

Open Access Article

Agricultural Insurance Policy Development System in Indonesia: A Meta-Analysis

Rahmat Fadhil^{1,*}, Muhammad Yasir Yusuf², T. Saiful Bahri³, Hafiizh Maulana², Fakhurrrazi⁴

¹ Department of Agricultural Engineering, Universitas Syiah Kuala (UNSYIAH), Banda Aceh, Indonesia

² Faculty of Islamic Economics and Business, Ar-Raniry State Islamic University (UIN AR-RANIRY), Banda Aceh, Indonesia

³ Department of Agribusiness, Faculty of Agriculture, Universitas Syiah Kuala (UNSYIAH), Banda Aceh, Indonesia

⁴ Agricultural Insurance Researcher, RISPRO-LPDP, Banda Aceh, Indonesia

Abstract: Agricultural insurance is an effort to minimize risks and uncertainties in the agricultural sector business. This program is needed by farmers in Indonesia who are susceptible to the numerous risks of crop failure. So far, there are still various obstacles in the implementation of agricultural insurance in Indonesia. This study aims to describe the development of policies in the application of agricultural insurance in Indonesia. This study was carried out using the Policy Development System Engineering approach through a meta-analysis. This research produces several policy recommendations for improving the agricultural insurance system in Indonesia going forward. Some of the recommendations include increased coordination between the institutions involved, systematic information exchange between the parties, quality improvement in field staff human resources, socialization program improvement at the farmer level, establishment of quick and swift insurance claim procedures, increased role of farmer group chairpersons, an increase in premium subsidy with various schemes, and Islamic agricultural insurance policies in Indonesia. Policy recommendations are strategic steps taken by various stakeholders providing an integrated and sustainable agricultural insurance system in Indonesia.

Keywords: rice farming insurance, livestock insurance, insurance system, subsidy, strategy.

印度尼西亚农业保险政策制定系统的元分析

摘要：农业保险是为了最大程度地减少农业部门业务中的风险和不确定性而做出的努力。印度尼西亚的农民需要该计划，因为他们容易遭受农作物歉收的众多风险。迄今为止，在印度尼西亚实施农业保险仍然存在各种障碍。这项研究旨在描述印尼农业保险政策的发展。这项研究是使用政策制定系统工程方法通过荟萃分析进行的。这项研究为改善印尼的农业保险制度提出了一些政策建议。其中的一些建议包括：加强相关机构之间的协调，各方之间系统的信息交流，提高实地工作人员人力资源的质量，改善农民一级的社会化计划，建立快速而迅速的保险理赔程序，增加农民团体主席的作用，通过各种计划增加的保费补贴以及印度尼西亚的伊斯兰农业保险政策。政策建议是利益相关者采取的战略步骤，可为印度尼西亚提供一个综合，可持续的农业保险体系。

关键词：稻谷农业保险，牲畜保险，保险制度，补贴；战略。

Received: 3 January 2021 / Revised: 11 January 2021 / Accepted: 13 February 2021 / Published: 28 February 2021

Fund Project: Productive Innovative Research (RISPRO) Governance/Policy, Ministry of Finance of the Republic of Indonesia No. PRJ-120/LPDP/2019.

About the authors: Dr. Rahmat Fadhil, Department of Agricultural Engineering, Universitas Syiah Kuala (UNSYIAH), Banda Aceh, Indonesia; Dr. Muhammad Yasir Yusuf, Faculty of Islamic Economics and Business, Ar-Raniry State Islamic University (UIN AR-RANIRY), Banda Aceh, Indonesia; Dr. T. Saiful Bahri, Department of Agribusiness, Faculty of Agriculture, Universitas Syiah Kuala (UNSYIAH), Banda Aceh, Indonesia; Hafiizh Maulana, M. Sc, Faculty of Islamic Economics and Business, Ar-Raniry State Islamic University (UIN AR-RANIRY), Banda Aceh, Indonesia; Fakhurrrazi, M. Sc, Agricultural Insurance Researcher, RISPRO-LPDP, Banda Aceh, Indonesia

Corresponding author Rahmat Fadhil, rahmat.fadhil@unsyiah.ac.id

1. Introduction

Indonesia, as an agrarian country, has enormous natural resources for agriculture sector businesses. Having a tropical climate and fertile soil is the main capital for Indonesia's people to carry out agricultural activities. The agricultural sector is one sector that plays an important role in the world, especially in developing countries like Indonesia; this sector is one of the highest foreign exchange-earners. Agriculture has a major contribution to Indonesia's Gross Domestic Product (GDP). In the second quarter of 2019, the agricultural sector contributed 13.41% of Indonesia's total GDP based on constant 2010 prices, making the agricultural sector the second most contributing sector to GDP [1].

On the other hand, Indonesia is in the path of the pacific ring of fire, which makes Indonesia vulnerable to natural disasters. This will certainly have a negative impact and threaten biodiversity, which will also affect the agricultural sector and farmers' level of welfare. An uncertain and changing climate will greatly affect the agricultural sector. This will have implications for the disruption of farming activities that rely heavily on natural factors [2]. Natural factors pose a serious threat to the agricultural sector, especially rice, so strategic steps are needed in an effort to minimize the adverse impacts received by farmers. In addition to climate factors, other threats such as plant pests can also result in crop failure in rice farming.

Business in the agricultural sector is inseparable from very high risks and uncertainties. Therefore, the need for a system that can minimize risks or threats, and uncertainties that occur in the agricultural sector, especially rice farming, effectively and efficiently. Agricultural insurance can be the best alternative to minimize risks and uncertainties in the agricultural sector. Insurance can help transfer risks due to flooding, drought, and attacks from pests and diseases. Insurance is offered as one of the funding schemes to transfer risk, such as crop failure (AUTP 2017 General Guidelines). Furthermore, as stated in [3], agricultural insurance would greatly help farmers from large losses and ensure their future sufficient working capital by ensuring rice farming financing in the following season.

Insurance in agriculture is a concern of the world, both developed countries, developing countries, and less developed countries. In less developed countries that make the agricultural sector the main sector of the community's economy, the World Bank and FAO provide special intensive for agriculture areas that have high weather sensitivity [4]. Besides, the World Bank, together with microfinance institutions, continues to test new agricultural insurance products based on weather

indices [5, 6, 7, 8]. In developed countries like the United States, the agricultural insurance system has been in place since 1938. The most insured crops are corn, soybeans, and wheat. In 2008, data showed that approximately 80% of agricultural areas had been insured. The total insurance premium in 2008 and 2009 was nearly 10 billion. The insurance coverage is 50% of the average yield [9].

In European countries, each country implements a very different agricultural insurance system. In Austria, 50% of the premium for agricultural insurance is subsidized by the government. In contrast to the Czech Republic, direct insurance subsidies are paid by the government to insurance companies. The insurance covers more than 80% of agricultural land, where more than 60% is insurance against the risk of snow (freezing), hail, storm, flood, drought, and other risks [10]. Spain is one of the countries with an excellent agricultural insurance system. To run the agricultural insurance system involves cooperation between the public and private sectors, with specialized institutions for its operation and development. This system is financed by the Spanish central government and from local government budgets. The total premium for agricultural and livestock insurance under this system continues to increase each year from around € 3 billion in 1991 to nearly € 11 billion in 2008 [11].

In some countries such as Germany, the United Kingdom, and Scandinavian countries, the agricultural insurance system operates on a purely commercial basis without government interference. In contrast to France and the Netherlands, where the government plays an important role in providing insurance funds, farmers are also required to pay contributions to run the agricultural insurance program. In some developed countries such as the United States, agricultural insurance is limited to insurance against risks and uncertainties in climate or natural disasters and insurance against fluctuations in agricultural commodity prices [9].

In Indonesia, the implementation of the national agricultural insurance program has been carried out since 2015. The main focus of this program is on the Rice Farming Insurance, locally called Asuransi Usaha Tani Padi (AUTP). In carrying out this program, the government subsidizes premium payments of 80% while the remainder is paid independently by farmers. The government cooperates with JASINDO Limited Liability Company (PT) as an insurance company to handle AUTP [13]. During its implementation from 2015-2019, various obstacles were encountered, such as; socialization at the farmer level is still lacking so that farmers' understanding of AUTP and benefits is still low, farmers'

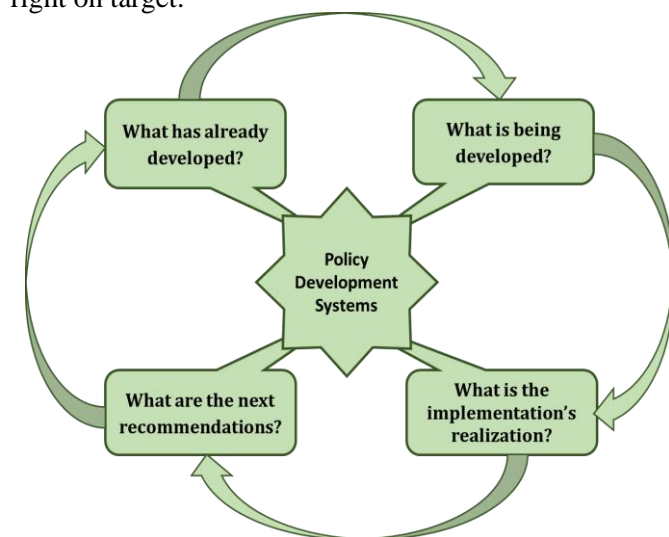
willingness to pay self-help premiums are still low, support from extension agents, plant pest control (POPT) and the officials at the field level are still out of numbers, the claim system is difficult according to farmers, farmers whose land feels safe do not feel flooded, drought and plant pests (OPT) attacks do not want to become AUTP participants, as well as several other obstacles that are still found in the application of insurance systems for rice plants in Indonesia [33].

Based on the description above, this article aims to formulate a policy development system in applying for agricultural insurance in Indonesia and several other new opportunities as research contributions through a meta-analysis. To elaborate, we divide it into seven discussion sections, including (1) introduction, (2) research methods, (3) insurance models in the agricultural sector, (4) agricultural insurance in Indonesia, (5) realization of agricultural insurance, (6) recommendation for developing agricultural insurance policies system in Indonesia, and (7) conclusions.

2. Methods

The study of agricultural insurance in Indonesia was carried out using the Policy Development System Engineering approach through a meta-analysis. There are four stages carried out in Indonesia's agricultural insurance study using the Policy Development System Technique (Figure 1), namely: 1) exploring the achievements in agricultural insurance; 2) exploring the existing situation in this sphere; 3) studying the ways of policy realization? 4) proposing recommendations for further improvement to elaborate various agricultural insurance development strategies in Indonesia that are right on target.

Fig. 1 Policy development systems



A meta-analysis is a form of quantitative research that uses data and information through numbers and statistical methods based on various research results to be managed, organized, represented, explored, and developed through extracting as much information as possible from the data obtained [13-15]. This method is very close to comprehensive and has been widely used by various researchers in formulating, mapping, and developing existing research results to be more strategic [16-20] and included in terms of recommending policies and governance [21-24, 42].

The data used in this study are primary and secondary data. Primary data are obtained through field observations. These data were obtained from interviews, questionnaires, and discussions with experts. The experts involved in the study were researchers from the Indonesian Ministry of Agriculture, researchers from the Indonesian Center for Agriculture Socio-Economic and Policy Studies (PSEKP), PT Jasindo (insurance company), Lecturer at Universitas Syiah Kuala (Unsyiah), Ar-Raniry State Islamic University Lecturer, farmers and insurance practitioners, agriculture and plantation service (Aceh Province, Central Java Province and East Java Province), Animal Husbandry Office (Aceh Province, Central Java Province and East Java Province). Secondary data are collected from the current data and the previous year's data obtained from relevant agencies and literature studies. This literature study data is generally used as supporting data.

3. Results and Discussion

3.1. Insurance Models in the Agricultural Sector

Agricultural insurance is currently applied in various countries, not only in developed countries such as America, France, Japan but also in developing countries such as Taiwan. Agricultural insurance is developing well, while in India, Bangladesh, and the Philippines, the development is still slow. French agricultural insurance system was developed more than forty years ago under state supervision [25]. Agricultural insurance in France has considerably grown since the reforms of 2004. Compared to Western Europe, in France, more than 60% of the agricultural area is insured. The situation is different in Germany: more than 80% of the agricultural area is insured [26].

Agricultural insurance in Latin America is relatively developed compared to other regions such as Africa and

many Asian countries. Agricultural insurance in Latin America has grown in recent years, but agricultural insurance is not distributed evenly between Latin American countries. The supply of agricultural insurance products in this region is relatively growing compared to other regions in terms of the number of companies offering insurance [27].

In the United States in 2003, premium subsidies, for example, amounted to 38-67% of the total premiums that farmers must pay. Then for administrative costs and total agricultural insurance premiums subsidized by the United States government reached 70-75% [28]. Furthermore, farmers could also buy other agricultural insurance packages with the Buy Up program, where farmers can arrange insurance from 50% to 85% of the average yield [9]. The insurance risk of crop failure is caused not only by disasters, but farmers can also insure their agriculture to avoid fluctuations in the prices of agricultural commodities. By buying an insurance package to avoid these price fluctuations, farmers will get insurance reaching 55% to 100% of the expected price. The premium for this insurance program depends on the actual production history on the farm. In terms of price insurance, the Risk Management Agency provides an estimated price.

ASEAN countries such as Thailand and Vietnam have also already run agricultural insurance programs compared to Indonesia. Thailand started to run agricultural insurance in 1978 and Vietnam in 1982. Although it was stopped due to high administrative costs and huge losses, the Thai government continued to innovate by producing an integrated agricultural insurance system that can survive until now. Agricultural products generally insured are cotton, corn, and soybeans. While in Vietnam, farmers are already independent in implementing insurance programs where the government no longer needs to provide premium subsidies. Agricultural insurance is carried out by an agricultural bank in collaboration with farmers and is not mandatory. Agricultural products covered by insurance are corn, cassava, and rice. In Japan, the type of agricultural insurance has been in effect since 1929. In Japan, agricultural insurance is focused on rice, livestock, fruit and fruit production, field crops, and greenhouse insurance [29].

One form of agricultural insurance currently being developed is weather-index insurance developed by the International Finance Corporation (IFC). This type of insurance has been applied in several countries such as Thailand, India, Mexico, Kenya, and Malawi. In developing countries, it is still under-represented in insurance coverage even though the agricultural sector in developing countries is relatively large compared to manufacturing and services [28].

Governments in several countries also play a role in implementing insurance programs by assisting in subsidies. According to [30], high-income countries, such as the United States, Spain, France, and Italy, provide:

1. Premium subsidy. The government provides premium subsidy assistance to ease the number of premiums that must be paid by farmers;

2. Operational subsidy. For private insurance as funds to cover some of the high administrative costs associated with operating an insurance scheme, including insurance company operating costs, loss assessment costs, and information gathering and monitoring costs;

3. Subsidized reinsurance. Reinsurance is a method used by insurance companies to reduce or manage risk. After the existing government insurance program, it is difficult for private insurance companies to innovate and introduce new risk management products. The government supports an insurance program to maintain the level of farm income. The public sector plays an important role in agricultural insurance because the policies and regulations that have been set will affect the region's activities and economic conditions.

According to [12], the government plays a very important role in maintaining and carrying out agricultural insurance implementation. The government was very instrumental in minimizing the risks faced by farmers by providing incentives and encouraging them to manage risks independently. This government subsidy is to avoid potential market failures, and this is inseparable from the combination of various kinds of risks faced by farmers.

3.2. Agricultural Insurance in Indonesia

Indonesia needs to anticipate the challenges of applying for insurance institutionally and financially by adopting agricultural insurance in other countries. Models of the study of agricultural insurance implementation are also widely carried out by building lessons learned from other countries. Such studies, for example, have been carried out comprehensively on the insurance system in New Zealand [25], Romania [26], Latin American countries [27], Australia [28]. The Fiscal Policy Agency (Badan Kebijakan Fiskal/BKF) examined the implementation of agricultural insurance nationally in terms of the conceptual, funding, and trial features of rice farming insurance as well as taking lessons learned in India, China, Vietnam, Thailand, and Japan [31].

Based on the Law of the Republic of Indonesia No. 19 of 2013 concerning Protection and Empowerment of Farmers, in essence, agricultural insurance aims to protect farmers in the form of working capital assistance. Identification of this protection is carried out in the form of crop damage or crop failure due to the risk of natural

disasters, attack of plant-disturbing organisms, outbreaks of infectious animal diseases, impacts of climate change, and/or other types of risks. In Indonesia, agricultural insurance is divided into four sub-sectors: insurance in the food crops, horticulture, plantation, and livestock sectors. The Indonesian Government began testing agricultural insurance by showing PT Asuransi Jasa Indonesia (Jasindo) as an insurance service provider from 2012 until 2015. Buffaloes and Cows Livestock Insurance (Asuransi Usaha Ternak Sapi/Kerbau (AUTS/K) has been tested since 2012 and received a good reception from various groups of population. The Rice Farming Insurance (AUTP) has been introduced and implemented since the 2012/2013 planting season. However, since 2015 the government has been more focused on developing Rice Farming Insurance (AUTP) because rice is a national strategic commodity that is very vulnerable to climate change and crop failure risk [29, 32, 33]. Through the Ministry of Agriculture, the Government of Indonesia issued Minister of Agriculture Regulation No. 40 of 2015 concerning Agricultural Insurance Facilitation, which is technically limited to the Rice Farming Insurance (AUTP).

In the 2017 AUTP report, the Ministry of Agriculture explained the scope of agricultural insurance funding in the form of an agreement between farmers. The insurance company aims to protect farmers in case of crop failure due to the risk of floods, drought, and pests. AUTP is a government program under the Ministry of Agriculture through the Director-General of Agricultural Target and Facilities (PSP) through a partnership with PT Asuransi Jasa Indonesia (JASINDO, insurance company), whose source of funding comes from the Indonesian Budget (Anggaran Pendapatan dan Belanja Negara/APBN) and Regional Government Budget (Anggaran Pendapatan dan Belanja Daerah/APBD) whose operational budget is contained in the DIPA of the Satker Directorate General of Agriculture and Agriculture Facilities. Thus, agricultural insurance, as one of the efforts to protect farmers as regulated in Act Number 19 of 2013, includes (a) farmers working on food crops that do not have land for farming and work on a maximum of two hectares, (b) farmers who own land and do food crop cultivation business in a land area of two hectares, and/or (c) horticultural farmers, smallholders or small-scale farmers.

Through rice farming insurance, the guarantee against crop damage due to flooding, drought, and pests and diseases of plants or plant pests (OPT), can be compensated as working capital for the sustainability of

his farming business. The vision of the agricultural insurance program is to make insurance a protection scheme against crop failure or other agricultural business risks, including livestock farming, towards modern agribusiness ventures in sustainable agricultural development. The mission of agricultural insurance program is to increase production of agricultural commodities and productivity on an ongoing basis and create conditions that benefit farmers/ranchers and still maintain environmental sustainability in national agricultural development.

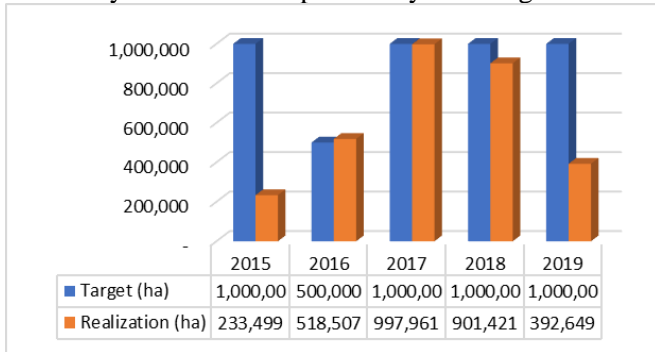
In Indonesia's agricultural insurance program, the agricultural insurance facility policy is guided by the Decree of the Minister of Agriculture No.30/Kpts/SR.210/B/12/2018 concerning Guidelines for the Assistance of Rice Farming Insurance Premium and No.31/Kpts/SR.210/B/12/2018 concerning Guidelines for Buffaloes and Cows Livestock Insurance Premiums. The price of rice cover is set at Rp.6,000,000 per hectare per planting season. The insurance price is the basis for calculating the premium and the maximum compensation limit. The total rice farming insurance premium of Rp.180,000/ha/planting season. The government's premium assistance amount is Rp.144,000/ha/planting season, and the remaining farmers are self-supporting Rp.36,000/ha/planting season. If the insured land area is less than or more than 1 (one) ha, then the amount of premium (and compensation) is calculated proportionally. As for the buffalo/cows insurance facility, the insurance premium is Rp.200,000/head/year. The government's premium assistance amount is Rp.160,000/head/year, and the remaining farmers are self-supporting Rp.40,000/head/year.

3.3. Realization of Agricultural Insurance

The AUTP target in 2015 was 1 million hectares and was realized at 233,500 hectares with a claim of 3,482 hectares. Based on this insignificant realization target, in 2016, the AUTP target was reduced to 500,000 hectares with the realization of 518,506 hectares, and claims reached 11,107 ha. In 2017 the target was increased again to 1 million hectares, along with various strategies and innovations, so that 997,961 hectares was realized with a claim of 25,028 hectares. In 2018, the target was still maintained at 1 million hectares and realized 901,420 hectares with claims of 10,754 hectares. The realization of the AUTP target from 2015 - 2019 can be seen in Figure 2.

In 2015 the realization of the AUTP program only reached 23.34% of the total targeted. In 2015 the AUTP

program was still an introductory stage that was only developed in 16 provinces of Indonesia's rice production centers. In 2016 there was an increase in the realization that reached 100%, but the land target area in 2016 was reduced by 50% from the previous year's target.

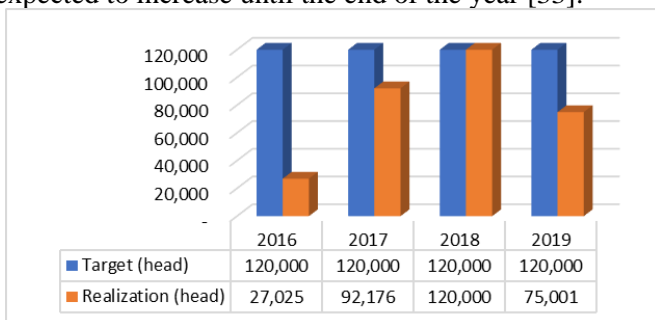


Data for 2019 as of July 31, 2019 [33]

Fig. 2 Targets and realization of the 2015-2019 AUPP program in Indonesia

In 2017 there was a very significant increase in realization of 99.80%, although it did not reach 100% as in the previous year. That year, the target area was doubled (1 million hectares) compared to 2016. In 2018 the targeted realization fell to 90.14% of the same target area as the previous year. Factors causing the decline were many claims that were late in 2017. Farmers felt the submission and search for claims were complicated, and PT Jasindo suffered heavy losses in several areas that participated in AUPP [29, 33].

For AUTS since the program began in 2016, it was targeted to reach 120 thousand head of cattle, but only 27 thousand were realized with 697 head claims. In 2017 the target was still the same, namely 120 thousand, and the realization had increased to reach 92,176, with 3,470 claims. For the year 2018, still, with the same target of 120 thousand heads, 120 thousand were successfully realized, with claims reaching 1,736. The realization of the AUTS/K target from 2016-2019 can be seen in Figure 3. In 2016 the realization of the AUTS/K program only reached 22.52% of the total targeted. In 2017 and 2018, there was an increase in realization, which reached 76.81% in 2017 and 100% in 2018. In 2019 the new target was to reach 62.50% as of July 31 and was expected to increase until the end of the year [33].



Data for 2019 as of July 31, 2019 [33]

Fig. 3 Targets and realization of the 2016-2019 AUTS/K program in Indonesia

A case study research on implementation in regions in Indonesia reveals that the implementation of AUPP faces many challenges in rice farming [34], such as low participation of farmers in the insurance program in Padang, with a range of 20% of the target. Based on logistic regression analysis, there is a positive and significant influence between farmers' participation in agricultural organizations and participation in agricultural insurance. Some obstacles in the implementation of AUPP in Kaliori District, Rembang, Central Java were reported [35]. There are still difficulties with the field officers, and the head of the farmer group invited members to participate in the socialization or join the AUPP program. The office of PT Jasindo located far from the agricultural territories is constrained in socialization, premium payment, and claims process, in addition, the motivation of the instructor to socialize the AUPP program is still considered very low. A similar situation was reported in [36]: the socialization or delivery of limited information was one of the obstacles in implementing AUPP in Ciwaringin District, Cirebon Regency, West Java. PT Jasindo socializes only to the head of the farmer group and member representatives so that the possibility of information not flowing to farmers' broader level is very likely. The limited information and knowledge of farmers about AUPP cause farmers' low participation in disseminating information about agricultural insurance to other fellow farmers. Another factor is the financial ability of farmers to pay very low insurance premiums. Farmers who are financially able to pay a premium of Rp36,000/ha/planting season are only 34.38%; this value is obtained from measurements based on the value of the ability to pay (ATP) and willingness to pay (WTP).

Several obstacles were found in implementing AUPP in Indramayu Regency, West Java Province [37], including the duration of the claim compensation payment process by PT Jasindo to the farmers' group. The length of time this claim is paid will greatly affect the reduced interest of farmers to take part in the AUPP program the following year. Farmers also think that the long process of filing claims is very difficult for farmers, so farmers are reluctant to follow the insurance process. Besides, farmers still have very low knowledge about the implementation scheme of the AUPP program, both regarding reporting schemes, forms of compensation that can be proposed, and so forth. The response of the agricultural insurance policy as an effort to protect farmers was carried out in a case study in Agorejo Village, Bantul Regency [38]. It was carried out effectively through the Association of Farmers' Groups. Agricultural insurance plays a role in transferring the risk

of irrigation water users. The same conclusions were drawn in [29], based on his observations on farmers' attitudes and satisfaction towards rice farming insurance attributes in Karawang regency, West Java, where the head of the farmer group recommended the motivation of farmers in participating in the AOTP.

In general, the obstacles and problems still encountered during the process of implementation of AOTP activities in Indonesia were (1) socialization to the level of farmers who are still minimal, (2) farmers do not fully understand the benefits of the Rice Farmer Business insurance program (AOTP), so farmers are reluctant to pay self-help premiums 20% voluntarily, (3) operational funding support from local/city governments is still low so this will also have an impact on the lack of support from extension agents, POPT and officials at the field level, (4) farmers assume the level of ease and accuracy of the claim process which is difficult, therefore farmers are not willing to become AOTP participants in the following season [33], (5) high-risk farmers are more likely to participate in the AOTP program than farmers with low-risk levels. Farmers who feel that their land is safe and will not be flooded, drought, and subject to OPT attacks do not want to become AOTP participants [39], (6) farmers feel they are not benefiting from the current insurance scheme, especially with the halal-haram system problems. Agricultural insurance developed at this time. Farmers who are religious and sensitive to halal-haram practices cause the agricultural insurance program to be a particular obstacle in its implementation [40].

3.3. Recommendations for Developing Agriculture Insurance Policies System in Indonesia

Based on the previous stage study, the strategic steps that can be taken to achieve an integrated and sustainable agricultural insurance program in Indonesia can be mapped. The development of an agricultural insurance system in Indonesia is not a seasonal and temporal job but rather an activity that must be carried out continuously, hoping that developments will occur over time. To achieve this, a recommendation for the design of policy formulations for the agricultural insurance system in Indonesia needs to be formulated and implemented as a whole, from the preparation, implementation, supervision, until evaluation throughout the implementation. The formulation of policy recommendations for developing agricultural insurance systems in Indonesia can be seen in Figure 4.

Various formulations of policy recommendations are influenced by the government's seriousness, insurance companies, and farmers to achieve change for the better. The results of the formulation of policy recommendations will face several limitations in the field; such as asymmetric information that can lead to moral hazard behavior by policymakers, differences in perceptions about the risk mitigation process for climate change, and attacks by plant pests, and changes in premium subsidy policy by the Indonesian government. The government, insurance companies, and farmers are three components of actors who play an important role in recommending strategic steps for agricultural insurance development in Indonesia.

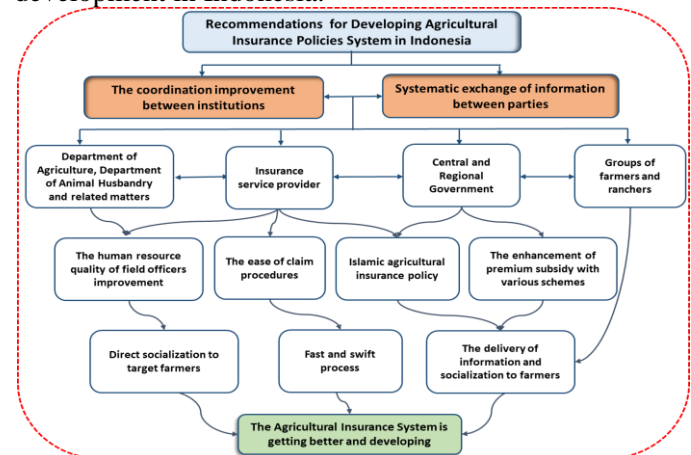


Fig. 4 Recommendations for developing agricultural insurance policies system in Indonesia

Based on Figure 4, some recommendations for strategic steps can be applied in developing agricultural insurance systems in Indonesia. The strategy recommendations are as follows: 1) Improvement of coordination between institutions involved in the agricultural insurance system, including local government, agriculture, and animal husbandry agencies as the executor and person in charge of the agricultural insurance program, PT. Jasindo is an insurance service provider, farmer groups or livestock groups, and other related parties. These stakeholders have their respective roles and responsibilities to succeed in the agricultural insurance program in Indonesia. 2) The need for an exchange of information between stakeholders involved in the agricultural insurance system systematically. This was also conveyed in [29]. One of the most needed attributes is the ease of getting information, so farmers can find out and share any developing information. So far, limited information delivery has become an obstacle to implementing AOTP [36]. 3) There needs to be an

increase in the quality of field officers, both field agricultural extension workers (PPL), technical implementing units (UPTD), and field officers from PT. Jasindo as an insurance provider. During this time, the role of agricultural extension workers and field officers from PT Jasindo is considered not optimal in carrying out its duties. The instructor's motivation to socialize the AOTP program was supposed to be very low [35]. 4) it is necessary to increase the socialization program carried out by agricultural extension workers (PPL) and PT Jasindo. According to [35], one of the obstacles in obstructing the delivery of information and outreach directly to the farmer level is the location of PT's office, Jasindo, far from the farmers. PT Jasindo only conducted limited socialization to the head of the farmer group, so it was possible that the information would not reach all farmers directly due to the limitations of the head of the farmer group [36]. 5) PT. Jasindo, as the insurance provider, needs to create a system that can make it easy for farmers to process claims quickly. During this time, findings in several regions in Indonesia showed that farmers still feel the PT Jasindo claim procedure complicated; there are delays in payment of claims and late agents who assess the damage [29; 37, 41]. 6) Central and regional governments need to increase premium subsidies with various schemes. It is undeniable that there are still very many farmers in Indonesia who have low financial levels, thus affecting the farmers' inability to pay premiums. One of the factors that prevented farmers from joining the insurance program was farmers' financial inability to pay insurance premiums [36]; the results of this study showed that 65.62% of respondents were unable to pay the premiums that had been set. 7) Establishment of an Islamic agricultural insurance system. The majority of Indonesian farmers are Muslims. The presence of Islamic agricultural insurance can be a way out for Muslim farmers who have been reluctant to follow conventional agricultural insurance programs to ensure agricultural management by managing the level of risk that can occur due to crop failure [40]. Also, the establishment of the Islamic agricultural insurance system presents mutual responsibility between farmers and insurance institutions. Both farmers and insurance institutions suffer no one-sided loss because of farmers' moral hazard. Another benefit is the Islamic system's existence will encourage the Islamic banking industry to finance farmers' capital. Because the concept of Islamic finance financing must have underlying assets, the Islamic agricultural insurance system is very compatible with the spirit and concept of Islamic banking. 8) Increasing the role of group and farmers' group leaders in delivering information and outreach to farmers more broadly. The head of the farmer group has a very big role in determining farmers'

decision to join the agricultural insurance program [29]. Implementing these recommendations is a complicated activity because it involves various parties with different interests in order. However, this effort must be interpreted as an effort to correct the deficiencies into something better.

Agricultural insurance policy development system based on meta-analysis studies produces an important novelty in terms of developing regulations for the protection and empowerment of farmers in Indonesia through the Agricultural Insurance facility. The study results have been formulated innovatively and contextually by exploring lessons learned about agricultural insurance models globally, the history of agricultural insurance in Indonesia, its implementation performance, and future policy development strategies. A comprehensive agricultural insurance policy design has been formulated hierarchically based on the actors and targets achieved in Indonesia's agricultural insurance policies. Specifically, the development of agricultural insurance policies in Indonesia in the future has been mapped with various policy options such as strengthening human resources, socialization, accelerating claims, premium subsidies by the government, and the idea of developing Islamic agricultural insurance products.

4. Conclusions

This research has contributed to the development of agricultural insurance in Indonesia and can also be information for other countries developing agricultural insurance systems such as Indonesia. The Indonesian government itself still very much needs various kinds of improvements to produce an agricultural insurance system that is getting better and growing in the future. Some of the improvements include increased coordination between the institutions involved, systematic exchange of information between the parties, improvement of the quality of field staff human resources, improvement of the socialization program to the farmer level, establishment of quick and swift insurance claim procedures, increased role of farmer and farmers' group chairpersons, an increase in premium subsidy with various schemes, as well as Islamic agricultural insurance policies in Indonesia.

Acknowledgments

The author thanks the Aceh Regional Secretary Economic Bureau, the Aceh Regional Development Planning Agency (BAPPEDA), and the Education Fund Management Agency (LPDP), Productive Innovative Research (RISPRO) Governance/Policy, Ministry of Finance of the Republic of Indonesia No. PRJ-120/LPDP/2019.

References

- [1] BADAN PUSAT STATISTIK. Official statistical news: Indonesia's economic growth in quarter II-2019 [R]. Indonesia: Available at <https://www.bps.go.id/>, 2019.
- [2] PUTRA, BE. Strategies for increasing farmers' participation in paddy farming business insurance (AUTP) in the paddy agriculture center area of Cianjur Regency [D]. Bogor: IPB University, 2019. (In Indonesian).
- [3] PASARIBU, M.S., AGUNG, I.S., AGUSTIN, N.K., LOKOLLO, E.M., TARIGAN, H., & SUPRIATNA, Y. Research proposal: development of rice farming insurance to cope with the risk of 75% loss due to flooding, drought, and disease pests [R]. Bogor: Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian (Kementerian Pertanian), 2010. (In Indonesian).
- [4] LARSON, D.F., ANDERSON, J.R., & VARANGIS, P. Policies on managing risk in agricultural markets [J]. *World Bank Research Observer*, 2004, 19(2): 199-230. ISSN 0257-3032.
- [5] MIRANDA, M.J., & GONZALEZ-VEGA, C. Systemic risk, index insurance, and optimal management of agricultural loan portfolios in developing countries [J]. *American Journal of Agricultural Economics*, 2011, 93(2): 399-406. ISSN 0002-9092.
- [6] SARRIS, A. Weather index insurance for agricultural development: Introduction and overview [J]. *Agricultural Economics (United Kingdom)*, 2013, 44(4-5): 381-384. ISSN 0169-5150.
- [7] BOBOJONOV, I., AW-HASSAN, A., & SOMMER R. Index-based insurance for climate risk management and rural development in Syria [J]. *Climate and Development*, 2014, 6(2): 166-178. ISSN 1756-5529.
- [8] NORTON, M., OSGOOD, D., MADAJEWICZ, M., HOLTHAUS, E., PETERSON, N., DIRO, R., MULLALLY, C., THE, T.-L., & GEBREMICHAEL, M. Evidence of demand for index insurance: experimental games and commercial transactions in Ethiopia [J]. *Journal of Development Studies*, 2014, 50(5): 630-648. ISSN 0022-0388.
- [9] VILHELM, V., ŠPIČKA, J., & VALDER, A. Public support of agricultural risk management – situation and prospects [J]. *Agris on-line Papers in Economics and Informatics*, 2015, 7(2): 23-102.
- [10] WEINBERGER, K. Management von Wetterrisiken in Anbetracht des Klimawandels und der GAP- Reform. „Ländlicher Raum“ Online-Fachzeitschrift des Bundesministeriums für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, [Online] Available at http://www.bmlfuw.gv.at/land/laendl_entwicklung/Online-Fachzeitschrift-Laendlicher-Raum/archiv/2009/weinberger.html. 2009.
- [11] TORAÑO, A.F. Das Erntever sicherungssystem in Spanien. Internationales Agrarversicherungssymposium Risikomanagement durch Versicherungslösungen [J]. Wien, 2010, 21(1).
- [12] YANUARTI, R., AJI, J.M.M., & RONDHI, M. Risk aversion level influence on farmer's decision to participate in crop insurance: A review [J]. *Agricultural Economics – Czech*, 2019, 65(10):481–489. <https://doi.org/10.17221/93/2019-AGRICECON>.
- [13] COOPER H, HEDGES LV, VALENTINE JC. The Handbook of Research Synthesis and Meta-Analysis, 3rd edition [M]. New York: Russell Sage Foundation, 2019.
- [14] KING, W.R., & HE, J. Understanding the Role and Methods of Meta-Analysis in IS Research [J]. *Communications of the Association for Information Systems*, 2005, 16(32). DOI: 10.17705/1CAIS.01632.
- [15] DECOSTER J. Meta-analysis Notes [R]. Retrieved from <http://www.stat-help.com/notes.html>. 2004.
- [16] KRUSCHKE, J.K., & LIDDELL, T.M. The Bayesian New Statistics: Hypothesis testing, estimation, meta-analysis, and power analysis from a Bayesian perspective [J]. *Psychonomic Bulletin & Review*, 2018, 25:178–206.
- [17] GUREVITCH, J., KORICHEVA, J., NAKAGAWA, S., & STEWART, G. Meta-analysis and the science of research synthesis [J]. *Nature*, 2018, 555: 175-182. <https://doi.org/10.1038/nature25753>
- [18] CARD, D., KLUVE, J., & WEBER, A. What works? a meta analysis of recent active labor market program evaluations [J]. *Journal of the European Economic Association*, 2018, 16(3): 894–931. <https://doi.org/10.1093/jeaa/jvx028>.
- [19] FRANKLIN, J.C., RIBEIRO, J.D., FOX, K.R., BENTLEY, K.H., KLEIMAN, E.M., HUANG, X., MUSACCHIO, K.M., JAROSZEWSKI, A.C., CHANG, B.P., & NOCK, M.K. Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research [J]. *Psychological Bulletin*, 2017, 143 (2):187–232. <https://doi.org/10.1037/bul0000084>.
- [20] GERRISH, E. The impact of performance management on performance in public organizations: a meta-analysis [J]. *Public Administration Review*, 2015, 76(1):48-66. <https://doi.org/10.1111/puar.12433>.
- [21] BUSCH J., & FERRETTI-GALLON K. What drives deforestation and what stops it? a meta-analysis [J]. *Review of Environmental Economics and Policy*, 2017, 11(1):3–23. <https://doi.org/10.1093/reep/rew013>
- [22] LABANDEIRA, X, LABEAGA, J.M., & LÓPEZ-OTEROA, X. A meta-analysis on the price elasticity of energy demand [J]. *Energy Policy*, 2017, 102:549-568.
- [23] JANAKIRAMAN, N., SYRDAL, H.A., & FRELING, R. The effect of return policy leniency on consumer purchase and return decisions: a meta-analytic review [J]. *Journal of Retailing*, 2016, 92(2): 226-235.
- [24] CLARK, D.B., TANNER-SMITH, E.E., & KILLINGSWORTH, S.S. Digital games, design, and learning: a systematic review and meta-analysis [J]. *Review of Educational Research*, 2016, 86(1):79-122. <https://doi.org/10.3102/0034654315582065>.

- [25] SHADBOLT, N.M., OLUBODE-AWASOLA, F., GRAD, D., & DOOLEY, E. Risk- an Opportunity or Threat for Entrepreneurial Farmer in Global Food Market [J]. *International Food and Agribusiness Management Review*, 2010, 13(4): 75-96.
- [26] MITU, N.E. Agricultural insurance in romania: present and future aspect. Munich Personal RePEc Archive (MPRA) [D]. Rumania: University of Craiova, Faculty of Economics and Business Administration, 2007. Available at <http://mpra.ub.uni-muenchen.de/10773/>.
- [27] WORLD BANK. Agricultural insurance in Latin America, developing the market [R]. Report No. 61963-LAC. Washington DC: World Bank, 2010.
- [28] NATIONAL RURAL ADVISORY COUNCIL. Feasibility of agricultural insurance product in australia for weather related production risk [R]. U.S: Department Of Health And Human Services, 2012.
- [29] MUSTIKA, M. (2018). Analysis of farmers' attitudes and satisfaction with rice farming insurance attributes in Karawang Regency, West Java [D]. Bogor: IPB University, 2018. (In Indonesia).
- [30] WENNER, M., & ARIAS, D. Agricultural insurance in Latin America: where are we?. us agency for international development (USAID) [R]. New York: Inter-American Development Bank, 2011.
- [31] INSYAFIAH, & WARDHANI, I. Study on national agricultural insurance implementation preparation [R]. Jakarta: Badan Kebijakan Fiskal Kementerian Keuangan Republik Indonesia. (In Indonesia), 2014.
- [32] DIREKTORAT JENDRAL PRASARANA DAN SARANA PERTANIAN. *Rice farm insurance premium assistance guidelines* [R]. Jakarta: Direktorat jendral prasarana dan sarana pertanian, 2015. (In Indonesia).
- [33] OTORITAS JASA KEUANGAN. Rice Farming Insurance; Cow Business Insurance; Small Fish Farmer Fisheries Insurance; Fisherman Insurance [R]. Jakarta: Otoritas jasa keuangan, 2019. (In Indonesia).
- [34] AZRIANI, Z., REFDINAL, & PALOMA, C. Pelaksanaan Asuransi usaha tani padi dalam mewujudkan ketahanan pangan di Kota Padang (implementation of paddy farmer business insurance in realizing food security in the City of Padang) [C]. *Prosiding Seminar Nasional UNS*, 2018, 2(1): 36-43. (In Indonesia).
- [35] SAYUGYANINGSIH, I. *Factors influencing farmers following rice farming insurance (AUTP) in Kaliori District, Rembang* [D]. Bogor: Institut Pertanian Bogor, 2018. (In Indonesia).
- [36] AGUSTINA, A. (2018). Analysis of the ability and willingness to pay of participants and non-participants of rice farming insurance in Ciwaringin District, Cirebon Regency) [D]. Bogor: Institut Pertanian Bogor, 2018. (In Indonesia).
- [37] PRASETIO, K. Factors affecting farmers' participation in the rice farming insurance program in Indramayu Regency, West Java Province) [D]. Bogor: Institut Pertanian Bogor, 2019. (In Indonesia).
- [38] SEPTIAN, D., & ANUGRAH, G.C. Farmer protection through the agricultural insurance concept at the argorejo village farmers association, Bantul Regency [J]. *Jurnal Penelitian Hukum*, 2014, 1(2): 92-108.
- [39] FABRIANUS, A.D. Adverse selection dan moral hazard pada asuransi usahatani padi di Provinsi Jawa Timur (Adverse selection and moral hazard in rice farming insurance in East Java Province) [D]. Bogor: Institut Pertanian Bogor, 2019. (In Indonesia).
- [40] BIRO PEREKONOMIAN SEKRETARIAT DAERAH ACEH BEKERJASAMA DENGAN FAKULTAS PERTANIAN UNSYIAH. *Final report: study of sharia agricultural insurance system in Aceh* [R]. Banda Aceh: Fakultas Pertanian Universitas Syiah Kuala, 2019. (In Indonesia). (In Indonesia).
- [41] KAWANISHI, M., GURITNO, C.S., & FARID, F.Y. Assessment of farmer demand for crop insurance: a case study in Indonesia [J]. *Journal of the Risk Research Society of Japan*, 2016, 26(1): 1-9.
- [42] FADHIL, R., QANYTAH, Q., HASTATI, D.Y., & MAARIF, M.S. Development Strategy for a Quality Management System of Gayo Coffee Agro-Industry Using Soft Systems Methodology [J]. *Periodica Polytechnica Social and Management Sciences*, 2018, 26(2), 168–178.

参考文:

- [1] 中央统计局。官方统计新闻：印尼第二至 2019 年第二季度的经济增长 [R]。印度尼西亚：网址为 <https://www.bps.go.id/>，2019 年。
- [2] BE, PUTRA。契安祖摄政稻田农业中心地区增加农民参与稻田农业商业保险的策略[D]。茂物：IPB 大学，2019 年。（印尼文）。
- [3] PASARIBU, M. S., AGUNG, I. S., AGUSTIN, N. K., LOKOLLO, E. M., TARIGAN, H. 和 SUPRIATNA, Y. 研究建议：开发水稻种植保险以应对洪水造成的 75% 损失的风险，干旱和病虫害[R]。茂物：社会经济分析和农业政策中心（农业部），2010。（印尼文）。
- [4] LARSON, D. F., ANDERSON, J. R. 和 VARANGIS, P. 农业市场风险管理政策[J]。世界银行研究观察员，2004，19 (2) : 199-230。ISSN 0257-3032。
- [5] MIRANDA, M.J. 和 GONZALEZ-VEGA, C. 发展中国家的系统性风险，指数保险和农业贷款组合的最优管理[J]。美国农业经济杂志，2011，93 (2) : 399-406。ISSN 0002-9092。
- [6] SARRIS, A. 农业发展的天气指数保险：简介和概述 [J]。农业经济学（英国），2013，44 (4-5) : 381-384。ISSN 0169-5150。
- [7] BOBOJONOV, I., AW-HASSAN, A. 和 SOMMER R. 基于指数的保险，用于叙利亚的气候风险管理和农村发展 [J]。气候与发展，2014，6 (2) : 166-178。ISSN 1756-5529。
- [8] NORTON, M., OSGOOD, D., MADAJEWICZ, M., HOLTHAUS, E., PETERSON, N., DIRO, R.,

- MULLALLY, C., THE, T.-L., 和 GEBREMICHAEL, M. 指数保险需求的证据：埃塞俄比亚的实验性游戏和商业交易[J]. 发展研究杂志, 2014, 50 (5) : 630-648. ISSN 0022-0388.
- [9] VILHELM, V., ŠPIČKA, J., 和 VALDER, A. 农业风险管理的公共支持—现状与前景[J]. 阿格里斯经济学与信息学在线论文, 2015, 7 (2) : 23-102.
- [10] WEINBERGER, K. 鉴于气候变化和帽改革, 对天气风险的管理. 联邦农林部农村地区在线贸易杂志[R]. 环境与水管管理, [在线], 网址为 2009. http://www.bmlfuw.gv.at/land/laendl_entwicklung/Online-Fachzeitschrift-Laendlicher-Raum/archiv/2009/weinberger.html 上找到.
- [11] TORAÑO, A.F. 西班牙的农作物保险制度. 国际农业保险研讨会通过保险解决方案进行风险管理[J]. 维也纳, 2010, 21 (1) .
- [12] YANUARTI, R., AJI, J.M.M. 和 RONDHI, M. 风险规避水平对农民参加农作物保险的决定的影响[J]. 农业经济学—捷克, 2019, 65 (10) : 481-489. <https://doi.org/10.17221/93/2019-AGRICECON>.
- [13] COOPER H, HEDGES L. V. 和 VALENTINE J. C. 研究综合与荟萃分析手册, 第 3 版[M]. 纽约: 罗素圣人基金会, 2019.
- [14] KING, W.R., 和 HE, J. 理解元分析在是研究中的作用和方法[J]. 信息系统协会通讯, 2005, 16 (32) . <https://doi.org/10.17705/1CAIS.01632>.
- [15] DE COSTER J. 元分析笔记 [R]. 2004. 取自 <http://www.stat-help.com/notes.html>.
- [16] KRUSCHKE, J.K. 和 LIDDELL, T. M. 贝叶斯新统计: 从贝叶斯的角度进行假设检验, 估计, 荟萃分析和功效分析[J]. 心理公告与评论, 2018, 25 : 178-206.
- [17] GUREVITCH, J., KORICHEVA, J., NAGAGAWA, S. 和 STEWART, G. 荟萃分析和研究综合科学[J]. 自然, 2018, 555 : 175-182. <https://doi.org/10.1038/nature25753>
- [18] CARD, D., KLUVE, J. 和 WEBER, A. 什么有效? 最近活跃的劳动力市场计划评估的荟萃分析[J]. 欧洲经济协会学报, 2018, 16 (3) : 894-931. <https://doi.org/10.1093/jeea/jvx028>.
- [19] FRANKLIN, J.C., RIBEIRO, J.D., FOX, K.R., BENTLEY, K.H., KLEIMAN, E.M., HUANG, X., MUSACCHIO, K.M., JAROSZEWSKI, A.C., CHANG, B.P. 和 NOCK, M.K. 自杀思想和行为的危险因素: 50 年研究的荟萃分析[J]. 心理公告, 2017, 143 (2) : 187-232. <https://doi.org/10.1037/bul0000084>.
- [20] GERRISH, E. 绩效管理对公共组织绩效的影响: 一项荟萃分析[J]. 公共行政评论, 2015, 76 (1) : 48-66. <https://doi.org/10.1111/puar.12433>.
- [21] BUSCH, J. 和 FERRETTI-GALLON K. 是什么驱使森林砍伐并阻止森林砍伐? 荟萃分析[J]. 环境经济学与政策评论, 2017, 11 (1) : 3-23. <https://doi.org/10.1093/reep/rew013>
- [22] LABANDEIRA, X, LABEAGA, J.M. 和 LÓPEZ-OTEROA, X. 对能源需求价格弹性的荟萃分析[J]. 能源政策, 2017, 102 : 549-568.
- [23] JANAKIRAMAN, N., SYRDAL, H.A. 和 FRELING, R. 退货政策宽大对消费者购买和退货决定的影响: 荟萃分析[J]. 零售杂志, 2016, 92 (2) : 226-235.
- [24] CLARK, D.B., TANNER-SMITH, E.E. 和 KILLINGSWORTH, S.S. 数字游戏, 设计与学习: 系统的综述和荟萃分析[J]. 教育研究评论, 2016, 86 (1) : 79-122. <https://doi.org/10.3102/0034654315582065>.
- [25] SHADBOLT, N.M., OLUBODE-AWASOLA, F., GRAD, D. 和 DOOLEY, E. 风险-全球食品市场中企业家的机会或威胁[J]. 国际食品与农业综合企业管理评论, 2010, 13 (4) : 75-96.
- [26] MITU, NE.E. 罗马尼亚的农业保险: 现在和将来. 慕尼黑个人档案馆 (MPRA) [D]. 罗马尼亚: 克拉约瓦大学经济与工商管理学院, 2007 年. 请访问 <http://mpra.ub.uni-muenchen.de/10773/>.
- [27] 世界银行. 拉丁美洲的农业保险, 正在开拓市场[R]. 报告编号 61963-LAC. 华盛顿特区: 世界银行, 2010.
- [28] 国家农村咨询委员会. 澳大利亚农业保险产品应对与天气有关的生产风险的可行性[R]. 美国卫生与公共服务部, 2012.
- [29] MUSTIKA, M. (2018 年). 西瓜哇省卡拉旺摄政区农民对水稻种植保险属性的态度和满意度分析[D]. 茂物: IPB 大学, 2018. (印度尼西亚).
- [30] WENNER, M. 和 ARIAS, D. 拉丁美洲的农业保险: 我们在哪里? 美国国际开发署 (你说) [R]. 纽约: 美洲开发银行, 2011.

- [31] INSYAFIAH 和 WARDHANI, I. 关于国家农业保险实施准备的研究[R]。雅加达：印度尼西亚共和国财政部财政政策局。（在印度尼西亚），2014。
- [32] 农业基础设施和设施总干事。稻米农场保险保费援助指南[R]。雅加达：农业基础设施和设施总局，2015。（印度尼西亚）。
- [33] 金融服务管理局。金融服务局。稻谷农业保险；牛商业保险；小鱼农渔业保险；渔夫保险[R]。雅加达：金融服务管理局，2019年。（印尼）
- [34] AZRIANI, Z., REFDINAL 和 PALOMA, C. 在实现巴东市粮食安全中实施稻农商业保险（C）。联合国系统全国研讨会论文集，2018，2（1）：36-43。（在印度尼西亚）。
- [35] SAYUGYANINGSIH, I. 在伦邦的卡里奥里区，遵循稻谷农业保险（自动转换）后影响农民的因素[D]。茂物：2018年波斯尼亚茂物研究所。（印尼）。
- [36] AGUSTINA, A.（2018）。井里汶摄政区西瓦林宁区参加水稻种植保险的参与者和非参与者的支付能力和支付意愿分析[D]。茂物：2018年波斯尼亚茂物研究所。（印尼）。
- [37] PRASETIO, K. 影响农民参加西爪哇省因德拉马尤摄政区稻谷农业保险计划的因素[D]。茂物：波斯尼亚茂物研究所，2019。（印度尼西亚）。
- [38] D. SEPTIAN 和 G.C. ANUGRAH. 班图尔摄政区阿尔戈雷霍村农民协会通过农业保险概念保护农民[J]。法律研究杂志，2014，1（2）：92-108。
- [39] FABRIANUS, A.D. 逆向选择和道德风险起因（东爪哇省稻米保险中的逆向选择和道德风险）[D]。茂物：波斯尼亚茂物研究所，2019。（印度尼西亚）。
- [40] ACEH 区域秘书处经济局与联合国叙利亚农业合作。最终报告：亚齐伊斯兰教法农业保险制度研究[R]。班达亚齐（班达亚齐）：西亚加拉大学农业学院，2019。（印度尼西亚）。（在印度尼西亚）。
- [41] M. KAWANISHI, C.S. GURITNO 和 F.Y. FARID 农民对农作物保险需求的评估：以印度尼西亚为例[J]。日本风险研究学会杂志，2016，26（1）：1-9。
- [42] FADHIL, R., QANYTAH, Q., HASTATI, D.Y. 和 MAARIF, M.S. 基于软件系统方法的伽一种咖啡农产质量管理体系发展策略[J]。理工学院学报社会科学与管理，2018，26（2），168-178。