Rice crop insurance scheme to protect farmers from natural disaster risks: Field application experience

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Abstract. Climate change has caused severe agricultural risks, especially rice as the staple food of Indonesians. Production system disruptions result in crop failure due to various natural disasters, such as floods, droughts, and intensified pest and disease attacks, which not only cause a decrease in production, productivity, and grain quality but also affect the national food security program. The Ministry of Agriculture launched a rice crop insurance (AUTP) scheme in 2015 to protect farmers from natural disasters. This study aimed to describe the implementation performance of the AUTP scheme. The method used was a descriptive analysis based on previous research results and in-depth literature reviews. As stipulated in Law No. 19 of 2013 on farmer protection and empowerment, stakeholders have widely accepted the scheme with enthusiasm. This also indicates that this instrument effectively supports farmers from risks. The dynamics of its implementation revealed the need to prepare the insurance program for other schemes and expand similar mechanisms to different strategic crops. The application of technology, such as electronic registration and payments and specific tools is highly encouraged. The government's role and insurance companies' involvement in the implementation should improve the performance of rice crops.

1 Introduction

Agriculture is one of Indonesia's leading sectors supporting national development. The agricultural sector is very important because it is the mainstay of livelihood for most of the population in rural areas. The agricultural sector contributes significantly to GRDP, foreign exchange from export activities, agroindustry raw materials, and meeting food needs [1]. In fact, the agricultural sector can support the national economy under challenging conditions or economic crises, especially during the COVID-19 pandemic. Even though it has a strategic
role, the agricultural sector in Indonesia is often faced with many problems, including the risk of crop failure due to natural disasters such as climate change, drought, floods, and crop failure caused by pest attacks [2,3].

Global climate change seems to be an important issue in the current development of the world economy, including its impact on agricultural sector activities. The occurrence of climate change causes uncertainty in the agricultural sector, especially for rice farming businesses. Disruptions to the production system and crop failure due to various natural disasters, such as floods, droughts, and the intensity of pest and disease (OPT) attacks, will not only cause a decrease in production, rice productivity, and grain quality but will also affect the national food security program.

According to a previous study [4], floods and drought are natural disasters that can occur at any time, affecting the water availability for agriculture, crop damage, and even crop failure. If these natural phenomena occur on a wide scale, they threaten agricultural and food production and could even result in a food crisis in a regional area. Under these conditions, it is necessary to have an effective system that can minimise the risks from threats and uncertainties in the agricultural sector, especially in rice farming [5].

Rice crop insurance (AUTP) is one of the government's instruments for protecting farmers from losses caused by climate change, such as risk sharing due to drought, floods, and pest and disease attacks. The AUTP concept, mechanism, and scheme have been established and regulated in Law No. 19/2013 on farmer's protection and empowerment, then AUTP application based on the regulation of Minister of Agriculture No. 40/Permentan/SR.230/7/2015 concerning agricultural insurance facilities. Agricultural insurance benefits farmers by minimising losses resulting from crop failure and ensuring the availability of working capital for farmers to carry out their farming activities in the following season [5]. Therefore, the launch of the AUTP in 2015, with a target of covering one million hectares of rice fields, is highly appreciated because this insurance scheme can protect the interests of farmers.

In the AUTP scheme, rice farmers pay a premium of only IDR 36,000 (USD 2.4) per ha/planting season, with a government subsidy of IDR 144,000 (USD 9.6) to make a total premium of IDR 180,000 (USD 12) per ha/planting season. Based on the provisions for calculating claims, if farmers experience crop failure (at least 75% of damage) due to floods or drought and pest attacks, they will receive compensation of IDR 6 million (USD 400) per hectare. Data of actual AUTP implementation (2015-2018) showed a positive trend, with the total insured rice fields reaching 2.5 million ha from the target of 3.5 million ha or 72.50% [5].

Other previous research [5] also shows that during the national AUTP program trial period in 2019 (until July), there were 375,278.28 ha of rice fields that the AUTP program had protected against the target of 1 million hectare. This indicates farmers' enthusiasm to register as beneficiaries of the AUTP program. Their awareness of farm risks is appreciated thanks to the promotion and advocacy of crop insurance delivered by stakeholders, including the insurance company and the local government.

Systematic agricultural insurance trial activities ended in 2019; however, implementing the AUTP program still faces various obstacles and challenges. Promotion and advocacy need to be continued systematically, including the effective use of technologies, such as e-registration, e-reports, or e-claims, and the use of banking systems to transfer premiums and claims.

The digitalisation of the program through the SIAP application (agricultural insurance information system) is one of the initial steps to provide convenience and accuracy of farmer participation data so that it will improve the implementation of AUTP nationwide. This article aims to analyse the performance of the AUTP program implementation based on its
concept and implementation from its early introduction to the end of the pilot study (2015-2019) and the conditions up to 2022.

2 Methodology

This research aims to describe the performance of implementing a rice crop insurance scheme to protect farmers' interests. The method used was a descriptive analysis based on the results of previous research and an in-depth literature review. Data and information analysis was conducted by combining primary data and information from such research results, secondary data, and literature reviews related to the concept and implementation of the program.

The scope of information reviewed and analysed includes the introduction of a rice insurance scheme as a farmer's shield based on field experiences, global climate change, which causes natural disasters, and alternative policies to ease the burden on farmers when facing agricultural risks or crop failure. The discussion of the substance and description of the material are presented descriptively. It is divided into several sub-subjects related to the topic and description of the material presented in this article.

3 Results and Discussion

3.1 Concept of agricultural insurance and rice crop insurance (AUTP)

Basic concepts and general insurance definitions, or "verzekering" in Dutch, mean that coverage. Based on the law (KUHP Chapter 246), insurance (or coverage) is an agreement in which an insurer binds to an insured by accepting a premium to compensate for the damage or loss of expected profits that one may suffer due to an uncertain event. From an economic perspective, insurance is a collection of funds that can be used to cover or provide compensation to people who experience losses [6].

Insurance products continue to develop in line with the need for protection against losses in the agricultural sector, including risk coverage. Agricultural insurance aims to protect farmers from losses that lead to decreased crop yields caused by natural disasters, pests, and diseases. In practice, many countries provide protection for farmers after experiencing disaster/harvest failure. In Indonesia, however, farmers' protection is provided through the application of an agricultural insurance scheme. The government provides insurance premium assistance to insurance-participating farmers [5].

Farmer protection is generally carried out in two ways: (a) traditionally and (b) through agricultural insurance schemes. Traditional farmer protection is implemented by allocating a special (ad hoc) government budget for unexpected natural disasters in the agricultural sector. This aid aims to protect the national development budget (or the government budget) from the effects of natural disasters. This particular budget can be disbursed when there is a report of damage to an agricultural area, that causes a reduction in agricultural production in that area. Farmer protection is traditionally applied in Europe, North America, Latin America, China, and South Korea [5].

Furthermore, the agricultural insurance program based on Law Number 19 of 2013 aims to protect farmers through working capital assistance [5]. Farmers will benefit from farm risks if they experience crop damage or crop failure due to natural disasters, pest and disease attacks, infectious disease outbreaks, the impact of climate change, and other types of risks. Thus, farmers receive compensation to allow them to continue farming activities. Other objectives of insurance applications are to secure rice production, help farmers implement
Good Agricultural Practices (GAP) in rice cultivation, and provide confidence in financial/banking institutions' access because there is a guarantee against risks [7].

The benefits that farmers obtain after participating in the agricultural insurance program will include: (a) protecting farmers from a financial/funding perspective against losses due to crop failure; (b) increasing the position of farmers in the eyes of financing institutions (credit); (c) stabilising farmers' income due to loss coverage from insurance companies; (d) increasing production and productivity in the agricultural sector; and (e) insurance as a way to educate farmers to grow crops well. Therefore, agricultural insurance includes an agreement between the farmer and the insurance company by binding themselves to cover the risks of farming (especially food crops, horticulture, plantations, and/or livestock). Agricultural insurance is a farmer protection strategy established by the government and regional governments following their authority. Farmer protection is given to (a) farmers cultivating food crops who do not own farming land and cultivate a maximum area of two hectares; (b) farmers who own land and carry out food crop cultivation businesses on a maximum land area of two hectares; and/or (c) horticultural farmers, plantation crops, or small-scale livestock raisers (Law Number No. 19 of 2013).

Conceptually, several types of insurance are used as protection schemes against the risks of crop failure or loss. Types of agricultural insurance products include crop insurance, livestock insurance, forestry/plantation insurance, greenhouse insurance, poultry meat insurance, and fishery cultivation insurance (aquaculture insurance). Agricultural insurance applied in several countries based on products can be grouped into three categories.

1. Indemnity-based crop insurance, namely (a) insurance with named risks (named peril insurance). This insurance covers one type of risk: hail, fire, storm, or ice melt. The sum assured is calculated based on the value of agricultural inputs, such as seeds and fertiliser, and (b) crop insurance with several risks (multi-peril crop insurance/MPCL). This insurance covers events/occurrences caused by several reasons, such as drought, floods, and diseases. The sum assured is calculated based on the value of the insured plant, equal to the shortfall in harvest compared to the agreed value multiplied by the agreed price. Farmers receive compensation when the harvest value is below the insured price due to reduced yield and/or low prices at harvest.

2. Index-based crop insurance includes (a) insurance based on the results in an area (area-yield insurance). Insurance will pay the insurance money when the harvest value of those regions is below the index. What is meant by a region is a group of villages or districts with homogeneous agricultural production and output. The index size is determined based on the historical average results of the area and is usually in the range of 50% to 90% of the expected results; (b) climate-based insurance (weather insurance). Climate-based insurance often uses parameter indices, such as rainfall or temperature. Compiling the index requires past weather and climate data originating from weather stations and agricultural production statistics. The insurance value is paid when unexpected weather/climate conditions (climate index) are met without proof of crop failure. Insurance based on a climate index ensures the climate/weather index, not the plant (e.g., rainfall index).

In the AUTP scheme, the Ministry of Agriculture has implemented efforts to protect farming businesses for farmers since 2015. The implementation of agricultural insurance programs involves the government (regulator), private sector (implementing institution), and farmers (beneficiaries) through the concept of public-private partnership [4]. Agricultural insurance was introduced to help farmers avoid significant losses due to farming risks. This effort by the Ministry of Agriculture is one of the concrete steps in preparing the main food ingredients from rice farming production.
In the AUTP scheme, only one insurance model has been introduced, which is compensation for production costs (indemnity-based insurance model) to cover crop damage or harvest failure. As mentioned earlier, in the AUTP scheme, farmers pay a premium of IDR 36,000 (20%) and government assistance of IDR 144,000 (80%) per ha per planting season to cover risks caused by floods, drought, and pest attacks, with potential claims amounting to IDR 6,000,000/ha/planting season [4,5,8–12]. Conceptually, several features used as references in implementing the AUTP scheme are presented in Table 1.

Table 1. Features and conceptual description of rice crop insurance (AUTP).

<table>
<thead>
<tr>
<th>No.</th>
<th>Conceptual description and arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insured Farmers group (Poktan), which consists of members, namely farmers who carry out farming activities as a unit of risk (anyone risk)</td>
</tr>
<tr>
<td>2</td>
<td>Object of coverage Rice fields cultivated by farmers (owners, cultivators) of Poktan members</td>
</tr>
<tr>
<td>3</td>
<td>Insurer BUMN/BUMD is the field of general/casualty insurance, and Insurance Companies form a consortium.</td>
</tr>
<tr>
<td>4</td>
<td>Insurance policy Each Poktan gets one insurance policy and a policy overview containing closing data.</td>
</tr>
<tr>
<td>5</td>
<td>Insurance period One planting season (4 months) from planting to harvest</td>
</tr>
<tr>
<td>6</td>
<td>Insurance price IDR 6,000,000/ha (area less than 1 ha is calculated proportionally)</td>
</tr>
<tr>
<td>7</td>
<td>Insurance premium rates Estimated at IDR 180,000/ha/planting season (3% of coverage IDR 6,000,000).</td>
</tr>
<tr>
<td>8</td>
<td>Insurance premium coverage Government 80% = IDR 144,000/ha Farmers 20% = IDR 36,000/ha</td>
</tr>
<tr>
<td>9</td>
<td>Guaranteed risk a. Flood b. Drought c. Certain pests and diseases (according to local types)</td>
</tr>
<tr>
<td>10</td>
<td>Guaranteed pests (according to local pest types) Pest: rats, brown planthoppers, grasshoppers, stem borers, armyworms and others. Diseases: blast, tungro, brown spot, stem rot, hollow stunted, and others</td>
</tr>
<tr>
<td>11</td>
<td>Claim submission requirements a. Flood, drought or pests with damage intensity percentage ≥ 75% b. Premium has been paid c. Losses are checked by POPT-PHP and reported to the insurance company d. The insurance company decides the amount of loss</td>
</tr>
<tr>
<td>12</td>
<td>Payment of claims • 14 days after approval of the amount of loss • Claims are paid to the farmers/Poktan account</td>
</tr>
</tbody>
</table>

Source: [5,13]

Eight types of risks are inherent in the agricultural sector supply chain: weather, natural disasters, environmental, market, logistics, operational, policy, and political risks. Concerning farm risks, six causes of uncertainty influence the agricultural sector: (a) natural factors (drought, pest, and disease attacks), (b) disasters (floods, fires, landslides, and volcanic eruptions), (c) price fluctuations (input and output), (d) technology that causes low productivity and production, (e) actions of other parties (sabotage, confiscation, and changes in regulations), and (f) conditions of farmers/families (death, serious illness). According to [14], drought and flood events are the main causes of crop failure in Indonesia.

Several agricultural business risks are designed to be accommodated in agricultural insurance programs. In a situation where profits from various agricultural commodities are
marginal, the situation turns around. Marginal profits drive the need for risk, including insurance, but also reduce the ability to purchase the protection that one needs. Agricultural insurance can be seasonal or annual, and is closely related to cultivation patterns. Food crop business insurance is seasonal; damage or loss is related to one growing season, which simplifies the loss assessment. In general, the higher the value of commodities, the higher the demand for insurance. High-economic-value commodities are usually financed by banking facilities that require them to be insured [12]. For food and horticultural crops, the insurance system is closely related to events and protection against:

1. Drought
   Drought is a weather event that often occurs in tropical countries, such as Indonesia, and must receive careful attention from insurance companies. The occurrence (time of impact) and affected area (geographical area) must be clearly defined. Droughts begin under vague circumstances, but their effects persist into the next growing season. Furthermore, drought can be exacerbated by other causes, such as plant diseases that attack plants that are stressed due to a lack of water. Damage due to drought can affect hundreds of square kilometres of land. However, the damage can be verified by conducting field inspections.

2. Flood
   Flood damage can be caused by excessive rainfall on agricultural land. However, it can also be caused by excess water in other areas, such as overflowing rivers or lakes that flow into farming land. The risk of flooding can be insured, except for agricultural land not sufficiently supported by drainage, drainage channels not maintained, or farming land located on low-lying contours; therefore, it is prone to flooding.

3. Pests and diseases (OPT)
   The risk of pest and disease infestations varies significantly according to the type of pest and/or disease, region, and intensity of attack. The risks covered in the agricultural insurance program must be included in the cooperation agreement between the interested or collaborating parties, mutually agreed upon, and complied with.

3.2 Implementation, targets, and achievements

The implementation of the AUTP scheme at the field level is carried out through the involvement of the duties and functions of the relevant Agricultural Services, both at the provincial, district/city, and sub-district levels (UPTD or BPP). The extension workers support them as implementing assistants in carrying out the AUTP scheme at the farmer group level. Institutional collaboration at the central level involves the Ministry of Agriculture through the Directorate General of Agricultural Infrastructures, the Directorate General of Food Crops, and the insurance company (state-owned enterprise) as implementing partners for the agricultural insurance program (Figure 1).

The implementation of the AUTP scheme has covered almost all regions of Indonesia, especially rice production centre areas. Nationally, the performance of the protection program through the AUTP scheme has attracted the interest of many farmers. The location of farmers' rice fields that have been insured in the last two years (figure in 2017) has increased significantly. In 2015-2016, only 660 thousand ha were recorded. However, in 2017, almost 998,000 ha of the target of 1 million hectares was realised, spreading across the country in 16 provinces and 17 districts.
An overview of the performance of the AUTP scheme has been outlined since the government rolled out premium assistance. Even though the realisation of the AUTP scheme has fluctuated since 2015, some farmers have enjoyed farm protection and obtained insurance claims, which are generally used as initial working capital for the next planting season’s activities [4]. The participation of farmers in the AUTP scheme is shown in Table 2.

### Table 2. Participation in AUTP scheme, 2015-2022.

<table>
<thead>
<tr>
<th>Year</th>
<th>AUTP Scheme</th>
<th>Amount claimed (IDR 000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Target (ha)</td>
<td>Actual (ha)</td>
</tr>
<tr>
<td>2015</td>
<td>1,000,000</td>
<td>233,499.55</td>
</tr>
<tr>
<td>2016</td>
<td>1,000,000</td>
<td>499,962.25</td>
</tr>
<tr>
<td>2017</td>
<td>1,000,000</td>
<td>997,960.54</td>
</tr>
<tr>
<td>2018</td>
<td>1,000,000</td>
<td>806,199.64</td>
</tr>
<tr>
<td>2019</td>
<td>1,000,000</td>
<td>971,218.76</td>
</tr>
<tr>
<td>2020</td>
<td>1,000,000</td>
<td>1,000,001.38</td>
</tr>
<tr>
<td>2021</td>
<td>1,000,000</td>
<td>400,000.01</td>
</tr>
<tr>
<td>2022</td>
<td>1,000,000</td>
<td>353,258.50</td>
</tr>
</tbody>
</table>

Note: 1 The target was cut to only 500,000 ha due to government budget reductions  
2 Similar to 2016, the government budget reductions due to the COVID-19 pandemic  
Source: [13]

The number of participants and implementation of the AUTP scheme almost reached the implementation target (99.80%) in 2017. However, in the previous year (2016), it almost reached the targeted land area (99.99%), as the target was reduced to 500,000 ha. This occurred because, in that year, there was a reduction in the government budget, causing a change in the area target set. The target for implementing each national AUTP scheme per year is one million hectares.

In the implementation of the AUTP scheme, it was recorded that the total area that could be realised during the trial (2015-2018) had reached 72.50% out of the target of 3.5 million hectares, of which 2.537 million hectares were achieved. Meanwhile, the number of claims during the implementation period reached 53.34 thousand hectares, equal to 2.10% of the
insured land area. In 2019 (when the pilot study was ongoing), the target area of the insured land was set at 1 million hectares. The target for the next three years (2020 to 2022) is similar; however, this target was achieved only in 2020. Meanwhile, in 2021-2022, this target was affected by the COVID-19 pandemic, which caused the government budget to be cut drastically and diverted to control the deadly virus. Therefore, the actual insured area had to be adjusted according to the availability of the government budget.

Based on data [5], the dynamics of the number of rice farming areas and farmers’ rice fields that experienced disruption due to flood, drought, and pest and disease attacks recorded from 2014 to 2018 fluctuated significantly. Nationally, losses due to lack were relatively more comprehensive in 2015, reaching 599 thousand hectares. Meanwhile, the most widespread flooding and OPT disturbances occurred in 2014, reaching 340 thousand hectares (flood) and 510 thousand hectares (OPT), respectively (Figure 2).

The target area for the AUTP scheme may increase in the following years, knowing that Indonesia’s large rice area fields. However, a relevant question in this case is how the government allocates the increasing trend in insurance premium subsidies. On the one hand,
the budget burden for premium subsidies will significantly increase if the coverage of the AUTP scheme is expanded. However, government budgeting politics indicate that subsidies for various development programs will be significantly decreased to ease the government's burden. Policies to reduce such a burden should be thoroughly considered without sacrificing the farmer's enthusiasm for the crop insurance scheme. Otherwise, the different rice crop insurance scheme models could be redesigned to suit the farmer's needs, such as weather-index-based or yield-index-based models. Comprehensive action research to prepare more appropriate models could benefit agricultural insurance stakeholders while also reducing the government's burden on premium subsidies.

3.3 Performance, obstacles, and challenges in field implementation

Based on data [5], the premium paid by farmers participating in the AUTP scheme with a target and insured land area of one million hectares reached IDR 29 billion (self-help premium) and IDR 116 billion (subsidised premiums), so the total premium amount reached IDR 145 billion (80.62%). East Java province has made the most significant premium payments among the other rice production centres. The total premium in East Java Province alone was IDR 71.8 billion (almost 50%). With this information, during the 2015-2018 implementation, the area of insured land only reached 2.5 million hectares.

Several problems related to the implementation of the AUTP scheme [13], including (a) farmers' understanding of the insurance scheme is still low, (b) inability to pay the 20% premium, (c) limited human resources (extension workers and POPT-PHP officers), (d) late policy submission, (e) late claim payments/late transfer, (f) participant registration requirements not in accordance with the guidelines, and (g) implementation of the agricultural insurance information system (SIAP) application is not easy for prospective insurance participants. The efforts and solutions undertaken to respond to these problems include (a) increasing socialisation, (b) involving the regional government and capital institutions, (c) more intensive use of the SIAP application, and (d) carrying out monitoring and evaluation.

According to previous studies [4,7], the challenges in implementing agricultural insurance programs are quite complex, starting from global climate change, which results in farming risks and the availability of funds as working capital to continue farming activities. Challenges in farming management, processing, and marketing add to the complexity of these problems, leading to plant damage or crop failure. These are among the reasons why the development of agricultural insurance has become very important. Therefore, socialisation activities with proper plans and materials and designated personnel to deliver the messages should promote the crop insurance scheme. Furthermore, the agricultural insurance program must also be applied to other strategic commodities, such as corn, soybean, chilli, shallot, sheep/goat, sugarcane, coffee, and cocoa. These commodities are considered essential livelihoods for most farmers, and the insurance scheme would be vital to the associated farm risks.

Research results [7] on improving services in agricultural insurance program applications show that farmers and officers in the field still have an inadequate understanding of agricultural protection policies. This can be figured out from the many basic questions that all groups ask when implementing this insurance scheme. This situation is thought to be due to the incomplete dissemination of agricultural insurance programs or explanations of insurance schemes for strategic commodities. In this regard, improving services for agricultural insurance scheme applications must be carried out. Apart from socialisation and promotion regarding agricultural insurance, which still needs to be improved, more effective
services and making it easier to implement insurance schemes must also continue to be implemented with improvised simplifications that make activities easier [7].

3.4 The role of government and development mechanisms

The role of the government in the socialisation and promotion of agricultural insurance is inadequate to change the farmer's mind toward the importance of insurance to cover farm risks [7]. Officials and implementing institutions at local levels are not sufficiently equipped with comprehensive materials for socialisation. With minimum capacity in information delivery, an understanding of agricultural insurance at wider dissemination will not be achieved. Socialisation and promotion activities for the agricultural insurance program are intended to explain this program comprehensively and symmetrically to many parties so that field implementation activities can be successfully conducted.

The agricultural insurance programs will only run well according to targets if all stakeholders have good and harmonious communication, cooperation, and coordination [7]. Communication (two-way), implementation of dissemination (programs), and coordination (activities) are the keys to the success of agricultural insurance programs. Communication between field officers and the implementing or insurance company is projected to achieve program implementation efficiency. Effective coordination encourages the increased performance of such agricultural insurance programs. The technical officials still need close coordination of agricultural insurance implementation, specifically with the farmers/farmers group at the field level. Special compensation in the form of incentives for implementing officers is recommended for coordination. The financing/expenditure mechanism for socialisation and promotion does not include compensation and incentives to field workers (extension workers and pest observers), while their contribution to the frontline is vital.

Socialisation and promotion of agricultural insurance programs need to include (a) effective implementation of scheduled programs in the field (registration/participation, incident reporting procedures, submission, and payment of claims), which is expected to make agricultural business risk transfer more effective; (b) preparation of agricultural insurance program socialisation materials/materials with the organiser's schedule and capacity; and (c) promotional activity planning includes the participation of all target farmers in the area concerned.

The AUTP scheme has been implemented to help farmers face losses due to farming risks. The benefits of being an agricultural insurance participant have been enjoyed by some farmers, although statistically, the size/extent or coverage of this insurance scheme since 2015 fluctuated. In the future, the development of insurance schemes that cover various strategic commodities needs to continue. The Center for Agricultural Socio-Economic Policy Studies, Ministry of Agriculture, has initiated and will continue its efforts to develop this insurance program through various in-depth analyses, evaluations, and reviews so that implementation can be recommended to improve the performance of the program. Preliminary studies on (a) chillies and shallots in 2017/18, (b) corn and soybeans in 2018, (c) sugarcane and cocoa in 2019, and (d) goats and sheep in 2019 are now available to develop appropriate insurance scheme products for the respective commodities [7].

Apart from encouraging the digitisation of the concept and implementation of the AUTP scheme through the SIAP application, the agricultural insurance program also utilises drone technology (remote sensing system) to further improve the quality of implementing such strategic commodity insurance schemes. The results of trials in various regions show the possibility of using this technology to create fairness and accuracy in the schemes. Meanwhile, integrating insurance schemes with agricultural financing schemes (KUR and
other inclusive agricultural financing schemes) can further encourage efforts to increase agricultural production and productivity [7].

Based on the concept presented in [8,15], important aspects to enhance the development of the AUTP scheme are proposed as an improved agricultural insurance architecture: (a) increasing data availability; (b) integrating farming business costs with insurance; (c) developing a more strategic commodity insurance scheme; (d) preparing alternative agricultural insurance models and supporting technology; (e) integrating insurance with agricultural development programs; and (f) increasing outreach, promotion, and advocacy activities.

4 Conclusions and policy recommendations

4.1 Conclusions

Through the Ministry of Agriculture, the government has launched a program to protect rice farming from risks from disaster events with the impact of global climate change, which causes drought, flood, and pest and disease attacks. The AUTP scheme was established to directly compensate farmers who experience farm losses due to crop failure. This scheme has been strengthened through formal legality to become a national agricultural development program.

The initiation and implementation of the AUTP program was initiated in 2015 through a wide-scale trial scheme, and the trial period ended in 2019. The AUTP scheme has been accepted by some farmers in various regions as a protection instrument through farmer premium incentives to obtain claims for AUTP losses resulting from floods, droughts, and pest attacks. However, the implementation of the AUTP is still faced with several obstacles, problems, and challenges to become a better program in its implementation and provide benefits to the community, especially insurance-participating farmers.

The steps taken by the government to implement digital applications to support the implementation of the AUTP scheme to support better performance have been pursued with the design of information management through the SIAP application. The research results revealed the use of advanced technology through drone applications to support data accuracy. It is essential to determine the location of farmers’ land to be insured and avoid disputes between farmers and insurance company officials on differences in data claims.

Learning from the AUTP implementation scheme, the competent institutions under the Ministry of Agriculture have considered the protection system for other strategic commodities. Referring to the AUTP scheme implementation model, initial studies for (a) chilli and shallot (2017/2018), (b) corn and soybean (2018), (c) sugarcane and cocoa (2019), and (d) goat and sheep (2019) have been conducted with their potential to implement specific insurance schemes. The design of this strategic agricultural commodity insurance scheme has been and will continue to be developed by the government or other parties. It is important to provide agricultural insurance products that could help farmers earn compensation when facing farm damage or failure.

4.2 Policy recommendations

The field implementation of the agricultural insurance program through the AUTP scheme is still engaged with various obstacles and challenges, especially efforts to encourage the participation of farmers. It has been revealed that the farmers obtained asymmetric information in understanding the scheme. Although the AUTP scheme has been claimed to
be simple, cheap, and easy to carry out, field experience shows that actual implementation is still confronted with some ambiguous and unclear information delivered to potential beneficiaries. Therefore, comprehensive socialisation, promotion, and advocacy with proper materials and good technical delivery should easily convince farmers about the benefits of joining rice crop insurance. The agricultural offices at local levels could take initiatives to conduct socialisation, promotion, and advocacy regularly based on comprehensive materials provided by the Ministry of Agriculture at a central level.

Implementing insurance schemes for other strategic crops is highly recommended to include more small farmers in farm risk protection. The potential strategic commodities to be considered in this insurance scheme are corn, chilli, shallots, and goats/sheep. The Ministry of Agriculture is positioned to immediately introduce these insurance schemes.

Integrating insurance schemes with agricultural financing schemes (KUR or inclusive agricultural financing) is highly recommended. This means that small-scale farmers can access the available credit package at which the insurance premium has been bound into the package. Moreover, the synergy of leading tasks and functions in the coordination roles and capacities of each institution should be well addressed to ensure harmonious communication among stakeholders for the successful implementation of the insurance scheme in Indonesia.

References

5. S. M. Pasaribu, I. S. Anugrah, J. Hestina, R. Shofiyati, and F. Dabukke, Evaluasi program asuransi pertanian dan rancangan implementasi asuransi usahatani tebu dan kakao (Indonesian Center for Agricultural Socio-Economic and Policy Studies, Bogor, 2019)
7. A. A. Sulaiman, Syahyuti, Sumaryanto, and I. Inounu, Asuransi pengayom petani: Pembelajaran dan arah pengembangan (n.d.)
10. S. M. Pasaribu and A. Sudiyanto, Agricultural risk management: lesson learned from the application of rice crop insurance in Indonesia in Climate change policies and challenges in Indonesia (Springer, Berlin, 2016)
11. S. M. Pasaribu, A. Sudiyanto, M. Landay, Siswoyo, and M. Ali, Pelaksanaan pilot
12. S. M. Pasaribu, Reformasi kebijakan menuju transformasi pembangunan pertanian (IAARD Press, Jakarta, 2014)
15. S. M. Pasaribu, Reformulasi arsitektur asuransi pertanian mendukung sistem pangan berkelanjutan (IAARD Press, Jakarta, 2021)