rambutan	77,652	25	Avocado	86,317	25	Peanuts	22,786
26	Durian	72,677	26	Ginger	81,106	26	Clove	18,672
27	Soyabeans	70,670	27	Carrots	64,447	27	Leeks	17,066
28	Sugar Cane	67,021	28	Tomatoes	64,354	28	Chayotte	16,010
29	Jackfruits	65,861	29	Coffee	63,568	29	Lanzon	15,945
30	Peanuts	61,062	30	Tobacco	60,817	30	Ginger	14,106

Food Crops Horticulture(Vegetables) Horticulture(Fruits) Estate Crops

Note : No data for Chili

Source : Database Agricultural Statistics-Ministry of Agriculture Website (Accessed November 2020)

Table 3.1.4 Production Volume of Major Horticulture Crops by Provinces

Crop Name	1st		2nd		3rd	
	Name of Province	Share of National Production (%)	Name of Province	Share of National Production (%)	Name of Province	Share of National Production (%)
Tomato	Jawa Barat	27.93%	Sumatera Barat	14.39%	Sumatera Utara	11.62%
Chili	Jawa Timur	24.75%	Jawa Barat	15.16%	Jawa Tengah	12.12%
Shallot	Jawa Tengah	30.49%	Jawa Timur	25.81%	Nusa Tenggara Barat	11.91%
Garlic	Jawa Tengah	40.73%	Nusa Tenggara Barat	34.29%	Jawa Timur	7.81%
Potato	Jawa Timur	24.36%	Jawa Tengah	22.36%	Jawa Barat	18.67%
Banana	Jawa Timur	29.08%	Jawa Barat	16.76%	Lampung	16.61%
Mango	Jawa Timur	40.87%	Jawa Tengah	17.27%	Jawa Barat	14.90%

Source : Horticultural statistics 2019 (BPS,2019)

3.1.2 Important Crops in Indonesian Agricultural Policy

The policy direction of the Ministry of Agriculture (MOA) related to strategic crops is stated in its Mid-Term Strategic Plan (Policy and National Strategy Direction, Strategic Plan 2020-2024). The Strategic Plan states the program to archive the production target value for respective strategic crops between 2020 and 2025.

The following table shows the major strategic crops in the strategic plan. The major strategic crops are selected from food crops (namely Rice, Maize, Soyabeans, and others), horticultural crops (namely Chili, Shallot, Garlic, Mango, Banana, Orange, and others), and estate crops (namely Oil palm, Coconut, Lubber, Sugarcane, Cacao, Coffee, and others) respectively. Especially, some crops are classified as an important cropnamely Rice, Maize, Soyabeans, Chili, Shallot, and Sugarcane in Indonesia.

Table3.1.5 Major Strategic Crops in the Mid-Term Strategic Plan 2020-2024

Category	Major Items
Food Crop	**Rice, Maize, Soyabeans**, Cassava, Sweet Potato
Horticulture	**Chili, Shallot**, Garlic, Mango, Banana, Orange, Durian, Mangosteen
Estate Crop	**Sugarcane**, Oil Palm, Coconut, Rubber, Cacao, Coffee, Cashew nuts, Pepper, Clove, Tea, Tobacco, Cotton

Bold classified as important crop

Source : Agricultural Strategic Plan (2020-2024), Ministry of Agriculture

3.1.3 Impact of COVID-19 on the Agricultural Products

Firstly, the Consultant Team examined an impact of COVID-19 on the agricultural products by the literature survey.The production volume of ricein nationwidein 2020 was 54.64million tons, it was decreased by 7.7%(59.20million tons in total) compared to 2018 and increased by 0.1%(54.60million tons) compared to 2019. The production volume of rice during the COVID-19 pandemic was almost the same as the yearbefore (see Figure 3.1.2).

In each target province, the production volume ofWest Java Province in 2020was9.01 million tons, it was decreased by 6.5% (9.64 million tons) from 2018 and0.8% (9.08 million tons) from 2019. The production volume of East Java Province in 2020 was 9.94 million tons, it was decreased by 2.5% (10.02 million tons) from 2018 and 3.8% (9.58 million tons) from 2019. Also, the production volume ofSouth Sulawesi Province in 2020 was 4.70 million tons, it was decreased by 20.9% (9.64 million tons) from 2018 and - 6.8% (4.70 million tons) from 2019, respectively.

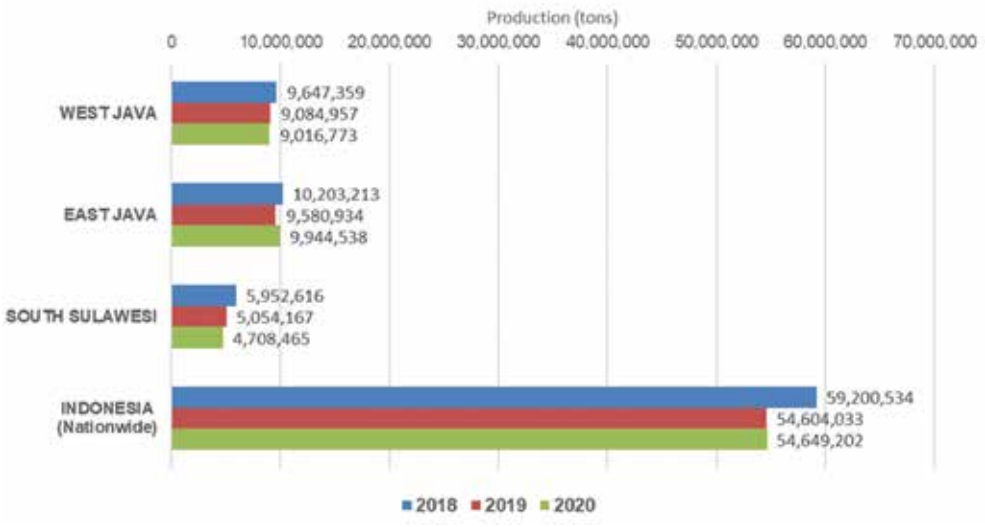


Figure 3.1.2 Production Volume of Ricein Indonesia (2018-2020)

Source:JICA Consultant Team based on BPS - Statistics Indonesia website (Accessed June 2021)

By end of Q2 2020 and early Q3 2020, the prices of strategic cropsthat significantly increased earlier in the year, namely Garlic, Sugar, and Shallots, have declined due to improved availability (it is shown in Figure 3.1.3 and Figure 3.1.4)[1] .The situation of COVID-19 and Ramadan season are indicated in the figures also.The PSBB was announced and implemented in April 2020, and restriction of movement and office closure stated after the announcement of the PSBB. Economic activities reopened in June 2020, and the price fluctuationwas slowly improved.

In addition, the comparison of the market price between 2019 and 2020 is shown in Figure 3.1.5 (a line graph in the Figure). The horticulture crop might be more affected by COVID-19 than preservable foods such as rice. Furthermore, price difference of horticulture crop is large between harvesting period and off-cropping season.

The market price of rice is broadly flat and stable. On the other hand, WFP and the website of newspaper mentioned that the demand for poultry contributed to low the market price of Maize[2, 3, 4].

The Mung bean and Peanuts prices drastically increased and kept the high price after April 2020. The one of the reasons for price increase of Mung bean is that the international rice has been risen due to surge in demand for Mung bean in India[5] .

The Shallot pricesdescribes similar curve both 2019 and 2020. However, the market price drastically increased by 40% from April to June compared with the same month of last year. The trigger for significant price increase is the crop failure and decline the production volume due to the floods at the end of

1 WFP (2020) Indonesia COVID-19: Economic and Food Security Implications (3rd Edition
2 WFP (2020)Indonesia COVID-19: Economic and Food Security Implications (3rd Edition)
The demand for chicken was declined due to the closure of hotels and restaurants in the early stages of the COVID-19 pandemic. After that, the demand increased around May 2020, which is the holiday after Ramadan, but the supply could not catch up due to the labor shortage of poultry farms due to movement restrictions, etc., and the price rose, and it is gradually stabilizing.
3 https://katadata.co.id/ekarina/berita/5e9a41c884448/penjualan-ayam-anjlok-40-imbas-corona-peternak-terancam-gulung-tikar
4 https://ekonomi.bisnis.com/read/20200511/12/1239121/ada-psbb-permintaan-pakan-ternak-menyusut
5 https://www.mdn.gov.mm/en/bean-price-jumps-three-year-record-high

February 2020 in some areas.Also, the difficulties of production supply due to COVID-19 contributed to the price increase.

Most of the Garlic is imported from overseas to Indonesia. For example, 90% out of 47tons of Garlic is imported from China in 2019[6]. Therefore, the price of Garlic significantly increased by two-foldin February compared with the same month of last year. This is due to the COVID-19 pandemic in China from the beginning of 2020.The Ministry of Agriculture issued a recommendation letter for product import of Garlicin April 2020, and the Government announced the resumption of Garlic import[7].

Lastly, Chili is classified into Red Chiliand Cayenne Pepper[8] by the statistical data. The major harvesting season for Chili is between May and June, but it became an oversupply due to decline consumer's buying power caused by the COVID-19 pandemic. Therefore, the price of Chili has declined[9, 10, 11]. The ministry of Agriculture considered to provide the financial support to Chili producers as a temporary measure[12].

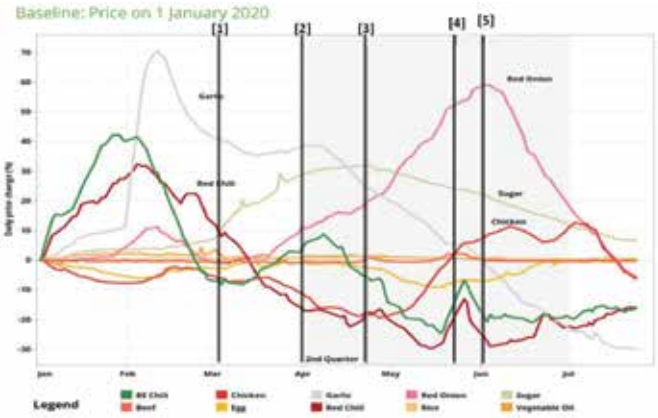


Figure3.1.3 Fluctuation of Food Price in Indonesia-1 (January-July, 2020)

Note [1] COVID-19 confirmed in Indonesia, [2] Start of PSBB, [3] Start of Ramadan Season, [4] Eid Al Fitr, [5] Reopening Economic Activities

Source: WFP(2020)revised by JICA Consultant Team

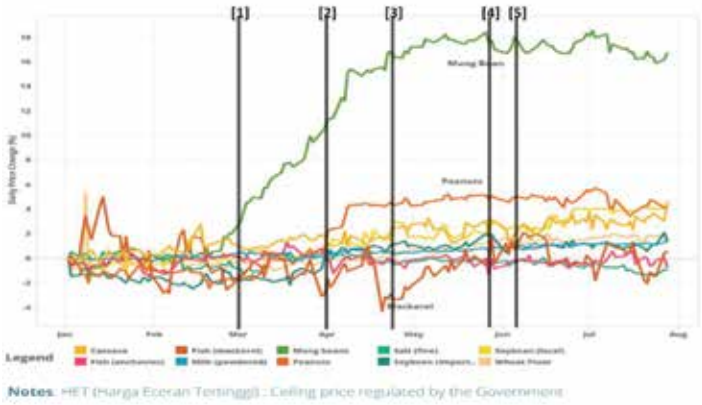


Figure3.1.4Fluctuation of Food Price in Indonesia-2 (January-July, 2020)

Note : [1] COVID-19 confirmed in Indonesia, [2] Start of PSBB, [3] Start of Ramadan Season, [4] Eid Al Fitr,[5]Reopening Economic Activities

Source: WFP(2020)revised by JICA ConsultantTeam

6 Horticultural statistics 2019 (BPS,2019)
7 https://katadata.co.id/febrinaiskana/berita/5e9a495d22f04/pasokan-bawang-putih-menipis-kementan-terbitkan-rekomendasi-impor
8 https://hargapangan.id/informasi/faq
9 https://surabaya.bisnis.com/read/20200604/532/1248611/panen-cabai-petani-jatim-kurang-terserap-saat-pandemi-covid-19
10 https://www.republika.id/posts/6729/petani-diminta-tunda-jual-cabai
11 https://www.cnbcindonesia.com/news/20200713142524-4-172266/harga-cabai-cabaian-tak-biasanya-naik-tipis-ada-apa/2
12 https://www.republika.id/posts/6729/petani-diminta-tunda-jual-cabai

Figure 3.1.5 Market Price(2019-2021.6)and Production Volume (2019) of Rice, Shallot, Garlic and Chili

Source : Website of PIHPS National, Paddy Harvested Area and Production in Indonesia 2019 (BPS,2019)
Horticultural statistics 2019 (BPS,2019)

3.1.4 Target Crops of Other JICA Projects/Surveys

Table 3.1.6 shows past/present JICA projects and surveysrelated to FVC in Indonesia.The target crops in respective project/ survey are selected namely Rice, Chili, Tomato, Kidney Bean, Potato, Carrot, Guava, Strawberries, and others.

Table 3.1.6 Related JICA Project/Survey on FVC in Indonesia

Target Crops / Commodities	Project Name	Scheme	Implementation Period
Rice	The Project on Formulation of Irrigation Development and Management Strategy for Food Security	Technical Cooperation Project in the form of Development Study	On-going

Vegetables	SDGs Business Model Formulation Survey with the Private Sector for the Establishment of Production and Marketing System for Scientifically assured High Quality Vegetables through Introducing the Soil Improvement Method by Ripened Compost in Indonesia	Public-Private Partnerships	Until May 2020
Vegetables, Fruits	Public-Private-Partnership Project for the Improvement of the Agriculture Product Marketing and Distribution System	Technical Cooperation Project	Until March 2020
Strawberries	Feasibility Survey for the Sixth Industrialization on the Growing Districts through Developing High-Qualified Strawberries' Virus-Free Plants	Public-Private Partnerships	Until August 2018
Vegetables, Fruits	Feasibility Survey for Agricultural Production, Distribution and Sales		
Improvement System Contributing to Small Farmers' Income and Food			
Safety	Public-Private Partnerships	Until April 2018	
Rice	Collaboration program with the private sector for disseminating Japanese technology for high value-added rice production in Indonesia	Public-Private Partnerships	Until April 2017

Source : JICA Consultant Team

3.1.5 Selection of the Target Crops

Based on statistics data, agricultural policies which indicate strategic crops and the market environment under the COVID-19 pandemic, five target cropswere selected for the filed survey as shown in Table 3.1.7. The target crops include not only rice but also other food crops, horticulture crops, and estate crops in respective target area.

The FVCs for Rice is examined in all target provinces. Also,other food crops i.e., Cassava in West Java, Maize in West Java and South Sulawesi are also selected as target crops. The reasons for its selection were based on the harvested area and yield data from statistical survey, and they are positioned as strategic crops in the current medium-term plan formulated by the Ministry of Agriculture.

As well as food crops, the horticultural crops were selected, and the production share by the provinces was also considered for the crop selection especially for West Java and East Java. In addition, the ConsultantTeam considered that the horticulture crops might be more affected COVID-19 than preservable foods such as rice.

Thus, following horticulture crops selected as target crops in each province, i.e.,Cabbage and Tomato in West Java, Chili, and Mango in East Java, also Shallot and Banana in South Sulawesi. Cabbage and Tomato have high production volume in West Java. Also, East Java has highest production volume for Chili and Mango in Indonesia. Statistical data and strategy crops in the mid-term plan by the MOA are referred for the crop selection of horticulture in South Sulawesi.

The crop selection of estate crops followed the same criteria as the food crops. Following estate crops namely Coconuts in West Java, Sugarcane in East Java, Oil Perm in South Sulawesi are selected as target crops. In South Sulawesi, Coconut has highest harvested area in the statistical data. However, Oil Perm has been selected as target crop, because to know the impact of COVID-19 for several crops, boasting the highest production volume in the world. The Project Team conduct the field survey to reveal the impact of COVI-19 on target crop's FVC in the target provinces.

Table 3.1.7 Target Crop Selection (5 Crops in Each Provinces)

Target Area	(5 crops)
West Java	Rice, Cassava, Cabbage, Tomato, Coconut
East Java	Rice, Maize, Mango, Chili, Sugarcane
South Sulawesi	Rice, Maize, Banana, Shallots, Oil Perm

Source : JICA Consultant Team

3.2 Questionnaire Survey Identifying Bottlenecks along Food Value Chain

3.2.1 Outline of Questionnaire Survey

Questionnaire Surveyregarding the impact of COVID-19 was conducted in the middle of January in the targeted three provinces: West Java, East Java, and South Sulawesi. The survey wasconducted by project staffs and agricultural extension officers, based on interview style using questionnaire formats. The interviews were conducted to the following value chain actors: farmers, agricultural input suppliers, traders, and processors etc.

Table 3.2.1 shows the number of respondents in each targeted area.There are 270 respondents in total for this questionnaire survey.A series of interviews were taken place in in the main production areas of the targeted crops coordinating with the agricultural bureaus of each Province.In addition, major agricultural stakeholders in the target value chains were selected as interview respondents through discussions with agricultural officers in each Province.

The survey wasconducted by face-to-face interviews with taking measures against infectious diseasesi.e.,gathering with small number of peopleoutsidesor in a well-ventilated room, keeping2 meters distance as much as possible, wearing masks and disinfect, etc.

Table 3.2.1 Targeted Number of Each Segment

West Java Province																							
No	Target crops	Location	Input Supplier			Farmer			Processor			Trader / Distributors			Retailer			Super market	Restaurant	Consumers			
			M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	T	T	M	F	T	
1.	Rice	Kabupaten Karawang	3	0	3	5	1	6	1	2	3	3	0	3	2	1	3	3	3	2	3	5	
2.	Cassava	KabupatenSukabumi	3	0	3	6	0	6	3	0	3	2	0	2	2	1	3						
3.	Cabbage	Kabupaten Bandung	3	0	3	5	1	6	1	2	3	3	1	4	2	1	3						
4.	Tomato	Kabupaten Garut	3	0	3	5	1	6	2	1	3	3	0	3	2	1	3						
5.	Coconut	Kabupaten Pangandaran	3	0	3	6	0	6	3	0	3	3	0	3	3	0	3						
Total Respondents			15	0	15	27	3	30	10	5	15	14	1	15	11	4	15	3	3	2	3	5	101

West Java Province																							
No	Target crops	Location	Input Supplier			Farmer			Processor			Trader / Distributors			Retailer				Super market	Restaurant	Consumers			
			M	F	T	M	F	T	M	F	T	M	F	T	M	F	U	T	T	T	M	F	T	
1	Rice	KabupatenNgawi	3	0	3	7	0	7	3	0	3	3	0	3	0	3	0	3	3	3	2	3	5	
2	Maize	KabupatenTuban	3	0	3	6	0	6	2	1	3	2	1	3	1	2	0	3						
3	Mango	KabupatenProbolinggo	3	0	3	6	0	6	0	3	3	2	1	3	3	0	0	3						
4	Chili	KabupatenTuban	3	0	3	6	0	6	3	0	3	3	0	3	1	1	1	3						
5	Sugarcane	Kabupaten Malang	3	0	3	6	0	6	3	0	3	1	2	3	0	3	0	3						
Total Respondents			15	0	15	31	0	31	11	4	15	11	4	15	5	9	1	15	3	3	2	3	5	102

South Sulawesi Province																							
No	Target crops	Location	Input Supplier			Farmer			Processor			Trader / Distributors			Retailer			Super market	Restaurant	Consumers			
			M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	T	T	M	F	T	
1	Rice	Kabupaten Bone	2	0	2	4	0	4	2	0	2	2	0	2	1	1	2	2	2	2	2	4	
2	Maize	Kabupaten Jeneponto	2	0	2	4	0	4	0	2	2	2	0	2	2	0	2						
3	Shallot	Kabupaten Pinrang	1	1	2	4	0	4	0	2	2	1	0	1	0	2	2						
4	Banana	Kabupaten Enrekang	1	1	2	4	0	4	0	2	2	1	1	2	0	2	2						
5	Oil Palm	Kabupaten Luwu Utara	2	0	2	4	0	4	0	2	2	2	0	2	1	1	1						
Total Respondents			8	2	10	20	0	20	2	8	10	8	1	9	4	6	10	2	2	2	2	4	67

Note : M = Male, F = Female, U = Unknown, T = Total

Source : JICA Consultant Team

Photo:Questionnaire survey on fields

Source : JICA Consultant Team

3.2.2 Affected Period of COVID-19 on Management Activities

The interview was also conducted to reveal the period with the greatest impact on management activities by COVID-19, between January and December 2020.The result is shown in Figure3.2.1,and it shows that many respondents were concentrated from March to August 2020.Especially March and April were most affected periods. From March to April, the first infected person in Indonesia was confirmed in early March and after that, various infectious disease countermeasures including large-scale social restrictions (PSBB) measures such as strict movement restrictions and sales / operation restrictions were taken nationwide. It is thought that the PSBB have had a lot of influence on the agricultural sector.

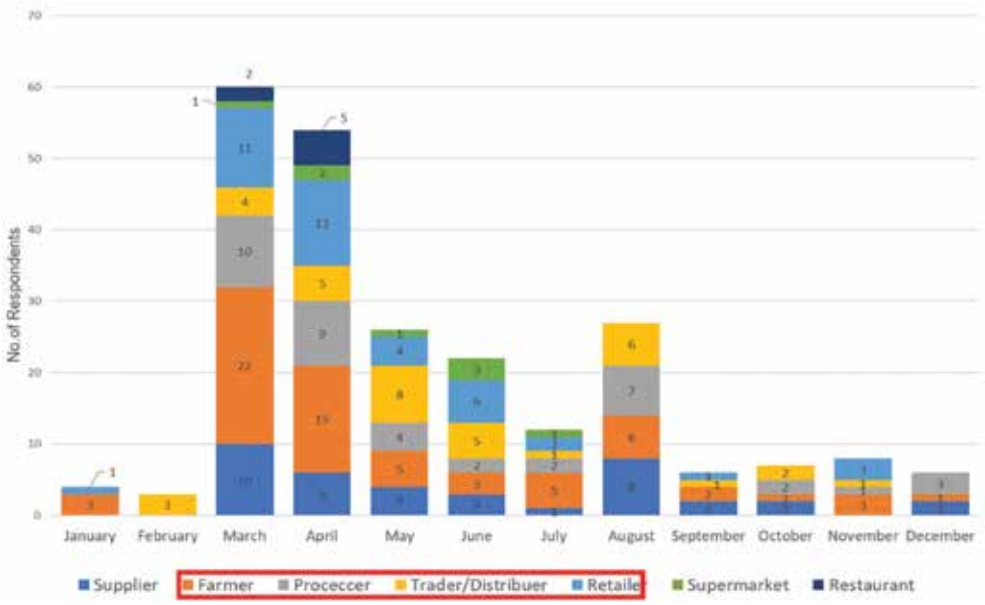


Figure 3.2.1 The most Affected Period of COVID-19

(Questionnaire Survey)

Source : JICA Consultant Team

The PSBB have been gradually eased since around June 2020, and economic activities have resumed. However, in some areas, restrictions are beingtightened and eased repeatedly depending on the infection situation. For example, the percentage of respondents who answered that August was the most affected is smaller compared to May to July according to Figure 3.2.1. This result came from respondents in East Java. It is related to the strengthening of various restriction measures by local governments since the number of infected people in East Java exceeded that of the capital Jakarta in August. For this reason, some respondents, especially in East Java said that impact would continue until December 2020.

In addition, regarding notable points for each segment on the value chain, it has been pointed out that some supermarket and restaurants continue to shorten business hours regardless of the PSBB. Although restrictions have been lifted, their business environment is still harsh conditions.

3.2.3 Concerned Points about COVID-19

In addition to hearing about the impact of the COVID-19 at each stage of the value chain, the Consultant Teamalso asked about what kind of concerns the respondents have in this situation.The respondents were askedhowthey are feeling about the effects of COVID-19 with the choice of (1) Risk of infection of COVID-19, (2) Financial impact such as decreased revenue and unemployment, and (3) Phycological effect due to quarantine and movement restrictions, and psychological depression.

As shown in Figure 3.2.2, the largest number of respondents answered they were concerned about the variousfinancial impact of COVID-19, and the parentage of respondents of this impact was 90 % including both answers that they worried very much and to some extent.Next,the risk of infection of COVID-19 was concerned by many respondents and its percentage was 80% including both answers that they worried very much and to some extent.

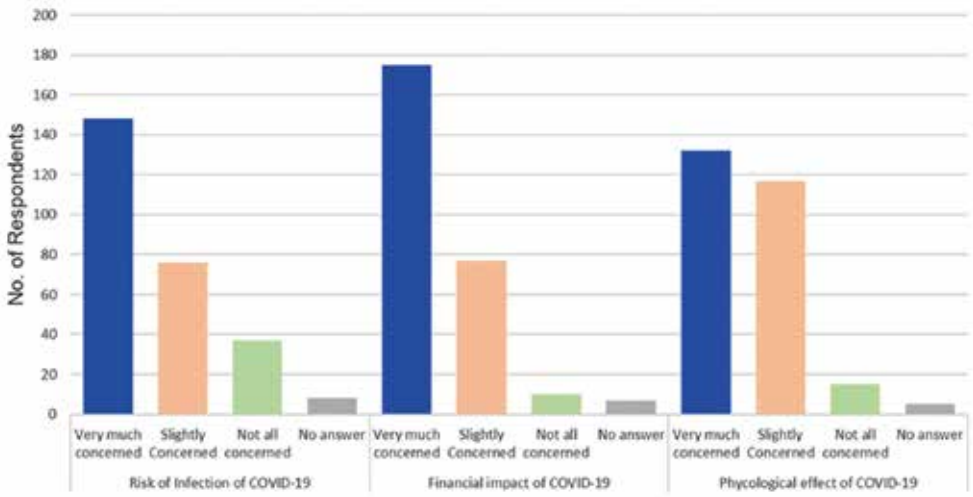


Figure3.2.2 Concerned points about COVID-19(Questionnaire Survey)

Source : JICA Consultant Team

3.2.4 Impact of the COVID-19 Pandemic on Each Value Chain Stage

In questionnaire survey, the respondents were answeredthe impact of COVID-19 for each targeted cropwith the choice of “Significantly Impacting”, “Slightly Impacting”, and “Not Impacting”. Figure3.2.3 shows mainresults in each category of target crop namely Food crop, Horticulture crop (fruits), Horticulture crop (vegetables), and Estate crop in each segment.

Many respondents answered that they were significantly affected by “Decrease the profitof product/ service”, “Spike in production/operation cost”, “Decrease volume of products traded / service provided due to restriction of movement”, “Decreasing the price of product (Seen from the seller)”, “Lack of labours due to the restriction of movement”, “Worsening financial condition affected by each impact”, “Limited access to Financial Support”, “Limited access to agricultural inputs, raw materials” etc.

The abovementioned events have occurred due to the measures taken for COVID-19 such as movement restrictions and restrictions on business and operating hours.It is thought that these effects are related to each other, for example, a decrease in profit was in part by an increase in cost, a decrease in price of productions and services, and a decrease in handling volume.

The main effects of COVID-19 are summarized below for each stage in the agricultural value chain.

Input Supplier Stage

√ At the input stage, many respondents said thatthere was a large impact of"Decrease the profit of product/ service", "Decrease volume of products traded/ service provided due to restriction of movement" on food crops, horticulture crops, and estate crops.

√ There was also the answer of the larger impact of "Waste & Loss due to closure of sales market/ processing facilities". Regarding this, many respondents said that this was mainly due to an increase in unsold products due to a decrease in trader or retailerresulting bydistribution stagnation caused by market closure and movement restrictions.

Production Stage

√ At the production stage, there were more respondents who answered there was large impact of "Decrease the profit of product/ service" on every crop category. Following comments were raised by respondents as main reasons of this matter: 1) most farmers usually have buyers come to their farmlands to sell agricultural products, but due to movement restrictionsit became difficult, and 2) decrease in sales volume because of the increase of price of materials andlabor fee.

√ Many respondents said that compared with food crops and estate crops, horticulture crops (vegetable) were most got the impact of "Decrease the profit of product/ service", In addition to the above reasons, this is thought to be caused bythe situation that most commodities weredisposed since horticulture crops (vegetable) is more difficult to be arrange the timing of selling because they are not preserved well under the situation of price fluctuation and movement restrictions.

√ In addition, there were a certain number of respondents who got the impact of"Limited access to agricultural inputs, raw materials"and it was also reported that there was an impact on cultivation aspect because it became to be difficult toprocure materials under the movement restrictions. In particular, some respondents said that it was difficult to obtain fertilizers subsidized by the government.

√ There were a certain number of respondents who got the impact of "Lack of labor" especially in horticulture crops (vegetable) and estate crops. It was pointed out that this is due to restrictions on the movement of people, making it difficult to secure a labor force from outside of the region, restriction of working hours, and increment of wages. It is thought that these effects were seen in vegetable cultivationwhich has a labor-intensive aspect, and in estate crop cultivation which is based on large-scale production.

√ Regarding "Lack of labor", it was pointed out that in South Sulawesi, labor shortages occurred when rice was transplanted due to restrictions on gatherings due to measures against infectious diseases. In other words, in addition to the lack of labor due to restriction of movements, it is also affected collaborative activities that were carried out on a village unit basis, such as rice planting, due to assembly restrictions.

Processing Stage

√ At the processing stage, there were more respondents who answered there was large impact of "Decrease the profit of product/ service", "Decrease volume of products traded / service provided due to reduce of demand", and "Lack of market/ buyer/ customer"

√ Most of the respondents were small businesses. Although some processors sold their products to retailers, many of them operated their businesses by selling them directly to consumers. For such small processors, there was many answers that the number of customers decreased due to the effects of movement restrictions, market closures, and the decline in consumer purchasing power, resulting in a significant decrease in sales volume and in a decrease in profits.

Distribution Stage

√ At trade phase, there were more respondents who answered there was large impact of “Decrease the profit of product/ service”,“Decrease volume of products traded / service provided due to movement restricts and reduce of demand", and “Lack of market/ buyer/ customer" on each type of crops. Many respondents said that the number of customers decreased due to infection prevention measures such as movement restrictions, and decline in purchasing power of consumers, and the closure of the market, resulting in decrease in profit.

√ In addition to the above, some respondents said that changes in consumer lifestyles and an increase in online food purchases were also related to a decrease in lack of market.

√ It was pointed out that the there was also the impact of “Lack of labor”. In addition to the answer that it became difficult to pay wages to workers due to the decline in profits, there was also the answer that it became difficult to arrange drivers due to movement restrictions etc., and as a result, the handling volume decreased.

√ For horticulture crop (vegetable), some respondents said that there was the impact of “Increase in waste and loss"by above-mentioned situation.

RetailStage

√ At the retail stage, questionnaire surveys were conducted at traditional retailers, supermarkets, and restaurants. The results are showed in Figure 3.2.4 which summarized separately with other segment because of difference of questioncontents.

√ There was more respondents who answered that there was more impact of “Decrease the profit of product/ service", “Worsening financial conditionbecause of decrease in revenue", “Waste & Loss due to closure of sales market/ processing facilities", and “Business suspension and shorten business hours due to PSBB"onretailers, supermarkets, and supermarkets, respectively.

√ It was pointed out that it became difficult to pay wages to employees in each business category due to the deterioration of business conditions and a decrease in profits. In addition, some respondents said that it was difficult to access government support and loans from financial institutions and such a situation is worsening financial condition.As the reasons for this, some points were risen that 1)budget was diverted to COVID-19 measures andbudget for support for agriculture (ex. subsidy for fertilizer) has decreased, 2) banks became reluctant (selective) to finance to avoid risk due to COVID-19, 3) the condition for getting a loan have become stricter.

Note: The numerical values in the figure represent the ratio of the number of respondents to the total number of respondents for each segment and each target crop.

Figure 3.2.3Impact on management activities of COVID-19 (Questionnaire Survey)

Source: JICA ConsultantTeam

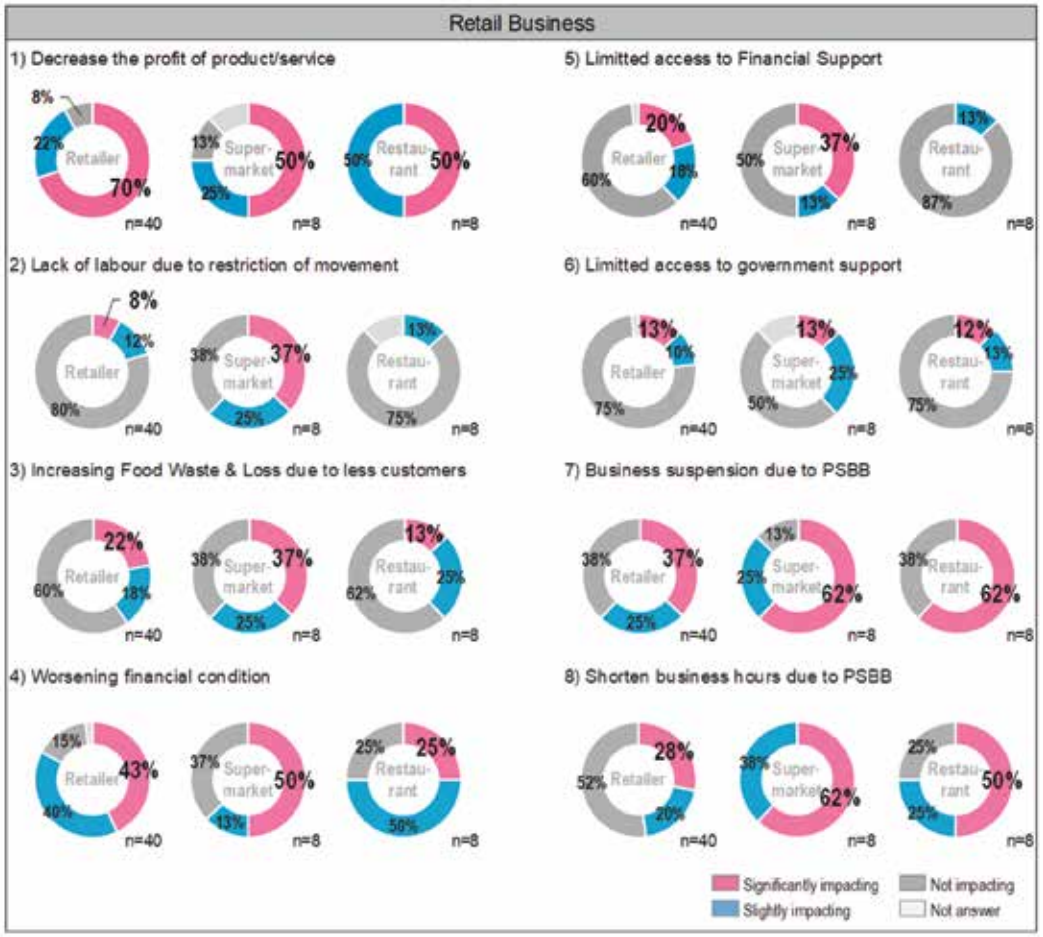


Figure 3.2.4 Impact on management activities of COVID-19 in the retail business

(from the Questionnaire Survey)

Source: JICA Consultant Team

3.2.5 COVID-19 Impact on Consumersand Behavioral Changes

In the questionnaire survey, it was also askedconsumers about the impact of the COVID-19 pandemic on households and changes in their behaviors. The results of the answers are showed in Figures 3.2.8 to 3.2.17, focusing on the points related to food.First, as shown in Figure 3.2.8 and 3.2.9, most respondents said that their lifestyle changes due to prevention measures of COVID-19.Specially, some respondents answered that there were changes mainly in eating habit, working environment, hygienic environment, social activities, and purchasing behavior.

Regarding household income, some respondents answered that their income increased, but 70 % of the respondents said that their income decreased (Figure3.2.10 and Figure3.2.11). In addition, about 80% of the respondents answered that household expenses increased (Figure 3.2.12). Regarding the increase in expense, it has been particularly pointed out that spending on telecommunication, food costs, fuel and light, and daily necessities has increased (Figure 3.2.13). On the other hand, some respondents said that their expense decreased, mainly for social expenses and entertainment (Figure 3.2.14).

Focusing on food purchasing behavior, before COVID-19, they purchased food mainly at physical store, but considering movement restrictions and infection prevention, they purchase food by online in addition to physical stores[13]. In addition, for online purchasing, there was answer that they use online services such as Shopee, Grabfood, Grabmart, Gofood, Courier, Gojek etc.

13 Respondents who purchase food at physical stores: decreased to 7 respondents from 10 respondents among 14respondents, Respondents who purchase either by online or at physical store: increased to 7 respondents from 3 respondents among 14respondents. (See Figure 3.2.15)

Due to the COVID-19 pandemic, changes which are generally pointed out have been seen in eating habits. For example, an increase in opportunity of cooking athome, (13 answers / 14 respondents), a decrease in opportunity of eating outside (4 answers / 14 respondents), and an increase in opportunities to buyprepared meal (9 answers / 14 people) (Figure 3.2.16). In this way, consumers' lifestyle and purchasing style are changing by COVID-19, and this situation should be kept in mind when considering measurement on the value chain corresponding to the situation of the COVID-19.

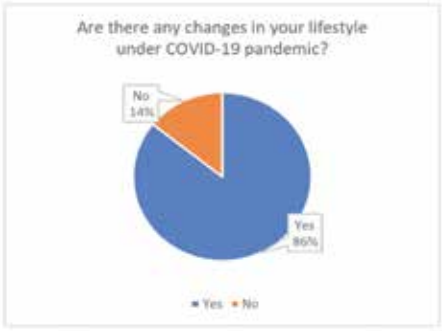


Figure 3.2.5Lifestyle changes due to COVID-19 -Regarding the presence or absence of change (Questionnaire Survey)

Source: JICA Consultant Team

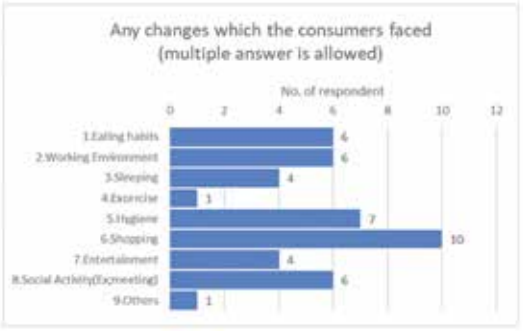


Figure 3.2.6 Lifestyle changes due to COVID-19 -About specific changes (Questionnaire Survey)

Source: JICA Consultant Team

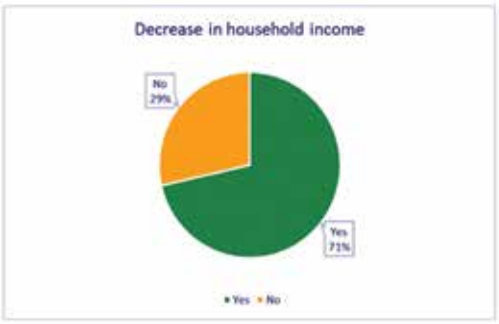


Figure 3.2.7 Changes in household income due to COVID-19 – About decrease in income (Questionnaire Survey)

Source: JICA Consultant Team

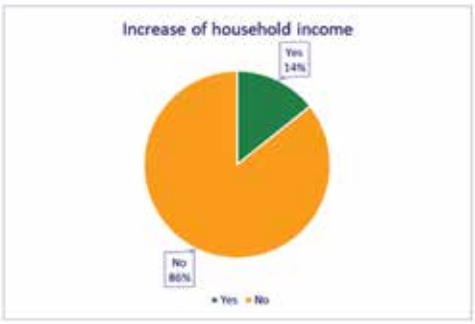


Figure 3.2.8 Changes in household income due to COVID-19-About increase income (Questionnaire Survey)

Source: JICA Consultant Team

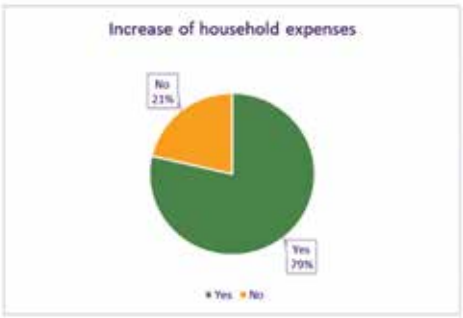


Figure 3.2.9 Changes in household expense due to COVID-19-About increase of expense (Questionnaire Survey)

Source: JICA Consultant Team

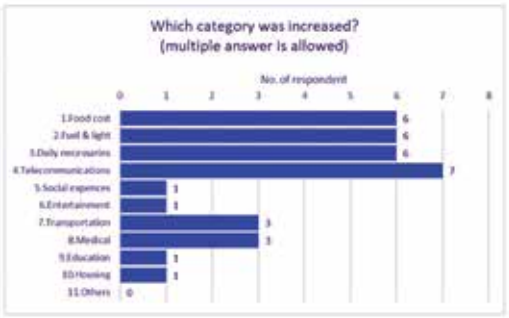


Figure 3.2.10 Changes in household expense due to COVID-19- About items for increase in expenditure(Questionnaire Survey)

Source: JICA Consultant Team

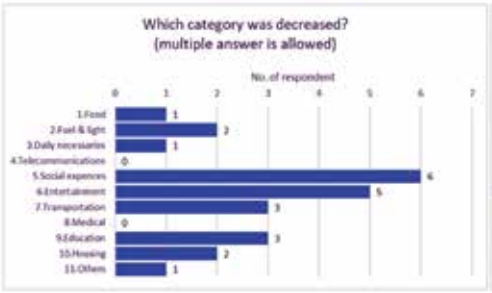


Figure 3.2.11 Changes in household income due to COVID-19-About items for decrease in expenditure (Questionnaire Survey)

Source: JICA Consultant Team

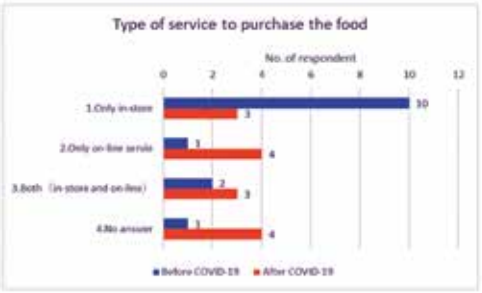


Figure 3.2.12 Changes inpurchasing behavior due to COVID-19 About type of service (Questionnaire Survey)

Source: JICA Consultant Team

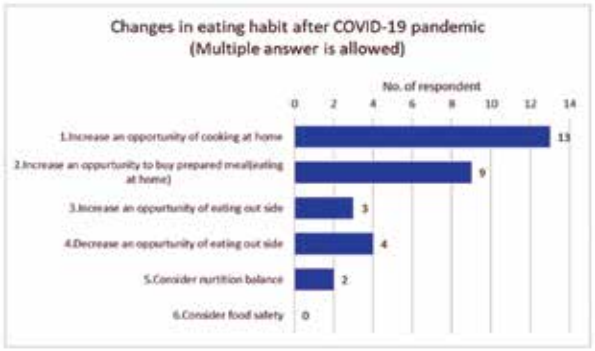


Figure 3.2.13 Changes in eating habit due to COVID-19 (Questionnaire Survey)

Source: JICA Consultant Team

3.2.6 Changes in FVC before COVID-19 and after/with COVID-19

The Consultant Team conducted the hearing not only the impact during COVID-19 pandemic also the challenges before COVID-19 to the related stakeholders.The answers are classified “Pointed out since before COVID-19 and after COVID-19 pandemic (It is shown by Orange in Table 3.2.17)”, “Pointed out since before COVID-19 and there is no change significantly (It is shown by Blue in Table 3.2.17)”, “Newly pointed out after COVID-19 pandemic (It is shown by Pink in Table 3.2.17)” in Table 3.2.17.

The results indicated the challenged for “Lack of Labors”, “Lack of Market/ Buyers”, “Difficulty of access to the market/buyers”and “High production/ operational cost” since before the COVID-19 in some crops and areas. However, those challenges became tangible during the COVID-19 pandemic in the results of survey. Furthermore, this trend was notable in the upstream than downstream of FVC due to the restriction of movement.

The most of respondent answered“Lack of Financial Support”was occurred since before the COVID-19 pandemic or during the COVID-19 pandemic. In addition, “Competition with others” and “Price competition, Price fluctuation” were also indicated since before COVID-19, but the coemption is getting stiffer related to price fluctuation during COVID-19 pandemic situation. On the other hand, “Lack of successors” and “Low Quality Management” is indicated and there was nosignificantly change in COVID-19 pandemic.

According to the results by province, the input stage in West Java,"Competition with Others"was indicated as the one of the challengesthat has been indicated since before COVID-19, and it becamenotable during the COVID-19 pandemic situation."Price competition and Price Fluctuation" is also in the same circumstance, particularly the input and production stages.

In South Sulawesi Province, "High production/ operational cost"was indicated as the new challengesafter COVID-19 pandemic situation.Only few challenges before and after COVID-19 has been pointed out in this survey in East Java.However, the higher COVID-19 cases reported than Jakartain East Javaat times. On the other hand, the local government implemented a prevention measures, and the respondents answered apart of the questionnaire such as the impact of COVID-19, hence the respondents in East Java would face the similar situation to other two provinces.

Figure 3.2.14 Challenges on each segment of FVC before / after COVID-19 from the results of Questionnaire Survey

Source : JICA Consultant Team

3.3 Value Chain Map by Target Crop Showing COVID-19 Impacts and Bottlenecks

3.3.1 Value Chain Map for Target Crops (before and after COVID-19)

The Consultant Teamcompiled the value chain map for respective target crops and examined the circumstances before and after COVID-19 based on the results of questionnaire survey. The value chain map of type crops such as food crops, horticulture crops and estate cropsshow from Figure 3.3.1 to 3.3.4 (see the value chain map of respective target crops in Appendix).The following points are indicated from each value chain map.

1) There were no significantchanges in main customers and sales method in each crop and segment before and after COVID-19 situation.
2) Some horticulture crops (vegetables) are distributed not only within the province also Jakarta. However, the most of target crops are basically distributed within the province. Also, the prevention

measures such as restriction of movement has been impacted on FVC, butthere was no significantly changes in the main customers before and after COVID-19.

3) The concerned person in supermarket answered that increased in frequency to communicate with customers and tradersusing by the smartphone application such as Happy Fresh after COVID-19 pandemic.On the other hand, the retailers in the traditional market channelsalmost never utilize the ICT tools.
4) There were more respondents who answered that theaverage production/ handling volume has been affected. For example, the handling volume was decreased by less than 50% compared with before COVID-19 pandemic.
5) Regarding the sales price, there were more respondents who answered that has been affected. Particularly, horticulture crops (vegetables) affected relatively large impact than other type of crops in each stage.
6) Regarding the production volume, the respondents answered that there are no significantly changes before and after COVID-19 pandemic except for horticulture crop (vegetables). The respondents who cultivated the vegetables answered that the production volume was decreased compared with before COVID-19 pandemic except for Chili.
7) In processing stage, most of respondents are answered that their business is small scale and sell the product to customer directly. There are more respondents who answered that their profit and handling volume were decreased due to decliningthe number of customers.
8) In addition, the respondents answered that there are no big differences for distribution channel compared with before and after COVID-19 pandemic in processing stage.
9) Regarding the transportation means, Truck and motorbike are used in most cases. In production stage, the traders cometo farmers place and purchase the product basically. The respondents also answered that there are no differences for transportation means compared with before and after COVID-19.

As the result, there are more respondents who answered that the number of customers and handling volume has been decreased due to prevention measures such as restriction of movement. On the other hand, the respondents answered there was no change in a mode of trading compared with before and after COVID-19.It means they continued the same way of business during the COVID-19 pandemic in most cases.

Food Crops

		Input Suppliers	Farmers	Processors	Wholesalers/ Distributors	Retailers
Stakeholders		• Input suppliers	• Farmers	• Processors	• Trader, Wholesalers	• Retailer, Supermarket, Restaurant
Who ? ・Names	Before	• Individual Farmers • Retailers	• Traders/Middleman • Individual Consumers • Factories • Processors • Millers (Rice) • Others	• Consumers(direct selling) • Traders • Small shops • Restaurant	• Retailers • Other traders/wholesalers • Processors • Consumers(direct selling)	• Consumers
	After	No big changes	No big changes	No big changes	No big changes	No big changes
Where ? ・Location	Before	• Within Province	• Within Province	• Within Province	• Within Province	• Within Province
	After	No big changes	No big changes	No big changes	No big changes	No big changes
What ? ・Form of products	Before	• Seed/Seedlings • Fertilizers • Chemical	• Rice, Cassava, Maize (Several varieties)	• Processed food • Rice(Milled) • Maize (Grain) • Cassava(Tapioca Flour)	• Rice(Milled) • Maize • Cassava	• Rice(Milled) • Maize • Cassava • Indonesian food
	After	• Difficult to obtain the fertilizers	No big changes	No big changes	No big changes	No big changes
How ? ・Means of Transportation ・Way of Communication	Before	N/A	• Trader came to farmer's place to collect the products • Car • Truck • Talk directly/ by telephone to customers • Collect the market information from traders/ neighbor farmers	N/A	• Big/ Small truck (own/ hired) • Moterbike • Retailers come to pick up the products	• Moterbike • Small truck • Public transportation
	After	N/A	No big changes	N/A	No big changes	• Moterbike • Small truck • Public transportation • Using the smartphone application for communication with traders/customers
Value? (Selling price- an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	Rice: No big changes Other food crop: Slightly decrease in farmgate price	No Rice: No big changes Other food crop: Slightly decrease in Selling price	No Rice: No big changes Other food crop: Slightly decrease in Selling price	No Rice: No big changes Other food crop: Slightly decrease in Selling price
Value? (Volume-an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	No big changes	• Decrease in sales volume up to 1/5 than usual. • Not decrease in sales volume but it takes more time to sell than before (Processing food from rice)	• Decrease in handling volume up to 1/5 than usual.	• Decrease in handling volume up to 1/3 than usual.

Figure 3.3.1 Value Chain Map Before/ After COVID-19: Food Crops

Source : JICA Consultant Team

Horticulture Crops (Fruits)

		Input Suppliers	Farmers	Processors	Wholesalers/ Distributors	Retailers
Stakeholders		• Input suppliers	• Farmers	• Processors	• Trader, Wholesalers	• Retailer, Supermarket, Restaurant
Who ? ・Names	Before	• Farmers • Retailers	• Traders/Middleman • Retailers • Processors	• Small shops(retailers) • Consumers (direct selling)	• Other middleman/ traders • Consumers(direct selling) • Others	Consumers
	After	No big changes	No big changes	No big changes	No big changes	No big changes
Where ? ・Location	Before	• Within Province	• Within Province	• Within Province	• Within Province	• Within Province
	After	No big changes	No big changes	No big changes	No big changes	No big changes
What ? ・Form of products	Before	• Seed/Seedlings • Fertilizers • Chemical	• Mango Banana (Several varieties)	• Mango juice • Banana chips	• Mango Banana • Processing food	• Mango Banana
	After	No big changes	No big changes	No big changes	No big changes	No big changes
How ? ・Means of Transportation ・Way of Communication	Before	N/A	• Trader came to farmer's place to collect the products • Car • Truck • Talk directly/ by telephone to customers • Collect the market information from traders/ neighbor farmers	N/A	• Small truck (own/hired) • Moterbike	• Car • Moterbike
	After	N/A	No big changes	N/A	No big changes	• Car • Moterbike • Using the smartphone application for communication with traders/customers
Value? (Selling price- an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	No big changes	No big changes	No big changes	No big changes
Value? (Volume-an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	No big changes	• Decrease in production volume and sales volume up to up to 30% than before	No big changes	• Decrease in handling volume up to 50% than before (Retailers) • No big changes (supermarket)

Figure 3.3.2 Value Chain Map Before/ After COVID-19: Horticulture Crops (Fruits)

Source : JICA Consultant Team

Horticulture Crops (Vegetables)

		Input Suppliers	Farmers	Processors	Wholesalers/ Distributors	Retailers
Stakeholders		• Input suppliers	• Farmers	• Processors	• Trader, Wholesalers	• Retailer, Supermarket, Restaurant
Who ? · Names	Before	• Farmers • Retailers	• Middleman/ Traders • Retailers • Consumers	• Consumers (direct selling)	• Retailers • Processors • Consumers (selling directly)	• Consumers
	After	No big changes	No big changes	No big changes	No big changes	No big changes
Where ? · Location	Before	• Within Province	• Within Province	• Within Province	• Within Province • Jakarta (Tomato from West Java)	• Within Province
	After	No big changes	No big changes	No big changes	No big changes	No big changes
What ? · Form of products	Before	• Seed/Seedlings • Fertilizers • Chemicals	• Tomato, Cabbage, Chili, Shallot(Several varieties)	• Processed food (e.g. Juice, Sauce, Fried snack, and others)	• Tomato, Cabbage, Chili, Shallot	• Tomato, Cabbage, Chili, Shallot
	After	No big changes	No big changes	No big changes	No big changes	No big changes
How ? · Means of Transportation · Way of Communication	Before	N/A	• Trader came to farmer's place to collect the products • Car • Truck • Motorbike • Talk directly/ by telephone to customers • Collect the market information from traders/ neighbor farmers	N/A	• Big truck (hired) • Small truck (own/hired) • Motorbike	• Big truck • Motorbike
	After	N/A	No big changes	N/A	No big changes	• Big truck • Motorbike • Using the smartphone application for communication with traders/customers
Value? (Selling price- an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	• Decrease in farmgate price up to 1/5 than before (except for Chili)	• Slightly decrease in selling price of products or no big changes	• Decrease in selling price (except for Shallot) • Increase in selling price (Shallot)	• Decrease in selling price (except for Shallot) • Increase in selling price (Shallot)
Value? (Volume-an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	• Decrease in production volume up to 1/3 (except for chili) • No big changes (Chili)	• Decrease in production & sales volume up to 50% than before	• Decrease in handling volume more than 50% than before*1 *2	• Decrease in handling volume more than 50% than before*3

*1 Trader of Shallot mentioned the handling volume decreased around 40%-70% than before.
*2 Trader of Tomato mentioned the handling volume decreased up to 1/3 than before.
*3 Retailer of shallot mentioned the handling volume decreased up to 1/10 than before.

Figure 3.3.3 Value Chain Map Before/ After COVID-19: Horticulture Crops (Vegetables)

Source : JICA Consultant Team

Estate Crops

		Input Suppliers	Farmers	Processors	Wholesalers/ Distributors	Retailers
Stakeholders		• Input suppliers	• Farmers	• Processors	• Trader, Wholesalers	• Retailer, Supermarket, Restaurant
Who ? · Names	Before	• Farmers • Retailers	• Factories • Middleman/Traders • Retailers	• Consumers (direct selling) • Companies	• Processors (factory) • Other traders/ middleman • Consumers (direct selling) • Retailers	• Consumers
	After	No big changes	No big changes	No big changes	No big changes	No big changes
Where ? · Location	Before	• Within Province	• Within Province	• Within Province	• Within Province	• Within Province
	After	No big changes	No big changes	No big changes	No big changes	No big changes
What ? · Form of products	Before	• Seed/Seedlings • Fertilizer • Chemical	• Coconut, Sugarcane, Oil Palm(Several varieties)	• Oil (Coconut, Oil Palm) • Juice (sugarcane) • Others (Product from coconut peel)	• Coconut, Sugar, Palm Oil	• Coconut, Sugar, Palm Oil
	After	No big changes	No big changes	No big changes	No big changes	No big changes
How ? · Means of Transportation · Way of Communication	Before	N/A	• Trader came to farmer's place to collect the products • Talk directly/ by telephone to customers • Collect the market information from traders	N/A	• Big Truck (Own) • Small Truck (Own) • Motorbike	• Car • Small Truck (hired) • Motorbike
	After	N/A	No big changes	N/A	No big changes	• Less communication with traders (Oil palm) • Traders couldn't come due to social restriction(Oil palm)
Value? (Selling price- an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	No big changes	No big changes	• Decrease in selling price up to 50% than before (Coconut) • No big changes (Sugar, Palm oil)	• Slightly decrease in selling price (Coconut) • No big changes (Sugar) • Slightly increase in selling price (Palm oil)
Value? (Volume-an example)	Before	N/A	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix	Details are shown in Appendix
	After	N/A	• No big changes (Sugarcane, Oil Palm) • N/A (Sugarcane)	• No big changes • Decrease in Handling volume up to 30% than before (sugarcane)	• Decrease in Handling volume up to 1/3	• Decrease in Handling volume up to 1/4

Figure 3.3.4 Value Chain Map Before/ After COVID-19: Estate Crops

Source : JICA Consultant Team

3.3.2 Challenges on FVC under COVID-19 Pandemic

The respondent's answer of impact of COVID-19 is classified by “Significantly Impacting” and “Slightly Impacting”. Also, the contents are categorized by management resources namely people, goods. money, and information/ communication (see Figure 3.3.5- 3.3.8) .Also, the major impact of COVID-19 on FVC rearranged based on each category of crop and management resources, it is shown in Figure 3.3.9.

Impact of “People”

√ The respondents answered that almost all the stages except for input stages of horticulture crophave been affected by decreased number of customer due to restriction of movement and limited access to the market.

√ In market stage, the number of customer was decreased in all the crop type's FVC due to prevention measures of COVID-19 such as restriction of movement, market closure, suspension/ shorten of business hours and others. Particularly, the respondents who worked in traditional trades channel such as small retail shops

Impact of “Goods”

√ The respondents answered that the agri-inputs were difficult to obtain in proper timing due to prevention measures of COVID-19, and sales volume of inputs were also declined due to decrease in farmer's purchasing power in input stage of each crop category.

√ Many respondents who handled the horticulture crops (vegetables) mentioned about increment of waste/ loss especially in production, distribution, and market stage.

√ In production stage, the respondents answered that someagir-inputs such as fertilizers and seeds were difficult to obtain in proper timing, and the sale volume was declined due to decrease in consumer's purchasing power and demand in each crop category.

√ Some respondents who cultivate the horticulture cropanswered that not only the sales volume but also the production area was declined during the COVID-19 pandemic. It is predicted that some farmers faced difficulty to maintain the same production area as before COVID-19 pandemic due to the demand decrease andlabor shortage.

√ In processing stage, declining of production and sales volume of processing product due to restriction of movement, decrease in consumer's purchasing power, and others was mentioned from the respondents in each crop category.

√ The respondents of the distribution stage also answered that the handling volume was declined due to restriction of movement and decrease in consumer's purchasing power in each crop category.

√ In market stage, the respondents also answered that the sales volume was declined due to decreasing in number of customers by the prevention measures of COVID-19 such as restriction of movement and market closure. Especially, the retailers who are running business in traditional market, they have affected the impact significantly due to the market closure.

√ In addition, the consumers answered that their lifestyle has been changed during the COVID-19 pandemic. For example, the opportunity of self-cooking at home was increased than before. As well as the eating habit, the purchasing behavior of foods has also been changed such as increase in food purchase through on-line service. The most of retailers who engaged in traditional has not responded such consumers demand yet. This is the one of the reasons for declining number of customers for their business.

Impact of "Money"

√ Declining of profit was mentioned from the respondents in each stage and crop category. The respondents answered that the reason of profit decline is due tosale opportunity loss, decrease in purchasing power of customers, spike in the costs, and others.

√ The farmers faced a stringent of operating funds due to tighter lending condition and risk aversion by the bank.

√ The consumers answered that a living expense including food cost was increased during COVID-19 pandemic. It predicts that it is one of the reasonsfordeclining of consumer's purchasing power.

√ **Impact of Information/ Communication**

√ The respondents in production stagewho cultivate vegetables and estate crop mostly answered that they faced limited access to extension service and market information due to prevention measures of COVID-19 such as restriction of movement and social activities.

√ The consumers answered that they increased in opportunity to purchase the food through on-line service. On the other hand, a part of farmers mentioned that they do not have smartphone device or do not know how to use on-line shopping service. Therefore, they face the difficulty of access to on-line service to utilize for their business.

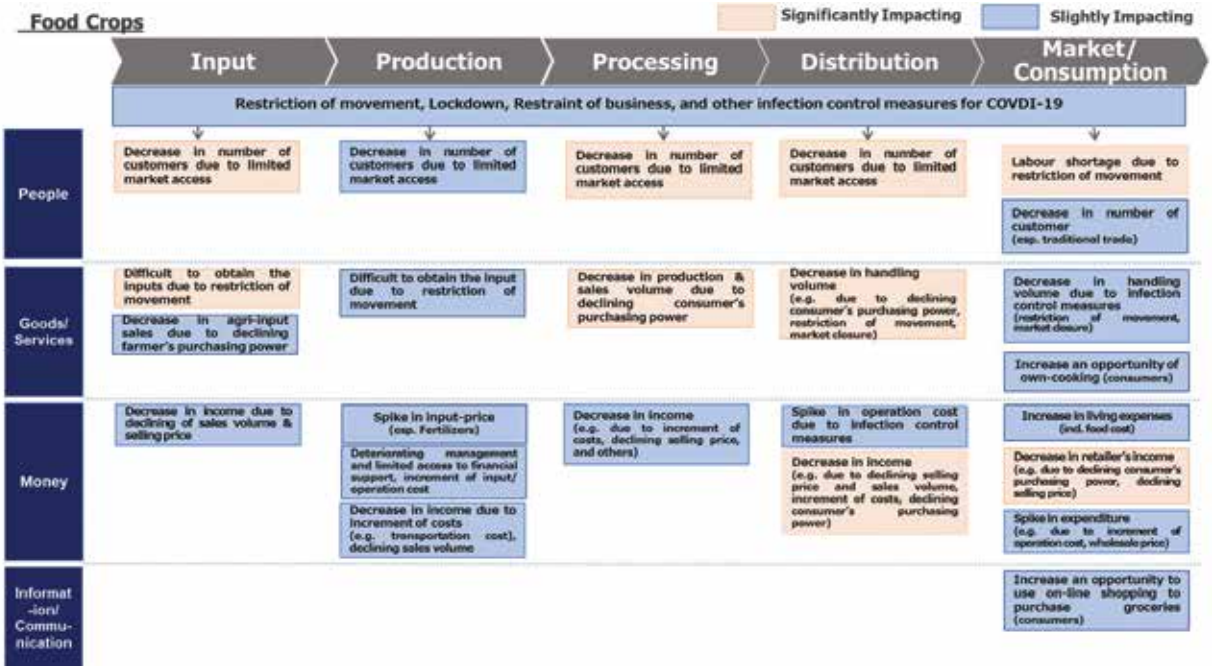


Figure 3.3.5 Major Impact of COVID-19 on FVC: Food crops

Source : JICA Consultant Team

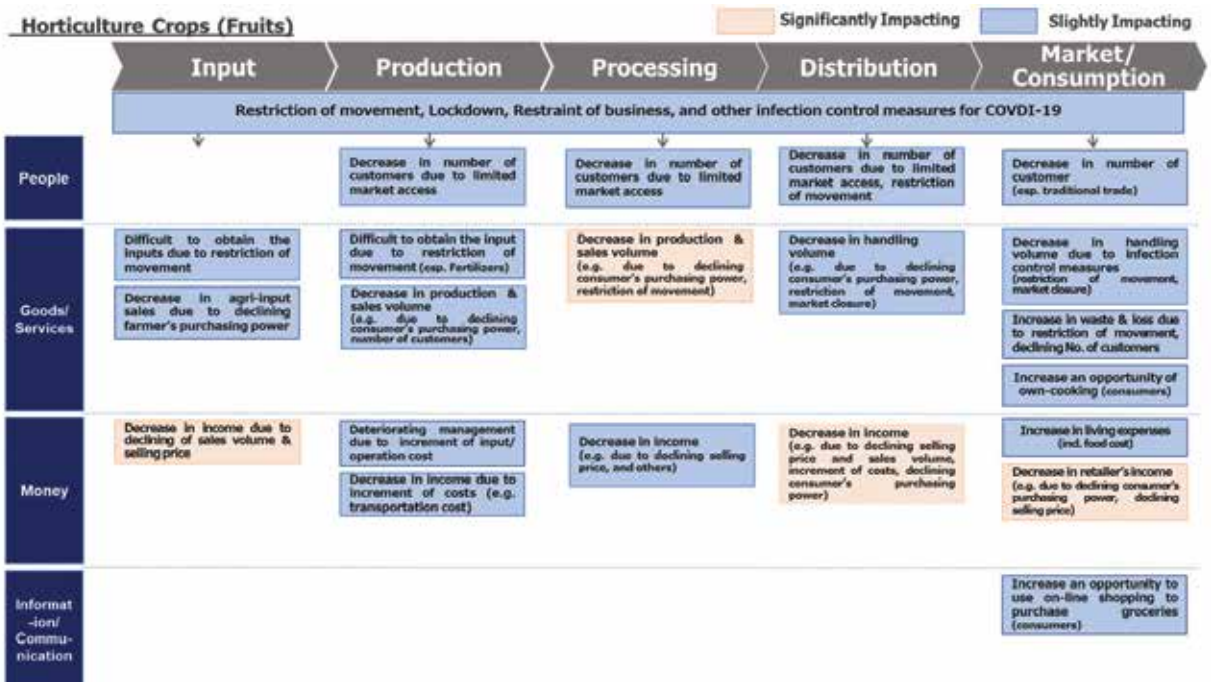


Figure 3.3.6 Major Impact of COVID-19 on FVC : Horticulture crops (Fruits)

Source : JICA Consultant Team

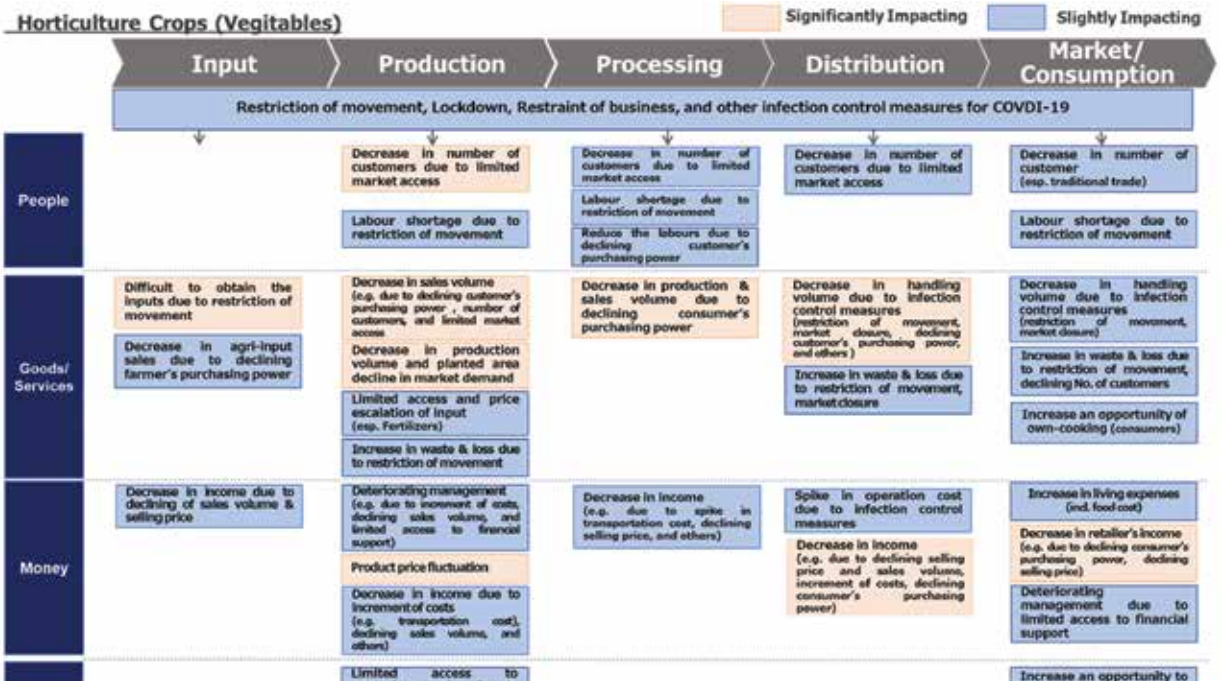


Figure 3.3.7 Major Impact of COVID-19 on FVC: Horticulture crops (Vegetables)

Source : JICA Consultant Team

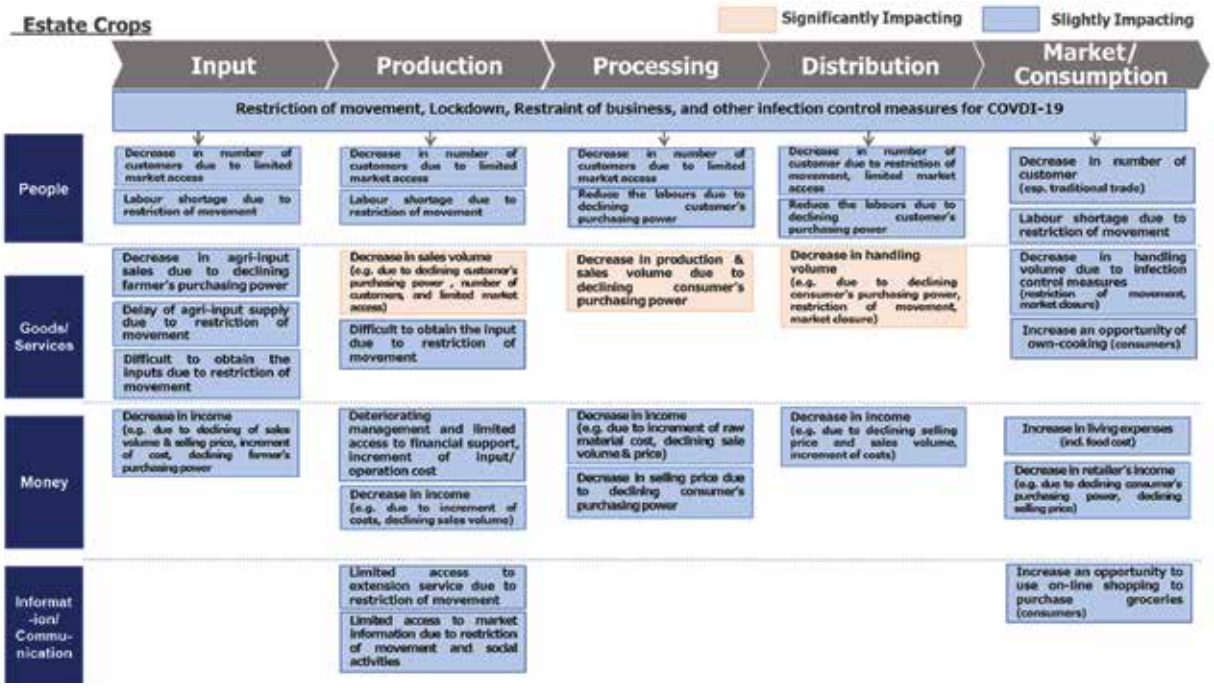


Figure 3.3.8 Major Impact of COVID-19 on FVC: Horticulture crops (Estate Crops)

Source : JICA Consultant Team

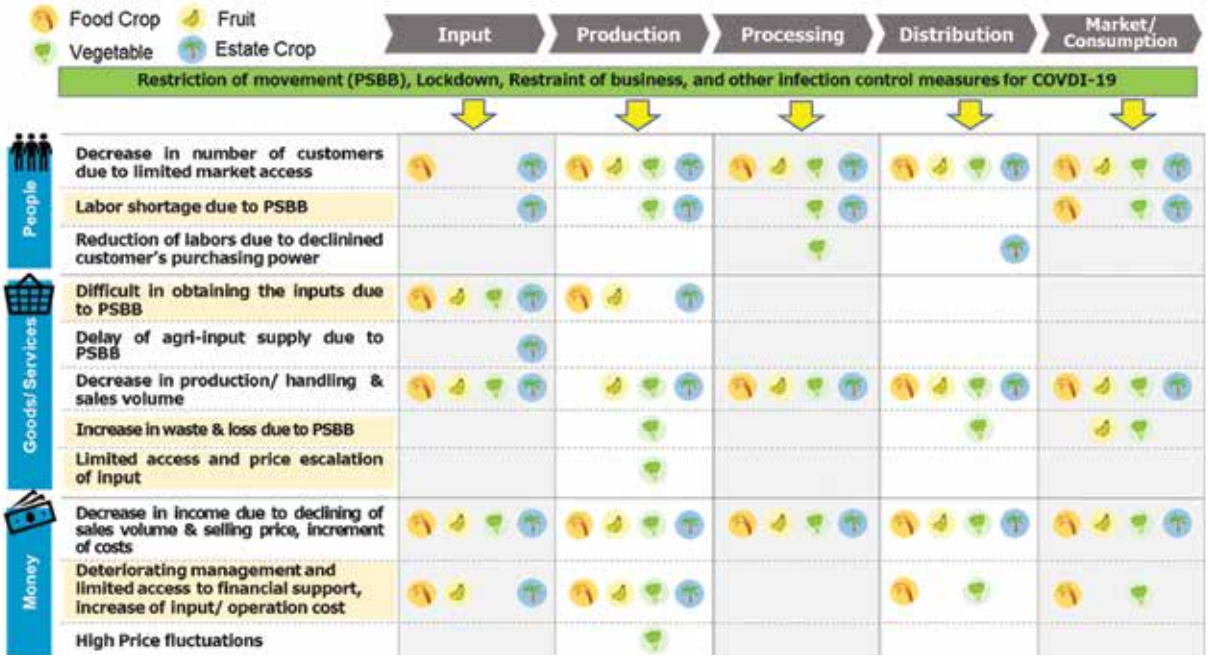


Figure 3.3.9 Major Impacts of COVID-19 on FVC (Summarized)

Source : JICA Consultant Team

CHAPTER 4 PROPOSED PILOT PROJECTS

4.1 Deduction of Survey Results and Formulate Pilot Projects

4.1.1 Deduction of Survey Results

COVID-19 has led to disruptions of supply chain and changes in consumers lifestyle, which have been by restriction of movement, suspension of business activities. Consequently, those prevention measures had an impact on declining income and deterioration of business condition for the farmers and person concerned on the FVCs.

In addition, the lifestyle of consumers has been changed such as increased in using on-line shopping and delivery service. Economic activities also have been changed due to changes in consumer's lifestyle. In agriculture sector, FVC with/after COVID-19 need to consider responding to such changes.

As a result of survey, the FVC in the target area has been affected by COVID-19 pandemic, but there was not drastically changed and continued business activities through existing value chain. Figure 4.1.1 shows issues/ challenges and expected countermeasures for COVID-19 on FVC based on the survey result.

The issues/ challenges by countermeasures of COVID-19 are classifiedinto five such as improvement of business condition, secure a stable access/supply, creation of sales opportunities, reduction of waste and loss, respond to consumer's behavior change, i.e., using ICT tools and others.

The ConsultantTeam stated in upper part of Figure 4.1.1, the prevention measures of COVID-19 have influence on business situation such as deterioration of business, declining of profit for related persons on FVC. In addition, some other impact has been occurred in each FVC stages,i.e., difficulty to obtain agri-inputs (especially the fertilizers with subsidy) due to restriction movement in input stage, labor shortage and increment of waste and loss associated with sales opportunity loss in production stage, sales opportunity loss and deterioration of business in processing stage, and increment of waste and loss associated with sales opportunity loss in distribution stage.

As well as other FVC stages, the market stage faced same challenges. Especially, the retailers who engaged in traditional trade could not operate physically due to the market closure and others. In these circumstances, the lifestyle and purchasing behavior of consumers has been slightly changed during the COVID-19 pandemic, i.e., an opportunity of purchasing the foods using on-line service is increased.

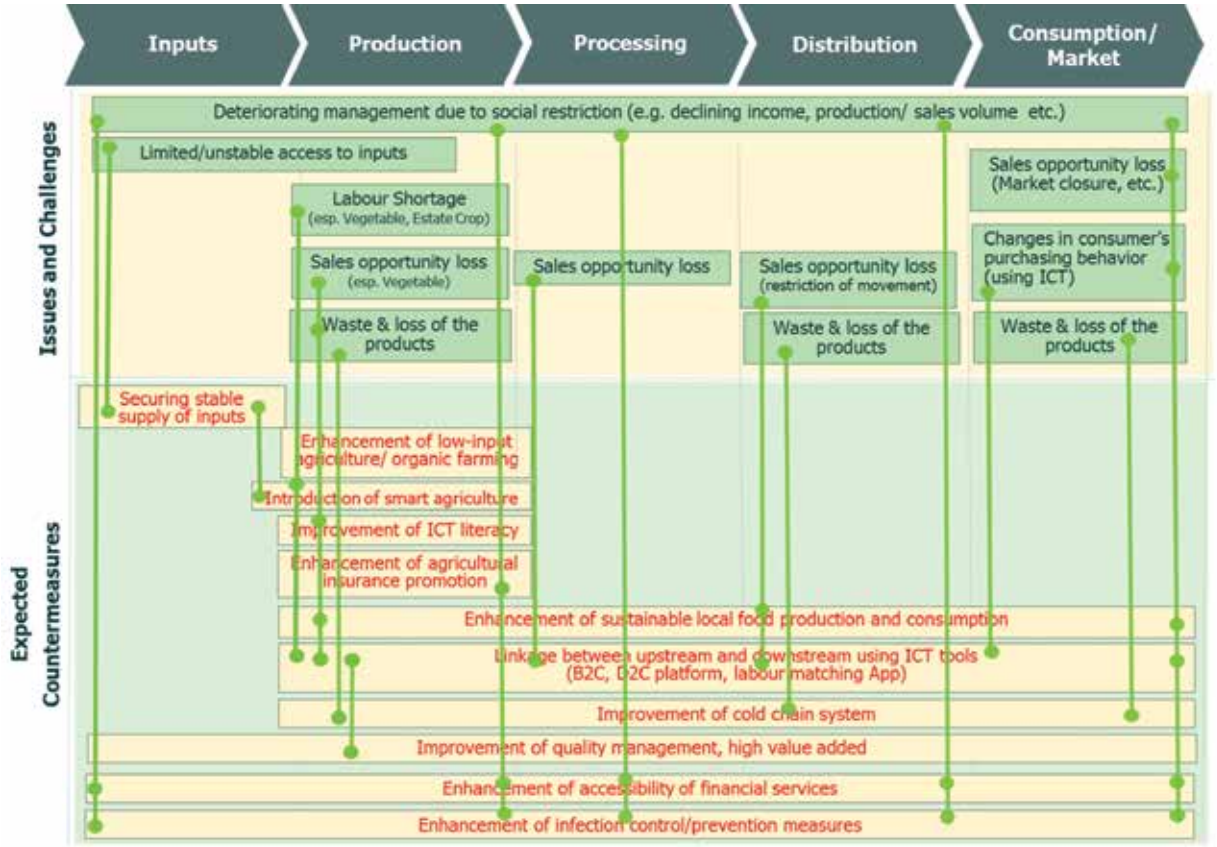


Figure 4.1.1 Issues/Challenges and Expected Countermeasures for COVID-19 on FVC

Source : JICA ConsultantTeam

4.1.2 Implications and Recommendationsand Concepts of Piot Projects

Expected countermeasures for strengthening of FVC under the COVID-19 pandemic are shown in the below part of Figure 4.1.1. Also, the relevance between issues/challenges and expected countermeasures are shown by the green line. As a prerequisite, enhancement of infection control such as had washing,mask-wearing, keep the social distance and others. A concrete measureshould be conducted based on basic infection controlrespectively or as cross-sectorial activity.

Regarding the unstable supply of input materials at the input stage and production stage, it is conceivable to develop a material supply system utilizing ICT for stable supply of input materials. At the production stage, in order to introduce agricultural technology to cope with the difficulty in obtaining input materials and to improve the excessive application of chemical fertilizers and pesticides, promotion of low input farming methods and organic farming, i.e.,Applying compost in vegetable cultivation, etc.) is also considered as countermeasures.

Regarding the labor shortage due to movement restrictions, smart agriculture technology such as using drone, sensor for monitoring of farmland can be considered as one of the ideas. On the other hand, in the tourism sector, which is greatly affected by COVID-19, it has been pointed out that there is a surplus of human resources because of temporary closures, etc. It is also conceivable to develop and promote the matching applications that connect with diverse labor personnelbeyond the sector.

At the consumer level, the purchasing behavior is changed in increased use of online services for grocery purchases. From the perspective of responding to such situations and building new sales channels, development of an EC platform that connects producers with consumers and sales companies can be

considered as one of the countermeasures. Such movements are also being promoted by the companies in Indonesia, and it is expected that system construction and operation in collaboration with such private companies will be useful.

On the other hand, the questionnaire survey also pointed out that few farmers have smartphones and they have limited access to such online services. Therefore, in order to promote the spread of online services, it is necessary to improvean accessibility of ICT and literacyof farmers also.

In the production stage, distribution, and market stage, it was pointed out that waste and loss increased. as one of the solutions, it is necessary to build a system that can maintain the freshness of food such as the improvement of cold chains. In addition to implementing such countermeasures, it is also necessary to consider restructuring the value chain in response to situations such as supply chain disruption caused by the COVID-19 pandemic. For example, it is conceivable to consider restructuring the value chain that enables local production for local consumption that is completed within the region such as a state or local unit.

Considering an additional government support to improve the limited access to financial services is also necessary, because the deteriorating of management is also pointed out from the respondents in each stage of the value chain. Also, limited access to financial services have been pointed out especially at the production stage, so it is necessary to. In addition to natural disasters such as drought, the business situation of farmers becomes unstable due to the influence of COVID-19, so measures such as further promotion of agricultural insurance can be considered to strengthen the resilience of farmers.

4.2 Proposed Pilot Projects

Based on the survey results, the pilot project (draft) for FVC support during and after the COVID-19 pandemic is shown below.

Project No.1

Project Title	Improvement of supply chain using e-commerce platform for mid/small scale farmers										
Target Groups	Small and medium-scale farmers, buyers (retailers, restaurants, hotels, café, school, hospital, processing companies, etc..,)										
Implementing Agency	BAPPENAS, Ministry of Agriculture										
Potential Collaborators	International Donors (ADB, WB, JICA, and others), Service Provider of e-commerce service (e.g.,Tokopedia, Tanihub,)										
Objectives: To diversify the sales channels that coordinate supply and demand at a certain scale using existing e-commerce platform.											
Rationale: Due to the disruption of distribution, both small and medium-scale farmers and buyers faced difficulties to access the agricultural product market. It increased in food loss and decreased in their profits as a result. Also, it is difficult for small and medium-scale farmers and buyers with small capital to take their own distribution improvement measures. In addition, under the COVID-19 pandemic, consumers are increasingly purchasing food products using online services, and consumer needs are also changing. Therefore, it is necessary to diversify the distribution channels and customers while utilizing existing online services.											
Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	5 years										

Expected Outputs	Development Indicators
√ Farmers' income is secured. √ Supply Chain is strengthened √ Farmers' IT literacy is improved. √ Number of sales channels is increased	√ Farmers' income is kept more than 80% compare with before the COVID-19 pandemic. √ Small/Medium scale farmers can utilize the online platform service. √ IT literacy of target farmers are improved. √ Utilization rate of smartphone/ smartphone application is increased. √ Quality of agriculture products are improved. √ Sales channel for Small/Medium Scale Farmers and traders are developed.
Major Activities with the Expected Outputs	Expected Sources
√ Training of farmers and extension officers to utilize the smartphone and application software. √ Needs assessment and situation analysis are conducted. √ Consideration of possibility of existing e-commerce plat form/ services. √ Training of farmers and extension officers for post-harvesting techniques.	MoA, other relevant government offices, Donors. Private Companies

Project No.2

Project Title	Enhancement of smart agriculture to resolve labor shortages through field operations using, e.g., drones for mid/ small scale farmers										
Target Groups	Farmers who faced labour shortage problem, Extension Officers										
Implementing Agency	BAPPENAS, Ministry of Agriculture										
Potential Collaborators	International Donors (ADB, WB, JICA,and others) Private Companies for ICT										
Objectives: To solve the labor shortage for farming activities and improve the productivity of farming											
Rationale Shortage of farm labor in the peak season is pointed out due to the measures of COVID-19 such as restriction of movement. Therefore, drones and other smart technologies will be utilized for the purpose of labor saving and efficient work by mechanization of agricultural activities. Introduction of drone will be not only possible to respond to labor shortages, but also enable to identify areas where the insufficient of fertilizer application, and appearance of pest and diseases. The recording of farming information and management information management using applications will be promoted for quality improvement of agricultural products. In addition, the drone will be owned and managed at the extension station, and the extension staff will play a central role in providing services to farmers. The operation of the drone will be carried out after receiving the training.										
Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	3 years										

Expected Outputs	Development Indicators
√ Labor shortage for farming is solved. √ Farmers' IT literacy is improved. √ Agriculture productivity is improved. √ Models of smart farming is developed	√ Smart agriculture technologies are utilized more than 30% of target farmers area. √ IT literacy of target farmers/extension officers are improved. √ Appropriate fertilizer application amount and pesticide amount are utilized in the field. √ Productivity of farming is improved than before
Major Activities with the Expected Outputs	Expected Sources
√ Priority areas are identified. √ Training of farmers and extension officers √ Needs assessment and situation analysis are conducted. √ Linkage between smart technology and farming practice √ Introduction of new agricultural and management practices to farmers/ extension officers in the target area	MoA, Donors, other relevant government offices, Private Companies

Project No.3

Project Title	Promotion and dissemination of low input sustainable farming for horticulture crops										
Target Groups	Vegetable/ Fruit cultivation farmers										
Implementing Agency	BAPPENAS, Ministry of Agriculture										
Potential Collaborators	International Donors (ADB, WB, JICA, and others), NGOs										
Objectives:To promote sustainable farming and cope with the difficulty of procurement of input materials											
Rationale: Due todisruption of distribution channel caused by COVID-19, the farm activities have been affected such as of insufficient/ unstable supply of agricultural materials, especially fertilizer. In addition to such unstable distribution conditions, it has been pointed out that excessive application of pesticides due to lack of knowledge of farmers since before the COVID-19 pandemic. At the production stage on FVC, an introduction and dissemination of low input farming methods in order to cope with the difficulty of procurement of input materials and to improve the excessive application of chemical fertilizers and pesticides. This project aims to establish a sustainable agricultural production structure.											
Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	5 years										

Expected Outputs	Development Indicators
√ Farmer's productivity is improved. √ Farmers' income is secured. √ Vegetable/ Fruits production is protected. √ Models of sustainable low-input farming are developed. √ Use of agricultural inputs, such as chemical, fertilizers, is minimized. √ Farmers understand about negative impact of the use of agricultural inputs. √ Guideline of low input sustainable agriculture is prepared.	√ Trained farmers obtain necessary knowledge for using sustainable low-input agriculture. √ Low input sustainable agriculture system is introduced more than 70% of the target areas. √ An average amount of chemical fertilizer used in the area is reduced. √ Appropriate extension modalities under COVID-19 situation are identified. √ All extension officers in the target areas are trained.
Major Activities with the Expected Outputs	**Expected Sources**
√ Training of farmers. √ On-farm trials are conducted at pilot farms. √ Research on low-input sustainable agriculture is done at experimental plots. √ Guideline for cultivation technologies, fertilizer application, compost making, and others are prepared.	MoA, Donors, other relevant government offices, NGOs, Private Companies

Project No.4

Project Title	Sales promotion through quality improvement of small- scale agricultural products/processed products
Target Groups	Farmers, small scale food processors
Implementing Agency	BAPPENAS, Ministry of Agriculture
Potential Collaborators	International Donors (ADB, WB, JICA, and others), Private Companies, NGOs
Objectives: To improve the quality of agricultural products / processing products produced by small scale producers	
Rationale: In Indonesia, as one of the issueson FVC, it was pointed out that high quality products could not be produced especially in rural areas, post-harvest management and processing capacity were insufficient by the preliminary survey. In the food processing industry, it is roughly divided into (1) competitive products produced by large companies using high-quality raw materials, (2) non-competitive products shared by low-quality raw materials. The small and medium-scale of processors who has low competitiveness and low-quality products has been affected by declining sales volume and profit due to various measures of COVID-19. In order to raise the level of competitiveness, it is necessary for small and medium scale of processors to accumulate the know-how and technology for producing, processing and distributing better quality of the agricultural products. Therefore, this project promotes quality improvement and sales of agricultural products/ processed agricultural products for the purpose of strengthening capacity at the production and processing level.	
Project	

Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	5 years										

Expected Outputs	Development Indicators
√ Quality of agricultural product/ processing food is improved. √ Producers' income is secured. √ Training for farmers/ small scale processors are conducted.	√ High value-added product is produced. √ Food waste & loss is reduced by 50% of present situation. √ Trained farmers/ Small scale processors obtain necessary knowledge for quality improvement. √ Operation manuals of quality improvement for farmers/ small scale processors are prepared
Major Activities with the Expected Outputs	Expected Sources
√ Needs assessment and situation analysis are conducted. √ Training farmers / small scale processors √ Suitable post-harvesting / processing method is established. √ Operation manual is prepared	MoA, Donors, other relevant government offices, Private Companies

Project No.5

Project Title	Improving cold storage infrastructure for perishable food										
Target Groups	Farmer, trader/wholesaler, distributor of horticulture crop, food crop and processing food,										
Implementing Agency	BAPPENAS, Ministry of Agriculture, Ministry of Industry, Ministry of Trade										
Potential Collaborators	International Donors (ADB, WB, JICA, and others), Private Companies (Logistics, ICT etc..,)										
Objectives: To improve the distribution system for perishable food using cold chain technology											
Rationale: In Indonesia, vegetables and fruits are mainly delivered by normal temperature. Also, it has been pointed out that many of them are spoiled even within the production area without being sold in the consumer market other than the production area by previous surveys. In addition, the waste and loss of horticulture crops has resulted in increased due to the disruption of supply chain by COVID-19 pandemic. Under these circumstances, this project will promote the development of refrigerated storage facilities and cold chains in order to respond to issues on the existing value chain and to improve distribution under and after COVID-19.											
Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	5 years										

Expected Outputs	Development Indicators
√ All necessary strengthen works are completed. √ Related stakeholders' income is secured. √ Farmers' accessibility to cold-storage service is increased. √ Improved capacity for related stakeholders.	√ Famers' accessibility to cold storage service is increased by 40% from present situation. √ Cold storage point map in the target area is established. √ Waste & loss in the farmers' level is reduced by 30% of present situation. √ Knowledge and Techniques for post harvesting by farmers is improved in the target area than before.

Major Activities with the Expected Outputs	Expected Sources
√ Major Activities with the Expected Outputs Expected Sources √ Needs assessment and situation analysis are conducted and creating business environment. √ Priority areas are identified. √ Installation of cold storage system. √ Training Farmers, Extension officers and traders/wholesalers. √ Examination of potential for collaboration with private company to establish the cold storage system	MoA, Donors, other relevant government offices, Private Companies

Project No.6

Project Title	Resolving labor shortage using matching system for farm labor between the multi sectors										
Target Groups	Paddy cultivation farmers, Fruit cultivation farmers										
Implementing Agency	BAPPENAS										
Potential Collaborators	International Donors (ADB, WB, JICA, and others), Ministry of Agriculture, Ministry of Tourism Other Ministries, Private Companies(Logistics, ICT etc..,)										
Objectives: To solve the labor shortage due to the restriction of movement											
Rationale: In Indonesia, the agriculture sector faces the aging and declining number of agricultural workers due to the diversification of employment patterns. The farm labor shortage during the peak season is also pointed out due to the restriction of movement by COVID-19 pandemic. On the other hand, the tourism sector is particularly affected by COVID-19, which has a great impact on the employment environment. In his circumstances, this project aims to build a system to secure the necessary human resources between agriculture sector and other sector using ICT technology, when the farmers need it.											
Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	3 years										

Expected Outputs	Development Indicators
√ Stable farm labor is secured when the farmer needs it. √ Farmers' income is secured. √ Farm labors' income is secured. √ Labor matching system is functioned between mulch sectors. √ IT literacy of farmers in the target area is improved.	√ Farmers' income in target area is kept more than 90% than before. √ Problem of labor shortage in the target is solved 50% than other areas. √ Models of labor matching system is established in the target area. √ Trained farmers obtain necessary knowledge for using labor matching system.

Major Activities with the Expected Outputs	Expected Sources
√ Application of matching system is developed with private company which applied the similar service. √ Needs assessment and situation analysis are conducted and creating business environment. √ Priority areas are identified. √ Training for ICT literacy for farmers. √ The pilot project for using labor matching system is conducted	MoA, Donors, other relevant government offices, Private Companies

Project No.7

Project Title	Reorganizing food distribution and consumption system in favor of local resources under new normal (e.g. a model establishment of "local production for local consumption")										
Target Groups	Stakeholders along the FVC (Farmer, Trader, Processor, Retailer, Supermarket)										
Implementing Agency	BAPPENAS, Ministry of Agriculture										
Potential Collaborators	International Donors (ADB, WB, JICA, and others), Private Companies (Logistics, ICT etc..,), NGOs										
Objectives: To strengthen the supply chain of agricultural products under new normal											
Rationale: The supply chain of agricultural products disrupted and had a negative impact on the distribution for people and goods/services. Restructuring of the value chain is necessary to consider in such situations. For example, restructuring of the value chain that enables completion within a region such as a state or local unit such as "local production for local consumption" can be considered as one countermeasure. Under these circumstances, this project build a model that promotes local production for local consumption as a form of distribution and consumption of agricultural products.											
Project Implementation	Implementation Period	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	3 years										
Expected Outputs			Development Indicators								
√ New value chain system is established. √ Farmers' income is secured. √ High-skilled human resource for agriculture is developed. √ Establishment of distribution system utilizing digital technology			√ Models "local production for local consumption" is established in the target area. √ High value-added product is developed. √ Regional consumption of domestic agricultural products is increased. √ IT literacy of stakeholders are improved.								
Major Activities with the Expected Outputs			Expected Sources								

√ Training on post-harvest processing technology and agricultural product processing technology for farmers √ Support for new sales channels using e-commerce technology. √ Technical support for the development of high value-added agricultural products √ Organizing farmers' cooperative and supporting organizational strengthening	MoA, Donors, other relevant government offices, Private Companies

APPENDIXES

Appendix 1: AUTP TOT Training Materials

Module 1: Introduction of TOT

MODULE 1:
Introduction of Training of Trainers (TOT)

Objectives

To strengthen the implementation capacity of agricultural staff and other officers related to AUTP promotion.

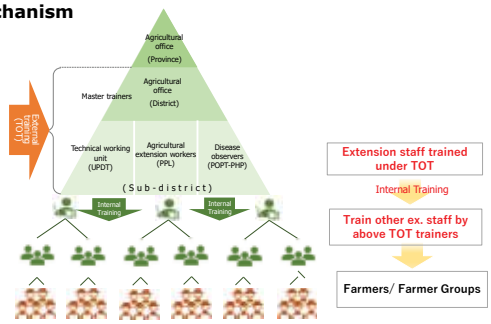
By the end of the TOT sessions, the participants are expected to be able to :

1. **Internalize the concept of agricultural insurance,**
2. **Acquire basic knowledge of AUTP and its operation,**
3. **Acquire basic skills for AUTP socialization and implementation,**
4. **Prepare action plans for AUTP promotion in the coming fiscal year,**
5. **Acquire skills and knowledge of loss claim procedure including implementation of the loss adjustment survey, and**
6. **Acquire basic knowledge of SIAP and PROTAN.**

TOT Module Structure

Module	Major Contents	Objectives
1. TOT Introduction	✓ Overview of TOT ✓ TOT mechanism	• Understand the objectives and overall structure of the TOT • Cultivate learning attitude
2. AUTP Introduction	✓ Overview of agricultural risk management ✓ Introduction of agricultural insurance ✓ Main features of AUTP	• Internalize the concept of agricultural insurance • Acquire basic knowledge of AUTP and its operation
3. AUTP Promotion	✓ AUTP promotional scheme ✓ AUTP socialization activities ✓ Action plan making for AUTP promotion	• Acquire basic skills for AUTP socialization and implementation • Prepare action plans for AUTP promotion
4. Loss Adjustment	✓ Claim handling process ✓ Loss survey methods	• Acquire skills and knowledge of loss claim procedure including implementation of the loss adjustment survey
5. SIAP and PROTAN	✓ Introduction of SIAP ✓ Instructions for SIAP users	• Acquire basic knowledge of SIAP and PROTAN

TOT Mechanism



Training Materials and Tools

When you give training to other staff, you can use the following materials:

Materials	Contents
TOT Trainer's Handbook	✓ It includes sample presentation slides and guidance materials of how to deliver key points of modules.
Presentation Materials	✓ The presentation materials used in this TOT will be provided to the TOT participants.
Video Materials	✓ Each module of this TOT will be recorded, and the recorded videos will be available for the TOT participants later.

The TOT participants are expected to make an action plan to conduct training to other staff and socialization activities to farmers. In Module 3, there is a training session about action plan making.

For Effective Training

- ✓ **Preparation is a key factor to succeed the training including time management and presentation rehearsal,**
- ✓ **Training should be interactive even online,**
- ✓ **Be flexible about the module structure,**
- ✓ **Facilitate discussions among the participants and ask them to share their experiences**
- ✓ **Group discussions should be considered if there are enough number of participants,**
- ✓ **Get feedback about training materials and training methods from the participants.**

Online Training Tools

Zoom is one of the most popular video conference application. The following are some of the main features:

- ✓ **Invitation and participation**
- ✓ **Record a training session**
- ✓ **Sharing your screen**
- ✓ **Mute and video**
- ✓ **Chat function**
- ✓ **Poll function**
- ✓ **Breakout room**

End of Module 1

Thank you!

Module 1: AUTP Introduction

MODULE 1:
AUTP Introduction

Agricultural Risk Management

Agricultural risk management is a management process of dealing with agricultural risks to minimize negative impact on farming activities.

Agricultural sector is exposed to various risks such as;



Proper management of agricultural risks is the key for development of agricultural sector.

Agricultural Risk Types

Risk Type	Main Features	Examples
Production Risk	Risks that affect agricultural production and yield resulting from adverse weather conditions and pest and diseases.	Drought, flood, wildfire
Environmental Risk	Risks that are related to environmental impact of agriculture. It includes various aspects from a spill from fuel or water degradation and runoff groundwater.	Soil degradation, water contamination, erosion
Market Risk	Risks that include fluctuation of agricultural input prices and farm gate prices of harvested crops as well as change in market/ consumer demand.	Fluctuation of input prices and farm gate prices, demand fluctuation in market
Institutional Risk	Risks that are related to regulations and policies. If these institutions, regulations and policies change, that might have impact on the whole agricultural sector.	Change of chemical use standard, tax laws and government support system
Financial Risk	Risks that are usually referred to the availability of credit service and its cost to meet cash flow requirements and the ability to withstand against financial shocks.	Limited credit services
Operational Risk	Risks that are referred to the labour availability including accidents, contract diseases and other uncertain life events for people working in farms.	Accidents, death, illness

Risk Management Strategies

Category	Concept	Examples	Remarks
Risk mitigation	To mitigate negative impacts of unexpected events/ shocks	Crop diversification, soil and water conservation and using improved varieties, etc.	Before the risk event (ex ante)
Risk transfer	To transfer financial consequences of negative impacts to a third party	Agricultural insurance, contract farming, etc.	Before the risk event (ex ante)
Risk coping	To manage financial consequences to sustain production and livelihoods following an event	Sales of assets, reducing consumption, borrowing money from relatives or banks, etc.	After the risk event (ex post)

Introduction of Agricultural Insurance

Agricultural insurance is one of the major tools to manage production risks as a risk transfer mechanism.

It plays an important role as a safety net for farmers and farmers' groups. Agricultural insurance could also play a role of collateral for lending.

Protects farmers from unforeseen evens of crop failure

Support investment in more profitable crops

Improve accessibility to lending services

Introduction of Agricultural Insurance

Agricultural insurance has been growing over the past 30 years. The global agricultural insurance premium tripled from US$10.2 billion in 2006 to US$30.7 billion in 2017.

Country	Premium (2006, US$m)	Premium (2017, US$m)	Growth (%)
USA	4,985	11,098	123
China	100	7,074	6,974
India	150	3,804	2,436
Canada	980	1,561	59
Spain	680	916	35
Japan	1,028	760	-26
Brazil	350	642	83
France	80	610	663
Italy	262	480	83
Turkey	40	450	1,025
Others	1,545	3,305	114
Total	10,200	30,700	201

Source: Roman Hohl (2019) *Agricultural Risk Transfer: from Insurance to Reinsurance to Capital Markets*, Wiley

Crop Insurance

Crop insurance is designed to cover economic loss of farmers or farming groups caused by natural disasters beyond farmers' control.

Agricultural insurance is divided into two main types; 1) Indemnity type and 2) Index type.

Agricultural Insurance	
Indemnity Type	**Index Type**
✓ Single peril insurance ✓ Multi peril insurance	✓ Area yield index ✓ Weather index ✓ Vegetation index, etc.

Different Types of Crop Insurance (1)

Type	Features	Perils Covered	Advantages	Disadvantages
Named-peril crop insurance	· Specific named perils insured · Widely used in mature markets	· Hail or frost, other localized perils	· Insurance of localized perils at farm level	· Adverse selection and moral hazard · Systemic perils not covered · High administration cost
Multi-peril crop insurance	· Multiple perils covered · Often require government subsidies	· All natural perils	· Insurance of systemic perils at farm level	· Adverse selection and moral hazard · High administration cost

Different Types of Crop Insurance (2)

Type	Features	Perils Covered	Advantages	Disadvantages
Weather index insurance	· Insurance based on weather data · Needs special expertise to structure indices	· Perils related to weather data (e.g. rainfall, temperature)	· Limited adverse selection and moral hazard · Low cost administration	· Basis risk · Perils are limited to weather data related · Requirements for historical weather data
Area-yield index insurance	· Indemnities occur based on area (e.g. administrative units), not individual farm level	· All natural perils	· Cover systemic perils · Limited adverse selection · Limited moral hazard · Low cost administration	· Basis risk · Localized risks are not covered · Requirements for historical yield data and yield sampling survey

Insurance Terminology (1)

Term	Description
Actuary	Professionals who use and analyze statistics, and use them to calculate insurance risks and premiums.
Adverse Selection	It refers to a situation where individual's demand for insurance is positively corelated to with the individual's risk of loss. For example, if insurance is not mandatory, farmers who know that they are likely to have a problem in the future may be more likely to get insurance.
Basis Risk	Basis risk arises for index-based crop insurance. It means that index measurements do not match an individual insured's loss.
Claim	A request for payment to compensate loss based on the terms of insurance contract
Coverage	The scope of protection provided under an insurance contract
Insurance Policy	A legal document of insurance between the insured and insurer, signed by an insurer, which contains the rights and obligations of each party and is a written proof of insurance agreement.
Insured	The party, who transfers the risk towards the insurer, is obliged to pay premium as the price of risk and obtained rights to give a claim if the insured farmers experience crop loss that is guaranteed by the policy.

Insurance Terminology (2)

Term	Description
Insurer	The party that receives a risk transfer from the insured, issues policy and gets an insurance premium and is obliged to give claims if there is a policy is guaranteed.
Loss Ratio	The percentage of incurred losses to earned premiums.
Moral Hazard	It refers to the situation that people who have insurance may be more likely to involve in risky events than those who do not have insurance. For example, farmers may change their behavior such as farm less carefully and spend more money on other activities once they know their loss will be covered by insurance.
Policyholder	The person who owns insurance policy. This is usually the insured farmers.
Premium	A value of money determined by the guarantor and paid by the insured as a condition for the validity of the insurance agreement.
Sum Insured/ Insured Amount	The amount of money that an insurer is obligated to cover in the event of a covered loss under insurance contract.

Crop Insurance Program in Indonesia

The government of Indonesia started in 2015 an indemnity-based crop insurance for smallholder farmers called AUTP (Asuransi Usaha Tani Padi).

Agricultural Insurance in Indonesia has been initiated by the Ministry of Agriculture (MOA) to protect farmers from crop failures caused by natural disasters, plant pest attacks, diseases, impacts of climate change and/or other risks stipulated in the Law No.19 of 2013 on Farmers Protection and Empowerment.

Year	Target (ha)	Realization (ha)	%
2015	1,000,000	233,500	23.4
2016	1,000,000	499,961	50.0
2017	1,000,000	997,960	99.8
2018	1,000,000	806,199	80.6
2019	1,000,000	971,218	97.1

Source: Ministry of Agriculture

Overview of AUTP (1)

AUTP participants criteria:

- ✓ Farmers who are members of farming groups
- ✓ Farmers are cultivating paddy fields and doing rice cultivation with maximum two hectares per registration per season
- ✓ Farmers who register for paddy fields must have a Population Identification Number (NIK)

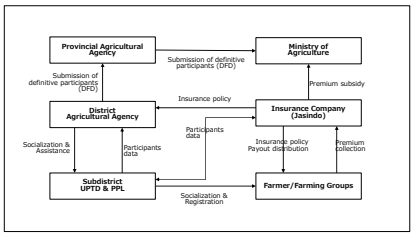
Location criteria:

- ✓ Technical irrigated land, semi-technical irrigation, village irrigation and simple irrigation
- ✓ Tidal lowland that has a functioning water (irrigation) system
- ✓ Rainfed lowland paddy fields are available sources of surface water or groundwater.

Overview of AUTP (2)

Item	Detail
Eligibility	Maximum thirty day after planting (HST)
Insured Risk	Flooding, drought, and pest attacks (Plant Disturbing Organisms: OPT)
Coverage Period	Start of the planting date until the end of harvest date
Sum Insured	Rp. 6,000,000 per hectare per season
Premium	3% of the sum insured (Rp.180,000) Government subsidy: 80% (Rp. 144,000) Farmers payment: 20% (Rp. 36,000)
Compensation	The compensation is given to the insured in the even of insured risks with the following conditions: i) The age of rice has passed ten days after planting (HST) ii) The age of rice has passed thirty days after stocking (tabela, direct seed planting) iii) The intensity of damage was >=75%, and the damage area was >=75% on each original plot area.

Implementation Organizations



Discussion: AUTP Activities

***Discuss their actual roles and responsibilities for AUTP activities. Share their experiences in AUTP activities with other participants.**

End of Module 1

Thank you!

Module 2: AUTP Promotion

MODULE 2:
AUTP Promotion

Why Socialization is Important ?

Socialization is the key activity to get farmers' familiarity about insurance and to achieve further expansion of AUTP.

- ✓ **Particularly, AUTP is a new insurance product to farmers. New products are often unsought until they are well socialized.**
- ✓ **In addition, farmers have to understand properly how AUTP works so that they can understand the benefit of AUTP.**

Objectives of Socialization

The main objective of socialization is to introduce AUTP properly to farmers. Specifically, the following things should be delivered to farmers through socialization:

- ✓ **Eligibility of AUTP**
- ✓ **Product information including premium amount, sum insured, coverage risks and conditions of the payouts**
- ✓ **Major benefit of AUTP**
- ✓ **Registration and claim procedures**

Socialization Approach

Item	Push (Direct Marketing)	Pull (Indirect Marketing)
Strategy	To create farmers' awareness for AUTP through direct communication with farmers	To create connections between farmers through mass media promotion
Target	Farming groups, community groups	Individual
Style	Meetings, seminars, workshops	Brochures, posters, promotional videos, websites
Communication	Direct to the farmers	Indirect to the farmers
Main Actors	Regional and local agricultural offices, extension staff	Ministry of Agriculture. Jasindo
Cost/ farmer	High	Low
Advantage	Can get farmers' feedback and response directly Can deliver the accurate information about the product	Cost effective
Disadvantage	Needs resources	Difficult to provide complicated information
Others	-	Bundling with other governmental programs can be a pull strategy.

Materials and Tools

[1] AUTP Guideline

1. **Guidelines Premium Assistance for Rice Farming insurance Introduction**
2. **Implementation Organization**
3. **Implementation**
4. **Distribution of Premium Assistance**
5. **Monitoring, Evaluation and Reporting**

https://psp.pertanian.go.id/wp-content/uploads/2020/06/02-Pedoman-Premi-Bantuan-Asuransi-Usahatani-Padi-Tahun-2020.pdf

[2] Posters and Brochures

[3] Videos and Social Media

https://twitter.com/hashtag/AsuransiUsahaTaniPadi

Current Socialization Practices

Item	Detail (example)
Timing (when)	*October and November*
Place (where)	*Community holes*
Actors in charge	*Agricultural extension staff*
Participant	*Farming group members (20 farmers)*
Purpose	*Awareness creation and insurance registration*
Facility/ Materials	*AUTP guideline book and registration form*
Others	

Exercise

In this session, socialization exercise will be done.

- ✓ Example of socialization program
- ✓ Demonstration
- ✓ Peer review

Action Plan Making (1)

An action plan plays an important role to achieve the goal (target coverage of insurance). Action plan making can help increase efficiency and accountability within an organization towards achieving the goal.

An action plan should include the following information:

- ✓ Specific goals to be achieved
- ✓ Tasks/ steps that need to be carried out
- ✓ People in charge of each task/ step
- ✓ Deadlines or milestones for those tasks
- ✓ Resources that are needed to complete the tasks
- ✓ Measurement to evaluate progress
- ✓ Evaluate the achievement

Action Plan Making (2)

The participants of this TOT have two main objectives:

- ✓ Strengthen capacity for AUTP promotion
- ✓ Give training to other staff to transfer knowledge and skills for AUTP promotion

The following are the basic conditions and steps for action plan making:

Step 1: Set specific target numbers. 1) the target number of to-be-trained staff in Kecamatan and 2) the target number of insured farmers/ insured area under AUTP.
Step 2: List up specific tasks to be taken. Also, clarify due dates and people in charge for each task.
Step 3: Identify resources you need to perform the tasks.
Step 4: Monitor, evaluate and update.

Action Plan Making (3)

Name of kecamatan: **********
Name: **********
Period: Nov.2020 – Oct. 2021
Target: No. of insured farmers/ insured area:

Example

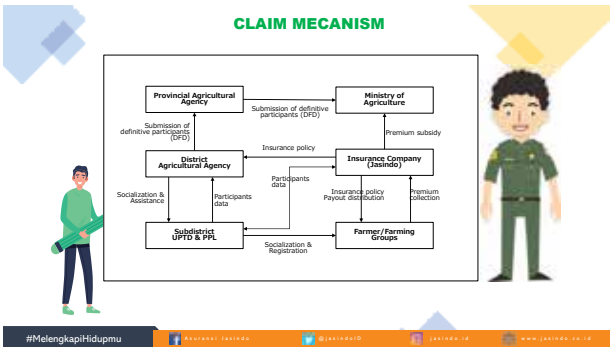
Tasks	Person in charge	Timeframe	Materials	Remarks
Meeting with representatives of farmers' group	**********	November 2020 March 2021	Brochures and posters	* *Please specify the number of meetings*
Registration for AUTP	**********	December 2020 April 2021	AUTP guideline Registration format	*Please set the target of insured farmers
Training for agricultural staff in kecamatan office	**********	Nov. 9- 30th, 2020	TOT handbook, presentation material, TOT videos	* Please set the target number of trained staff

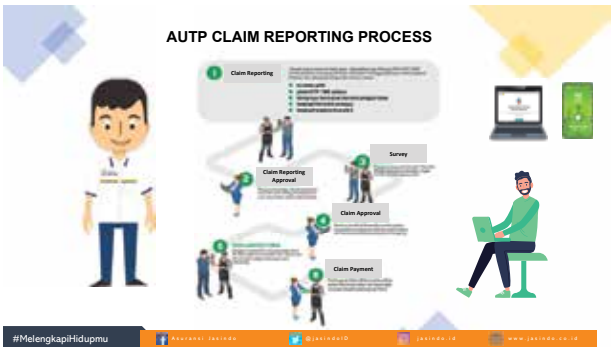
End of Module 2

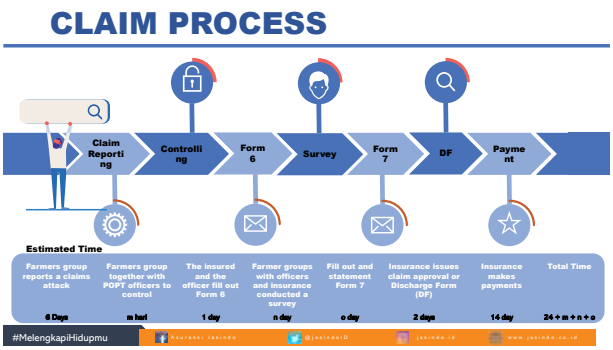
Thank you!


CLAIM PROCEDURE
ASURANSI USAHA
TANI PADI (AUTP)
#MelengkapiHidupmu

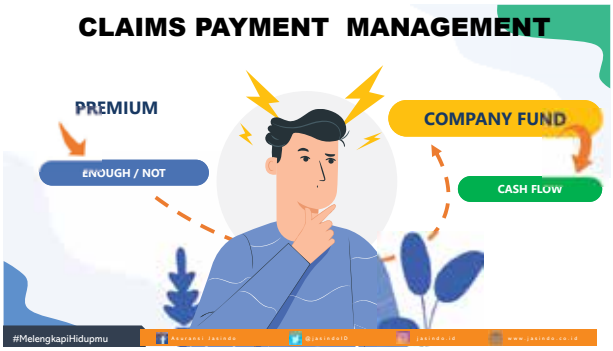

PROVISIONS
ACTIVITIES IMPLEMENTATION
The provisions that are used as guidelines for regulating the relationship between aid providers, beneficiaries and insurance implementers, namely:
Guidelines governing the relationship between the Ministry of Agriculture and Farmers / Poktan
Guidelines governing the relationship between Farmers / Poktan and Insurance Companies
Guidelines governing the relationship between the Ministry of Agriculture and Insurance Companies
01 GENERAL GUIDELINES FOR PREMIUM ASSISTANCE (Ministry of Agriculture Regulation)
02 AUTP PARENT POLICY
03 COOPERATION AGREEMENT / Contract
#MelengkapiHidupmu

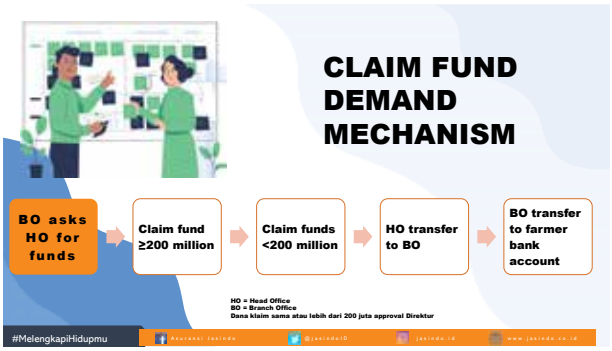

CLAIM MECANISM
Provincial Agricultural Agency
Ministry of Agriculture
Submission of definitive participants (DFD)
Premium subsidy
Insurance policy
District Agricultural Agency
Insurance Company (Jasindo)
Participants data
Socialization & Assistance
Insurance policy Payout distribution
Premium collection
Subdistrict UPTD & PPL
Farmer/Farming Groups
Socialization & Registration
#MelengkapiHidupmu


AUTP CLAIM REPORTING PROCESS
Claim Reporting
Survey
Claim Approval
Claim Payment
#MelengkapiHidupmu


CLAIM PROCESS
Claim Reporting
Controlling
Form 6
Survey
Form 7
DF
Payment
Estimated Time
Farmers group reports a claims attack
6 Days
Farmers group together with POPT officers to control
n hari
The insured and the officer fill out Form 6
1 day
Farmer groups with officers and insurance conducted a survey
n day
Fill out and statement Form 7
o day
Insurance issues claim approval or Discharge Form (DF)
2 days
Insurance makes payments
14 day
Total Time
24 + m + n + o
#MelengkapiHidupmu


CLAIM DOCUMENT
premium payment and government assistance, SK to determine
field evidence that have been verified and validated by the officer
Claim documents must meet data sufficiency, accountability, and zero moral hazard
Formr 6 and 7 following attachments
Photo proof of claim
Identity of Farmers
investigation report
#MelengkapiHidupmu


CLAIMS PAYMENT MANAGEMENT
PREMIUM
ENOUGH / NOT
COMPANY FUND
CASH FLOW
#MelengkapiHidupmu


CLAIM FUND DEMAND MECHANISM
BO asks HO for funds
Claim fund ≥200 million
Claim funds <200 million
HO transfer to BO
BO transfer to farmer bank account
HO = Head Office
BO = Branch Office
Dana klaim sama atau lebih dari 200 juta approval Direktur
#MelengkapiHidupmu


Thank You
Group PMP
asuransi jasindo

Module 3: Loss Assessment Survey and Claim Process

AUTP Insurance

INDEMNITY CALCULATION

AUTP INSURANCE

1. Claims that are insured in AUTP
2. Claims for compensation
3. Compensation Calculation

2

Loss Adjusters

Loss Appraisal Insurance

AUTP Insurance Claim Process

4

1. Claims that are insured in AUTP

Insured AUTP claims

Flood

is stagnation of water in rice fields during the growth period with a certain depth and period of time, resulting in physical damage and / or losses to rice plants

Drought

is the insufficient supply of water that is managed by rice plants during the growing period, resulting in physical damage and / or losses to rice plants.

Pests &Deasese

Plant Pest Organisms (OPT) consist of plant pests but are limited to only stem borer, brown planthopper, ginger root, rats and armyworms and plant diseases but limited to only blast, brown spot, tungro, stem rot and empty dwarf

6

Loss of Rice Field

Flood

Drought

2. Claims for compensation

CLAIMS FOR COMPENSATION

In the event that the Insured demands compensation under this Policy, the Insured is obliged to:

- Fill out the claim report form provided by the Insurer and submit it to the insurer.
- Submit a photocopy of the Policy, an official report of damage / loss signed by POPT-PHP and / or the Mantri Tani / Agricultural Extension Officer and photos of damage (Form 6, namely Loss Report).
- Submit a complete report on matters that according to his knowledge caused the damage and losses (Rainfall data for flood / drought claims, and data on pests that attack rice plants)
- Provide information and other relevant evidence, which is reasonable and appropriate to be requested by the insurer (the efforts that have been made).

AUTP CLAIM SURVEY SCHEME

3. Compensation Calculation

Pre Survey

- CHECKING THE CAUSES OF DAMAGE OR FAILED TO HARVEST FROM PADDY PLANTS
- ASKING THE DEPARTMENT PARTIES CONCERNING THE CAUSES OF THE DAMAGE BY LOCAL POPT, PPL AND RELATED POKTAN.
- ASK FOR DOCUMENTS RELATED TO HARVEST FAIL CLAIMS IN RELATED PARTIES, IN THIS MENTION IN POPT, OR AGRICULTURE DEPARTMENT AND VILLAGE OFFICES.
- ASK THE POKTAN FOR THE PREPARATION OF MEASUREMENT OF SAWAH LAND OF FARMERS AS OWNERS OR ASSETS.

Survey

- DOING LAND MEASUREMENT BY FARMERS USING GPS MEASUREMENTS ASSISTED BY THE ADJUSTER, RELATED SERVICE OR OF THE POKTAN PARTY.
- IN THESE MEASUREMENTS, FARMERS AS LAND OWNERS / EARERS GIVEN THE AUTHORITY TO FARMERS WHO WILL DO MEASUREMENTS IF FARMERS OF LAND OWNERS / EARERS CANNOT ATTEND THE MEASUREMENT
- MEASUREMENT RESULTS IN THE FORM OF COORDINATES ARE ACCEPTED BY THE ADJUSTER TO BE ENTERED IN THE APPLICATION, IN ORDER TO KNOW THE LAND LOCATION AND THE AREA OF THE LAND.

Post Survey

- AFTER GETTING THE AREA OF LAND, THEN MAKE A NEWS OF THE SURVEY ACCORDING TO THE AREA OF THE LAND WITH THE LOSS VALUE OF EACH LAND WITH THE PROVISION 1 HA = RP. 6,000,000.00
- THE INDEMNITY PROVISION IS THE MAXIMUM OF THE INSURANCE PRICE STATED IN THE POLICY WITH A MAXIMUM 2 HA / FARMER (2 x Rp. 6,000,000,000)
- AFTER COMPLETE THE BA SURVEY IS CREATED, THEN ARE ASKED OF THE FARMERS WHO EXPERIENCED LOSS TO SIGN THE BA SURVEY AS A FORM OF AGREEMENT TO THE CLAIM IN THE INTENT.
- THEN THE BA SURVEY ARE SIGNED BY PPL, POPT, POKTAN, ADJUSTER AND HEAD OF LOCAL DINAS. (FORM7)
- COMPLETED WITH ADDITIONAL DOCUMENTS, PHOTOCOPY OF EACH FARMER'S KTP, AND POKTAN ACCOUNTS

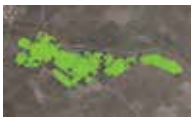
Measurement of Rice Fields

AUTP Policy and Attachments

Form 6 and Attachments

Form 7 and Attachments

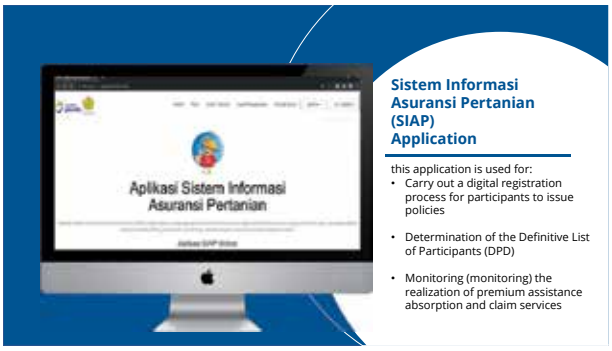
Results of Measurement of Rice Fields

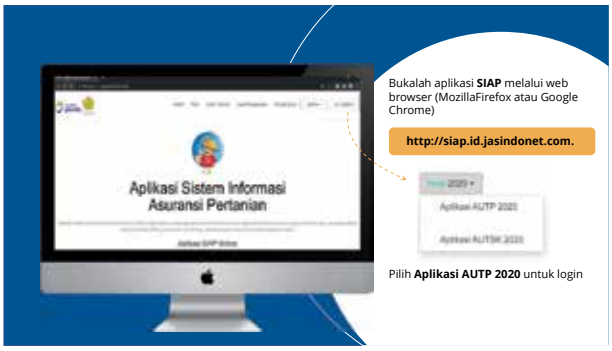


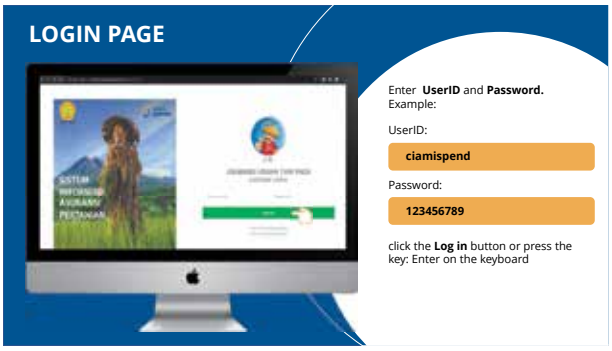
CONCLUSION

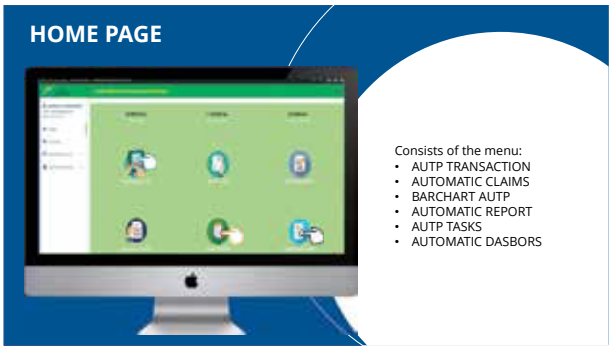
- The cause of the AUTP claim must be guaranteed by the policy, such as floods, drought and pest / plant pests.
- Complete claim documents in accordance with the losses experienced
- Land measurement using GPS (coordinates) in order to know the area of each farmer's rice field
- From the measurement results, the actual rice field area can be obtained, which is the basis for calculating the AUTP compensation.
- In accordance with the provisions, compensation is the maximum amount of the sum insured in the policy or hot-sickness for farmers is 2 HA (Rp. 12,000,000).
- Payment of the claim will be paid through a Poktan Account

Module 4: Introduction of SIAP









DASHBOARD PAGE

TConsists of blocks of information:

REGISTRATION
- Total Data Enter
- Premium 20% Paid / Unsettled
- Jasindo's approval
- UPTD verification
- Not Yet Submitted
- Registration Denied

DETERMINATION
- Complete / Incomplete DPD
- 80% Premium Paid / There
- DPS
- DPS Verification Results
- Complete DPS Unprocessed

TUTORIAL 2

Members Registration

PROFILE EDIT MENU

- Choose **User Management**
- **Profil**
- Change the data as desired
- Untuk kata sandi bagian jika tidak ingin diubah jangan di input apapun.
- Then Clik **Save User**

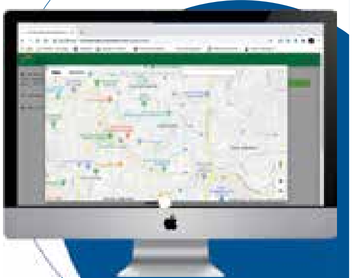
MEMBERS UPLOAD MENU

- Click **Transaction**
- Then immediately exit the Participant Upload page
- Enter **data Poktan (Farmer Group Data)**

MEMBERS UPLOAD MENU

How to enter Latitude and Longitude

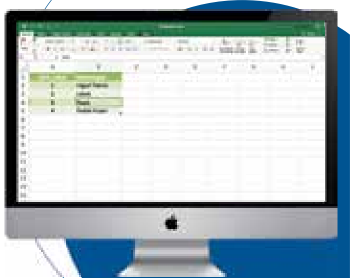
- Click **"Buka Map"**
- Enter the Poktan address as shown in the image, then click the suggested address that appears
- Then click where the Poktan address is, the Latitude and longitude fields will be automatically filled in



MEMBERS UPLOAD MENU

Pembuatan form **CPCL**

- Silahkan klik **Pembuatan form** untuk download format file template CPCL
- Ganti data yang ada di dalam excel dengan data CPCL yang sudah ada
- Setelah di masukkan semua isian poktan dan upload CPCL, klik **Upload** Lalu akan muncul keterangan jika berhasil
- **Jenis Lahan**: **Warna biru** jenis lahan terdapat pada format template CPCL pada sheet "jenis lahan". Masukkan ID sesuai jenis lahannya.
- **NIK**: gunakan tanda "-" untuk memisahkan nomor di NIK contoh: 123456-120690-0001. **Jika terdapat NIK yang sama** di dalam satu file excel, maka **proses upload akan gagal**
- **Kecamatan**: Download terlebih dahulu **file referensi wilayah**
- **Luas Lahan**: Tidak boleh di atas **2 Ha**



MEMBER APPROVAL MENU

On the home page, select the Transaction menu, then select Participants. The display will appear like this:

Add Anggota Kelompok Tani, untuk menambah peserta

gambar ini untuk mengedit data Poktan

gambar ini untuk melihat rincian data Poktan

gambar ini untuk melihat rincian peserta di dalam Poktan

MEMBER APPROVAL MENU

click this image before download **Form 1**

this image to download Form 1 which must be signed by the Agricultural Instructor

This image is for participant approval to be submitted to PT. Asuransi Jasa Indonesia (Persero) which previously will be leveraged by the District UPTD / District Extension Coordinator

this image to re-upload the participant template

To proceed to the next step

MEMBER APPROVAL MENU

- Choose the transaction status : : **Verifikasi UPTD Kecamatan/Koordinator Penyuluh Kecamatan**
- **Upload Form 1** signed and scanned.
- **Isi analisa/saran/disposisi/kesimpulan** to convince Jasindo to accept Poktan so that it can be insured.
- **Klik Submit**. Then the data will be lost in the AUTP participant table.

BRIVA PAYMENT

- Choose **Transaksi**
- Click **menu Transaksi**
- Sub menu **Daftar Tagihan Premi 20%**
- **Copy nomor virtual account** for premium payment.
- Payment can be made via **Bank BRI**, **BRI Internet Banking**, **BRI Mobile**, **ATM BRI**, atau **Agen BRILink**.

TUTORIAL 3

Policy Issuance

PRINT POLICY

Sample of **print out policy**

- Choose **Transaksi**

MENU TO VIEW DISTRICT DATA RECAPITULATION (AUTP-2 FORM)

- Choose **menu Rekapitulasi AUTP**
- Click **Form AUTP-2**

Click this icon

Click this icon for **download** Data Kecamatan

NB: Rekapitulasi Data Kecamatan akan muncul apabila SK DPD telah diterbitkan oleh Dinas Kabupaten

MENU TO VIEW DISTRICT DATA RECAPITULATION (AUTP-3 FORM)

- Click **menu Rekapitulasi AUTP**
- Click **Form AUTP-3**

Click this icon

Click for **download** Data Kecamatan

NB: Rekapitulasi Data Kecamatan akan muncul apabila SK DPD telah diterbitkan oleh Dinas Kabupaten

THE PROJECT FOR CAPACITY DEVELOPMENT
FOR THE IMPLEMENTATION
OF AGRICULTURAL INSURANCE
(AUTP PROMOTION AND FEASIBILITY STUDY ON AYII)
IN
THE REPUBLIC OF INDONESIA

AREA YIELD INDEX INSURANCE IMPLEMENTATION GUIDE

FEBRUARY 2023

Japan International Cooperation Agency (JICA)

Sanyu Consultants Inc.

SOMPO Risk Management Inc.

CHAPTER 1 INTRODUCTION OF AREA YIELD INDEX INSURANCE (AYII)

1.1 Basic Concept of AYII

Area Yield Index Insurance (AYII) is area-wise index insurance. The indemnity occurs at Desa (village) average yield rather than individual yield. AYII is generally designed to cover systemic perils such as drought, flood and pest and diseases where most farmers could be affected at the same timeacross the same Desa. The benchmark yield is established at Desa level based on the historical yield data. The actual yield data obtained through Crop Cutting Experiments (CCEs) is less than the benchmark yield, and then an indemnity is paid for all the insured farmers in the same area regardless of their individual losses.

Since AYII is index-based crop insurance, it has limited adverse selection and moral hazard. In other words, individual farmers' behavior such as sabotage and risk-oriented practiceshas limited impact on the insurance payout. In addition, AYII could cover almost all natural perils related to yield loss. Furthermore, insurers do not need to carry out loss adjustment survey because the indemnity of AYII is made based on average Desa yield rather than individual yield. For this reason, AYII is expected to reduce administrative cost compared to the indemnity-based traditional crop insurance.

1.2 Comparison between AUTP and AYII

One of the biggest differences between AUTP and AYII is insured unit. Insured unit of AUTP is individual farmland, whereas insured unit of AYII is Desa (village). This means that the indemnity is paid based on individual farmers' loss for AUTP, while the indemnity is paid based on average Desa yield loss. The following are the summary of comparison between AUTP and AYII (Table 1.2.1):

Table 1.2.1 Comparison between AUTP and AYII

	AUTP (Indemnity-based Insurance)	AYII (Index-based Insurance)
Premium rate	3% (as a portfolio rate, applied to all provinces)	2.65%
Expected premium amount	IDR 180,000/hectare /planting season. (Farmers' self-reliance is 20%, or as much as Rp.36,000/hectare/ planting season.)	IDR 159,000/hectare /planting season.
Risks covered	Flooding, Drought, Pests and diseases	Flooding, Drought, Plant Pest Organisms

Coverage (Sum insured)	The maximum payout amount (coverage level) is 6 million IDR/ ha (about 410$), based on an estimated average production cost of paddy per hectare.	The maximum payout amount (coverage level) is 6 million IDR/ ha (about 410$), based on an estimated average production cost of paddy per hectare.
Insurance period	MT1: November 1 - March 31 MT2: April 1 – October 31	MT1: November 1 - March 31 MT2: April 1 – October 31
Trigger (Benchmark yield, Threshold)	The current trigger point for an insurance loss is set at over 75% of the insured field (each original slot area) to sustain damage equal to or in excess of 75%of plants (=the intensity of damage was 75%).	The trigger in AYII is "benchmark yield" shown as a percentage of the 7-year historical average yield at the level of Desa. The benchmark yield value is set at 85% of the average yield for Desa.
Loss assessment (Loss survey)	Field loss assessment shall be made individually to check the actual paddy damages (triggered by a percentage damaged plants) to a portion of planted acreage.	One of the field sampling survey methods, Crop Cutting Experiment (CCE), shall be conducted to get the average area-yield.
Basis Risk	The basis risk is much smaller[1] than that of the index-based ones because of individual loss assessments.	Farmers may incur production losses but do not receive payouts. Basis risk is generally taken into account for index-based insurance products.

Source: JICA Consultant Team

1. Many insurance companies explain that there is no basis risk in indemnity-based insurances.

CHAPTER 2 AREA YIELD INDEX INSURANCE (AYII) DESIGN

2.1 Overview of Product Development Process

Product development lifecycle commences at availability of cleaned and filled yield data and other proxy data such as weather data and satellite data. One of the major challenges in the product development would be reviewing the accuracy of the collected data and validatingthe datasets with some proxy data. The following are the basic product development lifecycle:

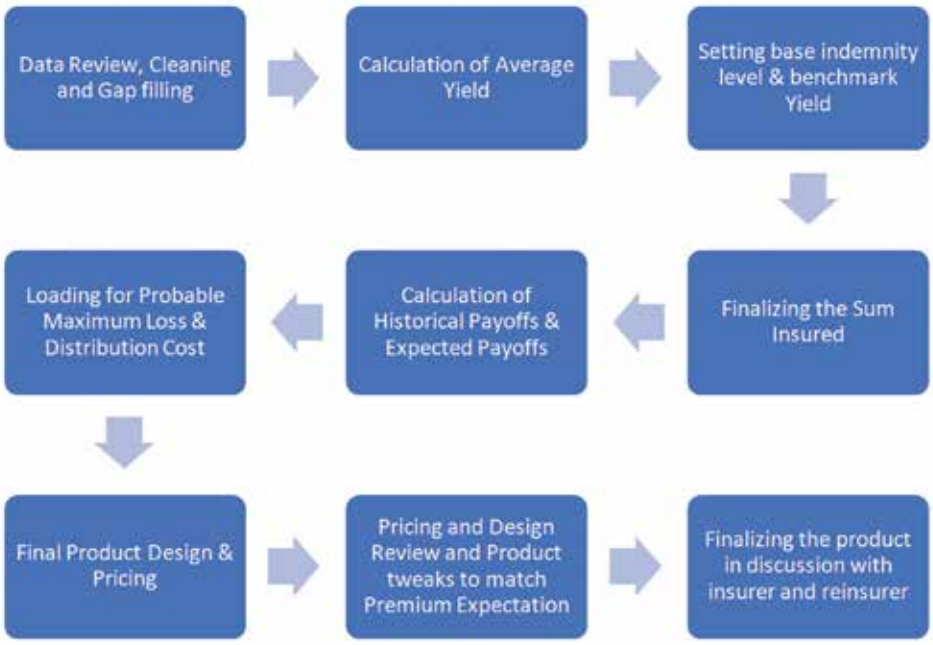


Figure 2.1.1 AYII Product Design Flow

The following are the key considerations for the AYII product development:

1. Level of settlement/granularity:
   - Farm level/lower or upper administrative level – this settlement level would be decided based on availability of historical datasets. Under the JICA AYII pilot scheme, settlement level was decided at Desa (village) level.
   - Extent of coverage/notified areas and premium parity required – premium parity would mean that if the premium has to be kept as same at a Kabupaten or Kecamatan level, it would need area sown data at village level to give adequate risk weights.

2. Loss settlement/ loss criteria
   - Types of risks to be covered (based on study of historical yield, crop risks, weather events, and market data and risk faced).
   - Loss assessment criteria and loss involved with each criterion – in this case loss assessment criteria are based on the CCEs.
   - Loss calculation during the season as per the loss type or at the end of season.

- Loss to be settled on actual yield from the CCEs or yield estimated using technology.
- Experiments to be performed only if there is any calamity or irrespective of the actual crop status.

3. Benchmark Yield
   - Average yield (recent 5 or 7 years) or average good years yield (best in recent 7 years or recent 5 good years with no calamity)
   - Level of risk to be covered (70%, 80%, 90% or 100%)

4. Premium, subsidy and applicable tax rates – this would have a bearing on the cost that has to be borne by farmers and thus would also impact the product design and indemnity levels.
   - Paying capacity of the farmers/affordability
   - Government support/subsidy
   - Applicable tax rates
   - Any caps on premium rates

5. Maximum coverage amount
   - Cost of cultivation or average income – if farmers income levels have to be covered than appropriate deductibles or monitoring mechanism might be required to ensure that there is no moral hazard risk in the product.
   - Same or different for Kecamatan or Desa – Extent of product design effort would also depend upon that the sum insured amount is varying from Desa to Desa or it is same for the Kabupaten or Kecamatan as a whole.

6. Insurance Provider
   - Government
   - Insurance company
   - Charitable organizations/ non- government organizations

7. Implementation
   - Period: season/1 year/ more than 1 year
   - Voluntary/ compulsory – the program is likely to be credit linked then the offtake of insurance would be higher. Also, possibility of adverse selection in a mandatory / compulsory insurance program is lower and hence can help in underwriting the product.
   - Distribution channel
     - Directly to farmers via central agency, local bodies, banks or social network organizations
     - Along with inputs (if farm inputs are provided by the government)

2.2 Data Collection for AYII Design

Data collection is key to conduct proper AYII design and pricing. Particularly, yield data and weather data are important for the AYII product development. As for yield data, minimum 10 years of yield data is required for the product design. Also, yield data has to be checked for any anomaly in the recording and punching. The main usage of yield data is to calculate average yield values. In this pilot implementation, the average yield of last (latest) 7 years is calculated by each Desa (village) for the sake of arriving at "benchmark yield".

Weather data includes rainfall, temperature, and wind information. These weather datasets are mainly used for calculating the Probable Maximum Loss (PML) for the drought, floods and pests and diseases events. The following table shows the list of basic data required for the AYII design:

Table 2.2.1 Data Requirements for AYII Design

Data Type	Time Series Duration (Ideal Case)	Data Usage
Area Sown	10 years	To evaluate the risk exposure and estimate portfolio risk concentrations
Yield data for each season	10 years	For development of basic product design and pricing
Data of variety sown with normal yield potential	10 years	For validation of yield data and understanding the possible reasons for the losses
Area Insured in past years of AUTP Program	5 years	For understanding and evaluating the uptake and reasons for variations in the uptake
Premium and Losses (Desa-wise) for past years	5 years	For risk evaluation and causal analysis of the losses
Weather Data including rainfall, temperature and wind information	30 years	To get better understanding of Probable Maximum Loss
For evaluating its utility for dispute resolution		
Remote Sensing data of NDVI, EVI, VCI or flood or drought extent	10 Years	For validation of yield data and understanding the variation in the data
For evaluating its utility for dispute resolution		

Source: JICA Consultant Team

2.3 Data Review and Analysis

Yield data at Desa level was obtained from Kabupaten agricultural offices. Historical yield data is available since 2010till2020, and some Desas have even longer historical yield data. In Indonesia, BPS is responsible for statistical data including yield data; however, they only have historical yield data at Kabupaten (district) level. Therefore, Kabupaten agricultural offices provided historical yield data at Desa level. The table below shows the summary of the collected historical yield data in Karawang Kabupaten:

Table 2.3.1 Historical Yield Data of Karawang and Kendal Used for the Product Development

No.	Kecamatan (District)	Desa (Village)	Yield Data Period	Kecamatan (District)	Desa (Village)	Yield Data Period
Karawang				Kendal		
1	Kutawaluya	Sindangsari	2012 - 2020	Pageruyung	Surokonto Wetan	2010-2020
2	Kutawaluya	Sindangmukti	2012 - 2020	Pageruyung	Gebangan	2010-2020
3	Kutawaluya	Kutamukti	2012 - 2020	Pageruyung	Surokonto Wetan	2010-2020
4	Pedes	Sungaibuntu	2000 - 2020	Patean	Wirosari	2010-2020
5	Pedes	Payungsari	2000 - 2020	Patean	Pagersari	2010-2020
6	Pedes	Rangdumulya	2000 - 2020	Patean	Selo	2010-2020
7	Cibuaya	Jayamulya	2011 - 2019	Patebon	Wonosari	2010-2020
8	Cibuaya	Kertarahayu	2011 - 2019	Patebon	Pidodo Wetan	2010-2020
9	Cibuaya	Gebangjaya	2011 - 2019	Patebon	Pidodo Kulon	2010-2020
10	Telagasari	Pasirkamuning	2010 - 2020	Plantungan	Wadas	2010-2020
11	Telagasari	Kalibuaya	2010 - 2020	Plantungan	Bendosari	2010-2020
12	Telagasari	Cilewo	2010 - 2020	Plantungan	Mojoagung	2010-2020
13	Rawamerta	Sukapura	2012 - 2020	Rowosari	Parakan	2010-2020
14	Rawamerta	Gombongsari	2012 - 2020	Rowosari	Karangsari	2010-2020
15	Rawamerta	Kutawargi	2012 - 2020	Rowosari	Randusari	2010-2020

Source: Karawang and Kendal Kabupaten Agricultural Office

The weather data is also collected through the international organizations and satellite data as follows:

√ Global Climate Observation System data from World Meteorological Organization (WMO)

√ Daily data available for all the parameters. There are a total of 15 stations available. Out of 15 stations, 10 stations have more than 20 years of data.

√ Most of the data for the stations are completed with few years' gaps. In few stations, significant gaps in data have been observed.

- WMO dataset is available for all the parameters received from weather stations include:
- Mean Temperature
- Maximum Temperature
- Minimum Temperature
- Precipitation
- Relative humidity

* Wind Speed

√ Global Precipitation Measurement (GPM) Data

* Rainfall data was available from the year 2016. Data from 1997 to 2015 is available under other mission of "Tropical Rainfall Measuring Mission (TRMM)" The resolution of this data is 0.1 degrees.

√ European Centre for Medium-Range Weather Forecasts - ERA5 (ECMWF) Weather Data

* Daily data was available for all the parameters of temperature, humidity, wind and rainfall.

Data Deduction and Analysis

√ Yield data

The yield data is available almost all the seasons between 2010 and 2020. One of the characteristics of the yield data is that it has similar trend across the Desas within a Kecamatan. The yield data was also available at farming group level for three Kecamatans in Karawang. The yield data at Desa level is only available for the remaining two Kecamatans.

√ Weather data

To estimate the extreme flood events, storm rainfall (cumulative five-day rainfall) data have been collected to fit a parametric distribution. This led to the estimation of the one in a 100-year event storm rainfall which comes out at about 250 mm. As regards standing water in the pilot areas, we have estimated the maximum standing water possible which comes to about 0.5 m. With this standing water, loss is estimated to the tice crop at various stages using empirical evidence. The analysis shows that loss to rice crop due to standing water depth of 0.5 m can be 10 - 15% of the sum insured.

2.4 Basic Conditions of AYII

2.4.1 Risk Coverage and Exclusion

The AYII product covers the following risks:

√ Flooding, in this case, is the inundation of agricultural land with a certain depth and period during the period of plant growth, resulting in damage to crops and reducing crop production levels, both floods caused by high rainfall and high tides (Rob).

√ Drought, in this case, is not meeting plants' water needs for a certain period during plant growth,resulting in non-optimal growth rates, damage to plants, and lowered crop production levels.

√ Plant Destruction Organisms (OPT) are organisms that can interfere with and damage plant lifeor cause plant death, including:

* Plant Pests: Stem Borer, Brown Planthopper, Stinky Planthopper, Rat, Armyworm and Golden snail.
* Plant Diseases: Blast, Brown Spot, Tungro, Stem Rot, Hollow Dwarf, Grass Dwarf/YellowDwarf, and Crackle.

However, policy has following exclusions:

√ A fire that occurs intentionally or unintentionally,

√ Theft and/or loss during and after the event which this Insurance Policy covers,

√ Intention of the other party with the knowledge of the Insured, unless it can prove that ithappened beyond the control of the Insured,

√ illful mistake or negligence by the Insured or the Insured's representative,

√ Forest, bush, grass, or peat fires,

√ Explosions of all kinds of explosives,

√ Nuclear reactions including but not limited to nuclear radiation, ionization, fusion, fission, orradioactive pollution, regardless of whether it occurs inside or outside the coverage area of ricefarming,

√ Earthquakes, volcanic eruptions, and Tsunamis,

√ Any form of business interruption, financial loss due to market failure, and similar financiallosses,

√ The government takes an action in the greater public interest,

√ Causes or risks that are specifically and/or not expressly stated as guaranteed in this InsurancePolicy,

√ Losses that occur after the insured plant is harvested,

√ Losses incurred after the expiration date of this Insurance policy,

√ Consequential losses that occur because of other losses.

2.4.2 Settlement Level

The level of settlement is kept at the Desa (village) level. This is because of the following reasons:

√ Availability of historical season and year wise yield at a village level. Historical farm level yields were not available.

√ Low variability of yield within a Desa. The variability in farm level yield was estimated using vegetative indices such as Normalized Difference Vegetation Index (NDVI[1]) and Leaf Area Index (LAI[2]).

√ The actual yields for the settlement year will be available through the crop cutting experiments done by agricultural extension officers.

√ Crop Cutting Experiment Data – Crop Cutting Experiments should be done using standard methodology referring to the method adopted by BPS. The Crop Cutting Experiments should be done during the same period as that of historical data should be taken into consideration.

2.4.3 Indemnity Level

The indemnity level was set up at 85% level. The decision on the indemnity level is based on:

√ Premiums (discussed in next section). The premium increases as the indemnity level increases, but with higher indemnity level, the product becomes more attractive for the farmers.

√ Hidden volatility in yield as there could be errors in the historical yield data. In order to take this into account, lower indemnity levels were recommended.

√ There may be errors in the village level yield data reported in the settlement season. In order to address this risk, lower indemnity levels were recommended in the first season.

2.4.4 Other General Conditions of AYII

It is also important to consider eligibility for insurance to minimize adverse selection. The following are major components of the AYII design:

Eligibility and requirements for insured croplands: eligibility for the insurance is limited to paddy farmers with less than 2ha. The AYII product is only the agricultural insurance option for farmers in the target 15 Desas in Karawang and the target 12 Desas in Kendal. Farmers are not allowed to join AUTP and AYII insurance scheme at the same time.

1 Normalized Difference Vegetation Index quantifies vegetation by measuring the difference between near-infrared (which vegetation strongly reflects) and red light (which vegetation absorbs). It can be used to analyze remote sensing measurements assessing whether or not the target being observed contains live green vegetation.

2 Leaf Area Index is defined as the total one-sided green leaf are per unit of ground surface. A leaf area index (LAI) expresses the leaf area per unit ground surface area of a plant and is used as an indicator of the growth rate of a plant.

Risk coverage and exceptions on natural disasters:guaranteed risks in the AYII product will be floods, drought, and plant destruction organisms (OPT).These exceptions are prescribed in the policy. Concerning natural disasters, earthquakes, volcanic eruptions, tsunamis, and wild fires were excluded by the clauses of general exceptions and special exceptions.

Insurance period: the insurance period is designed for one planting season, a maximum of 6 months, which starts 30 days after the planting.

Basic mechanism of AYII compensation: The AYII product triggers the payout based on a comparison of the actual yield with benchmark yield for the area. As the image diagram of AYII (Figure 3.2.2) illustrates, the benchmark yield is set at 85% of the average yield for eachDesa. If the actual yield is smaller than the benchmark yield value, the payout will be given. The actual yield and the benchmark yield are shown as a percentage of the average yield for a certain period in an insured Desa (an insurance unit) mentioned in the policy.

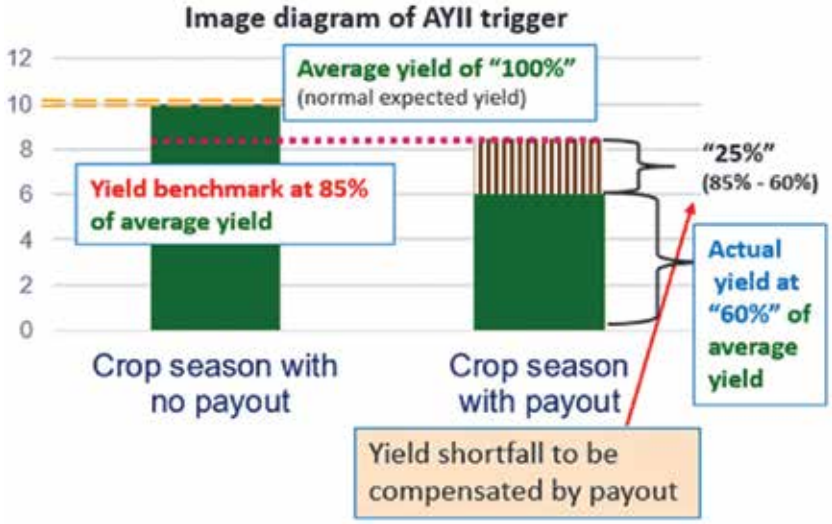


Figure 2.4.1 AYII Trigger Image

Source: JICA Consultant Team

Calculation of compensation in AYII:The calculation of the compensation amount is the ratio on the relation between the benchmark yield and the actual yield, using the following formula:

$$\left[\frac{\textit{benchmark yield - actual yield for the year}}{\textit{benchmark yield}}\right] x\text{"sum insured per ha" } x\text{ "area insured"}$$

It is expected for insured farmers to receive the following amount of compensation.As the sum insured per ha is 6,00,000IDR, if the benchmark yield value is set at 85% of the average yield and the actual yield value amounts to 60%, the result of the compensation amount will be 1,764,705IDR.

$$\left[\frac{85 - 60}{85}\right] x \text{“}6{,}000{,}000\,\mathbf{IDR}\ \ x \text{“ 1 }\mathbf{hectre}\text{”}=1{,}764{,}705\,\mathbf{IDR}$$

2.5 Premium Calculation

Ratemaking process is a key step of the product design after the determinations of the indemnity level, the level of benchmark yield, the sum insured, calculation of historical payoffs expected payoffs etc. Based on the comprehensive data collection. A pure premium can be defined as loss costs in terms of frequency and severity in pure premium method.

As shown in the following formula, the pure risk premium is calculated through frequency multiplied by severity. Average severity is the amount of loss associated with a payout, and can be a key financial expenditure for an insurer. It is common for insurers to study how often losses (claims) arise. The frequency as probability of occurrence is important for grasping expenses.

Pure risk premium = Frequency × Severity

(Probability of occurrence) × (amount of loss)

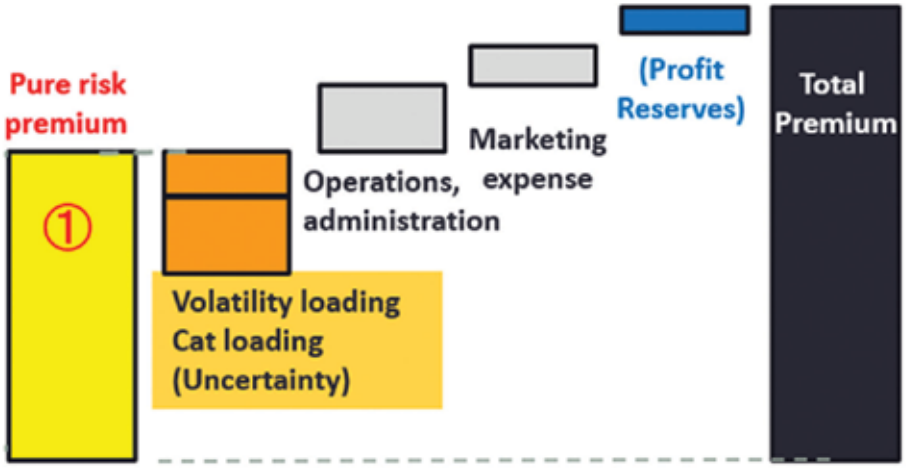


Figure 2.5.1 Pure Risk Premium Calculation

Source: JICA Consultant Team

As seen in Figure 2.5.1 above, the total risk premium is largely composed of pure risk premium, loadings such as volatility loading, catastrophic loading, uncertainty etc., operations and administration, marketing expense, and profit reserves (if we ignore taxes). To briefly grasp the appropriate level of the pure risk premium in proportion to the total premium, loss ratio can be of use. The loss ratio is the ratio of the sum of losses to the total premium, which is significant benchmark for the insured, not only from a management perspective but in this ratemaking process.

In general, the target loss ratio lies within the range between 50% and 80%. In this regard, it is stated that the premium rate of AYII program was previously and tentatively calculated on a basis of 70% target loss ratio[3] , and the figure will be one of benchmarks for this pilot implementation. Concerning loadings in the orange boxes in Figure 2.5.1,there are three types of loadings in ratemaking as below.

Pure (expected) risk premium is sum of Expected Loss, Volatility Loading and Catastrophic Loading. All the figures are expressed in terms of percentage of sum insured.

Pure Risk Premium includes (①Expected Loss + ②Volatility Loading + ③Cat Loading) + α

3 Agroinsurance Report

2.5.1 Expected Loss

In the expected loss (①), the average payout (compensation) of the last 10 years (2011 to 2020, or 2010 to 2019) (or 7 years) was used. The volatility loading (②) is expressed based on loss estimates at various return periods and applying a capital charge on these loss estimates. The catastrophic loading (③) is concerning extreme events which may occur once in 50 years or 1 in 100 years and relevant data was collected. The Project team has taken weather data for past 20 to 30 years from the WMO's Global Observation System for available weather stations in West Java region. "α" represents the other components except the loadings in the pure risk premium.

Calculation of expected loss (①): expected loss is average claim payout of the last 10 years (2011 to 2020, or 2010 to 2019). This value is shown as percentage of Sum Insured. The following formula will be used to calculate payouts for each year :

Max((Benchmark Yield – Detrended Yield) / (Benchmark Yield), 0) * Sum Insured
①　②

① Benchmark Yield for each Desa is the **de-trended Average Yield of the last 7 years multiplied by level of Indemnity**
② Cleaned data was checked for any trend and the data was adjusted for the trend **using linear detrending**

For de-trending, the Project Team has taken simple linear de-trending to identify and adjust the trend in the yield data. Wherever the yield data was suspect or not available, we have replaced the yield value with conservative yield value from the surrounding Desas to factor in the load on premium due to data inconsistency and/or non-availability.

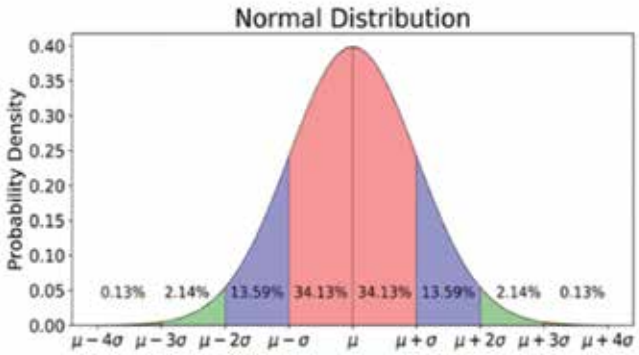


Figure 2.5.2 Distribution of Probability Density

Source: WRMS AYII Product Development Report

2.5.2 Volatility Loading

Volatility loading (②) is based on loss estimates at various return periods and applies a capital charge on these loss estimates. Capital charge is based on available benchmarks but can be modified by the insurer suitably. Capital charge decreases as the return period increases and depends on the capital cost of the insurance company. Capital charge is basically cost of the capital that insurer is setting aside to underwrite this risk. This would depend upon the amount of capital set aside for underwriting this risk by the insurer and return on capital that insurer expects.

Return period of a loss is the inverse of probability (generally expressed in %) of loss, it gives the estimated time interval between events of a similar size or intensity. So, for the estimation of return period of a loss, the probability of the loss is estimated based on a parametric distribution fitted on the 10 to 20-year yield data (see Figure 2.5.2) and using the z-score of the fitted distribution (i.e., normal distribution). It is assumed that the parametric distribution fitted to the yield data can help in calculating

losses up to a 50-year return period (i.e., chance of occurrence - 2%). Usually, 20-year data is accepted to estimate losses of a 50-year return period. For higher return periods (50-100%) extreme event analysis has been done.

Table 2.5.1 Return Period of a Loss

Loss	Probability and return period	Loss as % of sum insured	Capital charge	Loading as % of sum insured
Losses between mu + 1.0 sigma	33.14% probability, or 1 in a 3year return period	0.0%	12.5%	0.00%
Losses between mu +1 sigma to mu + 1.5 sigma	10% probability, or 1 in a 10-year return period	4.7%	7.5%	0.35%
Losses between mu + 1.5 sigma to 2.0 sigma	4% probability or 1 in a 25-year return period	9.6%	5.0%	0.48%
Losses between mu + 2 sigma to mu + 2.5 sigma	2% probability or 1 in a 50-year return period	14.5%	2.5%	0.36%
			Total	**1.19%**

Source: WRMS AYII Product Development Report

2.5.3 Catastrophic Loading

Catastrophic loading (③): in this AYII pilot, the Project Team has taken weather data for past 20 to 30 years from the WMO's Global Observation System for available weather stations in the West Java Province. This data has been primarily used for evaluating the catastrophe loading required to account for any adverse event that could have impact on yields in the past and that have not been reflecting in the 10-year yield data available for pricing.

Catastrophic risk loading has been calculated on maximum probable loss scenario which is loss calculation on the basis of modelled events which have return period of 50 to 100 years. These events have been modelled using proxy indicators such as heavy rainfall from weather phenomenon which have higher availability of longer time series data compared to crop yield data. The Consultant Team has also considered the worst case yield scenario from the available yield data we have gotten to reach maximum possible yield loss.

As the project area is irrigated by the cascading dams in the Citarum river, the effect of low rainfall in the Citarum was estimated by correlating past year-wise rainfall data in the Citarum river catchment zone and the water available in the Citarum river. Based on the estimated available river data that can be utilized by the cascading dams i.e., 90%, the consultant team estimated the irrigation water available in the Jatiluhur Irrigation Project Area (2,70,000 ha).

Adding the seasonal rainfall to the water available through the irrigation, it is calculated the shortfall in water available with respect to the ideal water requirement of the Rice crop (1200 mm). Based on the shortfall and the yield sensitivity to water shortage, the consultant team estimate the loss of yield in an extreme year.

Table 2.5.2 Basic Assumption for Probable Maximum Loss Calculation

Field		Value	Unit
Available Flow	Long term average - water availability Citarum and other rivers	7000	Million Cubic meters
	In case of extreme drought (e.g., in 1997 (-42% RF Dep), 2006 (-41% RF Dep))	5500	Million Cubic meters
	In case of 1 in 100 yr. drought event (-75% Dep from Normal RF)	4000	Million Cubic meters

Utilization (%)	Water Utilization in Normal years	100%	
	Water Utilization in Drought years	100%	
Utilized Flow	Water Utilized for irrigation (90% of available) in normal years	6300	Million Cubic meters
	Water Utilized for irrigation (90%) in drought year	4950	Million Cubic meters
	Water utilized for irrigation (90%) 1 in 100 yr. drought event	3600	Million Cubic meters
Water Available for Crop	Water available in the Rice fields in normal year per season	583.3	mm
	Water available in the Rice fields in drought year	458.3	mm
	Water available in the Rice fields in 1 in 100 yr. drought event	333.3	mm
Crop Water Requirement	Water required during a season for good Rice crop	1200	mm
Water Requirement-Rainfall	Deficit to be fulfilled by rainfall in a normal season (in a normal year, seasonal rainfall is 200 mm)	616.7	mm
	Deficit to be fulfilled by rainfall in a drought year	741.7	mm
	Deficit to be fulfilled by rainfall in 1 in 100 yr. drought event	866.7	mm
Lack of Irrigation	% further drop in yield in extreme years because of lack of irrigation	32%	
Yield Shortfall from potential Yield	Shortfall from Yield potential in Normal Year	28%	% Shortfall
	Shortfall from Yield potential in 1 in 100 yr. drought event	51%	% Shortfall
Yield shortfall from Normal Yield	Probable Maximum shortfall in yield from Normal yield	32%	% Shortfall

Maximum Yield Potential	90	Qt./ha
Normal Year yield	65	Qt./ha
Extreme drought yr. yield (1 in 100-year event)	44	Qt./ha
Yield diff b/w Normal & 1 in 100 yr. drought year	21	Qt./ha
Yield diff b/w Normal & 1 in 100 yr. drought year in % of Normal Yield due to water shortage	32.31%	% Shortfall
Conservative Yield Shortfall in 1 in 100 yr. drought event	40.00%	% Shortfall

Source: WRMS AYII Product Development Report

For estimating extreme flood events, we have collected storm rainfall (cumulative 5 days rainfall) and fitted a parametric distribution. Using this we have estimated the one in a 100-year event storm rainfall which comes out at about 250 mm.

Estimating the standing water in the project areas (after discounting the run off), we have estimated the maximum standing water possible which comes to about 0.5 m. With this standing water, loss is estimated to the rice crop at various stages using empirical evidence (Pls refer charts below). The analysis shows that loss to rice crop due to standing water depth of 0.5 m can be 10-15% of the Sum insured.

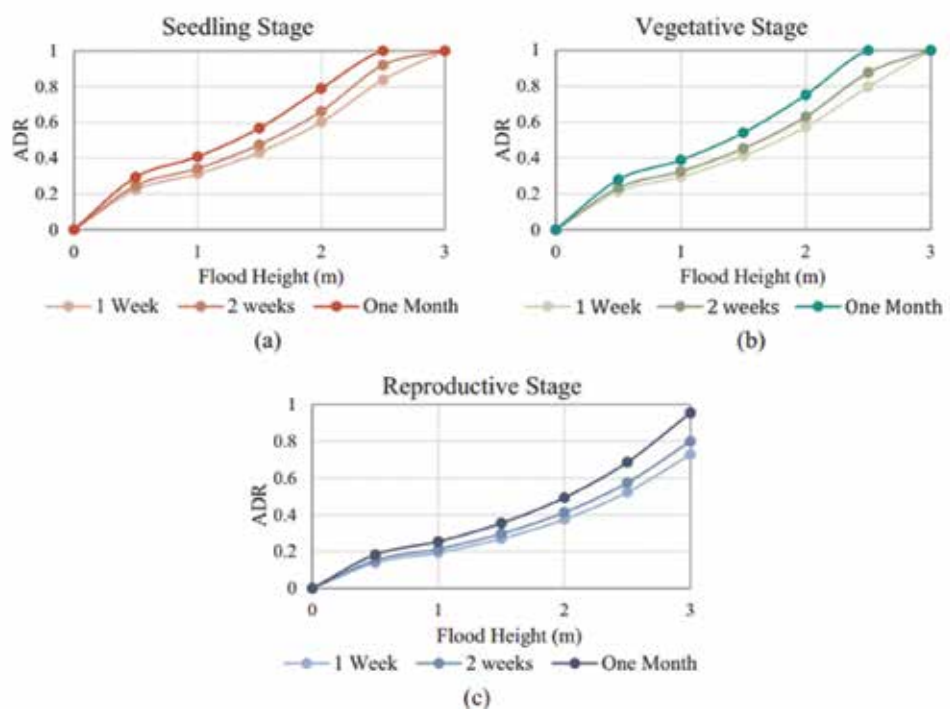


Figure 2.5.3 Agriculture Damage Rate (ADR)

Source: Establishment of flood damage function models: A case study in the Bago River Basin, Myanmar, 2018

Note: Agriculture Damage Rate (ADR) with reference to the flood depth (the depth is defined as height in the above graph) and flood duration for paddy crop

Also, it is seen that during the extreme rainfall seasons, the conditions also become conducive for pest and diseases that attack the Rice Crop e.g., BPH. Using empirical evidence from the South east region of India which has a very similar Rice agro-ecology as West Java, we have estimated worst losses because of BPH, which comes to about 30% of the sum insured and added it to the loss estimate to Rice due to inundation.Using the two analyses, we get a 1 in a 100-year loss of 40% of sum insured. It is applied a capital charge of 2% on this loss to estimate the CAT load but the capital charge can be increased up to 3%.

Based on the above calculations, a couple of values have been calculated:

a. Maximum Probable Loss based on proxy indicators – 40% (32%[4] + safety ratio 8%)

b. Maximum Probable Loss based on the worst case yield outcomes – 36%

The item b. is the assumption of the minimum historical yield of any of the target 15 Desas.2% of the values of two items above have been taken as loading for catastrophic risks (or extreme events causing high yield losses).

2.5.4 Finalization of the Premium Rate

At first, it is observedif the premium could be varied by Desa, depending on the risk each Desa was facing. Under this AYII project, however, equitable premium (fixed premium) is going to be applied across the 15 pilot Desas mainly from the point of an efficient administrative management.

4 Yield difference between normal & 1 in 100 years worst yield divided by normal year yield (%) is 32%. …(21Qt./ha/65Qt./ha)*100

Then, there are some options in how to set the fixed premium across the 15 Desas. One of the reasonable options is weighted average method, estimating the weighted average premium with weights based on the area sown in each Desa. This weighted average method is used for the premium calculation which can provide more equitable premium rate actuarially and address the issue of making the product attractive for Desaswith relatively high premium.

However, product would still be more attractive for insured farmers in riskier Desas compared to the ones in Desas with low risk. In this respect, the skew of business towards these riskier Desas and consequent losses to the insurer might be concerned in the long run. If varied rate subsidy is considered to offer in order to induce insured farmers in low risk Desas in buying the product, the issue of the advantages and disadvantages can be handled. In the future, weightage average rates for each Kecamatan may be a good alternative. Rate for each Kecamatan can be calculate using area sown of each Desa as weight. In this process, each Kecamatan would have a different premium rate, but all the Desas of that Kecamatan would have a single premium rate.

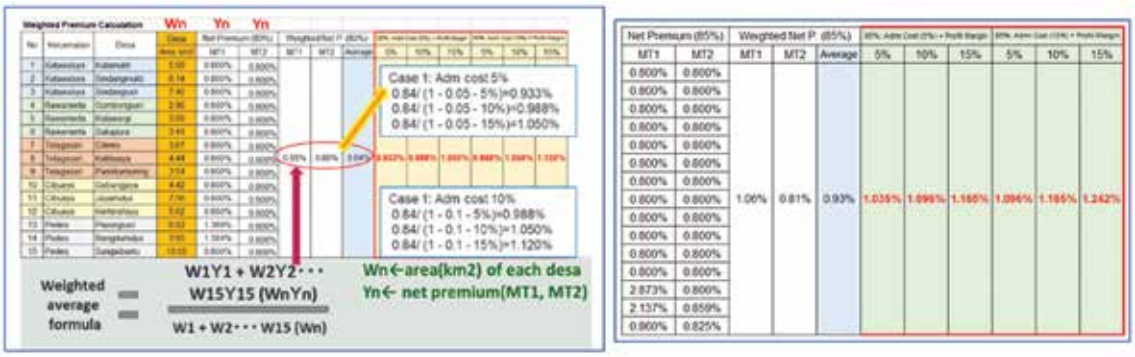


Figure 2.5.4 Calculation Process for Premium Rate

Source: JICA Consultant Team

As shown in the left matrix table about the calculation process of 80% indemnity level (Figure 2.5.4), the insurance premiums using weighted average were calculated from the dataset of "land area in Desa" and "Net Premium" (shown in MT1 and MT2[5]). In this table of indemnity level 80%, the administration cost and profit margin were considered in addition to the weighted net premium of 0.84% as the average value between MT1 and MT2, and we got the tentative value of 1.050%, in the case with 10% administration cost plus 10% profit margin as an example.

Likewise, regarding 85% indemnity level in the right table, we obtained the weighted net premium of 0.93% and the tentative value of 1.165% in the case of 10% administration cost plus 10% profit margin. Those figures were the results from tentative inputs of the administration cost and profit margin. Furthermore, the two tables above (Figure 3.2.5) as the result of the calculation on both MT1 and MT2 should not be directly applied to the pricing of the pilot which may need MT2 premium only. Consequently, the premium rate for the pilot implementation has been fixed 2.65%.

As a breakdown overview, the range of volatility loading (②) was roughly in the range of 0 % to 1.4%, and catastrophic loading (③) was approximately in the range of 0.8% to 1.5%. (The two upper limit values are briefly explained later.) Subsequently, the other elements including safety ratio prepared for uncertainty and marketing expense etc. were also included in the gap between 2.65% (premium rate) and the total value of the two pricing elements (② + ③).

The yellow bar of pure risk premium (① + ② + ③) in Figure 3.2.5 contains uncertainty and we can picture that this yellow bar (pure risk premium) would be a variable portion which is affected bythe value of uncertainty inside the bar and other elements such as marketing expenses outside the bar. We could

5 MT2 means the second paddy season. (MT1 means the first paddy season.)

set an upper limit figure of volatility loading (②) and catastrophic loading (③) respectively, shown in the followings.

<Two views of the pricing elements; upper limits>

(1) If we take the fact that the yield data does not explain the extreme loss events such as flood or drought into consideration, Catastrophic loading of 1.5 % will be given from the following approach.

* Severity : 30% (Average of historical shortfalls or maximum payout scenarios)
* Frequency : 5% = 2.5%(Drought: 1 in 40 years) + 2.5 %(Flood: 1 in 40 years)
* Cat Loading : Severity * Frequency = 30% * 5%

(2) Volatility loading of 1.4%may be applied to capture uncertainties around yield variation and low volatility as opposed to actual extreme loss events on the ground.

2.6 Other Aspects of Product Design

2.6.1 Other Terms of Coverage

Following are the other terms of the coverage:

a. No separate coverage for mid-season or localized risks – From the yield data one can infer that the yield volatility is not very significant. Also, it has been observed that the yield shortfall doesn't have a very significant correlation with the extreme weather events in past 10 years. Considering this, the AYII product does not give any payout for mid-season adversity or localized risks.
b. No coverage for prevented sowing – Statistics provided for the area sown have shown consistently similar sown area estimates for all the years. Also, there is no enough available data to do analysis of prevented sowing or sowing failure. Hence, the AYII product does not cover any instances of sowing failure

Assumption on Past Years' Data:

a. It has been assumed that Past years' yield data has been collected following the multi-stage stratified Random Sample and size of sampled plot is 6.25 sq. m.
b. It has been assumed that the yields suggested are of un-milled paddy and not de-husked and milled estimate of rice.
c. It has been assumed that the data provided has been obtained through official sources.
d. It has been assumed that data provided has been collected using a process that is followed consistently for all the years.
e. Crop Cutting Experiment Data – Crop Cutting Experiments should be done using standard methodology referring to the method adopted by BPS. For the purpose of second season for Paddy, Crop Cutting Experiments done during the same period as that of historical data should be taken into consideration.

2.6.2 Premium Rate Setting

One single premium rate was applied for all the targe Desas both in Karawang and Kendal. This is because the single premium rate is easier and more efficient for the insurance operation rather than having different premium rates for each Desa. The single premium rate was calculated by using weighted average based on paddy area in each Desa. This method provides more equitable premium rate actuarially and would address the issue of making the product attractive for Desas with high premium to some extent.

The following table shows different options for setting up a single premium rate. Under the AYII pilot scheme, the weighted average method was applied, yet other options would be considered in the future. These options are mentioned here for your reference purpose:

Table 2.5.3 Options for Single Premium Setting

Method	Description
Maximum of the Premium taken as premium for all Desa	This would be extremely expensive product for the Desa that have better risk profile and more consistent yields over past year. It would result in larger outlay from the government towards the subsidy. In the absence of subsidy, this would result in skewed subscription with only farmers from more risky Desa finding it useful to subscribe for the insurance program.
Average of the Premium taken as premium for all Desa	This would result in increase in premium to be paid by less risky Desa's. Also, this would also result in product for Desas with high risk becoming really attractive. Hence, it is likely to result in much larger offtake of insurance in high risk Desas compared to any other option. This may cause loss to insurance company since total premium received would be less than the actuarial premium.
Weighted Average Premium with weights based on the Area Sown under each Desa	This would provide more equitable premium rate actuarially and would address the issue of making the product really attractive for Desas with high premium to some extent. However, product would still be more attractive for riskier Desas compared to Desas with low risk. Hence, skew of business towards riskier Desas and consequent losses to insurer is likely.
More equitable subsidy-based option	If there is any possibility of offering government subsidy for the program, it would be more prudent to keep the premium rate for each Desas at the actuarial levels. However, for farmers the premium rates can be kept as same. For instance, if two Desas have actuarial premium rates of 2.5% and 4.00% respectively, farmers of both the Desas can be asked to pay 1.5% as premium. Remaining amount would be subsidized by the government.
Kecamatan Level Premium Rate	Another option would be taken weightage average rates for each Kecamatan. Rather than keeping the same rates for all the Desas irrespective of Kecamatans they are in, we can have same rates for each Kecamatan. Rate for each Kecamatan can be calculate using area sown of each Desa as weight.

Source: JICA Consultant Team

2.6.3 Prevented or Failed Sowing Coverage

Prevented or Failed sowing is a situation, where most farmers in the village or the insurance unit area are not able to carry out sowing of the crop on account of factors that are not in their control or where crop that has already been sown hasn't been able to germinate or has perished within specified period of time from sowing. The specified period of time is usually 30 days but may vary depending upon the crop sown.

Percentage of area remaining unsown or failed sowing for the insurance unit to be classified as the case of prevented sowing can be different in different countries or geographies.Crop Insurance provides for early payment of proportionate claims to help farmers take up the cost of re-sowing or sowing a different crop.

Delayed sowing is the situation where the crop has been sown but the sowing has been delayed for substantial portion of the normal sown area of that crop in the insurance unit. Delayed sowing also should

happen on account of climate or environmental factors like failure of rainfall, flood or delay in availability of dam water. While delayed sowing may or may not result in crop loss depending upon the crop and the environmental factors.

The AYII pilot scheme addresses these issues as follows:

Prevented sowing – the AYII product does not cover the prevented sowing because of following reasons:

√ Area sown data given to us doesn't suggest any prevented or failed sowing as there is no material reduction in the area sown in any year.

√ Due to lack of very granular and period area sown data for past years, it would be difficult to account for and rate all the possible instances of prevented sowing. This might increase the cost of the insurance solution disproportionate to the actual risk.

√ Area Yield Index Insurance would be offered for the first country and adding more complexity regarding the claims process might be difficult to manage on ground.

Delayed Sowing – Delayed sowing is more likely scenario in the context of Indonesia. Delayed Sowing however can be managed through keep dynamic seasonality discipline. Seasonality discipline for the season can be extended on the basis of following parameters and accordingly cut off dates for buying the crop insurance solution can be reviewed and extended:

√ Delay in Dam water level and likely dates for the release of the water for irrigation

√ Rainfall pattern before the start of the season in comparison to normal rainfall

√ Sowing status monitoring using remote sensing.

2.7 Claim Settlement Process

In AYII, payment of Claim Liabilities is the responsibility of concerned Insurance Company. Sincethe program doesn't entail settlement of individual farm losses, there can be instances wherefarmer has lost the crop but he/she is still not eligible for the claims. Considering this, primaryresponsibility of calculating and settling insurance claims is of Insurance Company.Following steps would be taken for the calculation of claims:

1) Calculation of Actual Yield

* Actual Yield would be calculated based on the requisite number of Crop CuttingExperiments (CCE) to be conducted.
* Yield of all these CCE for a specified Insurance Unit Area would be aggregated andstatistical mean of the yields of all the CCE in an insurance unit area would becalculated.

This statistical mean is considered as Actual Yield of the Insurance Unit Area.

2) Calculation of per Hectare Claims

If the Actual Yield (AY) of the Insurance Unit Area is less than the Benchmark Yield (BY), thenthe calculation of claims would be done using the following formula:

$$\frac{\text{Benchmark Yield of Notified Insurance Unit-Actual Yield Notified Insurance Unit}}{\text{Benchmark Yield of Notified Insurance Unit}} \times \text{Sum Insured per hectare}$$

If AY is less than the benchmark yield of the Insurance Unit Area, all insured farmers growing that crop inthat Insurance Unit Area are deemed to have suffered a shortfall of similar magnitude inyield and thus would get same amount of claim per hectare.

3) Calculation of per Farmer Claim

Actual claim payable to each farmer would be calculated using the following formula:

Claims per hectare for Insurance Unit X Area Insured by the Farmer

Other important points for the claims processing are:

* In case the insurance is taken by bank providing the farm credit on behalf of the farmer,claims would be paid to the bank for crediting it to the loan account of the farmer.
* It is important to note that farmer is not required to intimate loss of crop for getting claimsunder AYII. Farmer is also not required to lodge the any formal claims request for any claimsrequest.
* Insurance company would do the calculation of claims on the basis of yield data providedby BPS.

APPENDIX I Premium Calculation for Karawang

1) Yield data in Target Desas

KECAMATAN	Desa	Season	Avera e eld K t e																		Trend- R Sq.	Correl	T stat	T test - p value	Last data year	Detrend	Slope
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020							
Kutawaluya	Kutamukti	I														55	55	55	57	60	60	63	65	0.94	0.97	11.345	0.000	2020	Yes	0.63
Kutawaluya	Sindangmukti	I														72	73	72	71	71	70	73	73	0.07	0.26	0.763	0.468	2020	No	
Kutawaluya	Sindangsari	I														73	73	72	71	71	71	73	73	0.04	0.19	0.555	0.594	2020	No	
Rawamerta	Gombongsari	I														75	77	78	78	78	76	78	80	0.44	0.66	2.508	0.036	2020	No	
Rawamerta	Kutawargi	I														73	74	74	74	74	74	74	75	0.71	0.84	4.427	0.002	2020	Yes	4.93
Rawamerta	Sukapura	I														77	76	78	78	78	77	79	80	0.64	0.80	3.810	0.005	2020	No	
Telagasari	Cilewo	I												70	78	74	77	80	74	77	71	68	75	0.02	-0.13	-0.424	0.681	2020	No	
Telagasari	Kalibuaya	I												70	78	74	77	80	74	77	72	71	76	0.00	-0.03	-0.105	0.918	2020	No	
Telagasari	Pasirkamuning	I												71	79	76	77	81	76	78	72	70	75	0.05	-0.23	-0.754	0.468	2020	No	
Cibuaya	Gebangjaya	I													73	74	73	74	74	74	74	74	74	0.51	0.71	3.065	0.013	2020	No	
Cibuaya	Jayamulya	I													74	76	75	76	75	75	75	75	75	0.02	0.16	0.479	0.643	2020	No	
Cibuaya	Kertarahayu	I													74	74	74	75	74	74	74	75	74	0.25	0.50	1.728	0.118	2020	No	
Pedes	Payungsari	I	72	72	71	70	73	74	72	71	72	72	71	70	70	70	69	69	70	70	70	70	50	0.38	-0.62	-3.524	0.002	2020	No	
Pedes	Rangdumulya	I	56	60	56	58	60	67	65	60	57	61	71	60	65	61	65	66	63	53	65	59	45	0.01	-0.08	-0.365	0.719	2020	No	
Pedes	Sungai Buntu	I	56	59	56		60	67	64	60	57	61	72	60	65	65	61	65	66	63	64	66	58	55	0.04	0.20	0.912	0.373	2020	No	
Telagasari	Cilewo	I											70	78	74	77	80	74	77	71	68	75	75	75	0.02	-0.13	-0.423	0.682	2020	No	
Telagasari	Kalibuaya	I											70	78	74	77	80	74	77	72	71	76	76	76	0.00	-0.03	-0.105	0.918	2020	No	
Telagasari	Pasirkamuning	I											71	79	76	77	81	76	78	75	70	75	75	75	0.05	-0.23	-0.754	0.468	2020	No	
Telagasari	Kutamukti	II														55	55	57	60	60	63	65	65	0.94	0.97	11.345	0.000	2020	Yes	0.63
Kutawaluya	Sindangmukti	II														72	73	72	71	71	70	73	73	0.07	0.26	0.763	0.468	2020	No	
Kutawaluya	Sindangsari	II														73	73	72	71	71	71	73	73	0.04	0.19	0.555	0.594	2020	No	
Rawamerta	Gombongsari	II														77	78	77	77	78	77	78	79	0.25	0.50	1.533	0.169	2019	No	
Rawamerta	Kutawargi	II														74	74	74	74	75	75	74	75	0.82	0.90	5.573	0.001	2019	Yes	5.36
Rawamerta	Sukapura	II														77	77	77	77	77	78	79		0.68	0.82	3.847	0.006	2019	No	
Telagasari	Cilewo	II												71	76	74	75	82	77	75	71	76	76	0.03	0.17	0.525	0.612	2019	No	
Telagasari	Kalibuaya	II												70	76	76	76	83	77	75	72	76	76	0.01	0.11	0.317	0.758	2019	No	
Telagasari	Pasirkamuning	II												71	76	75	75	84	78	77	72	78	78	0.07	0.26	0.810	0.439	2019	No	
Cibuaya	Gebangjaya	II													74	74	73	74	74	74	74	74	72	0.18	-0.42	-1.311	0.226	2019	No	
Cibuaya	Jayamulya	II													75	76	76	76	77	76	76	77	76	0.57	0.76	3.284	0.011	2019	No	
Cibuaya	Kertarahayu	II													75	74	74	75	74	74	74	74	76	0.06	0.25	0.724	0.490	2019	No	
Pedes	Payungsari	II	75	75	74	74	77	77	76	74	75	75	74	73	74	74	73	72	72	73	74	73	70	0.57	-0.75	-4.993	0.000	2019	No	
Pedes	Rangdumulya	II	64	60	60	56	64	64	65	63	66	65	74	65	66	71	75	59	64	66	66	66	65	0.17	0.41	1.972	0.063	2019	No	
Pedes	Sungai Buntu	II	64	59	60		65	64	65	63	66	65	74	65	66	71	76	59	65	65	65	65	65	0.10	0.32	1.435	0.168	2019	No	
Telagasari	Cilewo	II												71	76	74	75	82	77	75	71	76	76	0.03	0.17	0.525	0.612	2019	No	
Telagasari	Kalibuaya	II												70	76	76	76	83	77	75	72	76	76	0.01	0.11	0.317	0.758	2019	No	
Telagasari	Pasirkamuning	II												71	76	75	75	84	78	76	72	78	78	0.07	0.26	0.810	0.439	2019	No	

			Loss (in 80%)- Detrended data																					Average Expected Loss			
KECAMATAN	Desa	Season	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Volatility	80%	85%	90%	95%
Kutawaluya	Kutamukti	I													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.01	0.0%	0.0%	0.0%	0.0%
Kutawaluya	Sindangmukti	I													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.48	0.0%	0.0%	0.0%	0.0%
Kutawaluya	Sindangsari	I													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.37	0.0%	0.0%	0.0%	0.0%
Rawamerta	Gombongsari	I													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.20	0.0%	0.0%	0.0%	0.0%
Rawamerta	Kutawargi	I													0%	0%	0%	0%	0%	0%	0%	0%	0%	0.25	0.0%	0.0%	0.0%	0.0%
Rawamerta	Sukapura	I													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.03	0.0%	0.0%	0.0%	0.0%
Telagasari	Cilewo	I											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.45	0.0%	0.0%	0.0%	0.4%
Telagasari	Kalibuaya	I											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.27	0.0%	0.0%	0.0%	0.1%
Telagasari	Pasirkamuning	I											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.20	0.0%	0.0%	0.0%	0.2%
Cibuaya	Gebangjaya	I												0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.25	0.0%	0.0%	0.0%	0.0%
Cibuaya	Jayamulya	I												0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.63	0.0%	0.0%	0.0%	0.0%
Cibuaya	Kertarahayu	I												0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.34	0.0%	0.0%	0.0%	0.0%
Pedes	Payungsari	I	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	6.44	0.5%	1.6%	2.6%	3.5%
Pedes	Rangdumulya	I	0%	0%	0%	0%	0%	0%	0%	0%	0%			0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	5.41	0.5%	1.0%	1.6%	2.5%
Pedes	Sungai Buntu	I	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4.30	0.0%	0.0%	0.2%	1.0%
Telagasari	Cilewo	I											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.44	0.0%	0.0%	0.0%	0.4%
Telagasari	Kalibuaya	I											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.27	0.0%	0.0%	0.0%	0.1%
Telagasari	Pasirkamuning	I											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.20	0.0%	0.0%	0.0%	0.2%
Kutawaluya	Kutamukti	II													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.01	0.0%	0.0%	0.0%	0.0%
Kutawaluya	Sindangmukti	II													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.48	0.0%	0.0%	0.0%	0.0%
Kutawaluya	Sindangsari	II													0%	0%	0%	0%	0%	0%	0%	0%	0%	1.37	0.0%	0.0%	0.0%	0.0%
Rawamerta	Gombongsari	II													0%	0%	0%	0%	0%	0%	0%	0%		0.79	0.0%	0.0%	0.0%	0.0%
Rawamerta	Kutawargi	II													0%	0%	0%	0%	0%	0%	0%	0%		0.18	0.0%	0.0%	0.0%	0.0%
Rawamerta	Sukapura	II													0%	0%	0%	0%	0%	0%	0%	0%		0.78	0.0%	0.0%	0.0%	0.0%
Telagasari	Cilewo	II											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3.09	0.0%	0.0%	0.0%	0.4%
Telagasari	Kalibuaya	II											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3.37	0.0%	0.0%	0.0%	0.5%
Telagasari	Pasirkamuning	II											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3.55	0.0%	0.0%	0.0%	0.6%
Cibuaya	Gebangjaya	II												0%	0%	0%	0%	0%	0%	0%	0%	0%		0.76	0.0%	0.0%	0.0%	0.0%
Cibuaya	Jayamulya	II												0%	0%	0%	0%	0%	0%	0%	0%	0%		0.52	0.0%	0.0%	0.0%	0.1%
Cibuaya	Kertarahayu	II												0%	0%	0%	0%	0%	0%	0%	0%	0%		0.53	0.0%	0.0%	0.0%	0.0%
Pedes	Payungsari	II	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		1.65	0.0%	0.0%	0.0%	0.0%
Pedes	Rangdumulya	II	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		4.65	0.0%	0.0%	0.1%	0.7%
Pedes	Sungai Buntu	II	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		4.29	0.0%	0.0%	0.2%	0.7%
Telagasari	Cilewo	II											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3.09	0.0%	0.0%	0.0%	0.4%
Telagasari	Kalibuaya	II											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3.37	0.0%	0.0%	0.0%	0.5%
Telagasari	Pasirkamuning	II											0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3.55	0.0%	0.0%	0.0%	0.6%

3) Summary of Premium Calculation in Karawang

					80%					85%					90%					95%				
Kecamatan	Desa	Season	Avg Yield (last 10 Years)	Volatility	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium
Kutawaluya	Kutamukti	I	65.4	1.0	52.1	0.00%	0.00%	0.80%	0.80%	55.4	0.00%	0.00%	0.80%	0.80%	58.6	0.00%	0.00%	0.80%	0.80%	61.9	0.0%	0.0%	0.80%	0.80%
Kutawaluya	Sindangmukti	I	72.2	1.5	57.6	0.00%	0.00%	0.80%	0.80%	61.2	0.00%	0.00%	0.80%	0.80%	64.8	0.00%	0.00%	0.80%	0.80%	68.4	0.0%	0.0%	0.80%	0.80%
Kutawaluya	Sindangsari	I	72.3	1.4	57.7	0.00%	0.00%	0.80%	0.80%	61.3	0.00%	0.00%	0.80%	0.80%	64.9	0.00%	0.00%	0.80%	0.80%	68.5	0.0%	0.0%	0.80%	0.80%
Rawamerta	Gombongsari	I	77.6	1.2	62.4	0.00%	0.00%	0.80%	0.80%	66.3	0.00%	0.00%	0.80%	0.80%	70.2	0.00%	0.00%	0.80%	0.80%	74.1	0.0%	0.0%	0.80%	0.80%
Rawamerta	Kutawargi	I	74.6	0.3	59.7	0.00%	0.00%	0.80%	0.80%	63.4	0.00%	0.00%	0.80%	0.80%	67.2	0.00%	0.00%	0.80%	0.80%	70.9	0.0%	0.0%	0.80%	0.80%
Rawamerta	Sukapura	I	77.9	1.0	62.6	0.00%	0.00%	0.80%	0.80%	66.5	0.00%	0.00%	0.80%	0.80%	70.4	0.00%	0.00%	0.80%	0.80%	74.3	0.0%	0.0%	0.80%	0.80%
Telagasari	Cilewo	I	74.8	3.5	59.5	0.00%	0.00%	0.80%	0.80%	63.2	0.00%	0.00%	0.80%	0.80%	66.9	0.00%	0.04%	0.80%	0.84%	70.6	0.4%	0.5%	0.80%	1.68%
Telagasari	Kalibuaya	I	75.5	3.3	60.0	0.00%	0.00%	0.80%	0.80%	63.8	0.00%	0.00%	0.80%	0.80%	67.6	0.00%	0.02%	0.80%	0.82%	71.3	0.1%	0.4%	0.80%	1.34%
Telagasari	Pasirkamuning	I	75.8	3.2	60.1	0.00%	0.00%	0.80%	0.80%	63.9	0.00%	0.00%	0.80%	0.80%	67.6	0.00%	0.01%	0.80%	0.81%	71.4	0.2%	0.4%	0.80%	1.37%
Cibuaya	Gebangjaya	I	73.9	0.3	59.2	0.00%	0.00%	0.80%	0.80%	62.9	0.00%	0.00%	0.80%	0.80%	66.6	0.00%	0.00%	0.80%	0.80%	70.3	0.0%	0.0%	0.80%	0.80%
Cibuaya	Jayamulya	I	75.3	0.6	60.3	0.00%	0.00%	0.80%	0.80%	64.1	0.00%	0.00%	0.80%	0.80%	67.8	0.00%	0.00%	0.80%	0.80%	71.6	0.0%	0.0%	0.80%	0.81%
Cibuaya	Kertarahayu	I	74.2	0.3	59.5	0.00%	0.00%	0.80%	0.80%	63.2	0.00%	0.00%	0.80%	0.80%	66.9	0.00%	0.00%	0.80%	0.80%	70.6	0.0%	0.0%	0.80%	0.80%
Pedes	Payungsari	I	65.7	6.4	51.2	0.46%	0.11%	0.80%	1.37%	54.4	1.61%	0.47%	0.80%	2.87%	57.6	2.63%	1.19%	0.80%	4.62%	60.8	3.5%	2.5%	0.80%	6.89%
Pedes	Rangdumulya	I	60.3	5.4	47.7	0.52%	0.06%	0.80%	1.38%	50.7	1.01%	0.33%	0.80%	2.14%	53.6	1.56%	0.97%	0.80%	3.32%	56.6	2.5%	2.2%	0.80%	5.48%
Pedes	Sungai Buntu	I	62.4	4.3	50.0	0.00%	0.00%	0.80%	0.80%	53.1	0.00%	0.06%	0.80%	0.86%	56.2	0.22%	0.40%	0.80%	1.42%	59.4	1.0%	1.4%	0.80%	3.20%
Kutawaluya	Kutamukti	II	65.4	1.0	52.1	0.00%	0.00%	0.80%	0.80%	55.4	0.00%	0.00%	0.80%	0.80%	58.6	0.00%	0.00%	0.80%	0.80%	61.9	0.0%	0.0%	0.80%	0.80%
Kutawaluya	Sindangmukti	II	72.2	1.5	57.6	0.00%	0.00%	0.80%	0.80%	61.2	0.00%	0.00%	0.80%	0.80%	64.8	0.00%	0.00%	0.80%	0.80%	68.4	0.0%	0.0%	0.80%	0.80%
Kutawaluya	Sindangsari	II	72.3	1.4	57.7	0.00%	0.00%	0.80%	0.80%	61.3	0.00%	0.00%	0.80%	0.80%	64.9	0.00%	0.00%	0.80%	0.80%	68.5	0.0%	0.0%	0.80%	0.80%
Rawamerta	Gombongsari	II	77.7	0.8	62.2	0.00%	0.00%	0.80%	0.80%	66.1	0.00%	0.00%	0.80%	0.80%	70.0	0.00%	0.00%	0.80%	0.80%	73.8	0.0%	0.0%	0.80%	0.80%
Rawamerta	Kutawargi	II	74.6	0.2	59.7	0.00%	0.00%	0.80%	0.80%	63.4	0.00%	0.00%	0.80%	0.80%	67.2	0.00%	0.00%	0.80%	0.80%	70.9	0.0%	0.0%	0.80%	0.80%
Rawamerta	Sukapura	II	77.5	0.8	62.0	0.00%	0.00%	0.80%	0.80%	65.9	0.00%	0.00%	0.80%	0.80%	69.8	0.00%	0.00%	0.80%	0.80%	73.7	0.0%	0.0%	0.80%	0.80%
Telagasari	Cilewo	II	75.4	3.1	60.9	0.00%	0.00%	0.80%	0.80%	64.7	0.00%	0.00%	0.80%	0.80%	68.5	0.00%	0.01%	0.80%	0.81%	72.3	0.4%	0.4%	0.80%	1.54%
Telagasari	Kalibuaya	II	75.4	3.4	60.9	0.00%	0.00%	0.80%	0.80%	64.7	0.00%	0.00%	0.80%	0.80%	68.5	0.00%	0.03%	0.80%	0.83%	72.3	0.5%	0.5%	0.80%	1.75%
Telagasari	Pasirkamuning	II	76.2	3.5	61.7	0.00%	0.00%	0.80%	0.80%	65.6	0.00%	0.00%	0.80%	0.80%	69.4	0.00%	0.04%	0.80%	0.84%	73.3	0.6%	0.5%	0.80%	1.89%
Cibuaya	Gebangjaya	II	73.4	0.8	58.6	0.00%	0.00%	0.80%	0.80%	62.3	0.00%	0.00%	0.80%	0.80%	66.0	0.00%	0.00%	0.80%	0.80%	69.6	0.0%	0.0%	0.80%	0.80%
Cibuaya	Jayamulya	II	76.0	0.5	61.0	0.00%	0.00%	0.80%	0.80%	64.8	0.00%	0.00%	0.80%	0.80%	68.6	0.00%	0.00%	0.80%	0.80%	72.4	0.1%	0.0%	0.80%	0.85%
Cibuaya	Kertarahayu	II	74.7	0.5	59.7	0.00%	0.00%	0.80%	0.80%	63.5	0.00%	0.00%	0.80%	0.80%	67.2	0.00%	0.00%	0.80%	0.80%	70.9	0.0%	0.0%	0.80%	0.80%
Pedes	Payungsari	II	72.8	1.6	57.9	0.00%	0.00%	0.80%	0.80%	61.5	0.00%	0.00%	0.80%	0.80%	65.2	0.00%	0.00%	0.80%	0.80%	68.8	0.0%	0.0%	0.80%	0.82%
Pedes	Rangdumulya	II	67.0	4.7	53.3	0.00%	0.00%	0.80%	0.80%	56.6	0.00%	0.06%	0.80%	0.86%	59.9	0.14%	0.41%	0.80%	1.35%	63.3	0.7%	1.4%	0.80%	2.88%
Pedes	Sungai Buntu	II	67.1	4.3	53.3	0.00%	0.00%	0.80%	0.80%	56.6	0.00%	0.02%	0.80%	0.82%	59.9	0.15%	0.29%	0.80%	1.24%	63.2	0.7%	1.2%	0.80%	2.64%

4) Net Premium Rate in Karawang

No	Kecamatan	Desa	Major Varieties			Assumed	Desa	Net Premium (80%)		Net Premium (85%)		Weighted Net P. (80%)			Weighted Net P. (85%)		
			1	2	3	3 Desa Area	Area, km2	MT1	MT2	MT1	MT2	MT1	MT2	Average	MT1	MT2	Average
1	Kutawaluya	Kutamukti	Impari 32	Ciherang		1,375	5.09	0.800%	0.800%	0.800%	0.800%	0.87%	0.80%	0.84%	1.02%	0.81%	0.91%
2	Kutawaluya	Sindangmukti	Ciherang	Impari 32	Mikongga		6.14	0.800%	0.800%	0.800%	0.800%						
3	Kutawaluya	Sindangsari	Impari 32	Ciherang			7.40	0.800%	0.800%	0.800%	0.800%						
4	Rawamerta	Gombongsari	Ciherang	Impari 32		1,154	2.90	0.800%	0.800%	0.800%	0.800%						
5	Rawamerta	Kutawargi	Ciherang	Impari 32	Mikongga		3.09	0.800%	0.800%	0.800%	0.800%						
6	Rawamerta	Sukapura	Ciherang	Impari 32			3.41	0.800%	0.800%	0.800%	0.800%						
7	Telagasari	Cilewo	Ciherang	Impari 32		1,114	3.67	0.800%	0.800%	0.800%	0.800%						
8	Telagasari	Kalibuaya	Impari 32	Ciherang	Mikongga		4.44	0.800%	0.800%	0.800%	0.800%						
9	Telagasari	Pasirkamuning	Ciherang	Mikongga			3.54	0.800%	0.800%	0.800%	0.800%						
10	Cibuaya	Gebangjaya	Ciherang			3,218	4.42	0.800%	0.800%	0.800%	0.800%						
11	Cibuaya	Jayamulya	Ciherang	Impari 32	Mikongga		7.56	0.800%	0.800%	0.800%	0.800%						
12	Cibuaya	Kertarahayu	Ciherang	Impari 32			5.62	0.800%	0.800%	0.800%	0.800%						
13	Pedes	Payungsari	Ciherang	Impari 32	Mikongga	1,650	6.92	1.369%	0.800%	2.873%	0.800%						
14	Pedes	Rangdumulya	Ciherang	Impari 32			3.95	1.384%	0.800%	2.137%	0.859%						
15	Pedes	Sungaibuntu	Ciherang	Impari 32	Mikongga		10.55	0.800%	0.800%	0.860%	0.825%						

APPENDIX II Premium Calculation for Kendal

1) Yield Data in Target Desas

Musim Tanam	Kecamatan	Desa	Jenis Irigasi	Kelompok Tani	Luas (ha)	Varietas	Jadwal Tanam	Jadwal Panen	Produktivitas (Kuintal/ha) 2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
I	PAGERUYUNG	Surokonto Wetan	Teknis	Sumber Rejeki	80	IR 64, CILIWUNG, CIHERANG, INPARI 32	Mei	Agustus	64.30	63.00	64.00	63.00	64.00	64.00	64.00	66.00	65.00	65.00	64.00
I	PAGERUYUNG	Surokonto Kulon	Teknis	Sumber Makmur	40	IR 64, CILIWUNG, CIHERANG, INPARI 32	April	Juli	67.00	67.60	63.00	63.00	63.00	62.00	63.00	64.00	63.00	63.00	67.00
I	PAGERUYUNG	Gebangan	Sederhana	Sumber Alam 1	24	IR 64, CILIWUNG, CIHERANG, INPARI 32	April	Juli	54.60	54.00	54.00	54.00	55.00	54.00	55.00	54.00	54.00	54.00	54.00
II	PAGERUYUNG	Surokonto Wetan	Teknis	Sumber Rejeki	80	IR 64, CILIWUNG, CIHERANG, INPARI 32	September	Desember	64.00	64.40	65.00	66.00	65.00	65.00	66.00	67.00	65.00	65.00	66.00
II	PAGERUYUNG	Surokonto Kulon	Teknis	Sumber Makmur	40	IR 64, CILIWUNG, CIHERANG, INPARI 32	Agustus	Nopember	62.00	62.20	64.00	64.00	63.00	63.00	64.00	64.00	63.00	63.00	63.00
II	PAGERUYUNG	Gebangan	Sederhana	Sumber Alam 1	24	IR 64, CILIWUNG, CIHERANG, INPARI 32	Agustus	Nopember	56.00	55.00	56.00	55.00	56.00	56.00	56.00	56.00	56.00	56.00	55.00
I	PATEAN	Wirosari	Sederhana	NGUDIRAHARJO I	69	Ir 64, Ciherang, Merauke, Inpari	Maret / April	Juli / Agustus	53.43	53.00	53.80	54.30	54.80	59.40	50.80	49.00	50.50	52.00	54.00
I	PATEAN	Pagersari	Sederhana	NGUDIRAHARJO II	57	Ir 64, Ciherang, Merauke, Inpari	Maret / April	Juli / Agustus	54.80	53.40	55.00	55.00	55.00	59.70	51.00	49.40	50.60	52.10	54.50
I	PATEAN	Salo	Sederhana	MARGOTIRTOSARI I	68	Ir 64, Ciherang, Merauke, Situbagendit, Inpari	Maret / April	Juli / Agustus	54.30	53.20	54.00	54.60	54.50	59.50	50.90	49.20	50.80	52.10	54.30
II	PATEAN	Wirosari	Sederhana	MEKARSARI	39	Ir 64, Ciherang, Merauke, Inpari	Maret / April	Juli / Agustus	56.50	56.40	56.90	57.30	57.20	61.00	52.30	50.60	52.40	53.40	55.60
II	PATEAN	Pagersari	Sederhana	SUBUR	32	Ir 64, Ciherang, Merauke, Inpari	Maret / April	Juli / Agustus	58.20	56.60	58.10	57.80	57.50	61.50	52.50	51.00	52.50	53.50	55.80
II	PATEAN	Salo	Sederhana	NGUDIRAHARJO I	69	Ir 64, Ciherang, Merauke, Inpari	Agustus/Septem	November/ Des	56.50	56.50	57.30	57.10	57.40	61.30	52.40	50.90	52.50	53.50	55.80
I	PATEBON	Wonosari	Sederhana	NGUDIRAHARJO II	57	Ir 64, Ciherang, Merauke, Inpari	Agustus/Septem	November/ Des	50.14	57.87	57.00	52.82	55.13	50.12	56.32	53.33	55.18	58.08	57.22
I	PATEBON	Pidodowetan	Sederhana	MARGOTIRTOSARI I	69	Ir 64, Ciherang, Situbagendit, Inpari	Agustus/Septem	November/ Des	49.36	58.13	57.26	51.23	54.68	50.18	56.47	52.83	55.18	58.23	56.57
I	PATEBON	Pidodokulon	Sederhana	MEKARSARI	39	Ir 64, Ciherang, Situbagendit, Inpari	Agustus/Septem	November/ Des	50.00	57.16	56.60	51.41	55.08	50.16	56.64	53.41	55.24	58.32	56.62
II	PATEBON	Wonosari	Sederhana	SUBUR	32	Ir 64, Ciherang, Situbagendit, Inpari	Agustus/Septem	November/ Des	50.87	58.36	57.67	52.97	56.58	50.92	57.92	54.53	56.58	59.88	58.07
II	PATEBON	Pidodowetan	Teknis	Sido Mukti, Ngudi Mulyo, Cucut Putih	41.67	Situ bagendit/ IR 64, Inpari 32/ Inpari 33	Mei / juni	Agustus /Septe	51.84	58.93	57.86	53.83	56.48	50.98	57.87	54.43	55.98	59.63	58.17
II	PATEBON	Pidodokulon	Teknis	Karya Tani, Mukti Tani, Karya Makmur	45.67	Situ bagendit/ IR 64, Inpari 32/ Inpari 33	Mei / juni	Agustus /Septe	51.10	59.16	58.00	53.81	56.30	50.96	57.76	54.01	56.16	59.40	58.00
I	PLANTUNGAN	Wadas	setengah teknis	Sari Tani, Dadi Joyo, Sido Makmur	120.77	umbul/lokal, Ciherang, Ciliwung, inpari 32	Okt/Nov 2021	Jan/Feb 2022	55.00	58.00	57.00	53.60	53.60	54.00	54.00	54.00	53.00	53.00	50.00
I	PLANTUNGAN	Bendosari	setengah teknis	Amanah, Tani jaya, Rukun Tani	169.56	umbul/lokal, Ciherang, Ciliwung, inpari 32	Okt/Nov 2021	Jan/Feb 2022	56.00	58.00	58.00	52.30	52.30	63.50	59.40	54.00	53.00	53.00	57.00
I	PLANTUNGAN	Mojoagung	setengah teknis	Makmur Mojoagung, Jaya Abadi	180.60	umbul/lokal, Ciherang, Ciliwung, inpari 32	Okt/Nov 2021	Jan/Feb 2022	59.00	59.00	54.00	53.80	53.80	64.00	60.00	54.00	53.00	54.00	57.00
II	PLANTUNGAN	Wadas	setengah teknis	Sari Tani, Dadi Joyo, Sido Makmur	120.77	umbul/lokal, Ciherang, Ciliwung, inpari 32	Feb/Mar 2022	Mei/Juni 2022	57.00	62.00	59.00	55.60	56.00	66.00	60.00	58.00	59.80	59.80	58.00
II	PLANTUNGAN	Bendosari	setengah teknis	Amanah, Tani jaya, Rukun Tani	169.56	umbul/lokal, Ciherang, Ciliwung, inpari 32	Feb/Mar 2022	Mei/Juni 2022	59.60	62.00	61.00	57.50	57.90	68.00	61.00	58.20	61.00	61.00	56.00
II	PLANTUNGAN	Mojoagung	setengah teknis	Makmur Mojoagung, Jaya Abadi	180.60	umbul/lokal, Ciherang, Ciliwung, inpari 32	Feb/Mar 2022	Mei/Juni 2022	60.40	63.00	58.00	57.00	57.00	68.00	63.00	59.00	59.80	61.00	55.00
I	ROWOSARI	PARAKAN	Tersier	Blimbing, Ngudi makmur 1, ngudi makmur 2	60	Inpari 32, situbangendit, ciherang	november/desemebr	Maret / April	36.00	41.44	42.40	52.00	53.76	55.68	54.08	50.40	44.64	40.32	42.40
I	ROWOSARI	KARANGSARI	Tersier	Boto Tumpang, tani makmur	90	Inpari 32, situbangendit, ciherang	november/desemebr	Maret / April	36.48	41.92	42.72	52.48	53.44	54.56	52.96	49.76	43.36	40.00	41.76
I	ROWOSARI	RANDUSARI	Tersier	Guyup Rukun, subur makmur	85	Inpari 32, situbangendit, ciherang	november/desemebr	Maret / April	36.64	40.80	41.76	52.64	53.28	55.84	53.76	50.08	43.84	39.04	41.76
II	ROWOSARI	PARAKAN	Tersier	Blimbing, Ngudi makmur 1, ngudi makmur 2	60	Inpari 32, situbangendit, ciherang	mei/Juni	Agustus /Septe	76.98	79.68	77.60	56.32	61.12	88.16	65.60	60.00	75.84	88.00	78.08
II	ROWOSARI	KARANGSARI	Tersier	Boto Tumpang, tani makmur	90	Inpari 32, situbangendit, ciherang	mei/Juni	Agustus /Septe	77.60	78.88	78.08	56.64	60.96	89.76	65.92	64.48	77.28	88.00	78.40
II	ROWOSARI	RANDUSARI	Tersier	Guyup Rukun, subur makmur	85	Inpari 32, situbangendit, ciherang	mei/Juni	Agustus /Septe	78.24	79.36	78.55	56.80	60.80	88.64	66.24	64.00	76.32	89.12	78.24

					80%					85%					90%					95%				
Kecamatan	Desa	Season	Avg Yield (last 10 Years)	Volatility	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium	Benchmark Yield	Expected Loss	Volatility Loading	CAT Loading @2% of PML	Expected Risk Premium
PAGERUYUN	Surokonto Wetan	I	64.2	0.9	51.7	0.00%	0.00%	0.81%	0.81%	54.9	0.00%	0.00%	0.81%	0.81%	58.1	0.00%	0.00%	0.81%	0.81%	61.3	0.0%	0.0%	0.81%	0.81%
PAGERUYUN	Surokonto Kulon	I	62.9	0.6	50.3	0.00%	0.00%	0.81%	0.81%	53.4	0.00%	0.00%	0.81%	0.81%	56.6	0.00%	0.00%	0.81%	0.81%	59.7	0.0%	0.0%	0.81%	0.81%
PAGERUYUN	Gebangan	I	54.2	0.4	43.4	0.00%	0.00%	0.81%	0.81%	46.1	0.00%	0.00%	0.81%	0.81%	48.9	0.00%	0.00%	0.81%	0.81%	51.6	0.0%	0.0%	0.81%	0.81%
PATEAN	Wirosari	I	53.2	2.8	42.3	0.00%	0.00%	0.81%	0.81%	45.0	0.00%	0.00%	0.81%	0.81%	47.6	0.00%	0.10%	0.81%	0.90%	50.3	0.3%	0.7%	0.81%	1.77%
PATEAN	Pagersari	I	53.6	2.8	42.5	0.00%	0.00%	0.81%	0.81%	45.2	0.00%	0.00%	0.81%	0.81%	47.9	0.00%	0.11%	0.81%	0.92%	50.5	0.2%	0.7%	0.81%	1.78%
PATEAN	Selo	I	53.3	2.7	42.4	0.00%	0.00%	0.81%	0.81%	45.1	0.00%	0.00%	0.81%	0.81%	47.7	0.00%	0.08%	0.81%	0.89%	50.4	0.2%	0.7%	0.81%	1.71%
PATEBON	Wonosari	I	55.3	2.9	44.0	0.00%	0.00%	0.81%	0.81%	46.8	0.00%	0.00%	0.81%	0.81%	49.5	0.00%	0.10%	0.81%	0.91%	52.3	0.4%	0.7%	0.81%	1.94%
PATEBON	Pidodowetan	I	55.1	3.2	43.9	0.00%	0.00%	0.81%	0.81%	46.6	0.00%	0.00%	0.81%	0.81%	49.4	0.00%	0.19%	0.81%	1.00%	52.1	0.5%	0.9%	0.81%	2.30%
PATEBON	Pidodokulon	I	55.1	2.9	44.1	0.00%	0.00%	0.81%	0.81%	46.8	0.00%	0.00%	0.81%	0.81%	49.6	0.00%	0.11%	0.81%	0.92%	52.3	0.6%	0.8%	0.81%	2.14%
PLANTUN	Wadas	I	55.0	3.6	43.6	0.00%	0.00%	0.81%	0.81%	46.3	0.00%	0.04%	0.81%	0.85%	49.1	0.00%	0.33%	0.81%	1.13%	51.8	0.3%	1.3%	0.81%	2.43%
PLANTUN	Bendosari	I	55.6	3.7	44.3	0.00%	0.00%	0.81%	0.81%	47.0	0.00%	0.04%	0.81%	0.85%	49.8	0.00%	0.35%	0.81%	1.15%	52.5	0.2%	1.3%	0.81%	2.32%
PLANTUN	Mojoagung	I	55.8	3.8	44.7	0.00%	0.00%	0.81%	0.81%	47.5	0.00%	0.05%	0.81%	0.86%	50.2	0.00%	0.38%	0.81%	1.18%	53.0	0.2%	1.4%	0.81%	2.36%
ROWOSA	PARAKAN	I	47.7	6.7	39.0	0.00%	0.87%	0.81%	1.68%	41.4	0.27%	1.62%	0.81%	2.70%	43.9	2.04%	2.88%	0.81%	5.73%	46.3	4.4%	4.3%	0.81%	9.46%
ROWOSA	KARANGSARI	I	47.3	6.4	38.4	0.00%	0.73%	0.81%	1.53%	40.8	0.19%	1.48%	0.81%	2.48%	43.2	1.46%	2.67%	0.81%	4.94%	45.6	4.0%	4.0%	0.81%	8.83%
ROWOSA	RANDUSARI	I	47.3	6.9	38.6	0.00%	1.00%	0.81%	1.81%	41.0	0.52%	1.75%	0.81%	3.08%	43.4	2.36%	3.07%	0.81%	6.24%	45.8	4.8%	4.4%	0.81%	10.03%
PAGERUYUN	Surokonto Wetan	II	65.4	0.9	52.5	0.00%	0.00%	0.81%	0.81%	55.7	0.00%	0.00%	0.81%	0.81%	59.0	0.00%	0.00%	0.81%	0.81%	62.3	0.0%	0.0%	0.81%	0.81%
PAGERUYUN	Surokonto Kulon	II	63.3	0.7	50.6	0.00%	0.00%	0.81%	0.81%	53.8	0.00%	0.00%	0.81%	0.81%	57.0	0.00%	0.00%	0.81%	0.81%	60.1	0.0%	0.0%	0.81%	0.81%
PAGERUYUN	Gebangan	II	55.7	0.5	44.7	0.00%	0.00%	0.81%	0.81%	47.5	0.00%	0.00%	0.81%	0.81%	50.3	0.00%	0.00%	0.81%	0.81%	53.1	0.0%	0.0%	0.81%	0.81%
PATEAN	Wirosari	II	55.3	3.0	43.7	0.00%	0.00%	0.81%	0.81%	46.4	0.00%	0.00%	0.81%	0.81%	49.2	0.00%	0.12%	0.81%	0.93%	51.9	0.3%	0.8%	0.81%	1.83%
PATEAN	Pagersari	II	55.7	3.2	43.9	0.00%	0.00%	0.81%	0.81%	46.7	0.00%	0.00%	0.81%	0.81%	49.4	0.00%	0.18%	0.81%	0.98%	52.2	0.2%	0.9%	0.81%	1.94%
PATEAN	Selo	II	55.5	3.1	43.9	0.00%	0.00%	0.81%	0.81%	46.6	0.00%	0.00%	0.81%	0.81%	49.3	0.00%	0.16%	0.81%	0.96%	52.1	0.2%	0.9%	0.81%	1.90%
PATEBON	Wonosari	II	56.3	3.1	45.1	0.00%	0.00%	0.81%	0.81%	47.9	0.00%	0.00%	0.81%	0.81%	50.7	0.00%	0.14%	0.81%	0.95%	53.5	0.6%	0.8%	0.81%	2.21%
PATEBON	Pidodowetan	II	56.4	2.9	45.0	0.00%	0.00%	0.81%	0.81%	47.8	0.00%	0.00%	0.81%	0.81%	50.6	0.00%	0.08%	0.81%	0.89%	53.4	0.5%	0.7%	0.81%	1.93%
PATEBON	Pidodokulon	II	56.4	3.0	44.9	0.00%	0.00%	0.81%	0.81%	47.7	0.00%	0.00%	0.81%	0.81%	50.5	0.00%	0.12%	0.81%	0.92%	53.3	0.4%	0.8%	0.81%	2.00%
PLANTUN	Wadas	II	59.4	2.9	47.7	0.00%	0.00%	0.81%	0.81%	50.7	0.00%	0.00%	0.81%	0.81%	53.7	0.00%	0.06%	0.81%	0.87%	56.7	0.3%	0.6%	0.81%	1.73%
PLANTUN	Bendosari	II	60.4	3.1	48.4	0.00%	0.00%	0.81%	0.81%	51.4	0.00%	0.00%	0.81%	0.81%	54.4	0.00%	0.10%	0.81%	0.90%	57.4	0.2%	0.7%	0.81%	1.76%
PLANTUN	Mojoagung	II	60.1	3.6	48.3	0.00%	0.00%	0.81%	0.81%	51.3	0.00%	0.00%	0.81%	0.81%	54.4	0.00%	0.23%	0.81%	1.04%	57.4	0.5%	1.0%	0.81%	2.39%
ROWOSA	PARAKAN	II	73.0	11.0	59.1	0.46%	1.14%	0.81%	2.42%	62.8	1.72%	1.90%	0.81%	4.43%	66.4	3.42%	3.28%	0.81%	7.51%	70.1	5.3%	4.7%	0.81%	10.81%
ROWOSA	KARANGSARI	II	73.8	10.7	60.0	0.56%	1.00%	0.81%	2.36%	63.7	1.55%	1.75%	0.81%	4.10%	67.5	3.25%	3.07%	0.81%	7.12%	71.2	5.2%	4.4%	0.81%	10.43%
ROWOSA	RANDUSARI	II	73.8	10.8	59.8	0.50%	1.02%	0.81%	2.33%	63.6	1.50%	1.77%	0.81%	4.07%	67.3	3.17%	3.10%	0.81%	7.07%	71.0	5.1%	4.5%	0.81%	10.38%

No	Kecamatan	Desa	MT1	MT2	Net Premium (80%)		Net Premium (85%)		Weighted Net P. (80%)			Weighted Net P. (85%)		
			Area	Area	MT1	MT2	MT1	MT2	MT1	MT2	Average	MT1	MT2	Average
1	PAGERUYUNG	Surokonto Wetan	80	80	0.806%	0.806%	0.806%	0.806%						
2	PAGERUYUNG	Surokonto Kulon	40	40	0.806%	0.806%	0.806%	0.806%						
3	PAGERUYUNG	Gebangan	24	24	0.806%	0.806%	0.806%	0.806%						
4	PATEAN	Wirosari	69	39	0.806%	0.806%	0.806%	0.806%						
5	PATEAN	Pagersari	57	32	0.806%	0.806%	0.806%	0.806%						
6	PATEAN	Selo	68	69	0.806%	0.806%	0.806%	0.806%						
7	PATEBON	Wonosari	57	32	0.806%	0.806%	0.806%	0.806%						
8	PATEBON	Pidodowetan	69	42	0.806%	0.806%	0.806%	0.806%	0.97%	1.14%	1.06%	1.20%	1.52%	1.36%
9	PATEBON	Pidodokulon	39	46	0.806%	0.806%	0.806%	0.806%						
10	PLANTUNGAN	Wadas	121	121	0.806%	0.806%	0.845%	0.806%						
11	PLANTUNGAN	Bendosari	170	170	0.806%	0.806%	0.851%	0.806%						
12	PLANTUNGAN	Mojoagung	181	181	0.806%	0.806%	0.857%	0.808%						
13	ROWOSARI	PARAKAN	60	60	1.676%	2.415%	2.697%	4.434%						
14	ROWOSARI	KARANGSARI	90	90	1.534%	2.365%	2.476%	4.104%						
15	ROWOSARI	RANDUSARI	85	85	1.808%	2.329%	3.082%	4.070%						

No	Kecamatan	Desa	MT1	MT2	MT1	MT2	Net Premium (80%)		Net Premium (85%)		Weighted Net P. (80%)			Weighted Net P. (85%)		
			Area	Area	Area	Area	MT1	MT2	MT1	MT2	MT1	MT2	Average	MT1	MT2	Average
1	PAGERUYUNG	Surokonto Wetan	80	80	8%	9%	0.806%	0.806%	0.806%	0.806%						
2	PAGERUYUNG	Surokonto Kulon	40	40	4%	5%	0.806%	0.806%	0.806%	0.806%						
3	PAGERUYUNG	Gebangan	24	24	2%	3%	0.806%	0.806%	0.806%	0.806%						
4	PATEAN	Wirosari	69	39	7%	4%	0.806%	0.806%	0.806%	0.806%						
5	PATEAN	Pagersari	57	32	6%	4%	0.806%	0.806%	0.806%	0.806%						
6	PATEAN	Selo	68	69	7%	8%	0.806%	0.806%	0.806%	0.806%						
7	PATEBON	Wonosari	57	32	6%	4%	0.806%	0.806%	0.806%	0.806%						
8	PATEBON	Pidodowetan	69	42	7%	5%	0.806%	0.806%	0.806%	0.806%	0.81%	0.81%	0.81%	0.83%	0.81%	0.82%
9	PATEBON	Pidodokulon	39	46	4%	5%	0.806%	0.806%	0.806%	0.806%						
10	PLANTUNGAN	Wadas	121	121	12%	14%	0.806%	0.806%	0.845%	0.806%						
11	PLANTUNGAN	Bendosari	170	170	17%	19%	0.806%	0.806%	0.851%	0.806%						
12	PLANTUNGAN	Mojoagung	181	181	19%	21%	0.806%	0.806%	0.857%	0.808%						
13	ROWOSARI	PARAKAN														
14	ROWOSARI	KARANGSARI														
15	ROWOSARI	RANDUSARI														

The final premium rate for AYII in Karawang is 2.65% per ha. This rate will also be applied in Kendal. However, the net premium of 1.36% is too high to reach the target rate of 2.65% given Jasindo's operational costs. Thus, Jasindo, MOA, and BAPPENAS agreed to exclude Rowosari from the target areas in Kendal during the pilot implementation stage. The weighted average net premium rate than became 0.82% per ha without Rowosari. With Jasindo's operational costs added, the final rate reached 2.65% per ha.

PART II AYII OPERATIONAL GUIDE

CHAPTER 1 INTRODUCTION

1.1 Background of AYII Pilot Activity

The Government of Indonesia has been conducting a pilot basis agricultural insurance program as an important mean of securing food security of the nation. For example, from 2015 to 2019 corresponding to the last mid-term national development plan (RPJMN 2015-19), an indemnity-based agricultural insurance (Asuransi Usaha Tani Padi; AUTP) had been tried every year targeting as much as 1 million ha of paddy land. Thereafter, the current RPJMN 2020-2024 also upholds agricultural insurance as one of priority programs, whereby the indemnity-based insurance is on-going.

While AUTP has achieved quick increase of insured farmers, necessary institutional capacity as well as the structural set-up have been left behind a bit. Facing these issues, the Government of Indonesia requested the Government of Japan to bring about the Project of Capacity Development for the implementation of Agricultural Insurance. Responding to the request, JICA is now implementing the Project with the schedule from October 2017. Under this JICA Project, to supplement the AUTP, a new insurance scheme, an Area-Index based insurance scheme, was also introduced in 2021 as pilot scheme.

1.2 Purpose of AYII Operation Guide

Area Yield Index Insurance (AYII) is first tried in Indonesia targeting the crop season of the MT2 2021 in selected 15 Desas in Karawang Kabupaten, Java West Province. In 2022, the government tries to continue the AYII scheme for the MT1 crop season in the same Desas in Karawang Kabupaten and expand to the new selected 12 Desas in Kendal Kabupaten, Central Java Province. In 2023, the pilot continues covering MT1 and MT2 of Karawang Kabupaten and MT2 of Kendal Kabupatens. This AYII operation guide aims at having the pilot implementation of AYII successfully by supporting the relevant stakeholders, especially the extension staff and Jasindo filed staff, to extend the AYII product to tehri clientele farmers.

The main target of this AYII operation guide includesmain implementors and practitioners of the AYII scheme; namely, agricultural extension officers, Jasindo filed staff, surveyors for Crop Cutting Experiments (CCEs) and representatives of farmers' groups. This AYII operation guide targets the AYII operation in 2023 season including both MT1 season and MT2 season in Karawang Kabupaten in West Java Province and MT2 season of Kendal Kabupaten in Central Java Province.

1.3 AYII Pilot Phase

1) Target Area for the AYII Pilot

The AYII pilot implementation targets the 15 Desas located in 5 Kecamatans of Karawang Kabupaten, Java West Province and 12 Desas located in 4 Kecamatans of Kendal Kabupaten, Central Java Province. Three Desas each have been selected from each of the fiveor four Kecamatans within Karawang and Kendal Kabupatens. The 27 Desas in total have been so selected as to taking into account geographical distribution covering from relatively upper elevation area to lower coastal area in each Kabupaten. The target Desas are summarized as below:

Table 1.3.1 List of the Target 15 Desas, Karawang Kabupaten

No	Kecamatan	Desa	Major Varieties			Desa
			1	2	3	Area, km2
1	Kutawaluya	Kutamukti	Impari 32	Ciherang		5.09
2		Sindangmukti	Ciherang	Impari 32	Mikongga	6.14
3		Sindangsari	Impari 32	Ciherang		7.40
4	Rawamerta	Gombongsari	Ciherang	Impari 32		2.90
5		Kutawargi	Ciherang	Impari 32	Mikongga	3.09
6		Sukapura	Ciherang	Impari 32		3.41
7	Telagasari	Cilewo	Ciherang	Impari 32		3.67
8		Kalibuaya	Impari 32	Ciherang	Mikongga	4.44
9		Pasirkamuning	Ciherang	Mikongga		3.54
10	Cibuaya	Gebangjaya	Ciherang			4.42
11		Jayamulya	Ciherang	Impari 32	Mikongga	7.56
12		Kertarahayu	Ciherang	Impari 32		5.62
13	Pedes	Payungsari	Ciherang	Impari 32	Mikongga	6.92
14		Rangdumulya	Ciherang	Impari 32		3.95
15		Sungaibuntu	Ciherang	Impari 32	Mikongga	10.55

Note: The 'Desa area' means administratively extended area including residential area, forest area, road, wetland, fishery pond, etc., and therefore the paddy areas are smaller than the Desa area indicated in above.

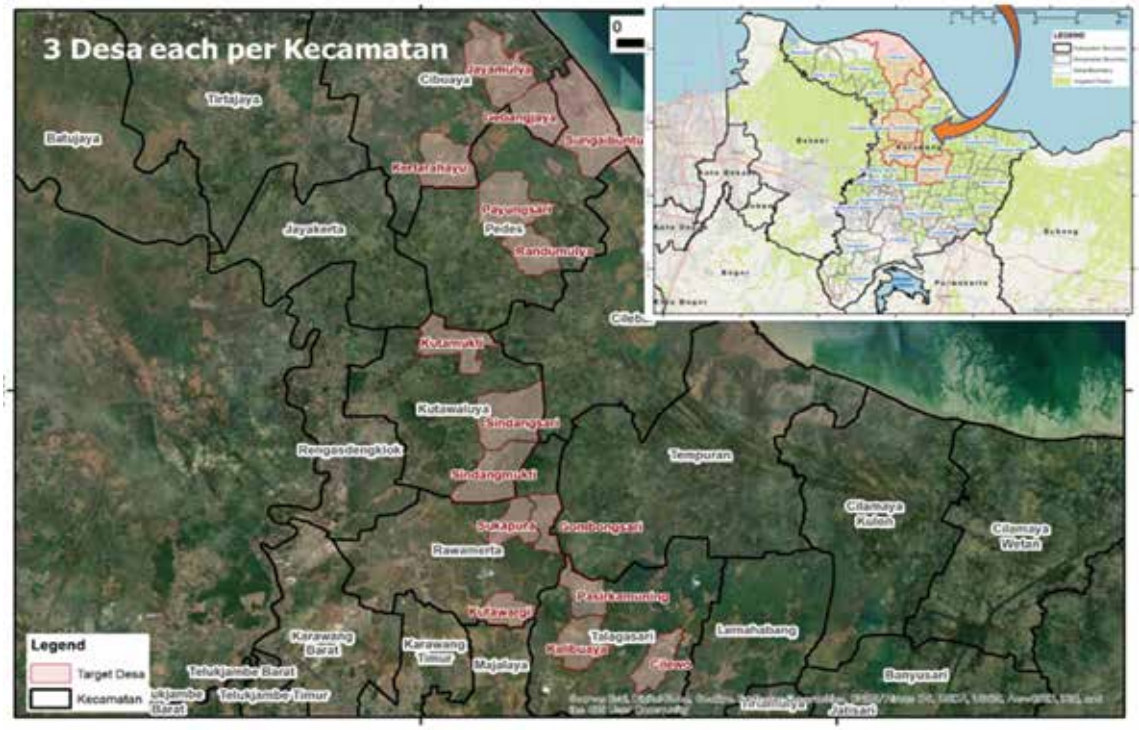


Figure 1.3.1 Location Map of the Target Desas in Karawang Kabupaten

Table 1.3.2 List of the Target 15 Desas, Kendal Kabupaten

No	Kecamatan	Desa	Major Varieties	Desa
				Paddy Area, km2
1	PAGERUYUNG	Surokonto Wetan	IR 64, CILIWUNG, CIHERANG, INPARI 32	0.80
2		Surokonto Kulon	IR 64, CILIWUNG, CIHERANG, INPARI 32	0.40
3		Gebangan	IR 64, CILIWUNG, CIHERANG, INPARI 32	0.24
4	PATEAN	Wirosari	Ir 64, Ciherang, Merauke, Inpari	0.69
5		Pagersari	Ir 64, Ciherang, Merauke, Inpari	0.57
6		Selo	Ir 64, Ciherang, Merauke, Situ Bagendit,Inpari	0.68
7	PATEBON	Wonosari	Ir 64, Ciherang, Merauke, Inpari	0.57
8		Pidodowetan	Ir 64, Ciherang, Situ Bagendit, Inpari	0.59
9		Pidodokulon	Ir 64, Ciherang, Situ Bagendit, Inpari	0.39
10	PLANTUNGAN	Wadas	Umbul/Lokal, Ciherang, Ciliwung, inpari 32	1.21
11		Bendosari	Umbul/Lokal, Ciherang, Ciliwung, inpari 32	1.70
12		Mojoagung	Umbul/Lokal, Ciherang, Ciliwung, inpari 32	1.81

Note: Paddy Area is provided by Agricultural DINAS.

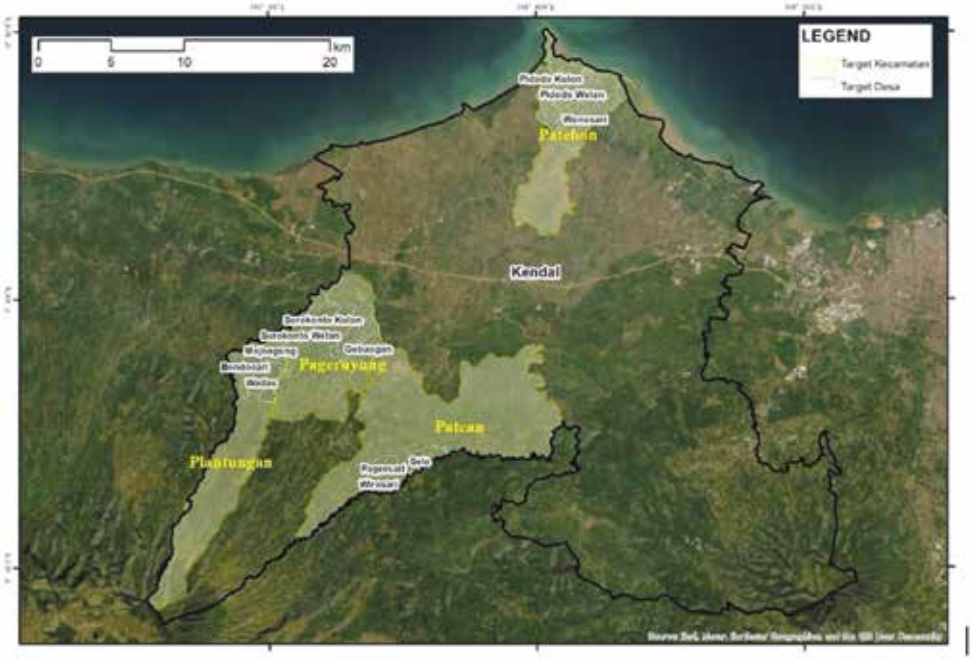


Figure 1.3.2 Location Map of the Target Desas in Kendal Kabupaten

2) Implementation Schedule of the AYII Pilot

The AYII pilot implementation is conducted covering the first and second paddy season (MT1 and MT2) in year 2023in Karawangand Kendal Kabupatens. For the MT1 season in Karawang Kabupaten, the planting is expected to start as early as November 2022 - January 2023 and the planted paddy is expected to be harvested from May to August 2023 in cases. For the MT2 season in Karawang Kabupaten, the planting is expected to start as early as August 2023 and the planted paddy is expected to be

harvested from November to early 2024. The MT2 season in Kendal starts in around April 2023 and the harvesting commences from July and ends in October 2023.

Please note that the specific planting and harvesting periods would be different from the above estimation depending on weather conditions as well as other agroecological conditions in the target areas; Therefore, the following milestone schedule of the AYII pilot activitieswould be modified based on the actual planting and harvesting schedule at the time:

Table 1.3.3 Timeline for the AYII Pilot Activities

<table>
<tr><th rowspan="2">Period</th><th colspan="2">Karawang Kabupaten</th><th colspan="2">Kendal Kabupaten</th></tr>
<tr><th>MT1</th><th>MT2</th><th>MT1</th><th>MT2</th></tr>
<tr><td>Jan, 2023</td><td rowspan="3">[Socialization and Registration]</td><td></td><td rowspan="12">Sales cut-off date passed in October 2022.</td><td></td></tr>
<tr><td>Feb</td><td></td><td></td></tr>
<tr><td>Mar</td><td rowspan="2">Cut-off date: 30th day after the planting.</td><td></td><td></td></tr>
<tr><td>Apr</td><td></td><td rowspan="2">[Socialization and Registration]
Cut-off date: 30th day after the planting.</td></tr>
<tr><td>May</td><td rowspan="4">[CCE and Claim]
10 CCEs need to be carried out in a Desa.</td><td></td></tr>
<tr><td>Jun</td><td rowspan="2"></td></tr>
<tr><td>Jul</td><td></td></tr>
<tr><td>Aug</td><td rowspan="3">[Socialization and Registration]
Cut-off date: 30th day after the planting.</td><td rowspan="3">[CCE and Claim]
10 CCEs need to be carried out in a Desa.</td></tr>
<tr><td>Sep</td><td></td></tr>
<tr><td>Oct</td><td></td></tr>
<tr><td>Nov</td><td></td><td rowspan="3">[CCE and Claim]
10 CCEs need to be carried out in a Desa.</td><td></td></tr>
<tr><td>Dec</td><td></td><td></td></tr>
<tr><td>Jan, 2024</td><td></td><td></td></tr>
<tr><td>Feb</td><td></td><td></td><td></td></tr>
<tr><td>Mar</td><td></td><td></td><td></td></tr>
</table>

CHAPTER 2 MAIN FEATURES OF THE AYII PRODUCT

2.1 Basic Concept of AYII

Unlike AUTP, for which individual farm plot situation matters for the damage assessment and therefore the payout, the AYII is applied by covering a certain extended area, that is Desa – the insurance unit – under the pilot implementation. Namely, AYII under the pilot implementation is triggered for the payout covering all the insured famers within the Desa – the insurance unit, or else may not be triggered over the Desa even if there are some insured farmers whose yields are very low.

Therefore, in implementing Area Yield Index Insurance (AYII), there should be an area-based benchmark yield, that is Desa-level Triggering Area-Yield predetermined in the pilot implementation. The Desa-level Triggering Area-Yield is called Benchmark Yield predetermined for the Desa concerned – the insurance unit. Likewise, The Benchmark Yield is decided to be 85% of the average yield for the Desa for the past certain periods (7 years in this product design).

Corresponding to the Desa-level Benchmark Yield (85% of the Desa's past average yield), the loss assessment should also be made by establishing the Desa-level actual yield. The Desa level actual yield should be established by averaging a number of actual paddy yields to be obtained from a sampling survey, that is Crop Cutting Experiments (CCE). Thus, the Desa level actual yield is compared with the Desa-level benchmark yield, and in case the former is higher than the latter, all the insured farmers within the Desa, which is the insurance unit, can get the payout, and visa-versa.

AYII operates on a certain extended area with the pre-determined area-index while AUTP works on individual basis plot. It means that the AYII is triggered to compensate an averaged area yield in a certain area, that is Desa under this pilot implementation, which is lower than the pre-determined Benchmark Yield at the Desa. Unlike this, AUTP is triggered to compensate individual crop damage by assessing the paddy field one-by-one. Following table summarizes the comparison between AUTP and AYII:

Table 2.1.1 Comparison between AUTP and AYII

Item	AUTP (Indemnity Based Insurance)	AYII (Index-based Insurance)
Area Covered	Individual paddy plot	A certain extended area (all the paddy plots within a Desa)
Major Character	Multi-peril crop insurance to compensate individual crop damage	Index-based crop insurance to compensate an averaged area yield in a certain area (Desa), which is lower than the pre-determined Benchmark Area Yield
Loss Survey	Loss survey shall be made to check the actual paddy damages (triggered by a percentage damaged plants to a portion (equal to 75% or more) of planted acreage.	Yield sampling survey, called Crop Cutting Experiment (CCE), shall be conducted to obtain the average area-yield of Desa.
Basis Risk	No basis risk because payout is made based on the result of individual basis loss survey.	Basis risk existence due to different yields among the farms located side-by-side within the Desa.
Moral Hazard	May be existence knowing that the Insured would receive compensation in case of his/her paddy damaged more than 70%.	May be limited because the loss assessment is conducted on an area-basis (Desa basis), and not by individual plot base.

Source: JICA Consultant Team

2.2 Basic Conditions of the AYII Product

2.2.1 Eligibility for AYII

The following are the main eligibility for the AYII pilot scheme:

√ The AYII pilot scheme targets only rice farm,

√ Farmers owners and/or tenant farmers who carry out rice farming with no more than 2 hectares per registration per planting season,

√ Farmers can be registered as insurance participants if they plant rice of a maximum age of 30th days,

√ Farmers who are not participants of the AUTP scheme,

√ Other eligibility is assessed by the implementing insurance company based on the sustainability of criteria and insurance risks.

2.2.2 Risk Coverage

The AYII pilot scheme covers the following risks:

√ Flooding, in this case, is the inundation of agricultural land with a certain depth and period during the period of plant growth, resulting in damage to crops and reducing crop production levels, both floods caused by high rainfall and high tides (Rob).

√ Drought, in this case, is not meeting plants' water needs for a certain period during plant growth, resulting in non-optimal growth rates, damage to plants, and lowered crop production levels.

√ Plant Destruction Organisms (OPT) are organisms that can interfere with and damage plant life or cause plant death, including:

* Plant Pests: Stem Borer, Brown Planthopper, Stinky Planthopper, Rat, Armyworm and Golden snail.
* Plant Diseases: Blast, Brown Spot, Tungro, Stem Rot, Hollow Dwarf, Grass Dwarf/Yellow Dwarf, and Crackle.

On the other hand, the AYII pilot scheme does not cover losses directly or indirectly caused by or as a result of:

1. A fire that occurs intentionally or unintentionally,
2. Theft and/or loss during and after the event which this Insurance Policy covers,
3. Intention of the other party with the knowledge of the Insured, unless it can prove that it happened beyond the control of the Insured,
4. Willful mistake or negligence by the Insured or the Insured's representative,
5. Forest, bush, grass, or peat fires,
6. Explosions of all kinds of explosives,
7. Nuclear reactions including but not limited to nuclear radiation, ionization, fusion, fission, or radioactive pollution, regardless of whether it occurs inside or outside the coverage area of rice farming,
8. Earthquakes, volcanic eruptions, and Tsunamis,
9. Any form of business interruption, financial loss due to market failure, and similar financial losses,
10. The government takes an action in the greater public interest,
11. Causes or risks that are specifically and/or not expressly stated as guaranteed in this Insurance Policy,
12. Losses that occur after the insured plant is harvested,

13.Losses incurred after the expiration date of this Insurance Policy,

14.Consequential losses that occur because of other losses.

2.2.3 Insured Period

The period of coverage under the AYII pilot scheme for each planting season begins on the estimated planting date and ends on the estimated harvest date.It is expected that the insurance period is maximum of 6 months, that starts 30 days after the planting. The shift in planting date other than what is written in the Policy can be notified to the insurer through PPLs (agricultural extension staff) and the local Agriculture Dinas.

2.2.4 Sum Insured and Premium Rate

1) Sum Insured Amount

The maximum sum insured amount is the amount stated in the insurance policy which represents the maximum responsibility of the insurer for any one claim under the policy. The maximum payout amount will be 6 million IDR per hectare which is briefly worked out from an estimated average production cost of paddy per hectare. Individual payout amount will be calculated the difference between benchmark yield and actual average yield per Desa with maximum of 6 million IDR.

2) Premium Rate

√ Insurance Premium Rate is 2.65% of the sum insured.

√ Maximum Sum Insured is Rp. 6,000,000 and an Insurance Premium of IDR 159,000/ha/MT

√ The amount of premium assistance from the governmentis 80% or Rp. 127,200/ha/MT and the insured farmers are 20% or Rp. 31,800/ha/MT.

√ This premium rate will be the same for all the target Desas.

The premium rate consists of 4 main aspects: 1) Expected loss, 2) Volatility loading, 3) Catastrophic loading and 4) others including administrative costs and profits of insurers. In the 1)Expected loss, the average payout (compensation) of the last 10 years (2011 to 2020, or 2010 to 2019) was used. The 2) Volatility loading is expressed based on loss estimates at various return periods and applying a capital charge on these loss estimates. The 3) Catastrophicloading is concerning extreme events which may occur once in 50 years or 1 in 100 years and relevant data was collected.

In the AYII pilot, it has taken weather data for past 20 to 30 years from WMO's Global Observation System for available weather stations.“others" represents the other components except the loadings in the pure risk premium. Consequently, based on the ratemaking process, the premium rate amounted to 2.65% in this pilot implementation.

2.2.5 Benchmark Yield and Indemnity Level

In an index insurance, payouts will be made when index matches a predefined condition. In this insurance, paddy yield is obviously used as the index. Then, the predefined condition is that if the actual yield[1] (value) of paddy rice is smaller than the benchmark yield[2] (value) of paddy rice, the payouts (compensation) will be given. It is significant that the actual yield and the yield benchmark are shown as a percentage of the average yield for a certain period of time in a village (Desa) as an insurance slot.

1 The actual yield per hectare of the insured crop, calculated based on the CCE's survey.

2 The threshold of the loss obtained from the agreed level of compensation multiplied by the Average Yield.The level of Indemnity is expressed as a percentage and is used to determine the benchmark yield value of the average result.

The yield benchmark value is set at the 85% level of average yield amount in this implementation. The actual yield (value) and the yield benchmark (value) are shown as a percentage of the average yield put in the policy.For example, assume that the actual yield value is at the 70% level of the average yield (100). As the yield benchmark value was at the 85% level of the average yield of 100 and the yield benchmark value was 15% higher than the actual yield value. The value of 15% of the average yield is the one to be compensated by a payout.

The benchmark yield is a predetermined before the registration for the AYII product starts. The benchmark yield plays a role of threshold whether there is a payout out or not comparing with Desa average yield at the end of the season. In this AYII pilot program, the benchmark yield is calculated 85% of average Desa yield over the last 7 years. Historical yield data at Desa level was collected from agricultural offices. Considering the trend of yield data, 7-year average yield in each Dasa was set as benchmark yield. The following table shows the benchmark yield in each Desa:

Table 2.2.1 List of Benchmark Yield in Karawang

Kecamatan	Desa	Benchmark yield(kwt/ ha), 7-y average	
		MT 1	MT 2
Kutawaluya	Kutamukti	55.4	55.4
	Sindangmukti	61.2	61.2
	Sindangsari	61.3	61.3
Rawamerta	Gombongsari	66.3	66.1
	Kutawargi	63.4	63.4
	Sukapura	66.5	65.9
Telagasari	Cilewo	63.2	64.7
	Kalibuaya	63.8	64.7
	Pasirkamuning	63.9	65.6
Cibuaya	Gebangjaya	62.9	62.3
	Jayamulya	64.1	64.8
	Kertarahayu	63.2	63.5
Pedes	Payungsari	54.4	61.5
	Rangdumulya	50.7	56.6
	Sungai Buntu	53.1	56.6

Source: JICA Consultant Team

Table 2.2.2 List of Benchmark Yield in Kendal

Kecamatan	Desa	Benchmark yield(kwt/ha), 7-y average	
		MT 1	MT 2
Pageruyung	Surokonto Wetan	54.9	55.7
	Surokonto Kulon	53.4	53.8
	Gebangan	46.1	47.5
Patean	Wirosari	45.0	46.4
	Pagersari	45.2	46.7
	Selo	45.1	46.6
Patebon	Wonosari	46.8	47.9
	Pidodowetan	46.6	47.8
	Pidodokulon	46.8	47.7

Plantungan	Wadas	46.3	50.7
	Bendosari	47.0	51.4
	Mojoagung	47.5	51.3

Source: Jasindo

Agricultural extension staff should confirm the official benchmark yield values before they start socialization and registration activities.

2.2.6 Claims Settlement and Compensation

The calculation of the amount of compensation is the ratio of the benchmark yield to the actual yield multiplied by the amount insured per hectare, using the following formula.

$$\left[\frac{\textit{benchmark yield - actual yield for the year}}{\textit{benchmark yield}}\right] x\text{"sum insured per ha" x "area insured"}$$

Terms and conditions on the compensation including changes of payment terms can be additionally prescribed in a special policy provision. Once special policy provision is prepared, the provision will be prioritized over the policy using the formula above. Fixed payment, like 6 million IDR for each insured farmer in the same Desa, is an example of the alternatives of the compensation calculated in the formula above.

2.3 Other Specifications

Overall, index-based insurances including AYII excel in relatively quicker loss assessments and claim processes. The main advantages of AYII products are the following points:

√ Fewer number of field surveys of production may be required to build the average yield (estimate of damaged plants) compared to that required for individual coverage in indemnity-based insurance.

√ Loss field surveys known as CCEs as one of sampling method would not be required to assess a loss for an individual farm.

√ Farmers would not have to report damaged fields and participate in a farm visit to identify management techniques to prevent further damage.

2.4 Basis Risk

Basis risk in index insurance arises when the index measurements do not match an individual insured's actual losses. This risk is often unavoidable to index-based insurances due to practically low density of data collected.

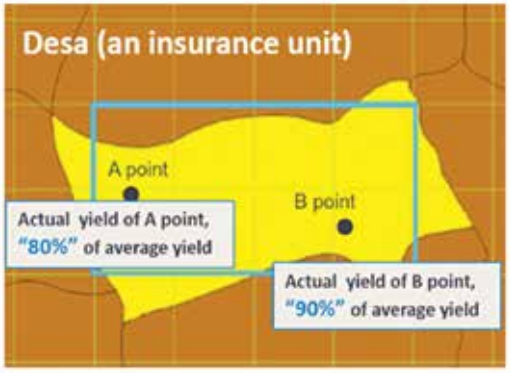


Figure 2.4.1 Image of Basis Risk

Source: JICA Consultant Team

Figure 2.4.1 shows the situation that an insured farmer in B point (90%) is NOT expected to obtain any compensation because the value is higher than the benchmark yield (85%) unlike the other insured farmer in A point (80%). If an insured in A point and the other insured in B point were bundled in the same insurance contract under only one Desa-level Area-Yield obtained through CCEs, which for example represented 95% of the Desa-level actual yield, both of them might be exposed to the basis risk seriously and expect no compensation respectively.

AYII is subject to the basis risk when farmers incur production losses but do not receive any pay-outs and vice-versa. In general, basis risk can be idealistically minimized by the following two matters.

√ Generate an accountable, reliable and statistically accurate system of measuring actual average area-yields in the defined insurance unit.

√ Defining homogeneous producing zones (such as insured units of Desa) with high levels of correlation between farmers in the same unit.

CHAPTER 3 INSTITUTIONAL ARRANGEMENT

3.1 Stakeholders and Institutions Concerned

The AYII pilot program involves in a wide range of stakeholders from an insurance company to agricultural extension staff in the field. The main implementers of the AYII pilot program are Ministry of Agriculture as well as Jasindo Asuransi, an insurer of the AYII product. The regional government of West Javaand Central Java, particularly Karawang Kabupaten and Kendal Kabupaten agricultural office is one of the key stakeholders under the AYII pilot implementation.

Figure 3.1.1 Major Stakeholders for the AYII Pilot Program

3.2 Roles and Responsibilities of Stakeholders

The following are the roles and responsibilities of the major stakeholders:

Ministry of Agriculture (MOA)

√ Coordinate with relevant agencies and organizations to implement AYII pilot activities,

√ Assist the Provincial, Kabupaten and Kecamatan agricultural offices in the implementation and monitoring of AYII pilot activities,

√ Assist Provincial, Kabupaten and Kecamatan agricultural offices for the collection of relevant data for evaluation and carry out the evaluation of AYII pilot implementation,

√ Provide technical supports to the stakeholders through providing training sessions and preparing technical materials, and

√ Monitor the performance of Provincial, Kabupaten and Kecamatan agricultural offices.

Provincial Agricultural Office in West/ Central Java

√ Coordinate with related agencies and organizations under the provinces,

√ Provide guidance on socialization and registration activities of the AYII pilot program in the target Desas of Karawang Kabupaten,

√ Finalize the participant list for the AYII program in the target area and report to Jasindo and other related organizations,

√ Carry out monitoring of the performance of the AYII pilot activities in the target Desas of Karawang/ Kendal Kabupatens, and

√ Verify historical yield data, threshold yield data and the results of the Crop Cutting Experiments (CCE) data and report to Jasindo and MOA.

Kabupaten and Kecamatan Agricultural Offices

√ Communicate with farmers' groups/ farmers to disseminate the AYII product,

√ Carry out socialization and registration activities in the target Desas,

√ Generate the participant list of the AYII program and report to the Provincial office,

√ Monitor the performance of the AYII pilot activities in the target Desas,

√ Conduct the CCEs through coordination with BPS and surveyors,

√ Estimate average yield at Desa level and approve the result,

√ Make an announcement of the CCE results to the public, and

√ Calculate the payout amount and make a claim to Jasindo.

Jasindo (Insurance Company)

√ Confirm eligibility of participants for the AYII product,

√ Issue an insurance policy for the AYII product and share the insured farmers list with relevant organizations,

√ Manage the participants' information under the AYII pilot program including insured areas, premium collection status and payout amounts,

√ Prepare necessary documents such as application formats, claim sheets and policy certificate, and

√ Distribute insurance payouts in case if it is triggered.

CHAPTER 4 SOCIALIZATION AND REGISTRATION

4.1 Socialization for AYII Product

The main purpose of the socialization is to raise farmers awareness of the AYII pilot program and deliver the information about the AYII productto farmers correctly. The basic socialization approach is almost the same as the AUTP socialization; namely, farmers' groups could be an entry point of the socialization activity. Yet, the AYII product is a new insurance product to farmers, and it works a different way from the AUTP. Therefore, an intensive socialization activity is important to provoke farmers' interest and awareness of the AYII product under this pilot program.

Key information you should deliver to the farmers: 1) outline of the AYII product including sum insured amount, premium rate and claim process, 2) main advantages of the AYII product and 3) a potential disadvantage.

1) Outline of the AYII product

√ Benchmark yield: 85% of the average yield over the last 7 years

√ Sum insured amount: IDR 6,000,000 / ha

√ Premium: 2.65%, IDR 159,000

- Farmers 20%, IDR 31,800 / ha
- Government 80%, IDR 127,200 / ha

√ Claim process: No filed loss assessment survey, instead yield sampling survey (CCEs) to estimate Desa-level actual yield. If the Desa-level actual yield is below the predetermined benchmark yield, there is a payout.

2) Main advantages

Lower premium rate: the premium rate of the AYII product is 2.65% of the sum insured (IDR 6,000,000). The premium amount is IDR 159,000 per ha. Just like the AUTP program, the government also subsidies the AYII pilot program with 80% of the premium amount. Hence, a farmer bears IDR 31,800 per ha to join the AYII pilot program. This premium is lower than that of the AUTP. This is because the AYII product could reduce the cost of field survey compared to the AUTP. The AYII product focuses on Desa-level actual yield, and there is no need to conduct field loss survey at each farmland. Instead, sampling survey (CCEs) is carried out to estimate the Desa-level actual yield. For this reason, the AYII pilot program could offer the lower premium insurance product.

3) Potential disadvantages

The AYII product is not a silver-bullet product to the farmers in Indonesia. It also has a potential disadvantage. The biggest potential disadvantage is basis risk. The basis risk means that there might be a gap between Desa-level actual yield and each individual yield. The payout of the AYII product is made based on the Desa-level actual yield. In other words, as long as the Desa-level actual average yield is above the benchmark yield, none of the farmers could receive the payout even if some of the farmers experience in crop loss.

Not only the advantages of the AYII product, but also this potential disadvantage should be delivered to the farmers. The extension staff is expected to convey both positive and negative aspects the AYII prod-

uct clearly. The AYII pilot program is not compulsory program for farmers. Expanding the AYII program in the future, it is important to gain the trust from farmers towards the AYII product. Better understanding of the AYII product could avoid any trouble at the end of the season.

4) Socialization Period

Identifying planting date in each target Desa is very first step to plan socialization period. The AYII pilot program targets the MT2 season; yet specific planting date varies from Desa to Desa. This preparation is also important not only to identify the socialization period, but also to know the timing of the sampling survey (CCEs) at the end of the season. Hence, it is important to identify specific planting period of the target season in each Desa before the extension staff starts the socialization activity.

Farmers have to sign up for the AYII product within 30 days after planting. This means that the extension staff should not accept application from farmers who plant their crops after this specific period. Once the extension staff identify the specific plating date in the target Desas, they should carefully plan to complete the socialization activity as soon as possible until 30th day after planting.

Checkpoints for Socialization Meetings

Socialization Item	Points to be checked Did you:
AYII Overview	❑ Deliver the main purpose of the AYII scheme?
	❑ Explain the basic concept of AYII and main differences between AYII and AUTP?
	❑ Explain the premium and the government subsidies?
	❑ Explain what the benchmark yield is and how the CCE is carried out?
	❑ Refer to advantages of the AYII product, e.g. lower premium.
	❑ Refer to disadvantages of AYII product, e.g. basis risk.
AYII registration and claim process	❑ Explain that the registration should be done within 30 days after planting?
	❑ Explain that farmers cannot join AUTP at the same time?
	❑ Explain how to fill in the Form 1?
	❑ Explain that insurance claim should be done based on CCE result?
	❑ Explain how the payout amount will be calculated?
	❑ Explain farmers cannot receive payouts until CCEs complete.
Others	❑ Take notes farmers' questions?
	❑ Enquiry Jasindo if there are any questions you cannot answer or explain during socialization meetings?

4.2 Registration Procedure

The following diagram shows the registration flow for the AYII pilot program:

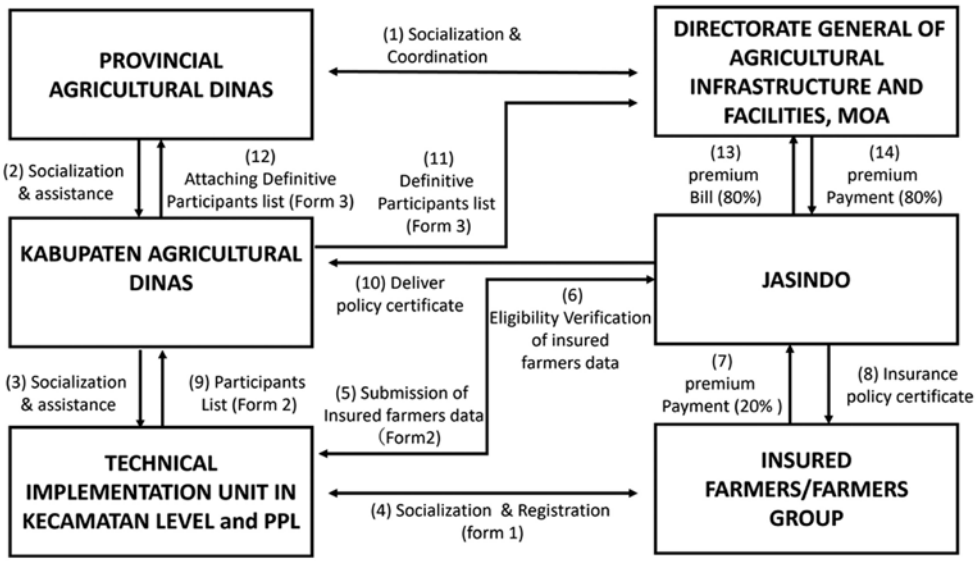


Figure 4.2.1 Registration Procedure

Table 4.2.1 Steps for Registration Procedure

Steps	Description	Timeline	Formats
(1) Socialization coordination MOA to Provincial DINAS	MOA shares the target with each provincial office.	Beginning of fiscal year	n.a
(2) Socialization and Assistance Provincial DINAS to Kabupaten office	Provincial office shares the target with each Kabupaten	Beginning of fiscal year	n.a
(3) Socialization and Assistance Kabupaten DINAS to Kecamatan Technical Implementation Unit and PPL	√ Kabupaten office shares the target with each Kecamatan. √ Kabupaten office conducts socialization to BPP and farmers' groups. √ Kabupaten office report benchmark yieldvalues to the technical unit and PPL	Before planting period	n.a
(4) Socialization and registration Kecamatan Technical Implementation Unit and PPL to Insured farmers/ farmers' groups	√ PPLs socialize farmers' group and facilitates registration process. √ PPLs support farmers in filling registration form (Form-1) √ Kecamatan office collects the Form 1 (registration form) from each Desa	√ Socialization: Should start at least 1 month before planting season √ Registration: Should be registered within 30 days after planting	Form 1 (registration form)

(5) Submission of Insured Farmers' Data Kecamatan Technical Implementation Unit and PPL to Jasindo	√ Form 2 is submitted to Jasindo √ Jasindo check the Form	Shall be submitted within 14 working days after receiving Form 1 from PPLs	Form 2
(6) Eligibility Verification of Insured Farmers' Data Jasindo to Kecamatan Technical Implementation Unit and PPL	Jasindo verifies Form 2 and report to Kecamatan technical implementation unit	Just after the Form 2 is delivered by Kecamatan Tech. Unit (Policy certificate need to be delivered to insured farmers within 10 working days (see Step 8))	n.a
(7) Premium Payment (20%) Insured farmers / farmers' groups to Jasindo	√ Insured farmers pays 20% premium to Jasindo, and submit the proof of payment to Jasindo √ PPLs assist the payment	Just after the Form 2 is verified by Jasindo (Policy certificate need to be delivered to insured farmers within 10 working days (see Step 8))	Proof of paymentof 20% premium
(8) Insurance Policy Certificate Jasindo to Insured farmers / farmers' groups	Jasindo issues and delivers the policy certificate to insured farmers.	Shall be delivered within no later than 10 working days after Form 2 is delivered to Jasindo	n.a
(9) Participants list Kecamatan Technical Implementation Unit and PPL to Kabupaten DINAS	√ Complete Form 2 √ Submit the Form to Kabupaten DINAS	Just after Step (8)	√ Form 2 (participant list) √ Proof of payment of 20% premium
(10) Delivery of policy certificate Jasindo to Kabupaten DINAS	Jasindo submits the policy certificate to Kabupaten DINAS, which has been delivered to insured farmers (Step.8)	Just after Step (8)	n.a
(11) Report definitive participants list Kabupaten DINAS to MOA	√ Report definitive participants list to MOA √ Check if the proof of 20% premium payment of the participants is completed	Just after Step (9)	Form 3 (SKDPD: Definitive participant list)
(12) Report definitive participants list Kabupaten DINAS to Provincial DINAS	Report definitive participants list to Provincial DINAS	Just after Step (9)	Form 3 (SKDPD: Definitive participant list)
(13) Premium Bill (80%) Jasindo to MOA	Jasindo issues the bill of 80% premium	-	n.a
(14) Premium Payment (80%) MOA to Jasiondo	MOA pays 80% premium based on the bill (Step 13)	-	n.a

Checkpoints for Registration Formats

Socialization Item	Main User	Points to be checked Did you:
Form 1 (registration form)	PPLs and Kecamatan officers	❑ Confirm all the items are filled in?
		❑ Check each farmer's name, MIK and phone number are correct?
		❑ Make sure actual planting period of each farmer filled in correctly?
		❑ Make sure names and signatures are the exactly same as their ID cards?
		❑ Confirm date filled in correctly?
Form 2 (participant list)	Kabupaten and Provincial officers	❑ Confirm that there is no missing information?
		❑ Make sure the amount of premiums filled in correctly?
		❑ Check the total numbers of insured farmers, land area, policy numbers and premiums filled in correctly?
Form 3 (SKDPD: Definitive participant list)		❑ Take notes farmers' questions?
		❑ Enquiry Jasindo if there are any questions you cannot answer or explain during socialization meetings?
Form 4 (Director decree)	MOA and Jasindo	-

4.3 Policy Certificate

Policy certificate is a written proof of a farmer's participation for the AYII pilot program. The policy certificate states basic terms and conditions of the AYII product as well as an insured farmer's information. The following are the main items of the policy certificate.

1. Target risks (floods, dryness and plant pest organisms)
2. General exception of the insurer
3. Special exception of the insurer
4. Liabilities of the insured farmers
5. Claims for compensation
6. Incorrect report
7. Changing in risk
8. Amount of compensation
9. Compensation payout
10. Liability or other insurance
11. Double indemnity insurance
12. Additional clauses

Please go through carefully every item of the policy certificate in the Annex. If you have any questions about the contents of this certificate, please contact Jasindo or Kabupaten officers. It is important to understand the contents of this certificate before you carry out the socialization activity.

CHAPTER 5 CLAIM PROCEDURE

5.1 Claim Trigger: Desa Level Area-Yield

The insurance payout is triggered by the Desa-level actual yield under the AYII pilot program. The Desa-level actual yield is calculated through the results of crop cutting experiments, hereinafter referred to as the CCEs. Agricultural DINAS randomly selects at least 10 sampling plots for the CCEs in each Desa. The Desa level yield is average yield of the sampling plots in each Desa.

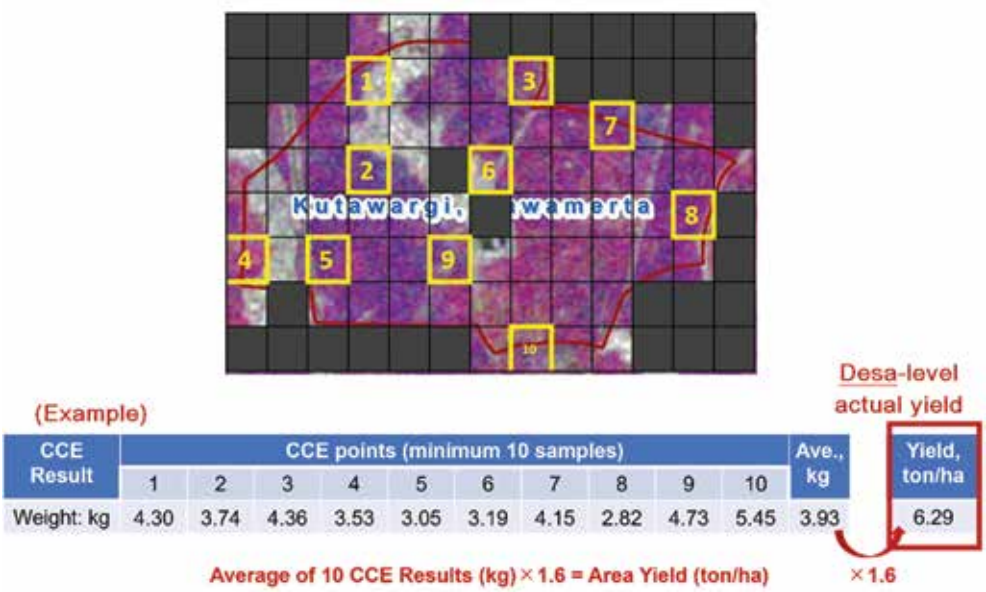


Figure 5.1.1 Calculation of Desa-level Actual Yield

Source: JICA Consultant Team

Sampling survey, the CCEs, will be carried out at the end of the season even if there is no crop loss or claims from farmers. After completion of the CCEs, Kabupaten agricultural office officially announces the Desa average yield.

5.2 Sampling Survey for Yield Assessment (CCE)

The CCE is carried out for the purpose of yield assessment. It is required to obtain sample paddy yields of target Desa for determination of an average paddy yield of the Desa. The survey is mainly composed of i) selection of survey target paddy plot and ii) implementation of the CCE in each paddy plot.

5.2.1 Selection of Survey Target Paddy Plots in Desaat the Beginning of Target Cropping Season

1. Random selection of 10 areas in Desa

Considering areas outside the Desa, artificial areas, e.g residential areas and roads, and other no-paddy field areas such as coastal mangrove areas, forest areas, and plantation areas, 10 areas need to be chosen arbitrarily in Desa.The step below is consideredas the selection procedure.

√ To locate 300 m x 300 m grid over the target Desa on the paper map or GIS software

√ To eliminate the grids in which land is fully covered bythe no-paddy areas (areas outside the Desa, artificial areas, other no paddy areas)

√ To give serial numbers to the grids with paddy area, which are not eliminated in step ii).

√ To generate 10 random numbers within the serial numbers using MS Excel or free smartphone applications

√ The 10 grids with the randomly selected numbers are target 10 areas of the Desa

2. Random selection of1 paddy plot in each selected area

1 paddy plot is chosen randomlyin each of 10 selected areas in Desa considering paddy cropping progress of the area. Finally, in total 10 paddy plots in different 10 areas of Desa are selected for sampling yield survey.

3. Installation of CCE flags

For avoiding the case that the target paddy is harvested before CCE is implemented, a flag or any other sign should be installed on the target paddy field. 10 flags or signs should be prepared and installed by each Desa. The steps from 1) to 3) above need to be completed at the beginning of target cropping season.

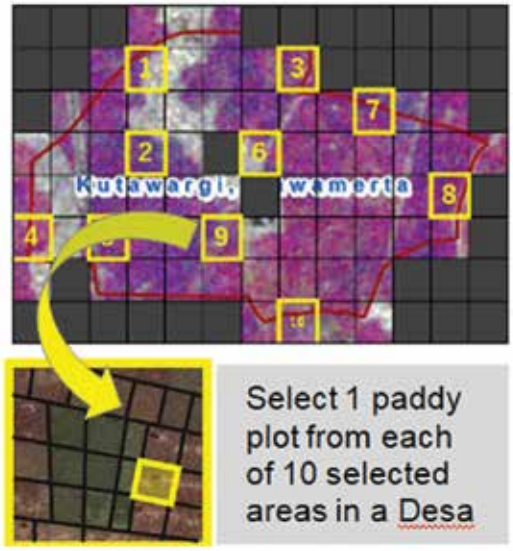


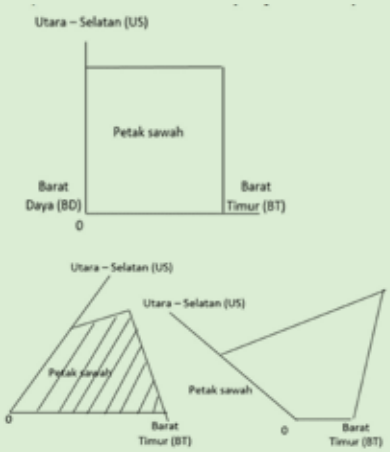
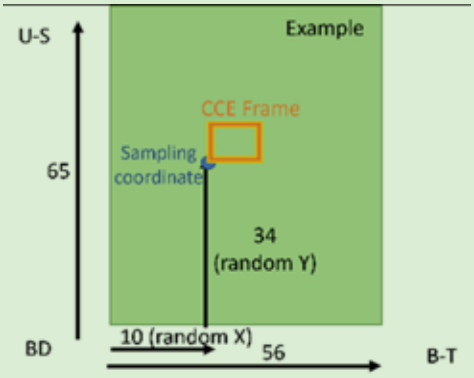
Figure5.2.1CCE Plot Selection

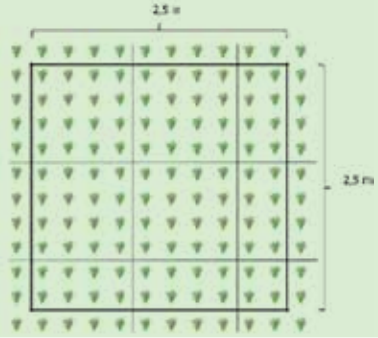
Source: JICA Consultant Team

5.2.2 Implementation of CCE in Each Paddy Plot

Yield survey, namely the CCE, is carried out in the randomly selected 10 paddy plots in Desa. The average of 10 yield samples are to be the area yield of the Desa, which is regarded as the actual yield of the Desa in the target season. Described herewith are the elements of the CCE procedure which is implemented in each paddy field:

Table 5.2.1 Procedure of CCE Implementation

No.	PROCEDUR	POINTS
1.	Locating the CCE Frame in paddy plot	√ To decide the coordinate origin of the sampling paddy field * Square paddy: set the southwest end as the origin  * Other irregular shape paddy: set a point at around southern west ridge as the origin  √ To measure the length of two sides (X: east-west/ Y: north-south) of the paddy field by regular footsteps and record the results √ To generate random numbers for X and Y respectively using a free mobile app or BPS's app √ To locate the CCE frame at the sampling coordinate 

2.	Preparation of CCE tools	√ 16 pipe sticks, includes: 4 end pipe rods, 8 central pipe rods, 4 pipe rods at the base, and 4 square rods √ 4 pegs made of iron √ Tripod and digital weight scale 
3.	Crop Cutting	√ To locate sides of the CCE frame (2.5m x 2.5m) between hill lines. (Example) In case of 25cm×25cm spacing and 2.5m x 2.5m CCE frame, 100 hills are included. No need to take samples from outside of the frame to obtain in total 100 hills. 
4.	Threshing	√ To thresh paddy on a tarpaulin sheet
5.	Removing Immature Grain and dirt	√ To remove immature grains and dirt by winnowing
6.	Weighing	√ To weigh paddy by weight scale √ To record the weight in kilogram (kg) The tool comprises tripod and digital weight scale. Weight of paddy bag need to be eliminated before weighing paddy.
7.	Calculating yield of Desa	√ In a Desa, 10 results are obtained √ To take average weight of 10 samples in kilogram (kg) (Sample No.1 + No. 2 + … + No. 10) / 10 = average weight (kg) √ To convert the average weight (kg) to yield (ton/ha) Average weight (kg) x 1.6 = Actual area yield (ton/ ha) Note: 1.6 is the unit conversion constant calculated by 100m x 100m / (2.5 m x 2.5 m) / 1000 √ To report the result to Kabupaten DINAS Head by Form 5: CCE Result Report,Form 6: Actual Yield Report, and Form 6 Attachement: CCE Survey Result Recapitulation using the Authorized Excel Format

Source: JICA Consultant Team

5.2.3 Handling of the Case of Insufficient CCEs

As is mentioned in Section 5.1, in total of 10 CCEs need to be carried out every season in each target Desa. However, there were the cases in past pilots in 2021 and 2022 that owners of target paddy plots had harvested the paddy not sharing the harvest timing with the surveyors and the surveyors missed the CCE chances. Described in this sub section is how the implementers handle the cases. The stake-holders specified in the [bracket]below showsthe persons in charge of each action.

√ To try to find out other paddy plots of which owner (farmer) accept CCE[Surveyors/ PPLs]
Note that priority should be given to obtain the total of 10 CCE results in the target season. It is recommended for the surveyors (extension officers/ PPLs) to have close communication with target farmers. In the case that a target plot has been harvested earlier than expected, it should be considered that the surveyor shifts to another plot. It is better if the substitute is found in the same 300m grid. If it is not found in the grid, however, it is accepted that the surveyor moves to neighboring grids. If the surveyor should not find any paddy plots in the Desa that accept CCE in the harvesting period, it can be considered that a CCE sample is taken from an area outside the Desa boundary, but neighboring the Desa.

5.3 Claim Procedure

The basic steps for the claim procedure as follows:

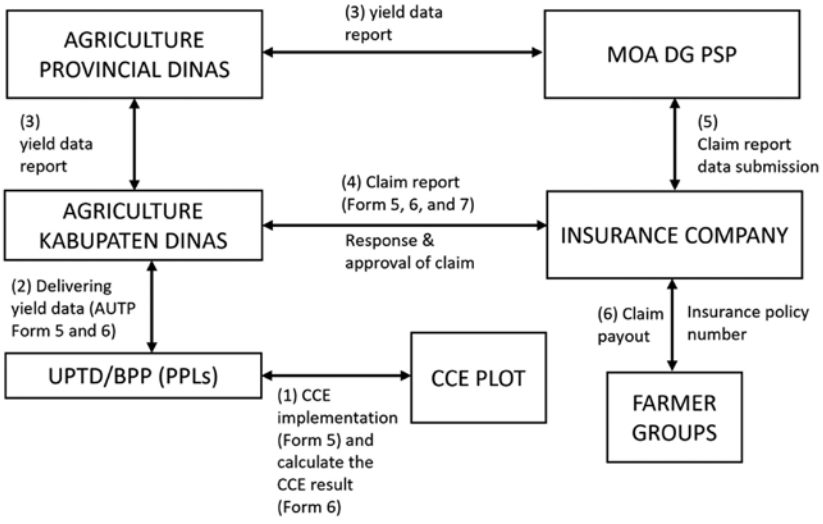


Figure 5.3.1 Claim Procedure

Table 5.3.1 Steps for Claim Procedure

Steps	Description	Timeline	Formats
(1): CCE implementation and CCE result calculation Kecamatan Technical Implementation Unit and PPL	√ Identify specific CCE plots √ Conduct 10 CCEs √ Collect 10 CCE results and calculate actual yield per Desa	√ Identify plots: Within the registration period √ CCEs: Harvesting period	√ Form 5 (CCE result form) and √ Form 6 (actual yield) √ Authorized Excel file

(2) Delivering yield data Kecamatan Technical Implementation Unit and PPL to Kabupaten DINAS	Report actual yield to Kabupaten	Within 7 working days after the completion of CCEs survey	√ Form 5 (CCE result form) and √ Form 6 (actual yield) √ Authorized Excel file
(3) Yield data report Kabupaten DINAS to Provincial DINAS	Report actual yield to Provincial and MOA	After calculation of actual yield	√ Form 5 (CCE result form) √ Form 6 (actual yield) √ Authorized Excel file
(4) Claim Report Kabupaten DINAS to Jasindo	√ Report actual yield to Jasindo √ If actual yield is lower than the benchmark yield, Kabupaten office makes a claim to Jasindo √ Jasindo examines the yield report	Within 7 working days after receiving the CCE results from Kecamatan office	√ Form 5 (CCE result form) √ Form 6 (actual yield) √ Form 7 (claim letter) √ Authorized Excel file
(5) Claim Report Data Submission Jasindo to MAO	Jasindo deliver claim report to MOA		n.a
(6) Claim payout Jasindo to Farmers' group	√ If claim is approved by Jasindo, Jasindo sends the notification to farmers' group √ Farmers' group have to respond the notification to Jasindo √ Insurance policy number need tp be specified the form provided by Jasindo √ After Jasindo confirms the response from farmers' groups, they provide insurance payout	Within 14 working days after receiving the claim from Kabupaten	n.a

Checkpoints for Claim Formats

Form	Main User	Points to be checked Did you:
Form 5 (CCE result form)	PPLs and Kecamatan officers	❑ Confirm that all the items are filled in?
		❑ Confirm that the coordinate (latitude and longitude) is recorded in decimal decree to 7 places of decimals?
Form 6 and the attachment (actual yield) Authorized Excel file	Kecamatan and Kabupaten officers	❑ Confirm that all highlighted cells are filled up (no missing information) on the authorized excel format?
		❑ Confirm that the CCE locations (latitude and longitude) is written in decimal degree and the figures are same as those of Form 5?
		❑ Confirm that the unit symbol of decimal degree (°) is NOT put in the cells?
		❑ Confirm that the figures of CCE sample weight (kg) are same as those on Form 5?
		❑ Confirm the figure of benchmark yield is correct?
		❑ Confirm the dates of CCE implementation on Form 6 are same as dates on Form 5?
		❑ Confirm that the dates of planting period on Form 6 are same as dates on Form 1?
		❑ Confirm the date of signature is written above the signature of head of UPTD?
Form 7 (claim letter)	Kabupaten and Jasindo	❑ Confirm that all ID card copies of claim farmers have been prepared?
		❑ Confirm that the bank account book copy of claim farmer group has been prepared?
		❑ Confirm that complete Form 5 and Form 6 are prepared?
		❑ Confirm that all the documents above, namely ID copies, bank account book copy, Form 5, and Form 6 including attachment, are attached to Form 7?
		❑ Confirm that all the items are filled in on Form 7?
		❑ Confirm the policy number and ID numbers of farmers are recorded correctly on Form 7?
		❑ Confirm the insured areas on Form 7 are same as those on Form 1?
		❑ Confirm the signatures of farmers on Form 7 is completely same as those on the ID card copies?

5.4 Payout Calculation and Payment

An insurance payout is made if the Desa-level actual yield is below the benchmark yield. Once the insurance payout is triggered, Kabupaten agricultural office makes a claim to Jasindo. The maximum payout amount is IDR 6,000,000 per ha under this AYII pilot program. Jasindo proceeds the payouts to policy holders after they receive the claim from Kabupaten agricultural office.

The following table shows the example of the payout calculation based on the formula below:

$$\text{Payout amount per ha} = \left[\frac{\text{benchmark yield - actural area yield}}{\text{benchmark yield}}\right] \times \text{sum insured per ha}$$

$$\text{Payout amount per ha} = \left[\frac{\text{benchmark yield - actural area yield}}{\text{benchmark yield}}\right] \times 6{,}000{,}000$$

Table 5.4.1 Example of Payout Calculation

Kecamatan	Desa	Benchmark yield (kwt/ha)		Desa level Ave. yield (kwt/ha) [EXAMPLE]	Payout amount (IDR/ha)
Kutawaluya	Kutamukti	53.2	<	54.1	0
	Sindangmukti	61.3	<	63.0	0
	Sindangsari	61.5	<	61.6	0
Rawamerta	Gombongsari	66.2	<	67.9	0
	Kutawargi	63.2	<	64.4	0
	Sukapura	66.1	<	66.9	0
Telagasari	Cilewo	63.9	<	64.8	0
	Kalibuaya	63.7	=	63.7	0
	Pasirkamuning	64.8	<	66.0	0
Cibuaya	Gebangjaya	62.4	>	61.9	48,077
	Jayamulya	65.0	>	61.2	350,769
	Kertarahayu	63.5	<	64.3	0
Pedes	Payungsari	61.5	>	61.4	9,756
	Rangdumulya	54.4	>	53.7	77,206
	Sungai Buntu	54.4	>	54.0	44,118

Source: JICA Consultant Team

Note that the payout calculation is always made based on Desa-level actual yield rather than yield of individual farmland or yield of each CCE plot. This means that some farmers, who have loss experience, might not be able to receive the payout if the Desa-level actual yield is above the benchmark yield. This is called "Basis Risk", a gap between individual farm yield and Desa-level actual yield. Basis risk is one of the potential disadvantages of the AYII product.

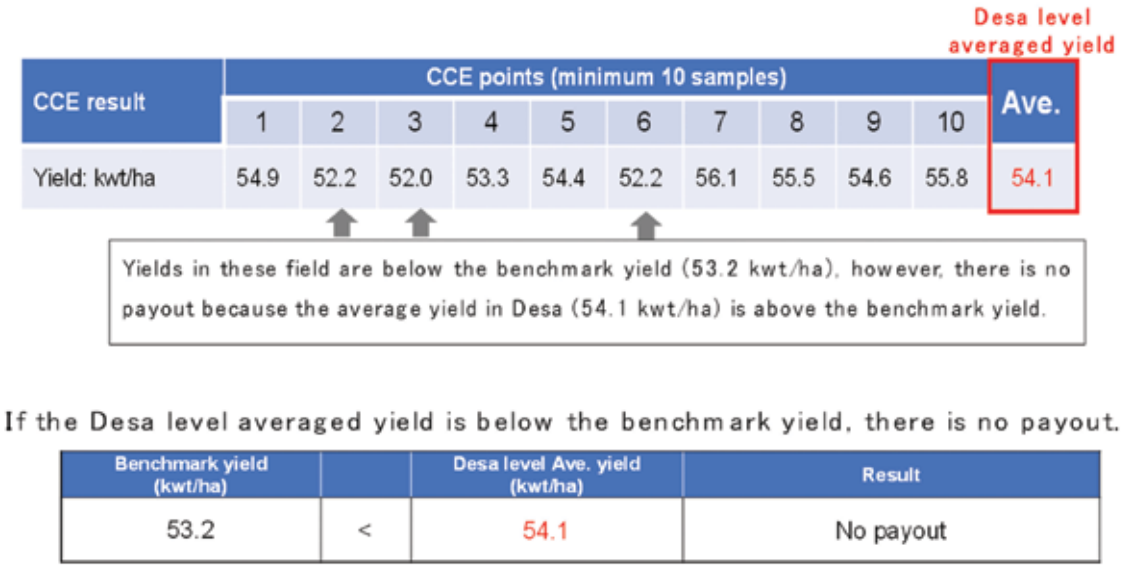


Figure 5.4.1 Payout Calculation

Source: JICA Consultant Team

Checkpoints for Claim Calculation

Item	Points to be checked Did you:
CCE verification	❑ Confirm the figures of CCE sample weight (kg) on the authorized excel format (Form 6 attachment) are same as those on Form 5?
	❑ Check the calculation of average CCE sample weight (kg) on the authorized excel format (Form 6 attachment) by pocket calculator?
	❑ Check the calculation of converting weigh (kg) to yield (ton/ha) on the authorized excel format (Form 6 attachment) by pocket calculator?
	❑ Confirm that the figure of benchmark yield on the authorized excel format (Form 6) is correct?
Payout calculation	❑ Confirm that the figures of payout calculation sheet on the authorized excel format are same as those on Form 6?
	❑ Check the calculation of payout on the authorized excel format by pocket calculator referring to the payout calculation formula on the General Guideline?

CHAPTER 6 MONITORING AND EVALUATION

6.1 Purpose of the Monitoring and Evaluation

Monitoring and evaluation are key to implement AYII pilot activity successfully and to improve AYII activity for further expansion in the future. The purposes of the monitoring and evaluationactivities include as follows:

√ To understand the status of the AYII pilot activity on the ground,

√ To learn from experience to improve the pilot practice and activities in the future,

√ To justify internally and externally how the resources used and the results obtained,

√ To create better initiatives for future expansion of the AYII scheme,

Monitoring, which is periodical checking the progress of assigned tasks against plans, is carried out by MOA, Provincial Dinas, and Kebupaten Dinas. Monitoring results should be documented and should be used for better decision-making to obtain successful results. The data and information acquired through the monitoring activities will beusedfor evaluation. The sample monitoring sheetsshown as tables in this section are attached on APPENDIX IV of this Operation Guide.

Evaluation, whichis assessment of the whole AYII pilot phase, is implemented by MOA, Provincial Dinas, and Kabupaten Dinas. Evaluation process is analysis or interpretation of all the data and information obtained throughout the AYII pilot activities; thereby, drawing overall impact of AYII pilot scheme and improving the AYII scheme in the future. MOA will take responsibility of the comprehensive evaluation. The report of the evaluation will be delivered to Directorate of Agricultural Finance at the end of 2023.

6.2 Implementation of Monitoring Activity

1) Action Plan Making

Action Plan Making is the first step for the monitoring of the AYII pilot. The action plan includes at least: 1) target insured areas, 2) target number of farmers for socialization and 3) target number of insured farmers in each Desa. The Action Plan Making can be a part of the Training of Trainers (TOT) session which should organized prior to the AYII socialization. It is expected that MOA works with Puslatan for holding the TOT session.The sample action plan is shown as follows:

Table 6.2.1 Sample for Action Plan Sheet

No	Kecamatan	Desa	Land Area, ha	Paddy Area, ha (80% of Land Area)	Transplanting Date (Planned)	Sales Cut-off Date (+30 days from Transplanted)	Target Socialization Meeting (No.)	Target Socialization Farmers (No.)	Target Famers Insured (No.)
No	Kecamatan	Desa							
1	Kutawaluya	Kutamukti	509	407					
2		Sindangmukti	614	491					
3		Sindangsari	740	592					
4	Rawamerta	Gombongsari	290	232					
5		Kutawargi	309	247					
6		Sukapura	341	273					
7	Telagasari	Cilewo	367	294					
8		Kalibuaya	444	355					
9		Pasirkamuning	354	283					
10	Cibuaya	Gebangjaya	442	354					
11		Jayamulya	756	605					
12		Kertarahayu	562	450					
13	Pedes	Payungsari	692	554					
14		Rangdumulya	395	316					
15		Sungaibuntu	1055	844					
	Total		7,870	6,296					

Source: JICA Consultant Team

It is also important to identify transplanting date and sales cut-off date in each target Desa. The sale cut-off date is 30th day after planted.

2) Monitoring for Socialization and Registration

Once the AYII socialization starts, monitoring on socialization and registrationshould be carried out periodically. It is recommended that the progress of socialization and registration should be checked biweekly with the monitoring format.Kabupaten agricultural office shares the progress with Provincial Dinas, MOA, and Jasindo. Ideally, the monitoring meeting should be organized biweekly with these stakeholders during the socialization/ registration period. Each PPL reports their socialization/ registration progress to Kabupaten agricultural office through the monitoring format. PPLs should also share the information such as constraints of the socialization and feedback from farmers and farmers' group representatives. The sample monitoring format is shown as below. Also, since the registration and claim payout are carried out in Poktanbasis, another sheet which compile poktan-base registration and claim monitoring sheet should be prepared (refer to Table 6.2.5).

Table 6.2.2 Sample for Socialization and Registration Monitoring Sheet

No	Desa/ Village	Kecamatan/ Sub-district	Socialized Farmer Number	REGISTRATION STATUS				
				Insured Farmer Group (Poktan)	Total Insured Farmer	Total Insured Area (Hectare)	End of Registration (Cut Off)	Estimated Harvest Schedule
ex.	Gombongsari	Rawamerta	50	2	10	14	14-Aug-22	Sept-Nov 2022

Source: JICA Consultant Team

3) Monitoring for CCEs and Claim

CCE implementation should also be monitored periodically. As mentioned in Chapter 5, Kabupaten agricultural office check the random selection method for the sampling plots as well as yield survey method in each sampling plot. In addition, Kabupaten agricultural office needs to monitor the progress of the CCEs in order to manage the CCE implementation and finalize the Desa yield without any delay.

Table 6.2.3 Sample for CCE Schedule Monitoring Sheet

Kecamatan	Desa	2023																														CCE Total (X)
		January				February				March				April				May				June				July				August				September			
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Telagasari	Cilewo																	1		1	1	5	1	1														10
	Kalibuaya																	1	2	2	4		1															10
	Pasirkamuning																	1	2		4		1	2														10
Rawamerta	Kutawargi									1	2	2	5																									10
	Gombongsari																	1	2		4	3																10
	Sukapura																	1	1		3	3	2															10
Kutawaluya	Sindangmukti															1	3	3			1	2																10
	Sindangsari																	1	3	3		1		2														10
	Kutamukti																							2	2	2		4										10
Pedes	Rangdumulya																							1		5	2	1	1									10
	Payungsari																								1	1	5	2	1									10
	Sungaibuntu																										1	1	5	2	1							10
Cibuaya	Kertarahayu																										1		1	1	5	1	1					10
	Gebangjaya																										2		6	2								10
	Jayamulya																										2		6	2								10
CCE Total (Y)			0	0	0	0	0	0	0	1	2	2	5	0	0	1	3	9	10	6	17	14	5	8	3	8	13	8	20	7	6	1	1	0	0	0	0	150

Table 6.2.4 Sample for CCE Result Monitoring Sheet

No	Kecamatan	Desa	Weight of paddy grain before drying from CCE (Kg/6,25 m2)										CCE Result Average in Kg/6,25m2	CCE Result Average in Ton/ha	Benchmark (Ton/Ha)	Estimated Claim Status
			CCE_1	CCE_2	CCE_3	CCE_4	CCE_5	CCE_6	CCE_7	CCE_8	CCE_9	CCE_10				
1	Telagasari	Cilewo	5.005	5.145	4.195	4.905	4.015	4.195	6.040	7.585	8.105	4.085	5.328	8.524	6.47	Not claim
2		Kalibuaya	5.000	5.000	5.400	4.500	5.800	5.000	6.000	5.800	6.200	5.200	5.390	8.624	6.47	Not claim
3		Pasirkamuning	5.001	6.200	5.100	4.900	4.900	5.700	5.300	5.500	5.800	4.800	5.320	8.512	6.56	Not claim
4	Rawamerta	Kutawargi	8.100	4.300	5.200	5.500	6.950	5.000	7.230	3.600	8.000	6.180	6.006	9.610	6.34	Not claim
5		Gombongsari	4.820	2.580	4.510	0.925	2.720	3.710	3.510	3.235	2.950	3.390	3.235	5.176	6.61	Claim
6		Sukapura	7.000	7.980	7.270	5.140	5.930	8.120	6.430	6.900	4.640	6.200	6.561	10.498	6.59	No Registration
7	Kutawaluya	Sindangmukti	6.910	6.290	4.020	4.270	3.950	6.300	6.410	3.820	5.890	4.420	5.228	8.365	6.12	No Registration
8		Sindangsari	3.500	2.800	4.300	4.510	7.500	3.870	5.340	4.500	2.880	4.020	4.322	6.915	6.13	No Registration
9		Kutamukti	5.205	3.430	4.800	2.790	5.200	2.700	3.325	3.180	2.050	4.290	3.697	5.915	5.54	Not claim
10	Pedes	Rangdumulya	3.380	2.410	3.040	2.890	4.260	3.700	2.030	2.150	1.790	2.450	2.812	4.499	5.66	Claim
11		Payungsari	4.440	3.650	3.315	3.370	3.135	3.375	3.460	2.765	3.815	2.745	3.407	5.451	6.19	Claim
12		Sungaibuntu	3.745	3.055	4.510	4.385	4.355	4.255	5.255	4.240	3.890	4.195	4.189	6.702	5.66	Not claim
13	Cibuaya	Kertarahayu				4.630	4.290	3.985	4.350	3.965			4.244	6.790	6.35	No Registration
14		Gebangjaya	3.675	4.435		3.995		2.855			2.870	2.905	3.456	5.529	6.23	No Registration
15		Jayamulya	3.540	4.823	2.360	3.053	2.535	3.550	2.740	2.285	5.045	5.685	3.562	5.698	6.43	Claim

In the case that claimsare triggered as results of CCEs, the progress of claim procedure, which is described in Section 5.3, needs to be monitored by Kabupaten Dinas. The implementing agencies, namely

Kabupaten Dinas, Jasindo, Kecamatan Technical Implementation Unit, and PPL, need to follow the pre-set timeline (Table 5.3.1) using the following sample of claimmonitoring sheet. Since the compensation is paid by the unit of farmer group (Poktan), the Poktan-wise monitoring enables the stakeholders to understand claim progress at a glance.

Table 6.2.5 Sample for Registration and Claim Monitoring Sheet

No	Farmer Group Name	Desa/ Village	Kecamatan/ Sub-district	REGISTRATION STATUS							CLAIM STATUS									
						DATE									DATE					
				Insured Farmer Number	Insured Area Number (Hectare)	End of Registration (Cut Off)	Registration documents received by Jasindo	20% Premium Payment Received by Jasindo	Insurance policy is Received by Farmer Group	Estimated Harvest Schedule	Benchmark (Ton/Ha)	Average Yield of Actual Harvest Per Desa (Ton/Ha)	Claim Status (Claim /Not)	Estimated Amount of Payout Per Hectare (Rp)	Claim Document received by Dinas	Claim Document received by Jasindo	Approval Documents Accepted by PPL/Poktan	Stamped Farmers Signed received by Jasindo	Payout Claim Paid by jasindo	Total Payout Claims Received by Farmer Group
ex	Karya Tani	Gombongsari	Rawamerta	10	14	14-Aug-22	2-Jul-23	5-Jul-23	10-Jul-23	Sept-Nov 2022	6.61	5.176	Klaim	1,301,664.15	30-Nov-22	4-Dec-22	14-Dec-22	17-Dec-22	19-Dec-22	18,223,296.03

APPENDIX I Terminologies

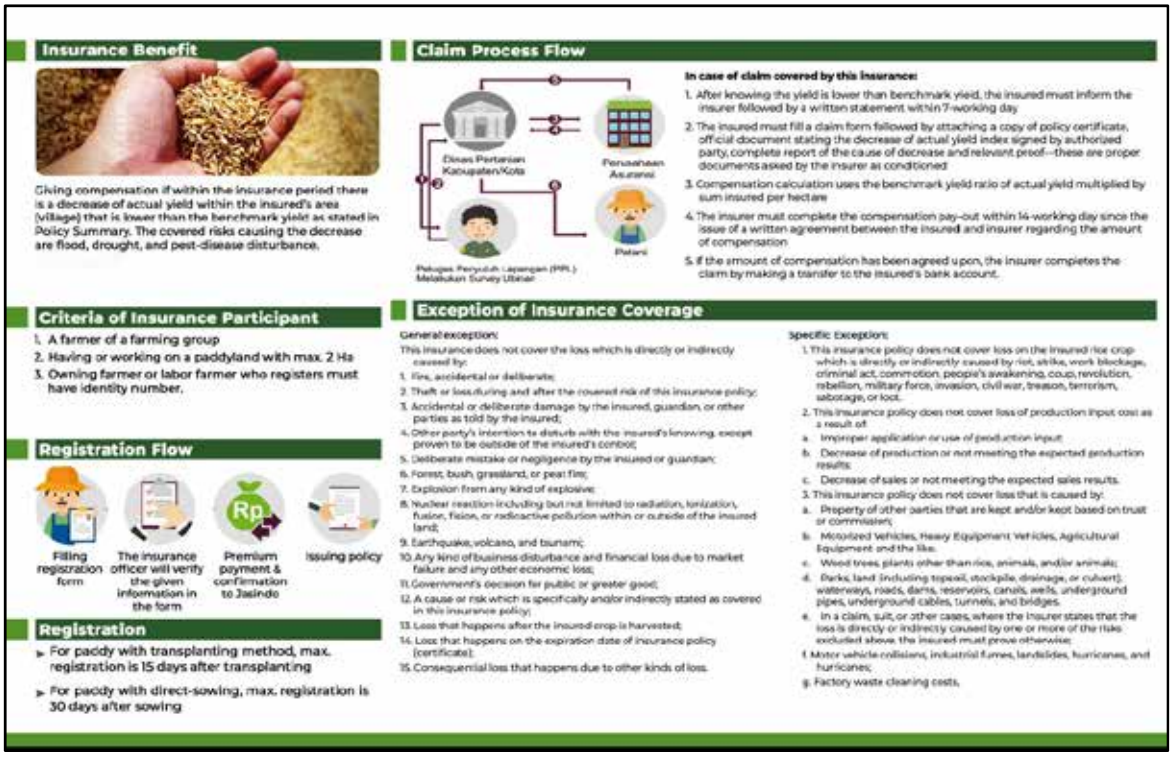
No.	Term	Description
1	Actual Yield	Actual Yield (AY) is the average actual yield per hectare in a village calculated based on a CCE survey.
2	Benchmark Yield	Benchmark Yield (BY) / Benchmark Results is the threshold value of a village's loss rate obtained from the average historical harvest data for 7 (seven) years multiplied by 85% (level of indemnity). The value of benchmark yield will be reviewed and updated periodically by the insurer/ Ministry of Agriculture.
3	Claim	A claim is a claim for compensation due to damage and / or loss due to risk guaranteed by the policy and according to the guidelines and gives the insured the right to file a claim for compensation to the insurer.
4	Compensation	Compensation is a payment of a sum of money to the insured as a replacement for damage and/or loss due to risk covered by the policy.
5	Crop Cutting Experiments (CCEs)	Crop Cutting Experiments (CCEs)/Ubinan is the number of trials required, which are carried out by the Government to assess the actual yield of the crop. The Crop Cutting Experiment (CCE) methodology as recommended by BPS/Ministry of Agriculture will be considered for conducting a minimum of 10 (ten) randomized trials.
6	Insurance	Insurance is a mechanism for transferring risk from the insured to the insurer with the payment of insurance premiums so that the insurer is obliged to pay for the losses that occur and are guaranteed.
7	Insurance Policy	Insurance Policy is an insurance engagement document between the insured and the insurer, signed by the insurer, which includes, among other things, the rights and obligations of each party and is written evidence of the existence of an insurance agreement.
8	Policy Schedule	Policy schedule is an attachment sheet to the Policy that contains information about the insured, the main points of coverage, the price of coverage and the calculation of premiums.
9	Premium	Premium is the amount of money determined by the insurer and paid by the insured as a condition of the validity of the insurance agreement and gives the insured the right to claim losses.
10	Sum Insured	The amount stated in this Policy Summary which represents the maximum responsibility of the Insurer for any and all claims arising under the Policy.

APPENDIX II Frequently Asked Questions

No.	Question	Answer
1	If our crops are damaged, how do you decide the compensation amount for crop losses?	The compensation amount would be decided based on the difference between the benchmark yield and the actual yield obtained through the CCE survey. If the actual yield is much lower than the benchmark yield, you will get higher compensation amount and vise versa
2	What is the difference between AUTP and AYII?	The biggest difference is that indemnity is based on individual loss under the AUTP program. On the other hand, indemnity is based on Desa yield. For this reason, filed assessment will be carried out in each claimed land under the AUTP program, yet filed assessment in each land is not carried out instead there is only sampling survey; namely CCEs.
3	Can we participate both AUTP and AYII program at the same time?	No, you do not participate both AUTP and AYII program at the same time. You have to choose either AUTP or AYII. This is because both programs are subsidized by the government. You are not allowed to receive dual subsidies.
4	How long does it take to get the payout from the insurance company after we our crop failure?	The insurance company will distribute the compensation within 14 working days after they approve the claims. The insurance company will approve the claims after finalizing the CCE results. Usually, it may take one month to complete the CCEsat the time of harvest season.
5	When our crops are damaged and decreased the yield, can we always receive the compensation from the insurance company?	You can receive the compensation from the insurance company as long asthe actualDesa yield is lower than the benchmark yield. However, even if you experience crop failure, you cannot receive the compensation if the actual Desa yield becomes higher than the benchmark yield.
6	Can we transfer the premium to the next season if we do not receive any payout from the insurance company?	No, you cannottransfer. You have to pay the premium every time when you join the program regardless of your payout history.
7	Why should I join the AYII program?	Agricultural insurance plays an important role to protect you, particularly financial aspects of your farming activities, against natural perils such as drought, flood and pest and diseases. Particularly, Area-Yield Index Insurance (AYII) is provided with lower premiums compared to the AUTP program.

APPENDIX III Socialization Materials

1) Brochures



2) Script for Radio Story

Scene	AUDIO
1 : Dialogue between farmers	In the background there is the sound of a Sundanese flute and the sound of a spoon clinking against a glass, and the sound of coffee brewing. Then, Mr. Haji Drinks his coffee, then the sound of Mr. Odang Footsteps is heard. B: Pagi, Pak Haji! Minum kopinya serius banget. Pagi, Pak Haji! Meuni serius kitu ngopina atuh. Good morning, Mr. Haji! Why are you drinking coffee so seriously? A: Eeeeh, Kang Odang. Itulah, agak pusing mikirin sawah belum ditanam. Eeeeh, Kang Odang. Nyaeta, mikiran sawah acan ditanem. Ah...You are Odang. It's a bit confusing to think that the paddy fields have not been planted yet. B: Kenapa belum tanam? Kan udah waktunya. Kunaon, Pak Haji? Pan tos jadwalna tanem sawah Pak Haji mah. Why haven't you planted yet? it should be time to plant. A: Mau tanam, tapi panen kemarin hasilnya turun. Khawatir rugi lagi waktu panen nanti. Bingung juga supaya tenang bertani. Rek tanem teh kamari ge hasil panen ngan saeutik. Bisi panen teh rugi deui. Bingung carana nyawah tenang teh kumaha. I want to plant, but last season's harvest fell. Worried about losing again at harvest time. Confused too, how to be safer in farming. B: Kemarin saya dapat info dari PPL, ada produk asuransi tani baru! Asuransinya melindungi hasil panen satu desa. Jadi, kalau nanti panen di desa turun dari biasanya, bisa dapat ganti rugi! Kamari teh PPL ngawartos ka abdi, aya asuransi tani nu ngajaga hasil panen di desa. Nalika panen desa turun, aya ganti rugi pikeun patani! I received information from the Agricultural extension staff yesterday that there is a new agricultural insurance product! The insurance protects the crops of one village. So, if later the average harvest in the village drops from the specified benchmark value, you can get compensation! A: Oh gitu? Kang Odang mau daftar? Oh kitu? Ari Kang Odang daftar? Is that so? Do you want to register this new insurance? B: Saya mau tanya-tanya lagi soal asuransi baru ke PPL-nya, Pak Haji! Mau ikut ke kantor UPTD? Ieu abdi bade naros ka PPL detil asuransina kumaha. Hayu atuh ka kantor UPTD? Haven't registered yet. Instead, I want to ask again about the new insurance to the PPL (Agricultural extension staff). Do you want to come to the Agricultural Extension Unit office (UPTD) too? A: Ayo, saya ikut! Habisin kopi dulu! Hayu lah! Beres ngopi nya! : Ok, I want to go too, after drinking coffee.

2 : Explanation from broadcaster	The Area-Based Paddy Harvest Index (IHPPBA/AYII) Agricultural insurance product has been introduced for 15 villages in Karawang Kabupaten. Farmers who own/cultivate paddy fields in the villages of Kutamukti, Sindangmukti, Sindangsari, Gombongsari, Kutawargi, Sukapura, Cilewo, Kalibuaya, Pasirkamuning, Gebangjaya, Kertarahayu, Jayamulya, Payungsari, Rangdumulya, and Sungaibuntu can insure up to maximum two hectares of farmland with a premium of Rp31,800 ,- per hectare. 80% of the premium has been subsidized by the Government to help farmers. This IHPPBA/AYII Insurance trial program provides compensation if the paddy yields in the 15 villages experience a number of declines from the previous village harvest index or bench mark yields value.
3 : Conclusion & final information from broadcaster	For further information and information, please contact the Agricultural extention staff or visit the UPTD Office in Kecamatan of Kutawaluya, Rawamerta, Telagasari, Pedes, and Cibuaya. Let's grow paddy with passion, settle and safety!

3) Script for Video Material

Scene	AUDIO
1	1. Belum tanam padi? 2. Khawatir hasil panen nanti kurang maksimal? 3. Mau Bertani aman, mendapat perlindungan dan keuntungan? * 1. Haven't planted paddy yet? * 2. Worried that the harvest will not be optimal? * 3. Want to farm safely, get protection and profit?
2	Kini hadir produk baru asuransi tani Indeks Hasil Panen Padi Berbasis Area yang diujicobakan di 15 desa dari 5 kecamatan di Kabupaten Karawang. Now, there is a new product for Farmer Insurance, the Area-Based Rice Yield Index, which is now tested in 15 villages from 5 sub-districts in Karawang Kabupaten.
3	Asuransi IHPPBA ini memberikan perlindungan ketika hasil panen terbaru suatu desa lebih rendah dari indeks panen desa yang sudah ditentukan. Maka, para petani pemegang polis di desa tersebut akan diberikan sejumlah kompensasi! This IHPPBA/AYII insurance provides protection when the latest harvest in a village is lower than the village harvest index that has been determined. Thus, the policy holders in the village will be given a certain amount of compensation!
4	Indeks panen desa diambil dari data panen selama 7 tahun terakhir. Sementara hasil panen desa terbaru diambil dari proses ubinan yang dilakukan di 10 titik di tiap desa. The village harvest index is taken from the previous harvest data for the last 7 years. Meanwhile, the latest village harvests are taken from the CCE process carried out at 10 points in each village.
5	Petani bisa mendaftarakan lahannya sebelum tanam sampai 15 hari setelah tanam. Lahan yang didaftarkan maksimal 2 hektar. Petani juga harus melampirkan fotocopy KTP. Lalu, mengisi lengkap formulir dari PPL pertanian. Farmers can register their land before planting until 15 days after the planting. The maximum land to be registered is 2 hectares. Farmers must also attach a photocopy of their ID card. Then, fill out the complete form provided by the Agricultural Extension staff.

6	Berkas yang dikirim akan diperiksa oleh pihak Jasindo. Setelah membayar premi sebesar 31.800 rupiah per hektar, petani akan mendapatkan polis asuransi masing-masing. Premi yang dibayarkan cukup ringan karena sudah disubsidi pemerintah dari total premi awal! The submitted file will be checked by Jasindo. After paying a premium of 31,800 rupiah per hectare, farmers will get their respective insurance policy. The premium paid is quite light because it has been subsidized by the Government from the total initial premium!
7	Program asuransi IHPPBA ini diujicobakan di wilayah desa dan kecamatan berikut ini. Total sawah yang terlindungi bisa mencapai 6.000 hektar! The IHPPBA/AYII insurance program is now piloted in the following villages and Kecamatan. The total protected paddy fields can reach as much as 6,000 hectares!
8	Informasi lebih lengkap bisa didapatkan dari teman-teman PPL di UPTD Rawamerta, Telagasari, Kutawaluya, Pedes, dan Cibuaya. Mari lindungi panen padi dengan AUTP IHPPBA! More complete information can be obtained from Agricultural Extension staff at UPTD Rawamerta, Telagasari, Kutaluya, Pedes, and Cibuaya. Let's protect the paddy harvest with AUTP IHPPBA/AYII!

Action Plan for MT…….Year……Kabupaten/District……..

No	Kecamatan	Desa	Land area, ha	Paddy area, ha	Planting Date	Sales Cut-off date (30days after planting)	Target Number of Socialization Meeting	Target Number of Socialized Farmars	Target Number of Insured Farmers
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

AYII Desa-wise Registration and Claim Monitoring Sheet For Planting Season (MT)……Year…….....Kabupaten/District.....

No	Kecamatan/ Sub-district	Desa/ Village	Socialized Farmer Number	REGISTRATION STATUS					CLAIM STATUS				
				Insured Farmer Group (Poktan)	Total Insured Farmer	Total Insured Area (Hectare)	End of Registration (Cut Off)	Estimated Harvest Schedule	Benchmark *(Ton/Ha)*	Average Yield of Actual Harvest Per Desa *(Ton/Ha)*	Claim Status *(Claim /Not)*	Estimated Amount of Payout Per Hectare *(Rp)*	Amount of Claim Payout Per Per Desa

CCE Result Monitoring Sheet For MT…….Year……Kabupaten/District…….....

No	Kecamatan	Desa	Weight of paddy grain before drying by CCE (kg/6,25 m2)										CCE Result Average in kg/6,25m^2	CCE Result Average in ton/ha	Benchmark Yield (ton/Ha)	Estimated Claim Status
			CCE _1	CCE_2	CCE_3	CCE_4	CCE_5	CCE_6	CCE_7	CCE_8	CCE_9	CCE_10				
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

CCE Schedule Monitoring Sheet For MT…….Year……Kabupaten/District……..

1. CCE Schedule for MT1

Kecamatan	Desa	2023																												CCE Total (X)
		February				March				April				May				June				July				August				September				
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Total Number of CCE																																		

CCE Schedule Monitoring Sheet For MT…….Year……Kabupaten/District…….....

2. CCE Schedule for MT2

Kecamatan	Desa	2023																2024														CCE Total (X)
		September				October				November				December				January				February				March				April				
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Total Number of CCE																																	

AYII Poktan-wise Registration and Claim Monitoring Sheet For Planting Season (MT)……Year………Kabupaten/District…………………

				REGISTRATION STATUS							CLAIM STATUS									
						DATE									DATE					
No	Farmer Group Name	Desa/ Village	Kecamatan/ Sub-district	Insured Farmer Number	Insured Area Number (Hectare)	End of Registration (Cut Off)	Registration documents received by Jasindo	20% Premium Payment Received by Jasindo	Iinsurance policy is Received by Farmer Group	Estimated Harvest Schedule	*Benchmark (Ton/Ha)*	Average Yield of Actual Harvest Per Desa *(Ton/Ha)*	Claim Status *(Claim /Not)*	Estimated Amount of Payout Per Hectare *(Rp)*	Claim Document received by Dinas	Claim Document received by Jasindo	Approval Documents Accepted by PPL/Poktan	Stamped Farmers Signed received by Jasindo	Payout Claim Paid by jasindo	Total Payout Claims Received by Farmer Group

APPENDIX V Yield Survey Result Record Sheets (Authorized Excel Sheet)

FORM-AUTP IHPPBA-6

ACTUAL YIELD REPORT

We hereby inform the village's actual yield, with the following information:

Desa:	
Number of Participating Group:	
Number of Participating Farmer:	
Insured Area:	ha
Planting Period (D/M/Y):	
CCE Period (D/M/Y):	-
Area Yield (CCE Survey Result):	ton/ha
Benchmark Yield:	ton/ha
Remark	

We hereby declare that the actual yield above is made in truth.
For this testimony, we have signed this report on actual yield dated:
Head of UPTD Kecamatan.

ATTACHMENT OF FORM-AUTP IHPPBA-6

CCE SURVEY RESULT RECAPTATION

Desa Name:	
Kecamatan Name:	

No.	CCE Date			CCE Location, decimal degree		CCE Sample Weight, kg	Remark
	Day	Month	Year	Latitude	Longitude		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Average Weight **kg**

Average Yield (Area Yield) **ton/ha**

Reported by PPL

NOTE: Average Yield (ton/ ha) = Average weight (kg) x 1.6
1.6 is the unit conversion constant calculated by 100m x 100m / (2.5 m x 2.5 m) / 1000

Desa No.	Kecamatan Name	Desa Name	Benchmark Yield	Area Yield	Claim	Percentage Yield Decrease	Sum Insured per hectare	Compensation Amount per hectare	Insured Area	Total Compensation Amount
Desa 1										
Desa 2										
Desa 3										
Desa 4										
Desa 5										
Desa 6										
Desa 7										
Desa 8										
Desa 9										
Desa 10										
Desa 11										
Desa 12										
Desa 13										
Desa 14										
Desa 15										

Desa No.	CCE No.	Kecamatan Name	Desa Name	CCE Date	Paddy Owner Name	Poktan Name	CCE Coordinate		CCE Sample Weight, kg	Average Sample Weight, kg	Area Yield, ton/ha
							Latitude	Longitude			
Desa 1	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
Desa 2	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
Desa 3	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										

APPENDIX VI Options of Handling the Insufficient CCE Case

It is recommended that the implementing agencies specify the way of the handling on either MOA General Guideline or insurance policy certificate in following years. Options below may be considered[3]:

Options

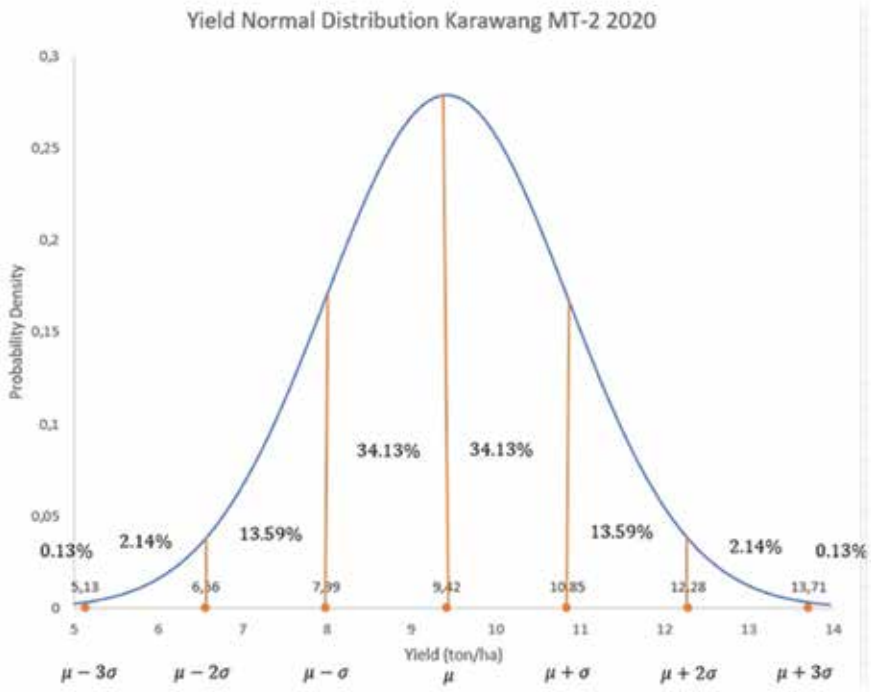
In the case that there is a Desa where the surveyors cannot obtain in total 10 CCEs in the target cropping season,

√ MOA and Jasindo calculate the probable average yield of all paddy plots in the Desa based on theaverage of insufficient CCE results for considering whether the implementing agencies accept or reject the average of insufficient CCEs as the area yield of the season. The implementing agencies agree on the acceptance or rejection and handle the case based on the agreement.The way of the calculation is shown below.

√ MOA and Jasindo adopt the average CCE yield of Kecamatan to which the Desa belongs to the average yield of the Desa of the season and judge whether there should be compensation payout in the Desa or not. Note that the average yield of Kecamatan need to be calculated from all CCE results in the Kecamatan of the season, so that the implanting agencies need to await the completion of all the CCEs.

[The Way of Calculating the Probable Average Yield of All Paddy Plots in Desa – for Option (a)]

The number of CCEs required in a Desa for obtaining the area yield of the cropping season, i.e. 10 CCEs per Desa in a cropping season, is calculated based on the hypothesis that the distribution of yields of all paddy plots (population) in a Desa has a normal distribution. The average yield and standard deviation of all paddy plots of Desa was also assumed using the data of 300 CCE samples taken in MT2 2020 for remote-sensing analysis trial by the JICA project. The figure below shows the normal distribution.



3 It is also required to judge whether the average yield resulting from the insufficient CCEs should be considered or not when Jasindo updates the benchmark yield of following cropping season.It is considered that the average yield of insufficient CCEscannot be included in the calculation of benchmark yield update. However, in the case that Jasindo changes the calculation method of benchmark yield in future in which highest and lowest yields in the recent 7 years are removed, the average yield resulting from the insufficient CCE can be included in the benchmark update.

Given the same normal distribution of yields, the probable range of average yield of all paddy plots of Desa (population) can be calculated using the number of CCE samples taken in the target season (samples), which is less than 10, and the average of the less-than-10 CCEs. The calculation formula is as follows.

$$C = \frac{\sigma}{\mu\sqrt{n}}$$

where, C is the standard error rate. Theσ shows the standard deviation of yields of all paddy plots in Desa (constant = 1.4 ton/ha) which was assumed using the 300[4] samples obtained in MT2 2020. Theμis the average of all paddy plots in Desa (constant = 9.4 ton/ha) which was also assumed using the 300 samples. The n is the number of CCE samples taken in the target season. As the calculation is made based on the hypothesis that the yields distribution of Desa (population) has a normal distribution, the C (standard error rate, %) indicates that the average yield resulting from less CCEs ranges:

Confidence Level	Probable Range of Average Yield resulting from the less CCEs		
68.3 %	Ave. Pop. x (1-C%)	≦ Ave. CCE ≦	Ave. Pop. x (1+C%)
95.0 %	Ave. Pop. x (1-1.96C%)	≦ Ave. CCE ≦	Ave. Pop. x (1+1.96C%)
95.4 %	Ave. Pop. x (1-2C%)	≦ Ave. CCE ≦	Ave. Pop. x (1+2C%)
99.7 %	Ave. Pop. x (1-3C%)	≦ Ave. CCE ≦	Ave. Pop. x (1+3C%)

Note: “Ave. Pop” shows the average yield of all paddy plots (population) in Desa. “Ave. CCE” shows the average yield of CCE paddy plots (sample).

Following the table above, the probable range of average yield of all paddy plots of Desa can be obtained as follows. Therefore, the range of average yield of all paddy plots can be calculated using the C which is calculated by the formula above and the average yield of less CCEs (sample).

Confidence Level	Probable Range of Average Yield of All Paddy Plots of Desa		
68.3 %	Ave. CCE. x (1+C%)	≦ Ave. CCE ≦	Ave. CCE / (1-C%)
95.0 %	Ave. CCE. x (1-1.96C%)	≦ Ave. CCE ≦	Ave. CCE. x (1+1.96C%)
95.4 %	Ave. CCE. x (1+2C%)	≦ Ave. CCE ≦	Ave. CCE. x (1-2C%)
99.7 %	Ave. CCE. x (1+3C%)	≦ Ave. CCE ≦	Ave. CCE. x (1-3C%)

Note: “Ave. Pop” shows the average yield of all paddy plots (population) in Desa. “Ave. CCE” shows the average yield of CCE paddy plots (sample).

4 Note that theσ and μ, which are constant values, are resulted from the 300 samples taken in MT2 2020, so that the values should be reconsidered in future referring the accumulated AYII-CCE results.

Japan International Cooperation Agency (JICA)
JICA Indonesia Office,
Sentral Senayan II, 14th Floor,
Jl. Asia Afrika No. 8, Jakarta 10270, Indonesia
Website: https://www.jica.go.jp/english/index.html

Ministry of National Development Planning/
National Development Planning Agency (BAPPENAS)
Jalan Taman Suropati No.2, Jakarta 10310, Indonesia
E-mail: pertanian@bappenas.go.id
(Directorate for Food and Agriculture)
Website: https://www.bappenas.go.id/

ISBN