

Republic of Indonesia

**Preparatory Survey for BOP business on
Weather Index Insurance in Agricultural
Sector in Indonesia**

Final Report

March 2018

Japan International Cooperation Agency (JICA)

Sompo Risk Management & Health Care Inc.

Sompo Japan Nipponkoa Insurance Inc.

Remote Sensing Technology Center of Japan (RESTEC)

**National Agriculture and Food Research Organization
(NARO)**

OS
JR
18-009

Table of Contents

- 1. BACKGROUND AND OBJECTIVE OF THE STUDY AND CONSISTENCY WITH DEVELOPMENT GOALS.....3**
- 2. OUTLINE OF THE STUDY4**
- 3. CONCLUSION 11**
- 4. PLANS FOR COMMERCIALIZATION14**
- 5. ENVIRONMENTAL AND SOCIETAL CONSIDERATIONS15**
- 6. EFFECT ON DEVELOPMENT OF PROJECT16**
- 7. POTENTIAL COLLABORATION WITH JICA16**

Abbreviations

Acronym	Full Spelling
BMKG	Badan Meteorologi, Klimatologi dan Geofisika (in Indonesian) Meteorological, Climatological, and Geophysical Agency
BPS	Badan Pusat Statistik (in Indonesian) Statistics Indonesia
BNPB	Badan Nasional Penanggulangan Bencana (in Indonesian) National Agency for Disaster Management
MOA	Ministry of Agriculture
OJK	Otoritas Jasa Keuangan (in Indonesian) Financial Services Authority
IFLS	Indonesian Family Life Survey

1. Background and Objective of the Study and Consistency with Development Goals

1.1. Background

Natural disasters such as droughts have become a major issue in the achievement of stable farm management in developing countries which are vulnerable to climate change and unprepared to respond.

“Adaptation” as a way of minimizing the impact of climate change is becoming increasingly important, and weather index insurance, which encourages swift recovery from natural disasters and increases farm management resilience, has been attracting attention as an adaptation measure. Weather index insurance enables prompt recovery from natural disasters by quickly paying out benefits based on weather data and other indexes, such as when cumulative rainfall drops below a certain level in a given period.

The Sampo Holdings Group, with Sampo Japan Nipponkoa Insurance at its core, has set “Promoting the Manageability of Global Environmental Issues” as one of its CSR material issues, and is promoting adaptation to climate change through product development, risk assessments, and research studies.

1.2. Objective

This study aims to assess the feasibility of introducing weather index insurance for agricultural workers in Indonesia. The study investigated agricultural workers’ insurance needs, obtained and verified agricultural and weather data necessary to develop insurance products, obtained licenses necessary to sell insurance, and conducted surveys for establishing sales channels. The study also ran sales simulations and test marketed insurance.

1.3. Consistency with Development Goals

In recent years, as climate change progresses, we are seeing rising temperatures, longer dry seasons, concentrated rainfall, and increases in other such phenomena. In Indonesia, droughts tend to occur when El Nino occurs, and farm management has become unstable due to the increase in droughts or other natural disasters. Rice production in Indonesia is affected by climate change, and by 2050 is predicted to be 38% lower than it was in 2015¹, which will have an enormous impact.

Meanwhile, the population of Indonesia is the fourth largest in the world, standing at 251.49 million in 2016, and is expected to increase in the future. Moreover, the impact on farm management of droughts and other disasters is serious, creating a vicious circle in which agricultural workers are unable to harvest crops, and run into difficulties repaying loans borrowed to hire labor, use farm tools, and purchase fertilizer.

For this reason, the Indonesian government has positioned food security and improving income for agricultural workers as one of its policy priorities and is promoting initiatives to introduce agricultural insurance.

Rice, the staple food of 90% of the Indonesian population, is mostly grown on Java, an island where

¹ Yusman Syaukat , THE IMPACT OF CLIMATE CHANGE ON FOOD PRODUCTION AND SECURITY AND ITS ADAPTATION PROGRAMS IN INDONESIA

irrigation systems are relatively widespread. There are many small-scale agricultural workers on Java who tend to take any excess production from self-sufficiency management to the market. However, not all agricultural workers have their own land, many pay rent to landowners to engage in farming.

Most agricultural workers living in Java borrow funds necessary for farm management such as for seeds, seedlings and fertilizer, and use money from the sale of crops to repay borrowed funds. When unable to earn a satisfactory amount due to natural disasters or the like, farmers are forced to come up with funds to make repayments by curbing spending on non-food items, or securing non-agricultural income by going to work in the cities.

Natural disasters are increasing in tandem with climate change while demand for food is increasing in tandem with population growth. The need for agricultural insurance to hedge against risks and stabilize farm management is rising. However, although the Asian agricultural insurance market has been expanding in recent years, the hurdle to developing products remains high and adoption rates remain low. People in poverty, in particular, lack adequate access to financial services such as insurance or financing and are forced to resort to schemes such as mutual financing in high interest rate regions.

The study focused on Java, a center of rice production, and the Nusa Tenggara islands which are at high risk of drought, and aimed to develop and introduce a weather index insurance product that covers against drought risks for rice. The introduction of weather index insurance will stabilize farm management for agricultural workers and will also encourage private banks to increase lending to such workers due to decreased default risk. The hope is that, by improving access to financial services in this way, farm management will improve among small-scale agricultural workers in the BOP segment through the use of financial services, encouraging agricultural workers to stand on their own two feet. This also conforms to the policies of the Indonesian government.

2. Outline of the Study

2.1. Areas of the Study

Areas that met the following conditions were targeted for detailed investigations as part of this study, and Bojonegoro and Gresik on Java (East Java) and Central Lombok on Lombok to the eastern side of Java across from Bali (West Nusa Tenggara) were chosen as areas that met these conditions.

- Areas with high rice yields (Indonesia's main crop)
- Areas at high risk from drought
- Areas with good access from sales bases and sales channels



Figure 2.1 Areas Targeted by the Study

Source: Adapted by Sampo Risk Management & Health Care from a figure included in Section 4 “Current State of Agriculture, Forestry and Fisheries Industry and Agricultural Policy in Indonesia” of the FY2012 Report on Agricultural Data Analysis in Major Countries, published by the Japan’s Ministry of Agriculture, Forestry and Fisheries

2.2. Organizations Involved in the Study

This study was conducted jointly by Sampo Holdings Group’s Sampo Japan Nipponkoa Insurance, Sampo Holdings Group’s local branch PT Sampo Insurance Indonesia, and Sampo Risk Management & Health Care, together with the Remote Sensing Technology Center of Japan (RESTEC) and the National Agriculture and Food Research Organization (NARO).

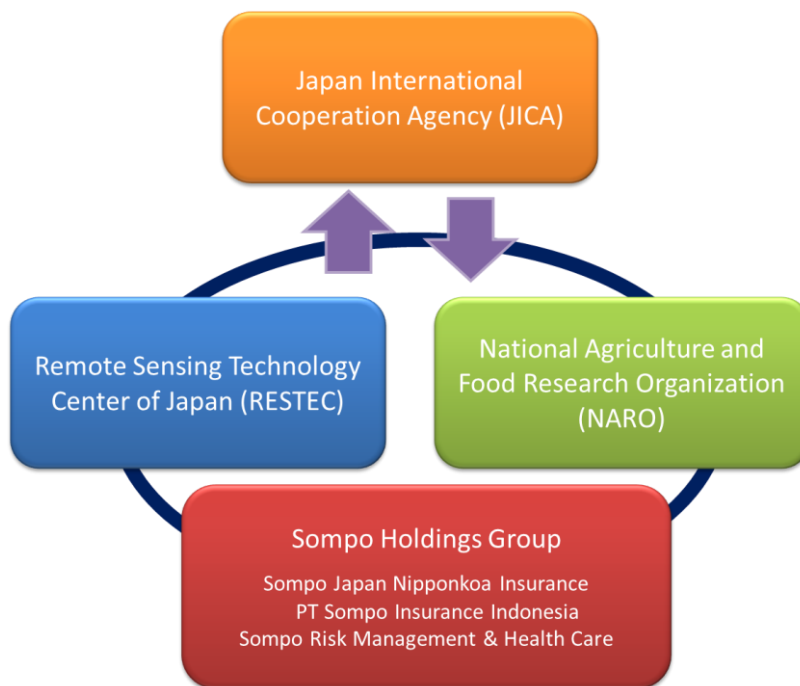


Figure 2.2 Project’s Investigative Organizational Chart

2.3. Schedule and Methods

The study was conducted according to the following schedule over a period of three years from April 2015 to March 2018. In fiscal year 2015, the study focused on agricultural fact-finding investigations and interviews with agricultural workers, gathering and analyzing weather data, validating satellite data usability, and analyzing the relationship between weather data and yield data. In fiscal year 2016, based on the results of investigations conducted in the previous year, the study focused on surveys for establishing sales channels and insurance simulations, and conducted investigations aimed at the design and sale of insurance products that meet customer needs. In fiscal year 2017, the study test marketed insurance products in the target areas.

Table 2.3-1 Outline of the Study

Item		Method
Preliminary study	Agricultural fact-finding investigation	<ul style="list-style-type: none"> Investigated Indonesia's farm management situation and agricultural characteristics, etc. through literature and interviews with experts (research institutions, NGOs, etc.) (May – October 2015)
	Interviews with Agricultural Workers	<ul style="list-style-type: none"> Visited agricultural workers, agricultural corporations, and Indonesian banks in Malang, Nganjuk, Bogor, Gresik, Bojonegoro and Lombok, and held in-depth interviews on insurance needs (May, November 2015).
	Gathering and Analyzing Weather Data	<ul style="list-style-type: none"> Field study of temperatures, daily precipitation, hours of sunlight, soil moisture content, etc. in the targeted areas in Malang, Gresik, Bojonegoro, and Lombok (May – November 2015) Analyzed data from meteorological agency (May – November 2015) Analyzed additional information using remote sensing data, etc. (May – November 2015)
	Validating Satellite Data Usability	Validated the usability of satellite data (from May 2015)
	Analyzing Relationship Between Weather Data and Yield Data	<ul style="list-style-type: none"> Conducted correlation analysis and multiple regression analysis to analyze the relationship between weather data (such as temperature and precipitation) and yield data of rice and other crops (May – November 2015)
Establishing sales channels	Coordinating with potential agencies	Interviews on target areas and crops (from November 2015)
	Building Sales Schemes	Investigations aiming at building weather index insurance sales systems and solicitation schemes (from May 2015)
Simulations	Planning Dry Run	Planned simulations that do not involve receiving money (dry run) (February – May 2016)

	Briefings	Held explanatory meetings for simulation participants in Bojonegoro and Lombok (May, September 2016)
	Implementing Dry Run	Implemented dry run and identified issues for actual operations (October 2016 – March 2017)
	Test Marketing	Started test marketing products in Bojonegoro and Lombok (from September 2017)
Insurance license	License application	Negotiated with authorities regarding licenses and applied for a license (from September 2015) and Obtained license (March 2016)

Table 2.3-2 Schedule of the Study

Item	Work Detail	Conducted by	Period																																			
			2015												2016												2017											
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Preliminary study	Agricultural fact-finding investigation	Sompo Risk Management & Health Care PT Sompo Insurance Indonesia NARO	█																																			
	Interviews with agricultural workers	Sompo Risk Management & Health Care PT Sompo Insurance Indonesia Sompo Japan Nipponkoa Insurance	█																																			
	Gathering and analyzing weather data	Sompo Risk Management & Health Care RESTEK NARO	█																								█											
	Validating satellite data usability	Sompo Japan Nipponkoa Insurance Sompo Risk Management & Health Care RESTEK	█																																			
	Analyzing relationship between weather data and yield data	Sompo Japan Nipponkoa Insurance Sompo Risk Management & Health Care NARO	█																								█											
Establishing sales channels	Coordinating with potential agencies	PT Sompo Insurance Indonesia	█																																			
	Building sales schemes	PT Sompo Insurance Indonesia	█																																			
Simulations	Planning dry run	PT Sompo Insurance Indonesia Sompo Japan Nipponkoa Insurance Sompo Risk Management & Health Care													█																							
	Briefings	PT Sompo Insurance Indonesia Sompo Japan Nipponkoa Insurance Sompo Risk Management & Health Care													█												█											
	Implementing dry run	PT Sompo Insurance Indonesia Sompo Japan Nipponkoa Insurance Sompo Risk Management & Health Care																									█											
	Test marketing (Bojonegoro)	PT Sompo Insurance Indonesia																									█											
	Test marketing (Lombok)	PT Sompo Insurance Indonesia																									█											
Insurance license	License application	PT Sompo Insurance Indonesia	█																																			

2.4. Outline of Results of the Study

(1) Interviews with Agricultural Workers

In May and November 2015, visits were made to Gresik, Bojonegoro, Lombok, as well as Java's Bogor (where agricultural research institutions are concentrated), Malang and Nganjuk regions, and the local agricultural workers, agricultural corporations, and Indonesian banks were asked about the situation surrounding such workers, preparations for irrigation systems, and the need for insurance.

The interviews discovered that in some regions of Indonesia there are areas at high risk from drought alongside areas at low risk from drought. The interviews also confirmed that risks varied depending on whether they are landowners or tenant farmers, or whether they are full-time workers or part-time workers, and identified the need for a close examination of areas and people with a strong need for cover against drought risks before actual operations. As a prior example, in northeastern Thailand, where Sompo Insurance (Thailand) Public Company Limited sells weather index insurance, weather and agricultural conditions are the same across a wider area, and the sales area can be expanded easily. It is not expected to be easy to expand sales areas in Indonesia.

Interviewees acknowledged that the simplicity of the weather index insurance system and the fast payments are advantages, and expressed an interest in the insurance. While there is a high level of interest, agricultural workers are not accustomed to taking out insurance offered by the private sector, thus the advantages of being insured need to be carefully explained at explanatory meetings.

Some agricultural workers are concerned about the credibility of private sector insurance companies and indicated that they would be able to trust such companies if BMKG precipitation data is used as an index. To earn their trust, it is important to base insurance payments on information from public institutions such as BMKG and MOA.

Agricultural workers expressed their demands for payments each planting season, insurance for workers who do not own land, and coverage against flooding and damage caused by disease and pests.

(2) Gathering and Analyzing Weather Data and Agricultural Data

Gathering highly accurate weather data on the target area is essential for designing and developing weather index insurance products. Moreover, past agricultural data of a constant quality is needed to assess risks and calculate rates.

BMKG's observation stations were visited during the field studies mentioned in (1) above, and it was confirmed that the quality of meteorological observations at the stations staffed by BMKG employees is adequate. As in the section 3.1 (2) Building Relationships with Government Agencies the details are mentioned, since it is preferable to base insurance payments on information from public institutions, the project group had negotiated signing on a Memorandum of Understanding (MOU) with BMKG that provide meteorological data since it started investigation, and in May 2017 both parties signed an MOU. The areas close to BMKG's meteorological observation stations or equipment will be first selected as the target.

At the same time, the limited number of meteorological observation stations staffed by BMKG employees was identified as an issue. BMKG also commissions provincial government employees to record meteorological data using precipitation gauges or other equipment. It is necessary to obtain such data and check its accuracy. While it is possible to design insurance products using precipitation data from satellites even if there are no nearby meteorological observation stations or equipment available, further investigations into the practical usability of such data are necessary.

Agricultural data which MOA compiles as statistical data is being obtained on yield areas and yields by district. However, MOA lacks both money and labor, and their sampling surveys are thought to be inadequate, so caution is necessary regarding the accuracy of data.

(3) Validating Satellite Data Usability

The usability of satellite data in designing and developing insurance products was validated on the assumption that weather data and agricultural data from government agencies, such as BMKG, is not available or cannot be accessed.

i) Using Satellites to Estimate Precipitation

Precipitation can be estimated using precipitation radars, microwave radiometers/sounders, or

infrared radiometers onboard the satellites, or Global Satellite Mapping of Precipitation (GSMaP), a combination of such gauges.

Precipitation estimated from satellites is calculated by measuring total cloud cover and ice or water droplets in clouds, etc., and is thus different to precipitation measured using ground-level gauges. In this study, past precipitation measurements recorded by BMKG for Jakarta and East Java on Java were compared and verified against GSMaP estimates. Using monthly precipitation estimated by GSMaP for wide-area distribution is not thought to be a problem.

GSMaP data is precipitation data that complexly combines sea, land, coastal area, and orographic precipitation estimation algorithms. Therefore, in actual operations, there is a need to first confirm orographic or other characteristics in the target area.

ii) Using Satellite Data to Grasp Vegetation

The vegetation index that identifies the state of vegetation using satellite data is a technique widely used in agricultural meteorology services and flooding and drought monitoring. The study investigated and analyzed the use of this index.

The vegetation index needs to be used carefully as it varies when clouds are high in the sky or when vegetation distribution over the ground is not far-reaching, and is influenced by parts of the ground not covered by vegetation. The study compared and analyzed the vegetation index calculated from satellite data and actual past droughts for the Gresik and Bojonegoro provinces chosen as target areas, and discovered that it is possible to grasp, to a certain extent, global vegetation activity on a provincial level and so a major drought can be detected. However, it is difficult to grasp the state of crops on the ground from vegetation activity at specific points. This is because of the influence of clouds peculiar to tropical regions and the diverse use of Indonesia's distinctive agricultural land.

Thus, in the case of weather index insurance in Indonesia, further investigations are needed for the use of the vegetation index.

(4) Survey for Establishing Sales Channels

Due to the variety of labor and employment patterns among agricultural workers, sales channel needs in Indonesia are thought to be diverse. Therefore, it is necessary to prepare multiple schemes for providing weather index insurance and to decide on the method that best suits agricultural workers, sales channels, and the insurance company.

Potential agencies include rural banks, commercial banks, NGOs engaged in rural development, and Islamic organizations deeply rooted in Indonesia. This study approached regional banks located close to the target areas based on the accessibility of agricultural workers to financial institutions. The study also investigated a wide range of Islamic organizations and NGOs working in rural areas.

As a result, a great potential of Islamic groups and NGOs was identified as a sales channel: e.g., playing a role in selecting the target farmers who receive insurance claims (creation of a list of farmers) at the time of test marketing in this study. In particular, Islamic group that acted as the sales channel for test marketing in Bojonegoro is active throughout Indonesia and so continuous collaboration is being considered for the future.

It should be noted, with respect to Islamic organizations, that an Islamic finance insurance license is needed in order to entrust insurance agent work to Islamic financial institutions. PT Sampo Insurance Indonesia is currently working on obtaining such a license.

It is also in progress to discuss sales of specific insurance products with regional banks located around the target areas.

Given the situation in which agricultural workers do not have enough insurance knowledge to enroll in insurance by themselves, it is considered effective to sell insurance products with loans (financing) or the sale of fertilizers, seeds, and farm tools attached. In addition to financial institutions, we will continue to exchange information with dealers of fertilizers, seeds, farm tools and others.

(5) Dry Run

In 2016, sales of weather index insurance were test piloted in Bojonegoro and Central Lombok (simulation that did not involve receiving money).

Thirty-five agricultural workers in Bojonegoro and 30 in Central Lombok participated, and all the participants did not own land.

As part of the dry run, meetings were held to explain products to agricultural workers and agricultural extension workers, and participating agricultural workers were asked to complete questionnaires and insurance application forms.

The questionnaires reconfirmed that not only do many agricultural workers not have bank accounts, most have also not received financing from banks, and are unfamiliar with financial institutions. While potential sales channels should focus on financial institutions, further extensive investigations into other sales channels, such as NGOs and Islamic organizations, are necessary.

Moreover, from the question concerning familiarity with insurance and interest in weather index insurance, it was apparent that even though insurance is not prevalent among agricultural workers, they do sense the advantages of enrolling in insurance.

The most effective way to promote weather index insurance among agricultural workers unfamiliar with insurance is to have them experience the effect for themselves. Moreover, providing continuous and respectful relevant education is important to encourage workers to take out insurance. Creating tools for explaining products is also essential so that all sales staff can give the same explanation and everyone can correctly understand the insurance system and details.

Apart from not accepting money, the dry run was conducted in the same way as real-life insurance sales. There were no cases in which payouts were made due to rainfall during the dry run insurance period not falling below the index.

Participants were informed of the outcome of the dry run by agricultural extension workers and this provided an opportunity to promote agricultural workers' understanding of weather index insurance.

(6) Test Marketing

The most effective way of promoting weather index insurance is to have them actually experience the effect and so in 2017 the insurance was test marketed in Bojonegoro and Lombok.

To test market the insurance, PT Sampo Insurance Indonesia sought donors via their website, and the

product was designed incorporating a crowd-funding method so that agricultural workers wishing to take out insurance are supported by donors who are not agricultural workers. The test marketing scheme was set up so that insurance premiums were paid by the donor and payouts were given to the agricultural workers. The system was designed taking into account Islamic donation (zakat) culture, as well as the situation that agricultural workers do not have adequate insurance knowledge to enroll in insurance by themselves.

An Islamic organization in Bojonegoro and an NGO in Central Lombok were asked to select the agricultural workers targeted to receive insurance payouts (compiled lists of agricultural workers), and they chose 100 and 152 workers respectively to participate in the pilot scheme, and all the participants did not own land.

The target insurance period was set to about two months, a period for single cropping. During the target insurance period, precipitation did not fall below the index and so there were no payouts, but due to insurance policies being issued to each agricultural worker and to arranging opportunities to explain the outcome to agricultural workers in the future, understanding of weather index insurance is believed to have deepened.

3. Conclusion

As a result of the study, an insurance license was obtained and an MOU was signed with BMKG, both of which are keys to commercialization, and sufficient relations were established with local government agencies. With respect to agricultural workers' insurance needs, the study confirmed the high level of interest in weather index insurance through interviews and questionnaires.

Test marketing by sales schemes and sales channels proposed in the project was conducted in the target areas and commercialization is deemed possible in the future by approaching related organizations.

3.1. Rationale for Determining Feasibility

The progress of the study that forms the rationale for determining the feasibility of commercialization is outlined below.

(1) Insurance Licenses

Licenses that approve the sale of insurance are essential for commercialization. An application was made at OJK for a simple micro insurance license that offers insurance for low premiums, and a license was granted in March 2016 following negotiations. As a result, weather index insurance can be sold as micro insurance. This was also supported by the Indonesian government, which is actively promoting micro insurance as a measure against poverty. In the future, it should be possible to acquire licenses for more flexible insurance products by leveraging the achievements made in acquiring a license for micro insurance.

(2) Building Relationships with Government Agencies

Weather index insurance is set up to provide insurance payouts based on weather data. Field studies highlighted the lack of familiarity among agricultural workers with insurance and the low levels of

confidence such workers have in private insurance companies. It is essential to design products that pay out based on data from public institutions such as BMKG, a government agency, to gain the trust of insured parties. Therefore, signing an MOU with BMKG, the institution that provides weather data, to build cooperative relations and ensure the continuous provision of weather data is essential for commercialization.

For this reason, the study repeatedly coordinated with BMKG and, as a result of continued negotiations, an MOU was signed in May 2017 that outlines the conditions not only for the provision of weather data but also for collaborating in providing training on weather index insurance and in developing insurance schemes.



Ceremony to Sign the MOU

(3) Agricultural Workers' Insurance Needs and Encouraging Their Understanding of Weather Index Insurance

Ensuring agricultural workers understand insurance is essential for weather index insurance to take hold. Field studies revealed that the level of awareness of insurance among Indonesian agricultural workers is low, but at the same time, such workers do see the advantages of taking out insurance.

For weather index insurance to be popular among agricultural workers unfamiliar with insurance, it is necessary for them to experience the effect for themselves through, for example, test marketing, and to provide continuous and respectful insurance education. Even though awareness of insurance is low among Indonesian agricultural workers at the moment, encouraging the necessary level of understanding for commercialization by enhancing product explanation tools and engaging in index insurance education should not be difficult.

(4) Establishing Sales Channels

Test marketing conducted during the study found that the Islamic organizations and NGOs that selected the agricultural workers targeted to receive insurance payouts (by creating a list of agricultural workers) have great potential as sales channels. Specifically, the Islamic organization which acted as

the sales channel for test marketing in Bojonegoro is active all over Indonesia and so continuous collaboration is being considered for the future. Moreover, specific discussions for the sale of insurance products are progressing with regional banks located in the vicinity of the target areas.

3.2. Outstanding Tasks for Commercialization

The following are tasks for commercialization identified from the study. What is the most important for commercialization is the establishment of sales channels. PT Sampo Insurance Indonesia will continuously lead to exchange information with local institutions to establish viable sales channels.

(1) Obtain Highly Accurate Weather Data

The number of meteorological observation stations staffed by BMKG employees that can provide high quality measurement data is limited. While it is certainly possible to design insurance products using satellite precipitation data in areas where no meteorological observation stations or equipment is available, attention must be paid to practical use.

(2) Educational Activities for Agricultural Workers

BMKG offers an agricultural climate training program to agricultural workers known as Climate Field School (CFS). BMKG proposed including an introduction to weather index insurance as part of CFS, enabling insurance-related educational activities via CFS. The plan is to continue discussing education and sales methods with BMKG in the future.

(3) Establishing Sales Channels

The goal of test marketing during the study was to cooperate with the Islamic organizations and NGOs that selected the agricultural workers targeted to receive insurance payouts (by creating a list of agricultural workers) and establish sales channels.

The questionnaires completed by agricultural workers during the dry run confirmed that many agricultural workers are unfamiliar with financial institutions. So the plan is to continue to focus on financial institutions as potential sales channels as well as to investigate the expansion of sales channels to incorporate non-financial institutions such as NGOs and Islamic organizations.

In particular, given the current situation in which agricultural workers do not have adequate insurance knowledge to enroll in insurance by themselves, insurance products with loans (financing) or the sale of fertilizer, seeds, and farm tools attached are expected to be feasible.

(4) Expanding Operating Areas

Indonesia is a mix of areas at high risk from drought that are close to areas at low risk from drought, and this abundant diversity is clear from data analysis and field surveys. Unlike in Thailand, this abundance of diversity will make expanding operating areas difficult.

With regard to expanding operating areas, the plan is to first build a model case in a limited area and then apply it to other areas. The appropriate order of priority for application to other areas should be decided based on the needs of agricultural workers.

If selling weather index insurance in an area is judged to be difficult due to its climate and orography, the possibility of selling other types of insurance should be investigated and considered.

(5) Basis Risk Evaluations

Due to being index insurance, there is a certain degree of basis risk in that the actual amount of damage suffered will differ from the insurance payout. The aim is to develop and market insurance products that eliminate basis risks as much as possible through analysis using satellite data.

4. Plans for Commercialization

4.1. Personnel Plans, Human Resource Development Plans

In anticipation of commercialization, PT Sampo Insurance Indonesia is recruiting employees with agricultural knowledge who will specialize in agricultural insurance. Sales staff for areas which will act as hubs for commercialization are also participating in the study and are being trained on-the-job.

4.2. Cost Accounting, Financial Analysis

Insurance premiums from customers are the main source of revenue, and insurance payouts are costs. Commissions, operating, general and administrative expenses will also be incurred. The table below shows income and expenditure projections for five years from fiscal year 2018. Test marketing took place in Bojonegoro and Central Lombok in 2017, and is expected to be expanded to other regions from 2018.

Table 4.2 Income and Expenditure Projections (Unit: yen)

	1st year (2018)		2nd year (2019)		3rd year (2020)	
	Amount	Ground for calculation	Amount	Ground for calculation	Amount	Ground for calculation
Net premiums written	-	(a) 500 yen	500,000	(a) 500 yen x 1,000	2,500,000	500 yen x 5,000
Net claims paid	-	Loss ratio 60% ((a) x 60%)	300,000	Loss ratio 60% ((a) x 60%)	1,500,000	Loss ratio 60% ((a) x 60%)
Loss adjustment expenses	-	Weather data expense	100,000	Weather data expense	100,000	Weather data expense
Net commissions	-	Commissions 10% ((a) x 10%)	50,000	Commissions 10% ((a) x 10%)	250,000	Commissions 10% ((a) x 10%)
Operating, general and administrative expenses	-	(b) OPEX 20% ((a) x 20%)	100,000	(b) OPEX 20% ((a) x 20%)	500,000	(b) OPEX 20% ((a) x 20%)
(Personnel expenses)	-	(b) x 50%	50,000	(b) x 50%	250,000	(b) x 50%
(Other expenses)	-	(b) x 50%	50,000	(b) x 50%	250,000	(b) x 50%
Underwriting income	-		-50,000		150,000	

4th year (2021)		5th year (2022)		Remarks
Amount	Ground for calculation	Amount	Ground for calculation	
5,000,000	500 yen x 10,000	15,000,000	500 yen x 30,000	Insurance unit price: 500 yen
3,000,000	Loss ratio 60% {(a) x 60%}	9,000,000	Loss ratio 60% {(a) x 60%}	Total loss ratio is set to 60%.
300,000	Weather data expense	500,000	Weather data expense	Estimated weather data expense (depends on the number of target areas)
500,000	Commissions 10% {(a) x 10%}	1,500,000	Commissions 10% {(a) x 10%}	Commissions for solicitation to be paid to local banks
1,000,000	(b) OPEX 20% {(a) x 20%}	3,000,000	(b) OPEX 20% {(a) x 20%}	OPEX: Operating expenses
500,000	(b) x 50%	1,500,000	(b) x 50%	
500,000	(b) x 50%	1,500,000	(b) x 50%	Marketing tools, briefing sessions (soliciting and payment)
200,000		1,000,000		

4.3. Financing Plans

In promoting this business, expenses for training BMKG and operators contracted to sell insurance and expenses for designing weather index insurance products in other areas are anticipated. The Sampo Holdings Group intends to finance these costs using its own funds.

4.4. License Acquisition Plans

As a requirement for commercialization of insurance, a license for simple micro insurance products that are offered at low premiums was granted in March 2016. To acquire a license for micro insurance, certain requirements must be satisfied, such as the premiums of less than 50,000 rupiah and the policy conditions of no longer than four pages. This time, an application was made for a license for wealth index insurance based on precipitation that insures agricultural workers.

It is believed to be possible to acquire licenses for more flexible insurance products by leveraging the achievements made in acquiring a license for micro insurance. The next steps to obtain such licenses will be taken flexibly based on discussions with sales channels.

5. Environmental and Societal Considerations

There is a possibility that compensation exceeding actual damage will be paid if basis risks are unduly actualized. This is one of the disadvantages of index insurance and products should be developed that minimize basis risk and ensure insurance characteristics while giving the utmost consideration to the fact that Indonesia is an Islamic country and constantly checking with local authorities.

In particular, in Indonesia, which has the highest Muslim population in the world, Islamic finance is moving ahead rapidly, so investigations are being conducted into the sale of insurance by organizations that handle Islamic finances.

PT Sampo Insurance Indonesia is currently working on obtaining an Islamic finance license so that it can sell insurance in Islamic finance.

6. Effect on Development of Project

The effect on development created by this project is measured using the “number of targets offered elective options for using insurance services: number of agricultural worker households targeted”, the “number of beneficiaries able to risk hedge through insurance policies: number of policyholders”, and the “scale of weather risk cover through insurance payments: amount of insurance payouts”.

Table 6 shows the future target of commercialization of the project.

Table 6 Effect on Development and Indexes

Effect on Development	Index	Target
Number of targets offered elective options for using insurance services	Number of agricultural worker households	--
Number of beneficiaries able to risk hedge through insurance policies	Number of policyholders	2nd year (2019): 1,000 3rd year (2020): 5,000 4th year (2021): 10,000 5th year (2022): 30,000
Scale of weather risk cover through insurance payments	Amount of insurance payouts	2nd year (2019): 300,000 3rd year (2020): 1.5 millions 4th year (2021): 3 millions 5th year (2022): 9 millions *Total loss ratio is set to 60%.

7. Potential Collaboration with JICA

7.1. Need for Collaboration

In July 2013 the Indonesian government enacted a Law on the Protection and Empowerment of Farmers that specifies the introduction of agricultural insurance and government support for such introduction. Since 2010, in an effort to support these Indonesian government policies, JICA has been providing support for designing an agricultural insurance system and for a roadmap review, and between 2014 and 2016, JICA supported the implementation of indemnity-based agricultural insurance that covers crops such as rice. Furthermore, in October 2017, JICA started to provide support for a technical cooperation project (Project of Capacity Development for the Implementation of Agricultural Insurance) that assists the introduction of index insurance and the popularization of agricultural insurance, so as to mitigate crop production risks with respect to tasks relating to current agriculture insurance projects. As this project overlaps with such JICA projects in many aspects, it is important to collaborate and share information.

During this study, the advice from JICA in Indonesia regarding disaster characteristics in East Java obtained from the above mentioned 2014-2016 JICA Project (indemnity-based agricultural insurance

pilot project that covers crops such as rice in East Java) conducted concurrently, proved to be extremely useful in selecting the study’s target areas. Furthermore, support for forming personal relationships with BMKG and MOA to acquire weather and agricultural data and support for signing a MOU with BMKG are linked to the success of the study.

Going forward, collaboration with the Project of Capacity Development for the Implementation of Agricultural Insurance that started in October 2017 is crucial. In particular, for designing agricultural insurance systems, using private sector operators, and engaging in educational activities on agricultural insurance in Indonesia, collaborating on projects and sharing information are important. Furthermore, continued back-up from JICA is necessary with respect to connections with the Indonesian government, information on rural areas of Indonesia, and support for partnerships with Indonesian banks.

Table 7.1 Existing JICA Projects

Project		Implementing Organization
Project of Capacity Development for Climate Change Strategies in Indonesia (2010-2015)		
Sub Project	(Sub project 1) Integration of Climate Change Mitigation and Adaptation into National Development Planning	National Development Planning Agency (BAPPENAS)
	(Sub project 2) Capacity Development for Climate Change Adaptation Action in Agriculture and Other Relevant Sectors	BMKG MOA
Project of Capacity Development for the Implementation of Agricultural Insurance (2017-2022)		BAPPENAS

7.2. Expected Outcome of Collaboration

The Indonesian government has started to consider the introduction of index agricultural insurance. By sharing issues, information, and data obtained during the project, the projects of both JICA and the Indonesian government will be developed more meaningfully and efficiently.

By collaborating with other JICA projects that support agricultural workers, it will be possible to comprehensively respond to the issues facing small-scale agricultural workers in Indonesia.