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Bundled Weather Index Insurance Pilot for Drought-Affected Areas in Sri Lanka: Reaching Marginal Farmers

Mohamed Aheeyar, Kalani Samarakoon and Sanjiv de Silva

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Contents

Summary

Drought is an almost annual phenomenon in Sri Lanka, occurring at varying degrees of severity and affecting many parts of the country. These droughts cause significant damage to agriculture and other economic and social activities. This paper assesses the effectiveness of satellite-based weather Index insurance (WII) bundled with real-time climate and agronomic advisory services provided to farmers' mobile phones. The aim is to enhance the drought resilience of diverse groups of farmers by providing solutions and strategies to extend bundled insurance products to more people and address equity issues.

In this pilot, an insurance product was introduced to farmers in a village in the North Central Dry Zone of Sri Lanka. WII products are seen as a part of the solution to reducing farmers' risk to climate change. However, in many places, the structure of insurance schemes in the agriculture sector has failed to reach small-scale and marginal farmers who are most in need of risk transfer mechanisms. Based on a farmer survey, we extracted lessons from implementing a bundled insurance scheme as a pilot project to explore the utility of farmer organizations as an entry point for engaging different farmer groups and ensuring they can understand the WII insurance products and can make informed choices.

The survey results show that efforts made at the outset to understand contextual issues and challenges contributed to an effective product design and rollout approach. The rollout was more effective due in part to a partnership with an established local organization while adopting an aggregator model. Covid-19 mobility restrictions prevented full implementation of the rollout.

Index insurance bundled with mobile weather and agronomic advisories increased farmer resilience and reached diverse groups. Farmers emphasized that being able to assess the costs and benefits based on understanding how key elements of the product work is key to their future engagement with such products, which highlights the importance of investing in awareness raising through a blend of print, verbal and visual tools that make complex products understandable to stakeholders with low levels of literacy.

Bundled Weather Index Insurance Pilot for Drought-Affected Areas in Sri Lanka: Reaching Marginal Farmers

Mohamed Aheeyar, Kalani Samarakoon and Sanjiv de Silva

Introduction

Continued global warming is projected to further intensify the frequency and severity of disasters across the globe, especially global monsoon precipitation and the severity of wet and dry events (IPCC 2021). Sri Lanka was ranked in second and sixth positions on the Global Climate Risk Index of 2017 and 2018 (Eckstein et al. 2019). Agriculture is an important sector in Sri Lanka's economy, accounting for 7% of gross domestic product (GDP), 27% of the labor force, and 23% of export earnings in 2020 (CBSL 2020). Over 75% of the country's population lives in rural areas with a high dependency on agriculture for their livelihoods (IFAD 2017). Climate change effects are more severe for smallholder and marginal farmers who are resource-poor and lack the adaptive capacity to build climate resilience.

Most people in poverty-stricken groups are smallholder farmers, landless farmers (including youth and women), and people engaged in micro-enterprises. About 42% of all landholdings cultivated by farmers in Sri Lanka are less than 0.4 ha and 82% are less than 1 ha, while 27% are landless farmers.[1] Smallholder and landless farmers cultivate land under different land tenure arrangements such as owner-operator, sharecropping, leased-in, mortgage-in, rent-in, and unauthorized cultivation on government lands. There are other vulnerable groups such as women-headed households, ethnic minorities, and socially underprivileged groups. Traditional norms give privilege to men, resulting in additional constraints to women's equitable access to land and capital, including credit, markets and control of assets (IFAD 2017).

Except for the tsunami disaster of 2004, drought has historically been the most significant hazard in terms of people affected and relief provided (Zubair et al. 2006). Drought is an almost annual phenomenon at varying degrees of severity affecting many parts of the country, causing significant damage to agriculture and other economic and social activities. High-intensity droughts are experienced at intervals of three to four years (Prasanna 2018). Droughts are the cause of the most damage to agriculture. Droughts weaken agricultural production, food security and the investment capability of farm households, and increase expenses related to healthcare (Prasanna 2018). The severity of droughts is high in the dry zone which is two-thirds of the country's total land area.

The role of crop insurance is well recognized in minimizing climate-induced shocks and vulnerabilities (FAO 2011). Insurance products transfer the risk of crop losses to a third party in exchange for an agreed premium that protects farmers from possible devastating losses. The resilience of vulnerable farmers living in the drought-prone districts of the country could be increased considerably through insurance enrollment. Crop insurance also helps stabilize farmers' income by reducing the impact of adverse climatic shocks and gives farmers the needed confidence to adopt improved technologies and high-input agriculture that can lead to higher productivity and more efficient use of natural resources.

The macro-level fiscal impacts of disasters and non-coverage of vulnerable communities in risk transfer programs such as insurance are highlighted in the Sri Lanka National Disaster Risk Management Plan 2018–2030. The first crop insurance piloted in Sri Lanka dates back to 1958 (Sandaratne 1974), and several insurance pilots and national level crop insurance programs have been implemented over the last five decades. The government introduced a compulsory bundled crop insurance scheme with the existing fertilizer subsidy program in 2013. In 2016, the government announced the National Loan Protection Scheme to compensate loanee farmers (the farmer with a loan) for any crop damage. However, it has been reported that the level of uptake of crop insurance programs is low (CBSL 2017; Wickramasinghe 2019). The reasons for the low penetration of these conventional indemnity insurance products are: (i) lack of awareness of insurance, (ii) lack of trust in insurance providers, (iii) high transaction costs, (iv) delay in indemnity payments, and (v) lack of transparency in loss assessments (Rambukwella et al. 2007; Wickramasinghe 2019).

Weather index insurance (WII) is recognized as an innovative product that can address the many issues associated with conventional insurance schemes. It is a cost-effective way of safeguarding against climate uncertainty, thereby protecting smallholder families from food insecurity and hunger and giving them the confidence to invest in and improve their farming enterprises (Bryla and Syroka 2007; Delavallade et al. 2015; Manojkumar et al. 2003). Index insurance products are based on a specific weather-related parameter with a close correlation

[1] http://www.statistics.gov.lk/Agriculture/StaticalInformation/CensusOfAgriculture/NumberAndAreaOfAgricultureHoldingsByAllSectorsAndbyDistrict

to crop losses. For example, rainfall is measured in a specific location for a given period and compared with pre-determined threshold levels to determine if a claim should be paid depending on whether there was a deficit or excess rainfall.

The first pilot of WII was implemented in Sri Lanka in 2010 by a private company, SANASA General Insurance Company Ltd. The government Agricultural and Agrarian Insurance Board (AAIB) has also implemented WII products on an experimental basis. However, the low density of weather stations and lack of quality and timely weather information was challenging given the variations in local microclimates. These variations determine the base risks in WII products (Wickramasinghe 2019).

Bundled Insurance Solution Piloted by IWMI and the Rollout Process

In the 2020–2021 wet season, the International Water Management Institute (IWMI) piloted an advanced weather index insurance product using satellite technology and advanced modelling in Dunumadalawa village, Galenbindunuwewa Agrarian Service Division, Anuradhapura district. The pilot targeted 120 rainfed maize farmers in the village. The product was designed to provide compensation for losses that could occur due to both deficit and excess rainfall. The farmers in the village depend fully on local rainfall for cultivation. Therefore, they are highly vulnerable to the effects of climate variability and the level of risk has been high. To help address these vulnerabilities, IWMI is working with the Department of Agrarian Development and a local insurer, SANASA General Insurance Company Ltd., to improve the resilience of farming communities by promoting bundled insurance solutions. The partnership between IWMI and SANASA also aims to increase the engagement of private insurers in managing climate risks.

At the start of the project, the research team made two reconnaissance visits to the project area to understand the village profile and institutional arrangements and discuss equity and inclusive issues. A baseline survey was conducted to describe social stratifications, farming systems, and other socioeconomic dimensions.

The farmers in this village were cultivating maize during the wet season of 2020–2021 and therefore the insurance product was designed for maize crops. Bundled insurance interventions in other countries have been more effective than introducing WII as a standalone product (Ajayi and Kadzamira 2020). The bundle comprised index insurance, context-specific local weather alerts twice a week at three- to four-day intervals, and weekly agronomic advisories provided throughout the wet season. Providing weather and agronomic advisories improved farmers' climate resilience and capacity to understand climate variation and enhanced their knowledge of standard agronomic practices that would help build resilience.

The village has both Sinhalese- and Tamil-speaking communities. Therefore, text messages were developed in both local languages and sent directly to mobile phones. Baseline findings indicated that about 92% of these farmers are using mobile phones, but only 20% have smartphones. Therefore, the project provided a text message service instead of using social media, which requires a smartphone.

The bundled insurance product was intended to increase farmers' resilience to climate vulnerabilities and increase productivity and income. Because of the limited resources available, the insurance covered a maximum of one acre per beneficiary (1 acre = 0.4 hectares). The pilot was fully subsidized, and the premium was paid by the project. The insurance bundle was distributed through a local farmer organization rather than at the level of individual farms (Box 1). The project benefited 115 farm families.

Box 1. Farmer organizations.

Farmer organizations are legally registered voluntary organizations created under the provisions of the Agrarian Services Act No. 58 of 1979 for the benefit of farmer members in a given geographical area. Farmer organizations are managed by an executive committee appointed by its members, which consists of a president, secretary, treasurer, vice president, assistant secretary and a few committee members. They mainly deal with agricultural enterprise requirements including the assessment of agricultural inputs, credit services, group marketing, marketing farm products, management of natural resources, organizing capacity building, farmer empowerment programs, and coordinating farmer needs and technology requirements with line agencies. The Department of Agrarian Development has the authority to monitor and audit farmer organization activities.

Insurance company staff visited the village and organized a community meeting with the help of farmer organization leaders. Features of the insurance product and the benefits were introduced. Since this farmer organization is a well-established and trusted community organization, farmers who attended the meeting were convinced and trusted the project. Special focus was given to inviting women farmers, women-headed households, landless farmers, farmers of different ethnicities and young farmers to the awareness meeting for the enrollment process by educating leaders on the approach of inclusive insurance. Local leaders and insurance company staff helped the farmers complete the documentation procedures. This paper presents the lessons and experiences of the pilot in terms of the design of the product, the effectiveness of the bundled solution, the rollout process, and the level of inclusiveness.

Objectives

The major objectives of this study were to assess the effectiveness of a bundled insurance solution piloted in Sri Lanka in enhancing the resilience of diverse groups of farmers to droughts and provide solutions and strategies to address equity issues. The specific objectives of the study are given below:

1. Understand the socioeconomic features of the beneficiaries and gender and power relations at the household level in relation to insurance ownership and how payouts are used.

2. Study the effectiveness of agronomic and climate advisories provided and associated climate resilience effects.

3. Understand farmer perceptions of the bundled insurance product design, rollout, and payout process.

4. Identify challenges associated with upscaling the bundled insurance product and ways to improve the product.

5. Assess the willingness of farmers to enroll in a bundled insurance program and what premium they would be willing to pay.

Methodology

A telephone survey was conducted in May 2021 among a sample of farmers using a pre-tested structured questionnaire. The study team could not visit the site for face-to-face interviews due to Covid 19 pandemic travel restrictions. The results are complemented by baseline information collected from qualitative and quantitative assessments in the pilot areas through a sample household survey, key informant interviews and focus group discussions in 2020 before the product rollout.

Interviews with officials from the Department of Agrarian Development, Irrigation Department and farmer organization leaders were conducted to understand their perceptions of drought impacts, strategies and coping mechanisms adopted to minimize adverse impacts and the roles of institutions in disaster recovery activities.

The sample survey was conducted among 40 farmers selected from the Dunumadalawa village in the Galenbindunuwewa Division. The study villages are illustrated in Figure 1. The sample households were stratified into three categories that included women, smallholder, marginal and landless farmers:

a. Farmers who benefitted from both WII and agronomic and climate advisories (15 farmers).

b. Farmers who benefitted from WII but did not receive the phone advisory services (15 farmers)

c. Farmers who did not enroll in the WII program (10 farmers representing both men and women farmers).

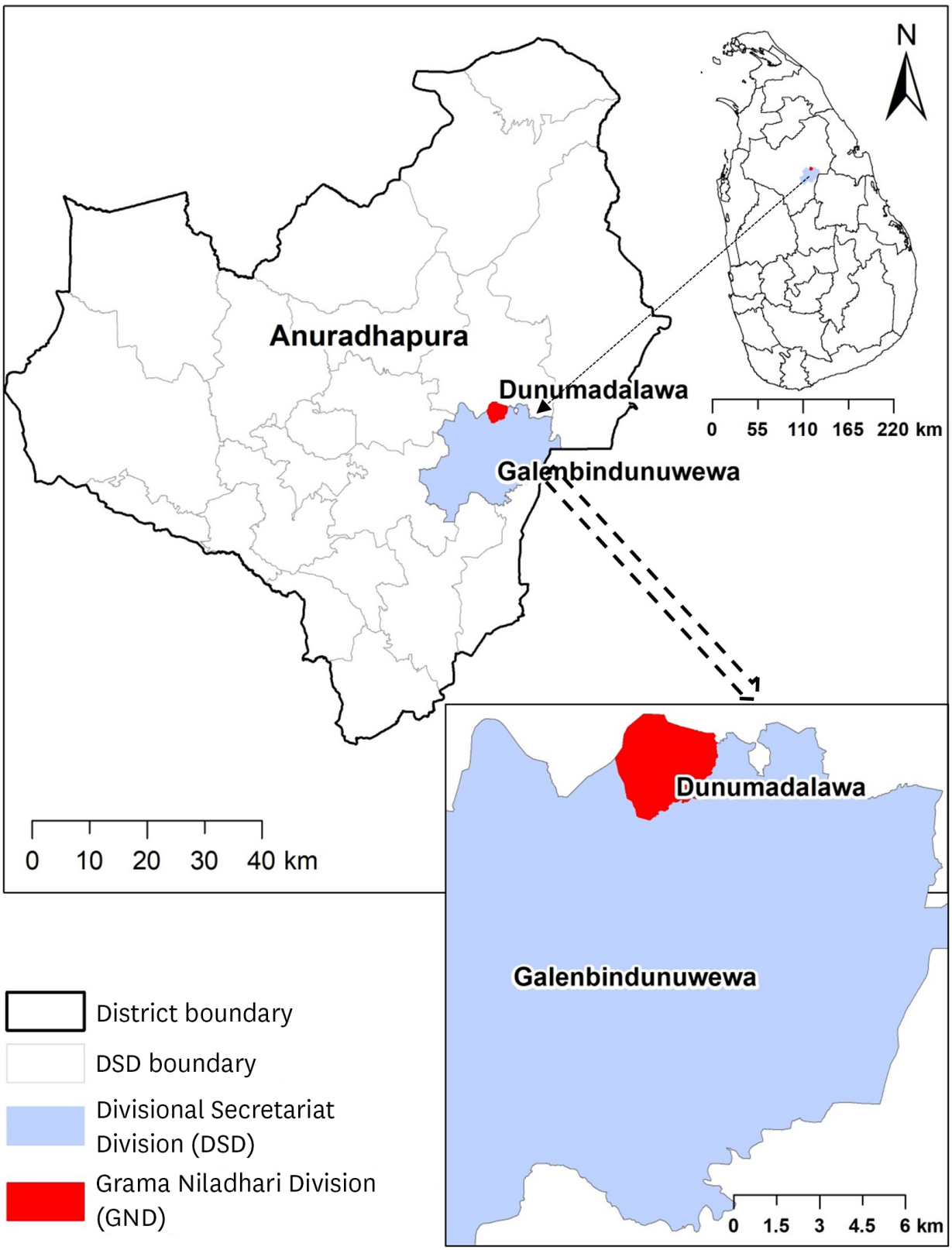

Figure 1. The study area – Dunumadalawa village, Galenbindunuwewa, Sri Lanka.
Design: Map showing pilot village prepared by Niranga Alahacoon (IWMI).

Socioeconomic Features of Insured Farmers

Based on the knowledge generated from the baseline survey and initial reconnaissance visits, we identified contextual issues, farmer classes, and the main socioeconomic dimensions that may affect the inclusive enrollment of farmers in a bundled insurance scheme. Smallholder and landless farmers constitute the majority of farmers in the village. Both men and women farmers owned land. The selected village had two ethnic communities, Sinhalese and Muslims. Muslims were in the majority. Age and level of literacy differences were evident and may have influenced the level of understanding of the WII product and the advisories provided.

Contextual issues were taken into consideration in enrolling farmers in the pilot. From a business perspective, private insurers are generally not keen to engage smallholders in dispersed remote areas due to the high transaction costs and payout rates compared to the potential revenue. To address this issue, the project adopted an aggregator model that did not involve individual farmers buying insurance or buying through an agent. Instead, group insurance was sold covering the targeted farmer group through a partnership with the local farmer organization. This aggregation model reduced the transaction cost of reaching individual farmers. Aggregation diversifies the insurer's portfolio while ensuring many farmers enroll. In this model, the insurer can collect premiums and settle claims through the farmer organization. Another advantage was the inclusion of landless farmers whose cultivation was certified by the farmer organization. Landless farmers have struggled to be included in insurance programs in the past (Aheeyar et al. 2019, 2020).

The survey findings show that the project included 40% of women farmers in the program, of which 46% were household heads. The project ensured the inclusion of 27% of Sinhalese farmers.

The age distribution is illustrated in Figure 2. About 67% of the sample farmers are less than 45 years of age indicating greater inclusion of young farmers in the pilot stage. Cultivation of maize crops under a buyback model through private traders is providing assured income that has motivated young farmers to take up farming. The majority of the beneficiary farmers had less than 20 years of farming experience (Figure 3).

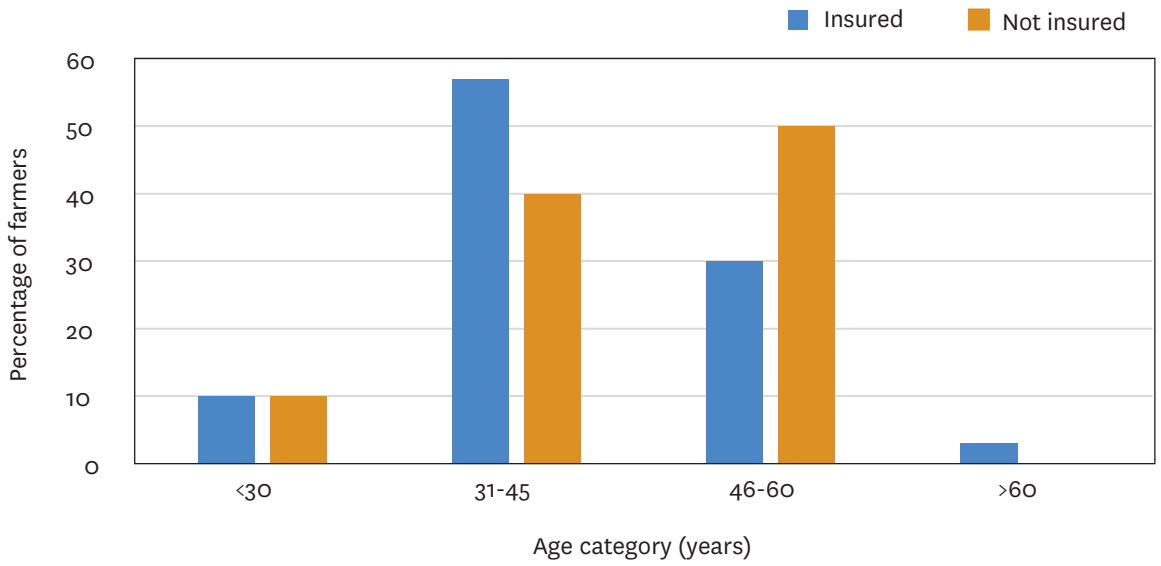

Figure 2. Age of sample farmers (N=30).
Source: Authors' survey, 2021.

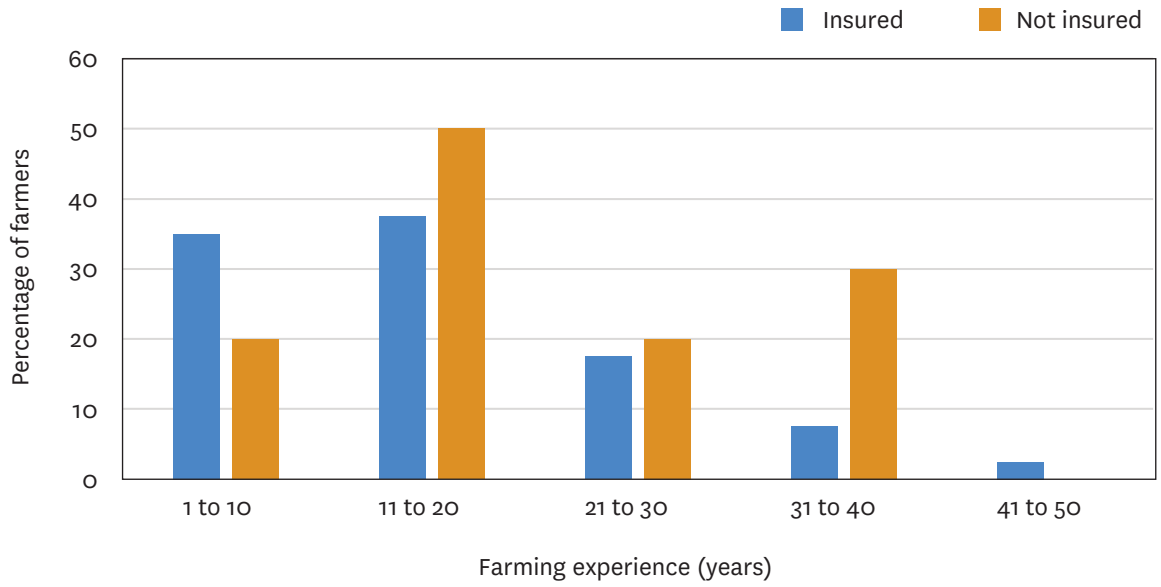

Figure 3. Experience of sample farmers (N=30).
Source: Authors' survey, 2021.

The level of literacy is high. A little more than half the farmers have tertiary level education or above (Figure 4). The level of education is seen as a factor in making it easier to promote a WII product. However, given the technical nature of the product, many farmers highlighted the importance of providing detailed information on the trigger points to better understand interventions. Meanwhile, awareness-raising agents need to communicate with the community in a way that is accessible to all, regardless of educational attainment.

The data on land ownership of the insurance beneficiaries show another feature of inclusion which is the enrollment of landless farmers in the program (Figure 5). The project enrolled about 57% of landless farmers. Most highland cultivators are using government land or land under various tenancy agreements for maize cultivation.

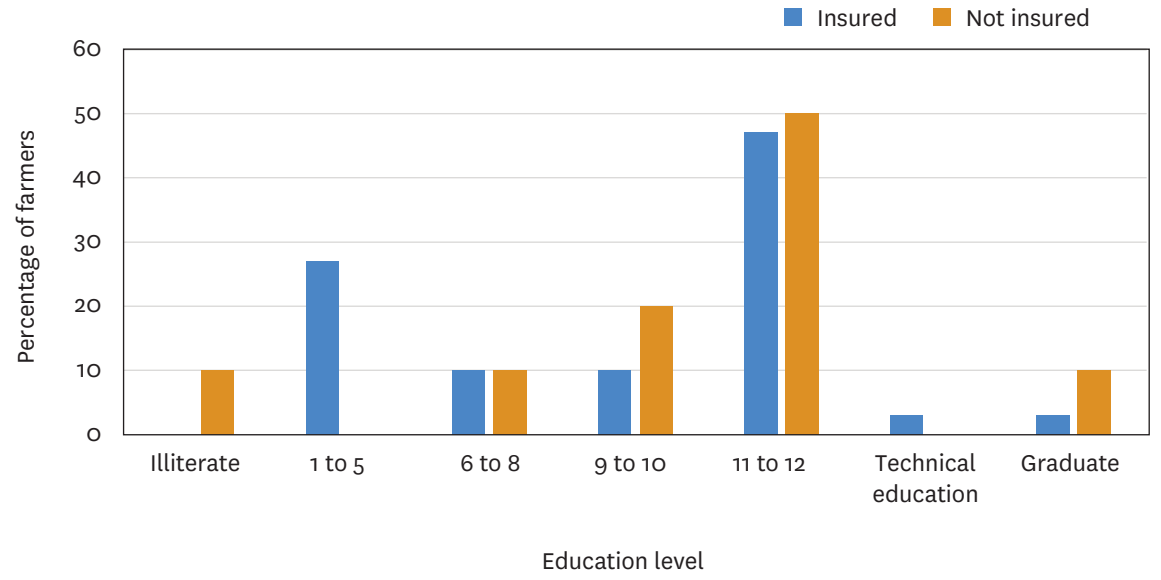

Figure 4. Education level of farmers (insured N=30, not insured N=10).
Source: Authors' survey, 2021.

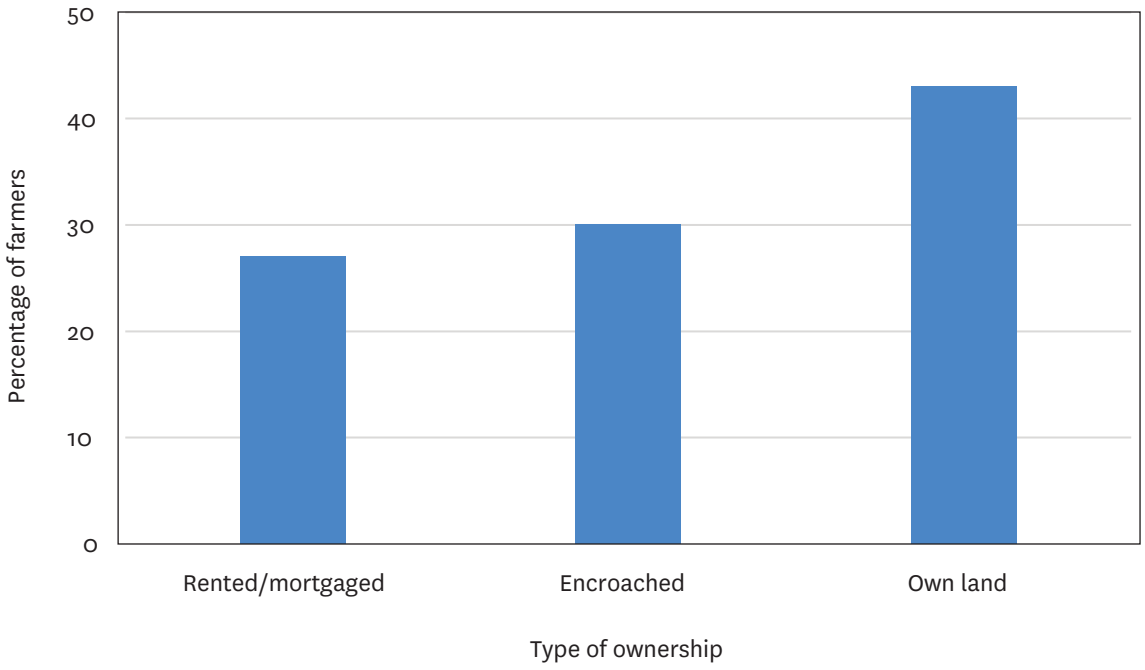

Figure 5. Type of land ownership of insured farmers (N=30).
Source: Authors' survey, 2021.

Nearly 80% of the insured farmers own comparatively more highland areas, but non-insured farmers owned larger areas of lowland paddy (Table 1). This was expected because the bundled insurance product was targeted at maize crops cultivated in the highlands.

About 50% of the farmers depend primarily on agriculture as their main household income, but the remaining half are part-time farmers and depend on other sources for their primary income (Figure 6). Small landholdings and single-season cultivation in a year, as determined by the rainfall pattern in the rainy season, are the major reasons for not depending on agriculture alone.

The findings show that age appears to be a factor with younger farmers with less experience having more interest in crop insurance. This may be due in part to their having less experience and thus interested in enrolling in a risk transfer mechanism. A comparatively higher level of understanding of climate change shocks and the latest technologies may also be reasons for their higher interest. The primary source of income is agriculture for half the insured farmers, indicating their vulnerability and interest in risk transfer mechanisms. The other half have diversified income sources.

Table 1. Average cultivated land area.

Type of farmer	Highland average (acre)	Lowland average (acre)
Insured	2.86	2.03
Not insured	1.75	3.17

Source: Authors' survey, 2021.

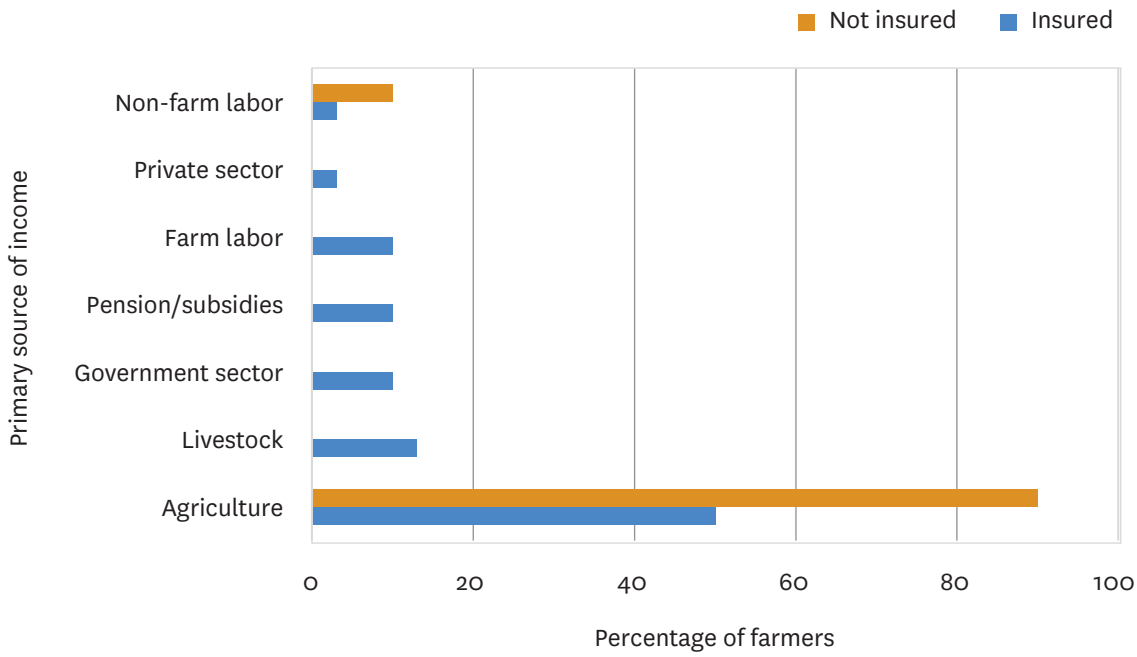

Figure 6. Primary source of household income (insured N=30, not insured N=10).
Source: Authors' survey, 2021.

Household-level Decision-making Process from a Gender Perspective

Disaster-induced crop damage has led to changes in routine working patterns and intra-household resource allocation priorities. Sometimes, men and women may have to undertake activities and roles in which they were not previously engaged. It has been found that climate change differentially affects the poor, women and children, and has disproportionate impacts on their nutrition status (Alderman 2010). Existing gender inequalities are likely to intensify with increases in climate change (Denton 2002). In disaster situations, men in the village have to focus more on off-farm activities or migrate to urban centers seeking alternative income sources while women have to shoulder a heavier workload in the field to fill the labor gap while still managing household work, childcare and changing livelihood strategies due to significant redistribution of work. Usually, women have to play a dual role as family caretakers and take up leadership roles in farming activities. The role of women in rearing livestock is prominent during droughts, especially for feeding animals. Similar differences have been reported in many past studies (Djoudi and Brockhaus 2011; Chindarkar 2012; Ram et al. 2013). Coping strategies employed by both men and women in response to climate-related shocks are significantly different (Ringler et al. 2014).

About 80% of the land ownership is with male farmers who undertake most of the cultivation work. However, the role of women in supporting farming activities is evidenced from the early stage of land clearing to the end of harvesting and post-harvesting activities. Women play a dominant role in the post-harvesting phase by cleaning and separating maize seeds from cobs, sun drying, packing and storing. Women's role in farming activities is significant as their engagement is labor intensive. All these smallholdings are fragmented and dispersed. These farmers sell their produce soon after the harvest due to a lack of knowledge on post-harvest technologies, absence of storage facilities, and the ability to get immediate cash to settle debts.

Figure 7 illustrates the role of men and women in cultivation activities. The findings show that most households undertake cultivation activities jointly with contributions from both men and women. The decisions related to agricultural production are taken by the male members of households, but the role of women in decision-making solely or jointly was reported by around half of the insured households (Figure 8). A similar pattern was observed in managing and controlling agricultural income earned by the insured households (Figure 9).

Farmers were asked who made the decision to enroll in the WII program or would make the decision in the future. Men make the decision unilaterally in almost half the households, but women play a role in the remaining half (Figure 10). Joint decisions are usually taken in household discussions but often men make the final decision. Therefore, efforts targeting women farmers, who are in charge of farming, and women-headed households are critical in addressing equity issues in designing and implementing interventions.

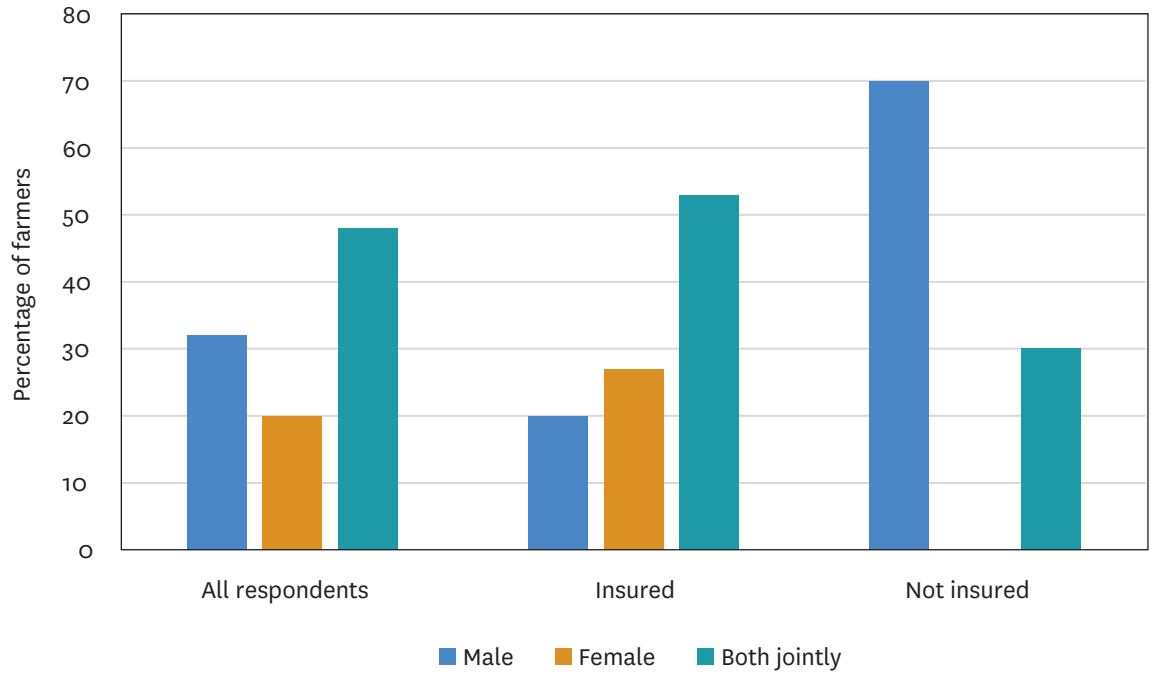

Figure 7. Who does most of the cultivation work? (insured N=30, not insured N=10).
Source: Authors' survey, 2021.

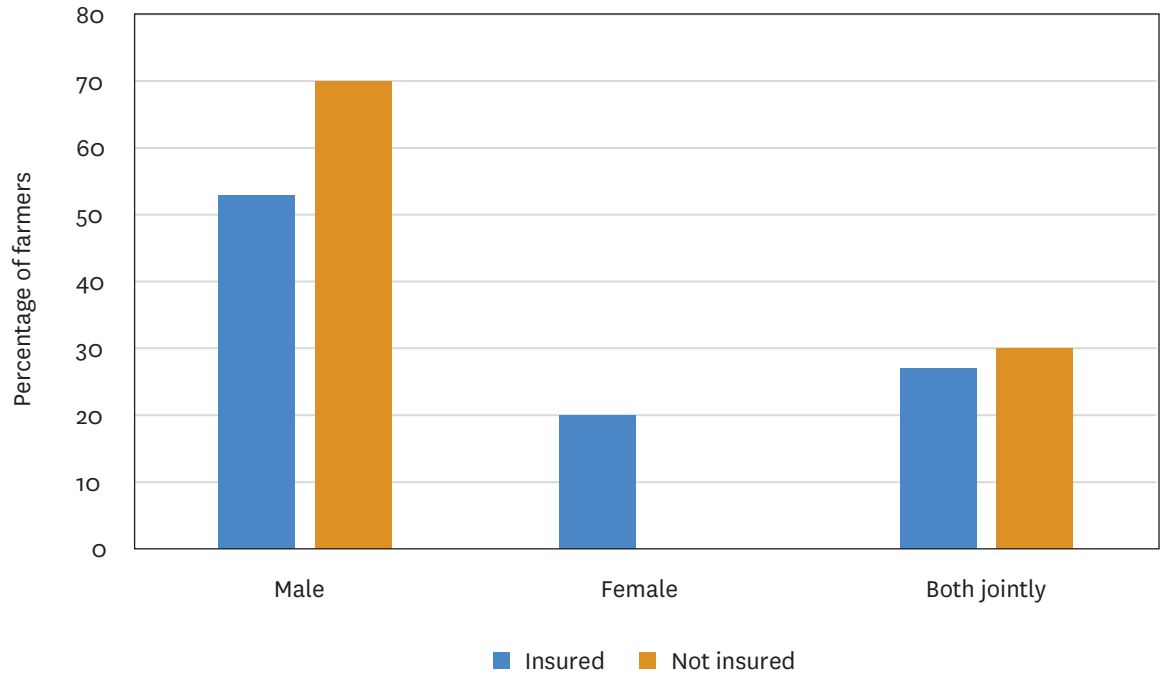

Figure 8. Decision-making in agricultural production (insured N=30, not insured N=10).
Source: Authors' survey, 2021.

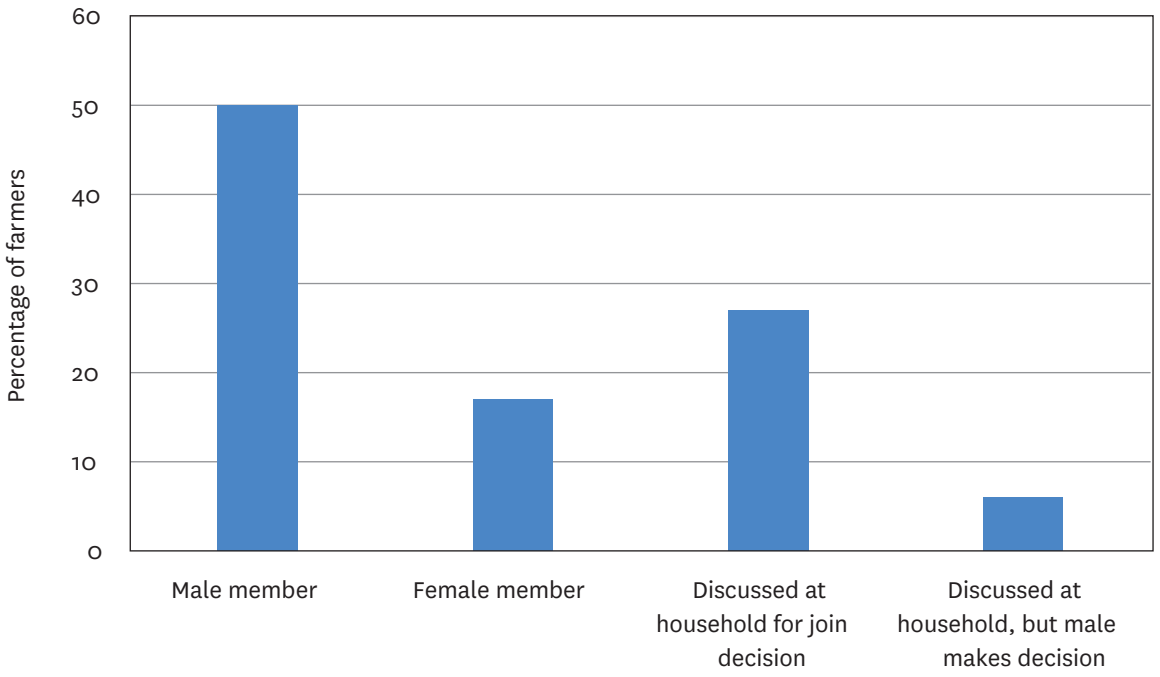

Figure 9. Who controls most of the income? (insured N=30, not insured N=10).
Source: Authors survey data, 2021.

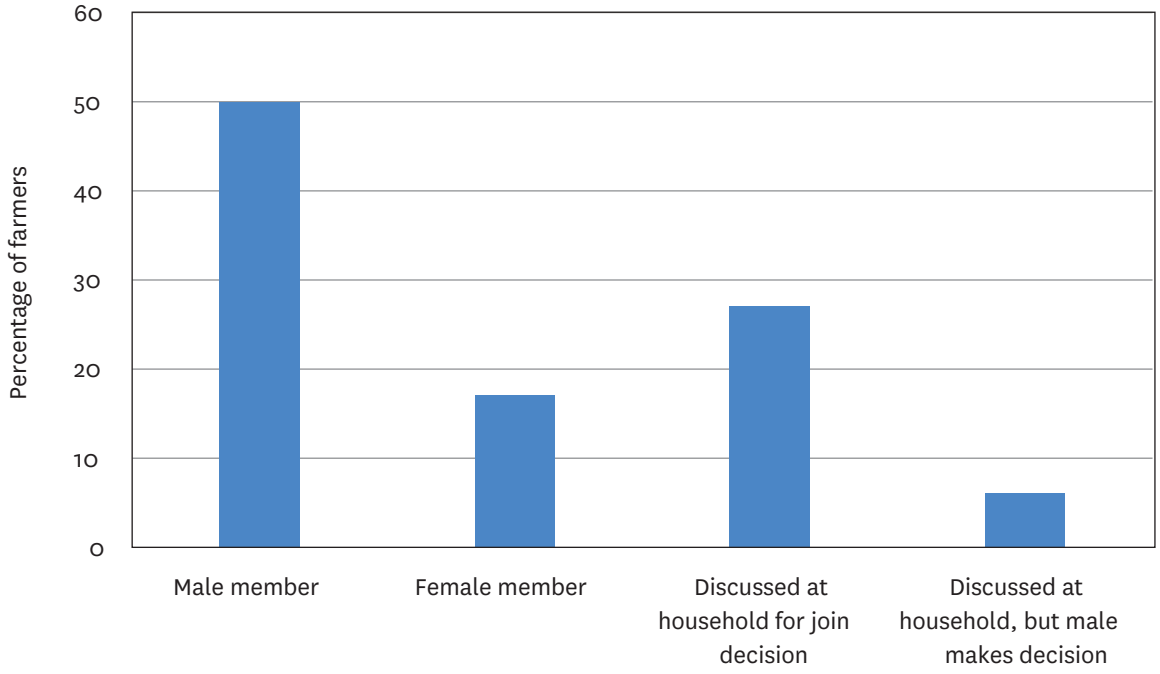

Figure 10. Decision-making to buy WII (insured farmers N=30).
Source: Authors survey data, 2021.

The insurance policy was bought in the name of male household heads in 60% of the insured households, while 30% of women members received the insurance policy in their names as they are the landowner, or they manage cultivation in the absence of a male counterpart (Figure 11). The insurance holder was a woman household head in 7% of the insured households.

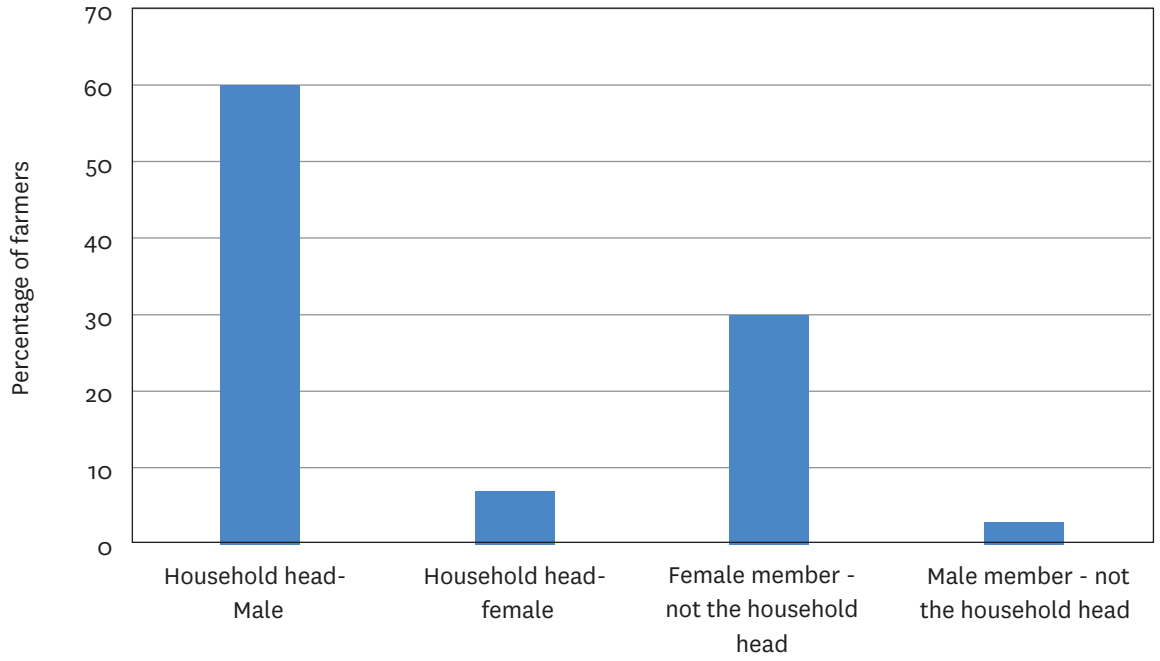

Figure 11. Ownership of insurance policy (N=30).
Source: Authors survey data, 2021.

Crop Insurance as a Risk Transfer Tool: Past Experiences

As expected, farmer enrollment in bundled insurance is comparatively higher for those with past crop insurance experience (Figure 12). All these past insurance experiences are associated with compulsory government insurance programs bundled with a fertilizer subsidy to cover paddy cultivation conducted on legal land. The survey findings show that 90% of the non-insured had no past insurance experience. One of the major reasons for the low level of enrollment in crop insurance was the requirement of legal land documents for enrollment.

Among the past crop insurance beneficiaries, only half had received any compensation despite the damage caused by droughts. Those who received compensation said that although the claim provided in the past was insufficient to compensate for the damage, it had provided some immediate relief.

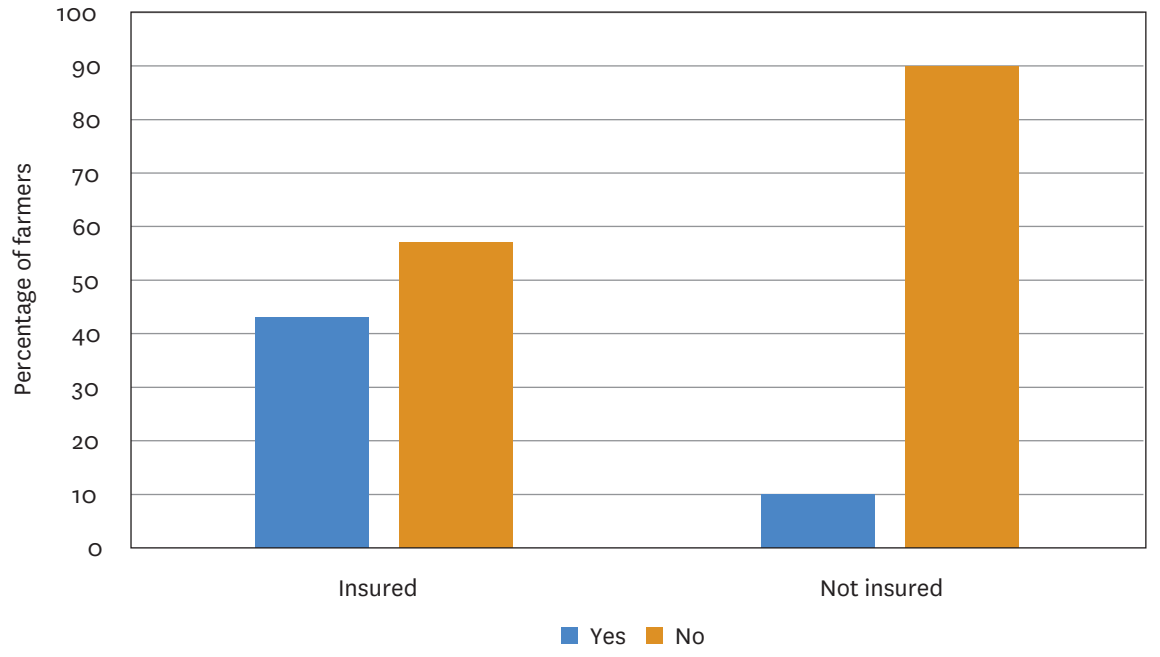

Figure 12. Past insurance experience of the sample farmers (insured N=30, not insured N=10).
Source: Authors' survey, 2021.

Awareness and Perception of Index Insurance Rolled Out in the Area

Figure 13 shows how farmers learned about the insurance product. About 73% received the message through a community meeting organized by the farmer organization with the participation of staff from SANASA Insurance Company. The farmer organization leadership played a key role in mobilizing farmers and creating an opportunity for them to engage and interact with the insurer. The farmer organization also helped the project disseminate information throughout the farming community.

The results indicate that 80% of the sampled farmers were informed about the index insurance rollout in the village by SANASA Insurance Company at the meeting organized by the farmer organization. About 88% of the non-insured farmers had not heard about the project, indicating a gap in the awareness-raising process. Since the project introduction was largely limited to a one-time community meeting organized at the initial stage, the farmers who were unable to attend the meeting did not receive the information. Only the farmer leader was aware of the detailed features of the insurance, such as how the insurance would provide benefits in case of crop damage and the sum insured. This farmer leader understood that he would be entitled to make a claim if there was excess or deficit rainfall, but not the trigger points, insurance coverage, or other product features.

Eighty-three percent of the insured farmers said the features of the insurance product were formally explained to them only once at the meeting organized by the farmer organization and the remaining farmers could not attend the meeting. The results highlight the importance of awareness raising to ensure farmers fully understand the product. Even though the trigger points were explained to them in the rollout, they could not remember.

Addressing the lack of clarity about weather index insurance is vital and there needs to be a comprehensive plan to empower the beneficiaries to make informed decisions and avoid unrealistic expectations. The farmer organization approach should not be used simply as a risk mitigation strategy by the insurance company. Instead, it should be a way to ensure farmers understand the product well enough to make informed decisions.

One thing that hindered the awareness-raising process during the pilot period was the Covid-19 pandemic that prevailed throughout the season, and the travel restrictions and lockdown conditions that prevented meetings and gatherings. However, a similar lack of clarity and understanding of index insurance products have been reported in previous interventions implemented under different programs (De Silva and Aheeyar 2017; Aheeyar et al. 2019, 2020). The findings indicate the necessity of rigorous community mobilization and targeted awareness programs with due consideration to the context. MiN, AII and IAIS (2017) reported that *"Farmers who receive fully subsidized insurance are often not even aware that they have insurance. Index insurance is more complex to understand*."

Considering the high level of literacy in the village, there is an opportunity to effectively use print materials such as leaflets and posters along with videos to build awareness of the project and the product features. The survey results also show that farmers are demanding the use of multiple methods to raise awareness with due consideration to the varying levels of literacy, skills, diversity, cultural backgrounds and convenience of the farmers (Figure 14). About 10% of the farmers preferred to receive text messages on their phones about insurance features and related alerts. The capacity of the farmer organization could be built on WII through implementing training of trainers of selected farmer organization representatives or other farmers to create broader awareness and troubleshoot problems with the project in the village. Providing an incentive to the farmer organization from the insurance project would more effectively incentivize farmer organization engagement.

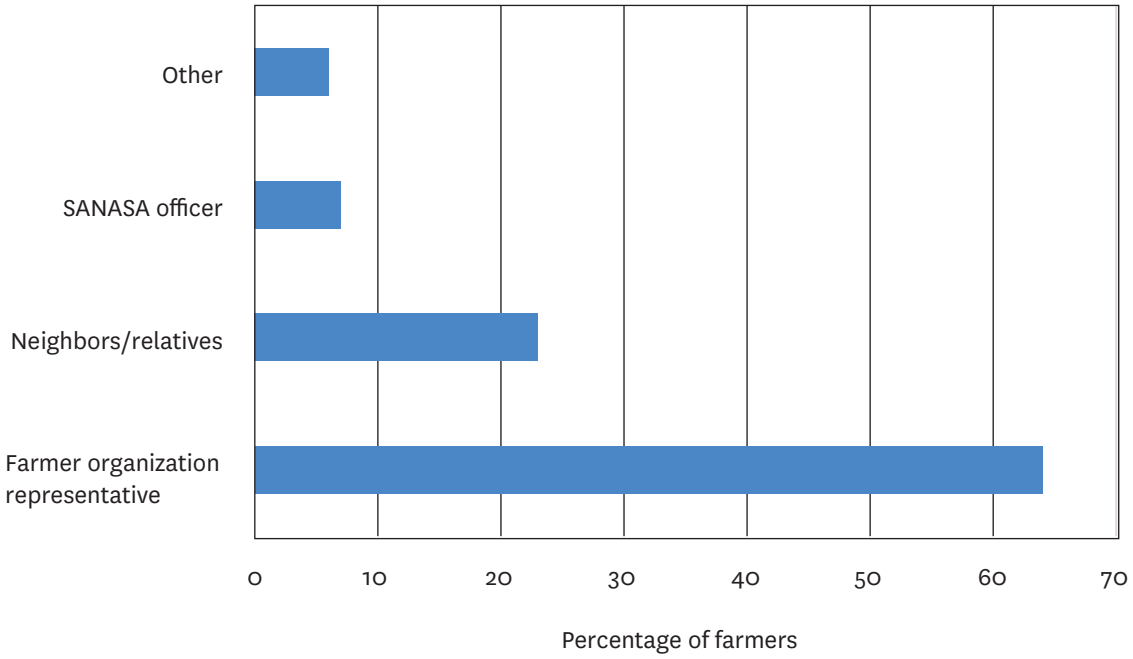

Figure 13. How farmers learned about WII (N=33).
Source: Authors' survey, 2021.

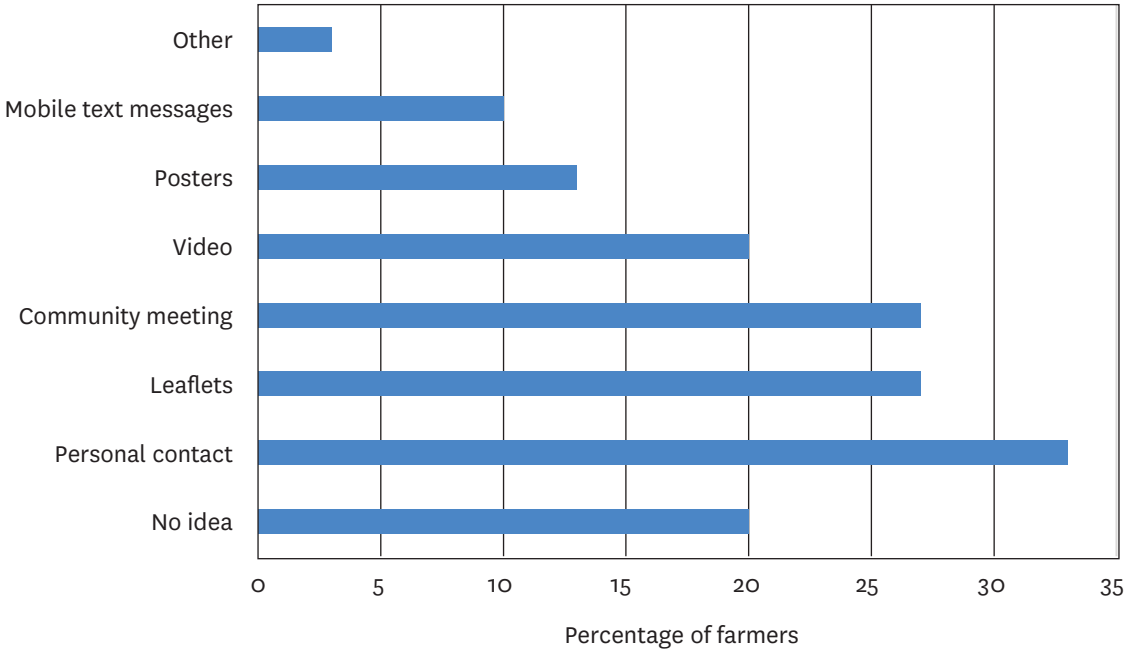

Figure 14. Insured farmers' preferred methods to receive information on WII (N=30).
Source: Authors' survey, 2021.
Note: Due to multiple answers, percentage adds up to more than 100.

Farmers were asked why they accepted index insurance despite their poor understanding of the product. Insured farmers expressed various objectives and motives for their engagement. As shown in Figure 15, 30% of the farmers were influenced by their neighbors and 23% believed that crop insurance would help them transfer drought risk to a third party. The findings emphasize the critical importance of educating people about the insurance concept to ensure they understand that insurance is a risk transfer tool. Although the insurance was fully subsidized in the pilot, only 10% said they were interested in it as a free product.

Over 70% of the farmers lacked an understanding of the type of risk covered by the insurance (Figure 16). The findings are in line with the earlier results showing that the majority of the farmers did not know the product features. These results further underscore the limited awareness of the product. Farmers in this region are experiencing various crop production perils in addition to climate risks. A beneficiary farmer said, *"We have so many crop production issues such as crop damage caused by elephants, mice digging holes in the field, fall armyworm problems and seed quality issues."* As explained by Ceballos and Robles (2020), farmers have a general expectation that they can cover all crop-related risks from one insurance product, but index insurance products are not one-size-fits-all products that cover all calamities. Adding multiple perils in a single insurance package would increase the premium cost and make it unaffordable to smallholders. Smallholder farmers are often satisfied with less coverage for a lower premium and may prefer products with varying coverage. Farmers generally start off purchasing insurance with low coverage and gradually move up as they come to trust the system and are more affluent (Al-Maruf et al. 2021). Farmers should be clear that drought is the major production risk affecting their livelihoods and needs to be covered by insurance.

The subsidized bundled insurance package covered a maximum of one acre per farmer to reach the maximum number of farmers (1 acre = 0.4 hectares). Since the majority are cultivating more than one acre, the overall level of satisfaction on area coverage by the insurance scheme was relatively low (Figure 17).

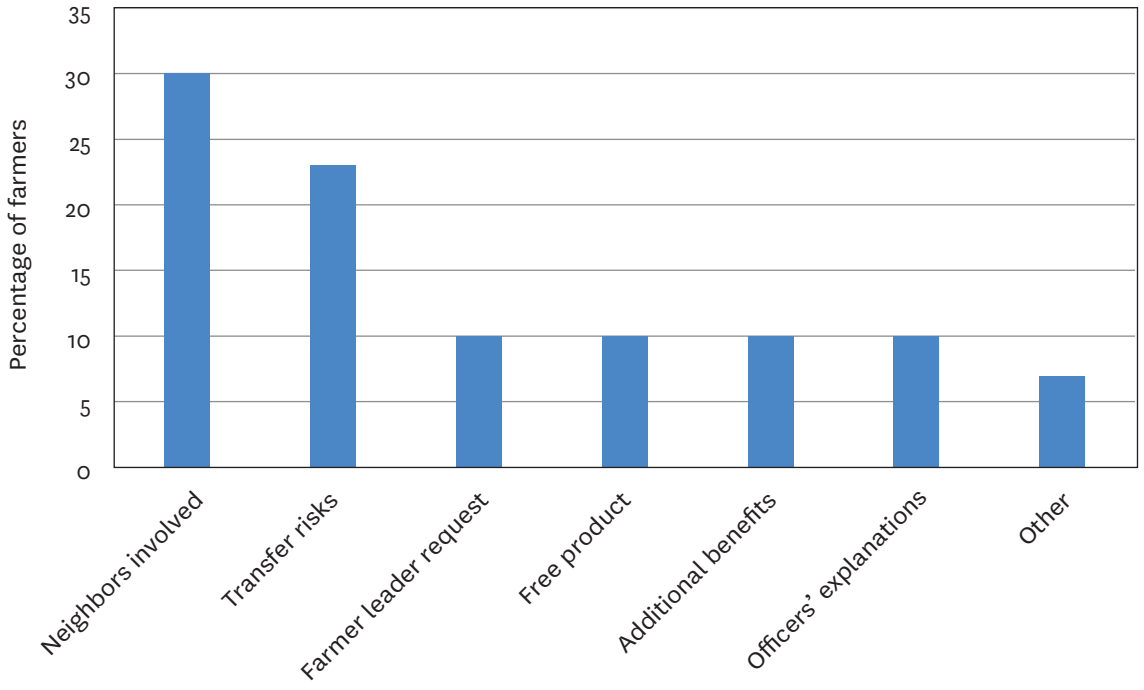

Figure 15. Objectives behind the insurance enrollment (N=30).
Source: Authors' survey, 2021.

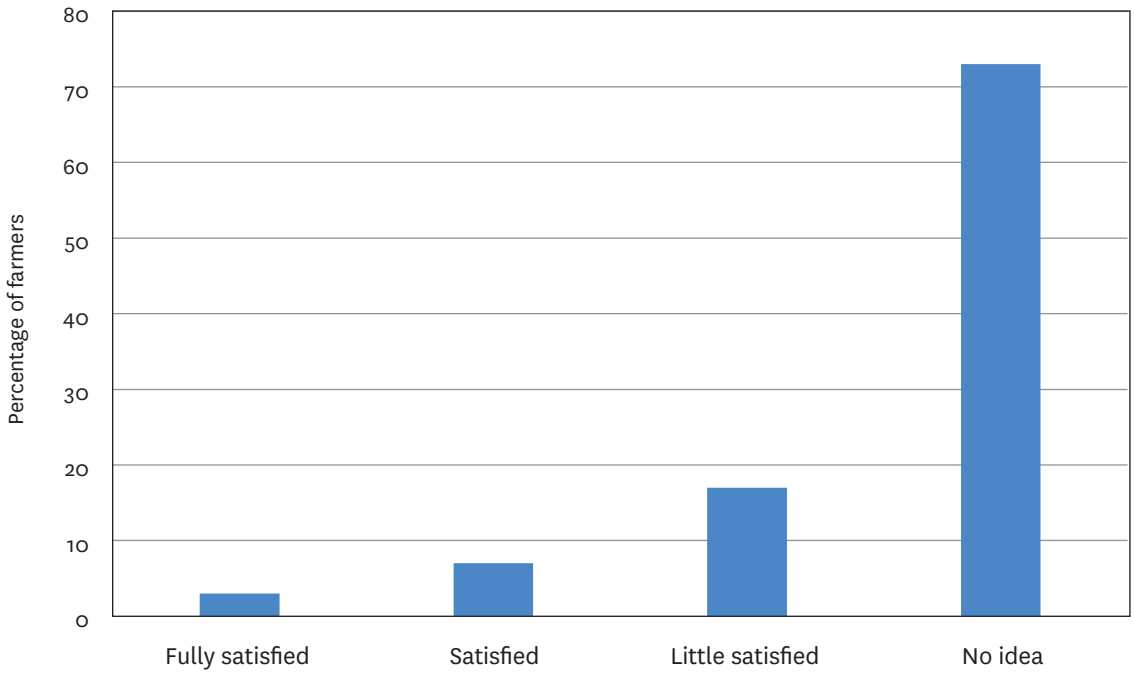

Figure 16. Level of satisfaction with type of risk covered (N=30).
Source: Authors' survey, 2021.

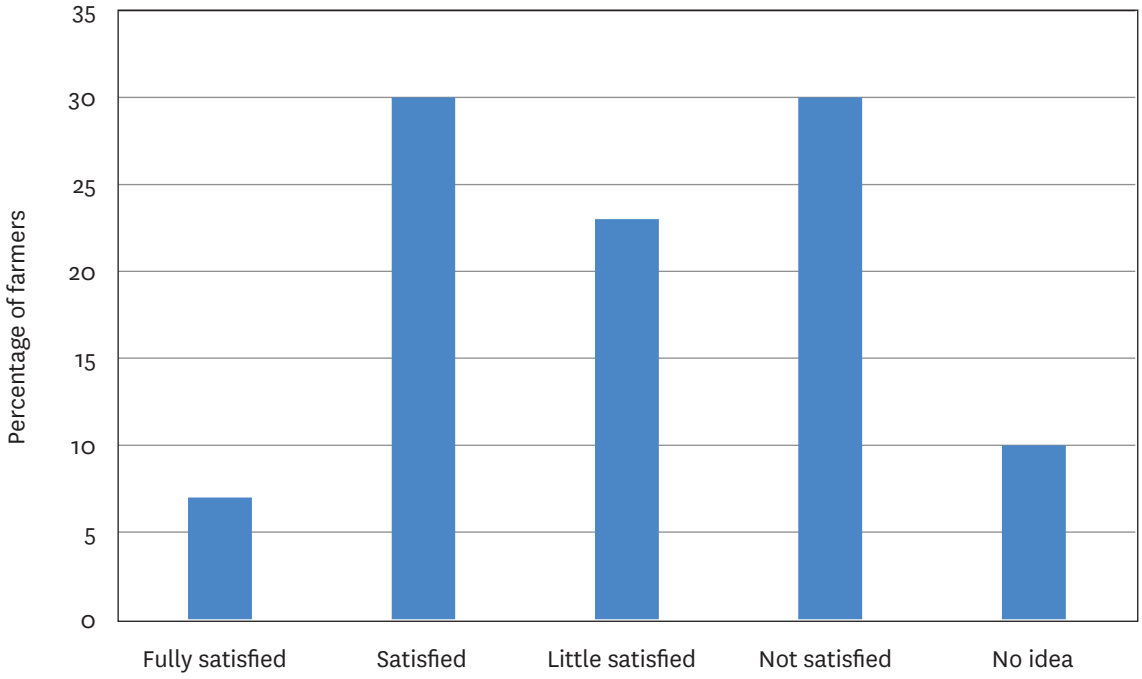

Figure 17. Level of satisfaction with land area covered (N=30).
Source: Authors' survey, 2021.

Farmers were satisfied with the process adopted for insurance enrollment with the support of the farmer organization (Figure 18). The documentation process was also deemed convenient and about 80% were satisfied.

According to farmers, the documentation process was explained well with good hands-on support by the farmer organization representative, and most did not face difficulties in filling out the application forms (Figure 19).

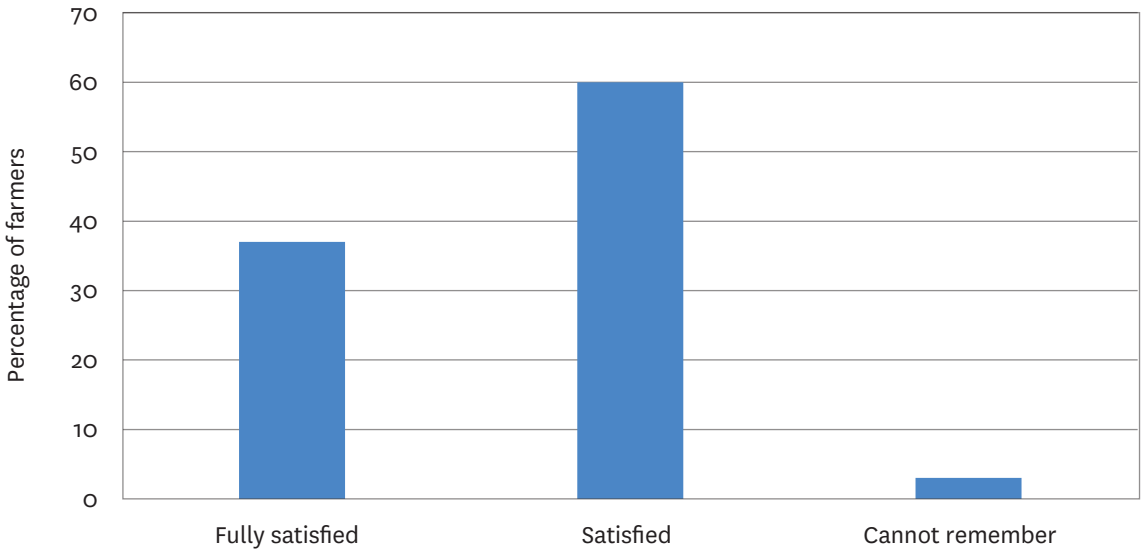

Figure 18. Level of satisfaction with the convenience of enrollment (N=30).

Source: Authors' survey, 2021.

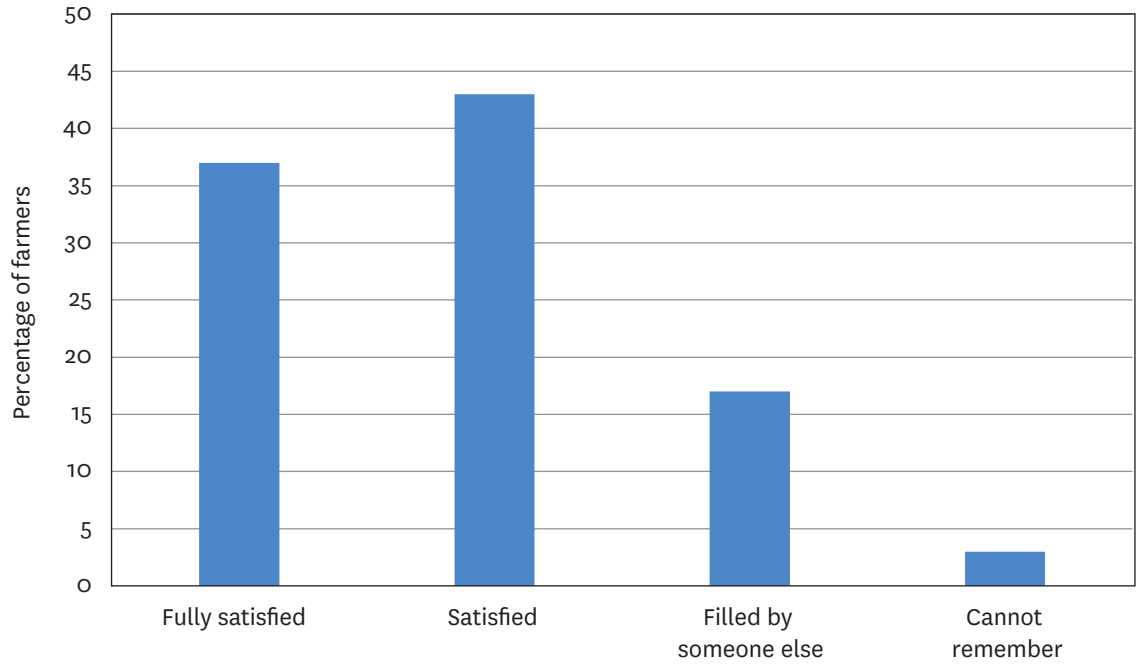

Figure 19. Level of satisfaction with documentation process (N=30).

Source: Authors' survey, 2021.

Farmer Perceptions of Insurance Payouts Triggered

A payout was triggered by excess rainfall in January 2021, although the majority of farmers did not expect a payout due to a marginal increase in rainfall. Payouts helped to build trust in the first index insurance piloted in the village following some unpleasant experiences with past indemnity insurance. Farmer perceptions on the payouts distributed are illustrated in Figure 20. Even though farmers did not expect a payout, 37% were not satisfied with the amount provided given the value of the insurance premium and the cost of cultivation. However, some farmers thought the amount was low due to the relatively good weather conditions that prevailed in that season.

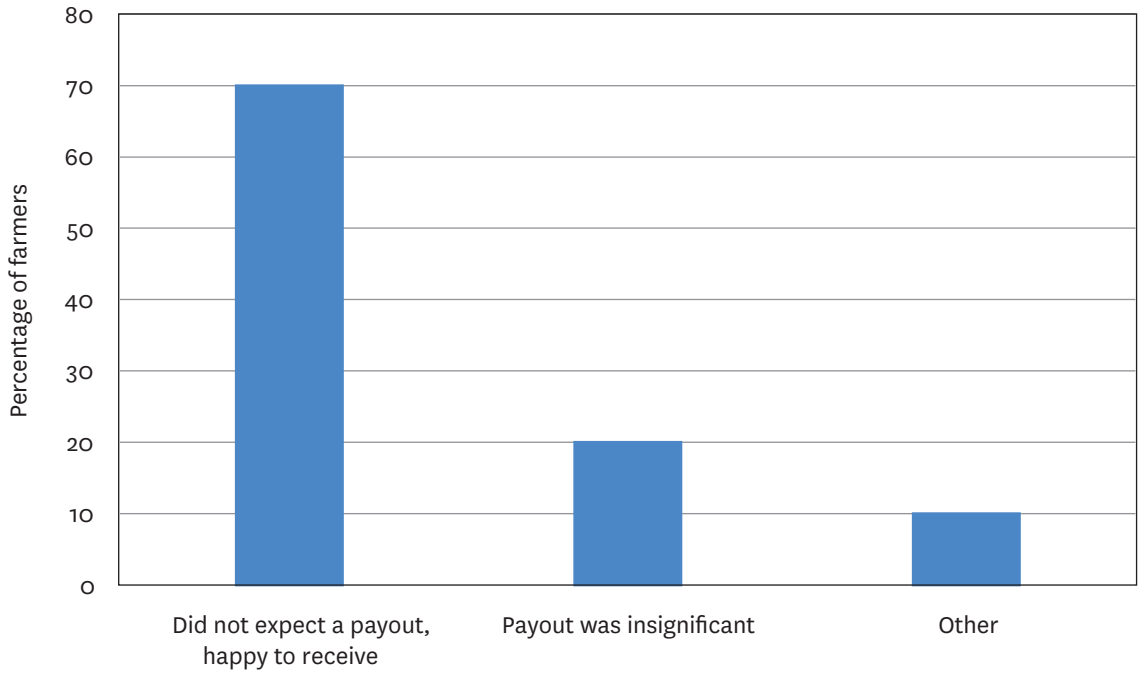

Figure 20. Opinions about payments made (N=30).
Source: Authors' survey, 2021.

Farmer Perceptions of Agronomic and Climate Advisories

At the beginning of the project, advisories were sent to 15 selected insured farmers. Routine messages sent to the farmers' mobile phones increased engagement and trust in the project. However, text messages sent to almost half the farmers failed to achieve the intended objectives. Results show five farmers did not notice the messages, two did not receive messages and one received advisories from another farmer, although he was a targeted beneficiary. One explanation for these results could be inadequate technological literacy on the part of some farmers. In the interviews conducted, several farmers said they were getting help from their children to read messages, to fill in documents and other technical matters. A similar situation was reported in the SUM Africa project where weather forecast messages sent to farmer mobile phones could not be understood by many farmers without additional support to make informed decisions regarding their farm activities, for example, by subscribing the service to extension officers working in the area (Ajayi and Kadzamira 2020).

Farmers were asked about the accuracy and usefulness of the weather advisory messages. Thirty-six percent had no opinion regarding the accuracy of advisories but 57% believed they were given 'accurate' or 'fairly accurate' information (Figure 21). Almost half the message receivers said the messages were 'useful' or 'very useful' for day-to-day planning of agronomic practices such as spraying pesticides, fertilizer application and harvesting (Figure 22).

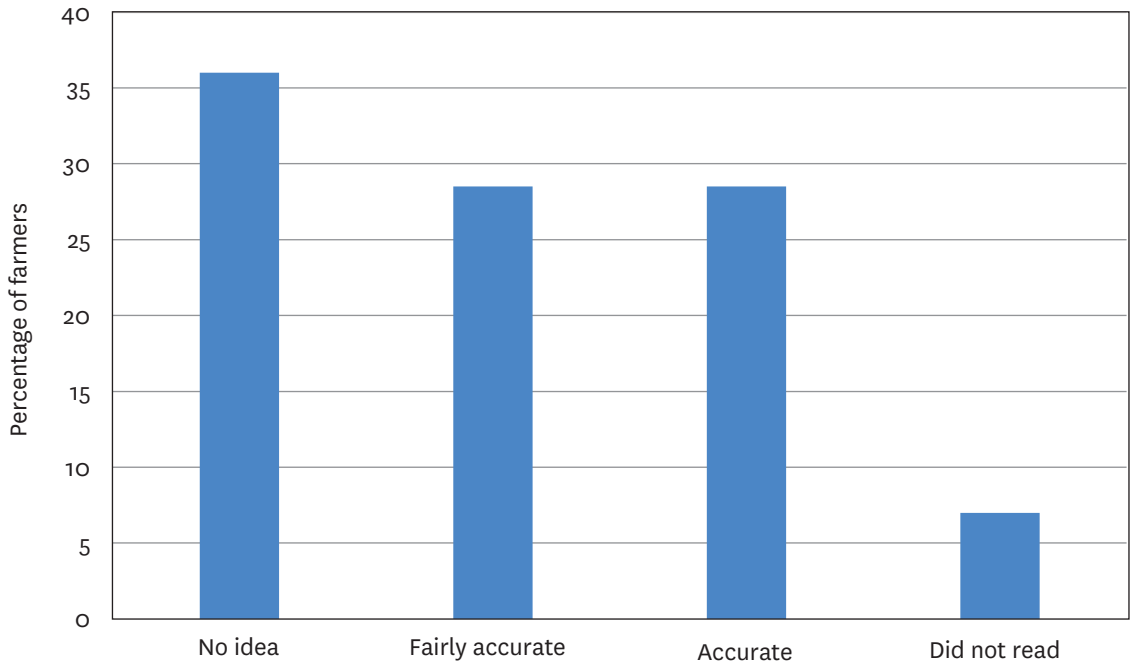

Figure 21. Perceived accuracy level of weather advisory (N=14).
Source: Authors' survey, 2021.

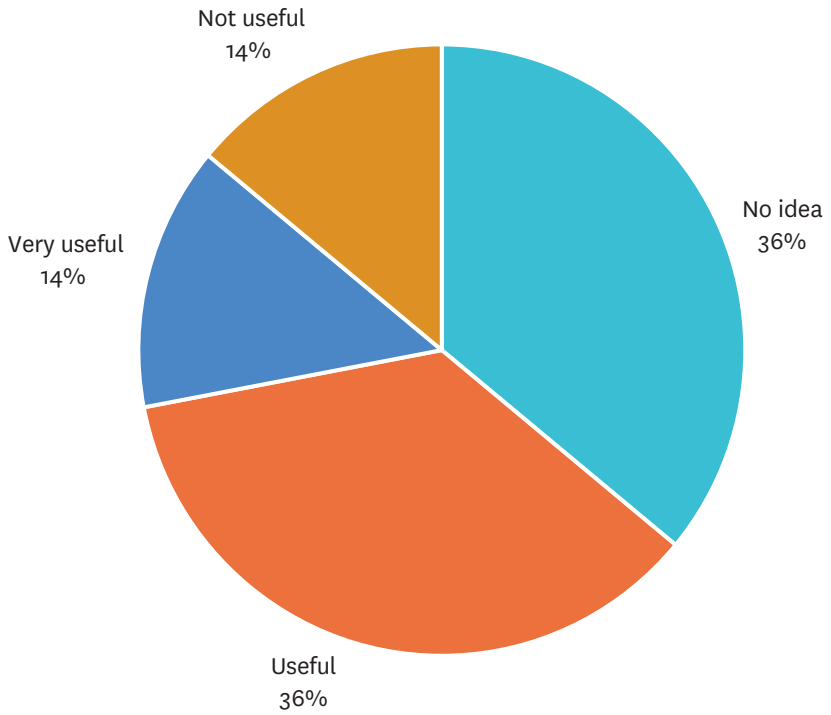

Figure 22. Perceived usefulness of weather advisories (N=14).
Source: Authors' survey, 2021.

Among the agronomic advisory receivers, nearly one-third had no idea about the usefulness, while an equal number of farmers said the messages were valuable (Figure 23). The farmers said that the timeliness of the messages sent should be improved and consider the stage of the crop. One farmer said, *"When we received agronomic messages for fall armyworm control, we had already finished spraying pesticide, so we did not benefit from the information*." However, many farmers said that the chemical recommendations given to control fall armyworm had greatly helped them to control the pest effectively and on time compared to past seasons. The language used was clear and easy to understand by the majority since the messages were simple and in local languages. These measures helped them to enhance resilience by minimizing yield reductions.

All the text message receivers shared information with their fellow farmers. About 71% always shared and 29% shared sometimes, mostly with their relatives, neighbors and friends. All the farmers who received the advisories saw the service as a value addition to the insurance and they expressed willingness to participate in future WII. About 86% of the farmers who received the advisories from their fellow farmers said they too would be willing to buy WII.

About 50% of the farmers who did not receive the messages said that not receiving advisories was not disadvantageous for their crop cultivation (Figure 24). The reason given by 78% of these farmers was they had over 15 years of farming experience and therefore they trust their knowledge and expertise and are confident in their abilities. Some farmers said they usually follow the advice of senior and experienced and large-scale farmers about when to start cultivation. One farmer said, *"We start cultivation when others start. We are not too concerned about climate forecasts. When experienced and large-scale farmers start cultivating, we are also starting because we trust their experience."*

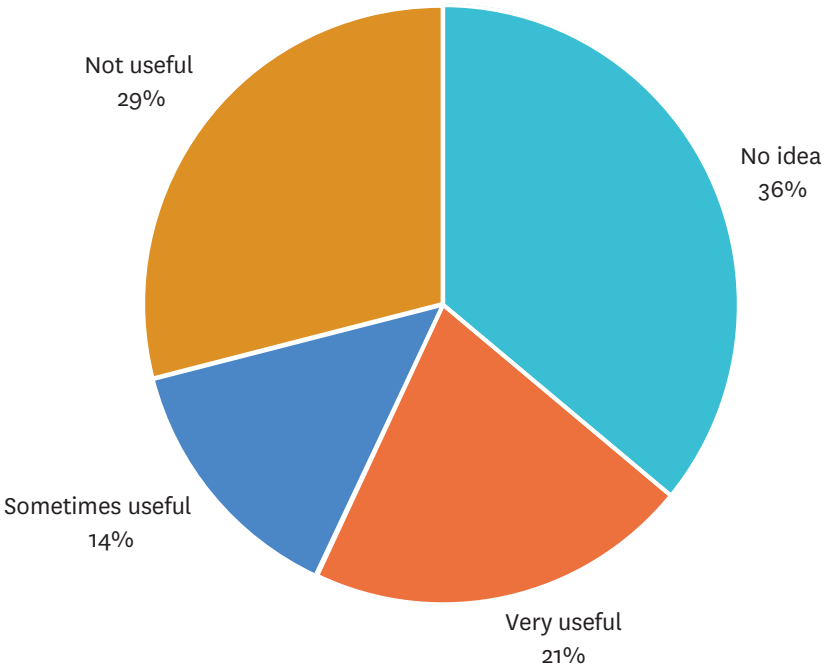

Figure 23. Perceived usefulness of agronomic advisories (N=14).
Source: Authors' survey data, 2021.

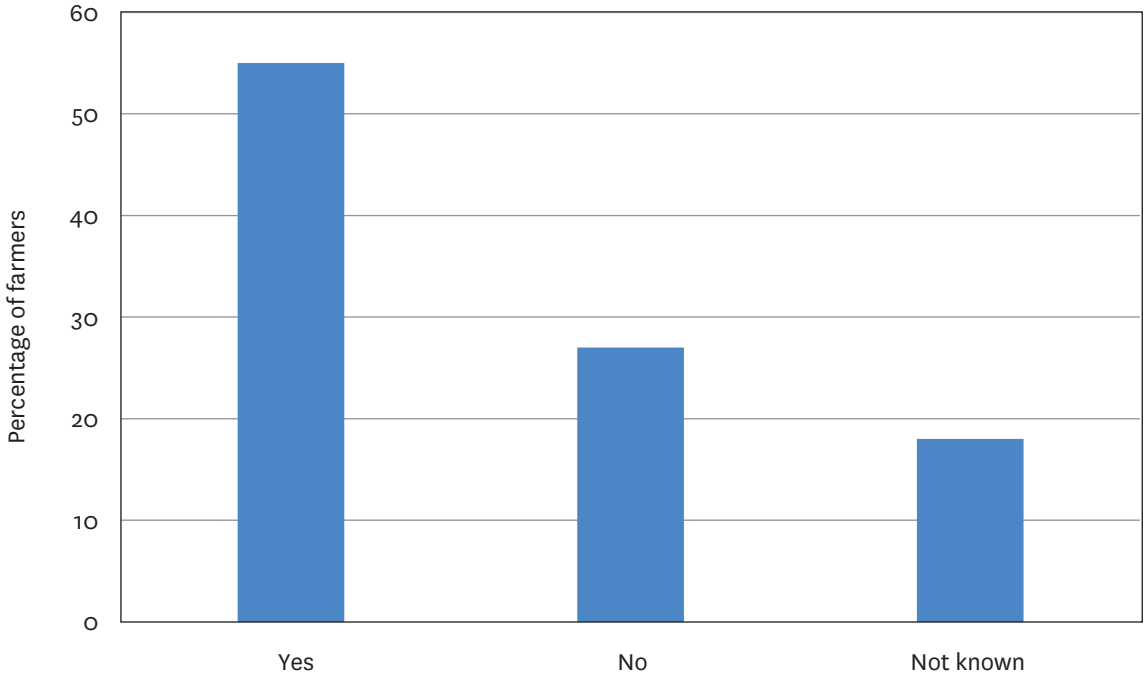

Figure 24. Is it a disadvantage to not receive information? (N=26).
Source: Authors' survey, 2021.

Willingness to Enroll in Future Weather Index Insurance

Evidence suggests that the farmer organization has the farmers' trust and that the awareness raising was somewhat less effective in that many did not know what the bundled insurance offered, and some did not check text messages about weather and agronomic advisories. The public ceremony organized by the project at the end of the season to distribute the insurance payouts contributed positively to creating awareness and trust in the product. Farmers were asked about their willingness to participate in future WII if they had to pay the premium. About, 87% of insured and 60% of non-insured farmers said they would be willing to pay a partial contribution toward the premium. Ninety-one percent of women insurance holders would purchase WII in the future and be willing to contribute to the premium. This is a good development considering a majority of the farmers did not understand the product features. Figure 25 lists the reasons given for their willingness to purchase WII. About 81% of insured farmers are willing to transfer risk through insurance based on their experience of increasing climatic risks. Similarly, five out of six non-insured farmers were also willing to participate in future WII. However, a future insurance program should clearly explain the types of risk to be covered by the insurance to avoid unrealistic expectations.

The main factor farmers considered in deciding whether or not to purchase insurance is the cost of the premium (Figure 26). Except for the premium amount, 38% of insured farmers would consider the payout system and 33% are concerned about the insured amount. Non-insured farmers are mainly concerned about the premium amount and the maximum amount paid by the insurance company to the policyholder in case of any crop damages. The findings indicate that farmers' major concerns are the investment-related costs and benefits.

Sixty-five percent of insured farmers and 100% of non-insured farmers said they would prefer to pay the premium in two installments, about 5% preferred monthly installments within the cultivation season, but the installment size should be based on the premium amount (Figure 27).

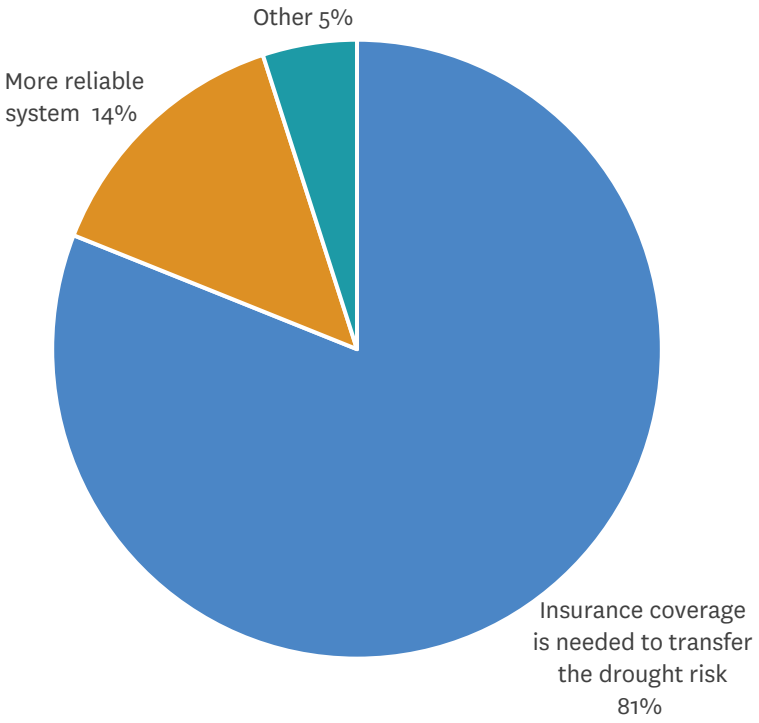

Figure 25. Reasons for willingness to participate in WII and make a contribution to the premium (N=21).
Source: Authors' survey, 2021.

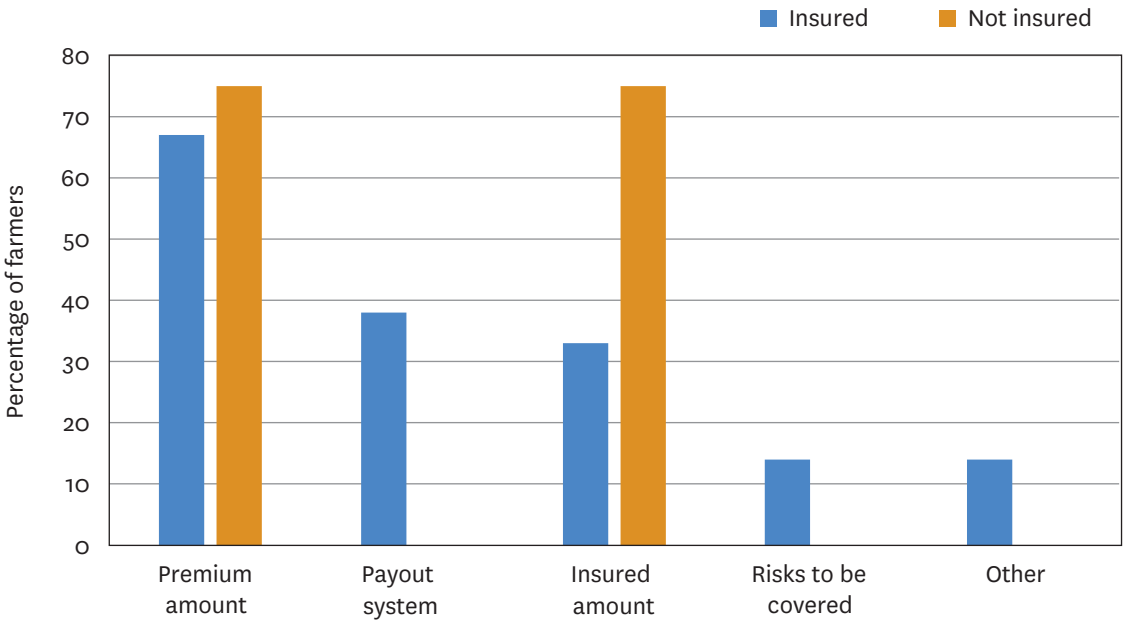

Figure 26. Factors to be considered when deciding to participate in WII and make a contribution to the premium (insured N=21, not insured N=4).
Source: Authors' survey, 2021.

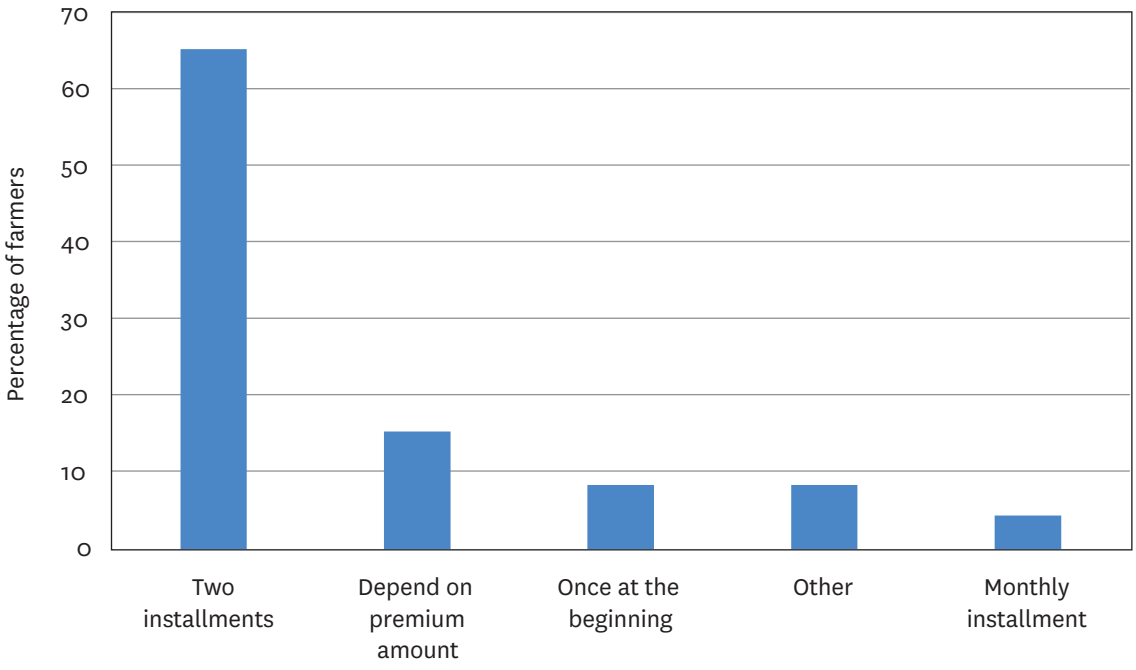

Figure 27. Insured farmers' preference to pay the premium (N=26).
Source: Authors' survey, 2021.

Farmers willing to participate in WII by making a contribution to the premium were asked about the amount they would be willing to pay to cover the cost of maize cultivation (LKR[2] 40,000 in 2020). Only 56% expressed a value while the remaining farmers could not express a value or wanted to discuss with fellow farmers or family members to decide an amount (Figure 28). This may be due to a lack of experience with crop insurance. Some farmers are of the view they should know the detailed description of the crop insurance product, for example, payment triggers, to decide the contribution. The amount farmers were willing to pay ranged from LKR 100 to 3,000 per acre (1 acre = 0.4 hectares) with an average value of LKR 1,933 for those who preferred to pay twice a season. Similarly, for farmers who prefer to pay monthly, the value ranged from LKR 400 to 1,000 per acre with an average value of LKR 633. About 28% of the respondent farmers said they would consider paying more than the expressed value if the insurance product was bundled with weather and agronomic advisories.

Only four farmers were not willing to contribute to the premium. The main reasons given are lack of clarity or awareness of the insurance product, reluctance to contribute to a premium, no land ownership documents, high premium cost and limited income. Of the non-insured farmers, 40% are not willing to participate in future WII. Among the non-willing farmers, half said they do not like to purchase any type of insurance product and the other half do not like insurance due to their religious beliefs.

The most common discussion at the household level about enrolling in WII is financing the premium. However, religious and cultural issues and a lack of interest in crop insurance were also reported among non-insured beneficiaries (Figure 29). For example, some of the Muslim farmers said that they are not allowed to accept interest-based insurance products and others believe that natural disasters are acts of God and have nothing to do with insurance. Similar thoughts were reported by Macmillan (2014) (cited in Greatrex et al. 2015) in Kenya in implementing index livestock insurance.

The majority of the farmers (70%) prefer to use digital technologies such as online bank transfer and mobile money transfer methods to receive their insurance payouts and the remaining farmers prefer direct payments. The farmer organization representative suggested providing an update of the bank transfer by sending a mobile text message after transferring money to bank accounts.

[2] Approximate exchange rate: USD 1.00 = LKR 197.42 as at April 2021.

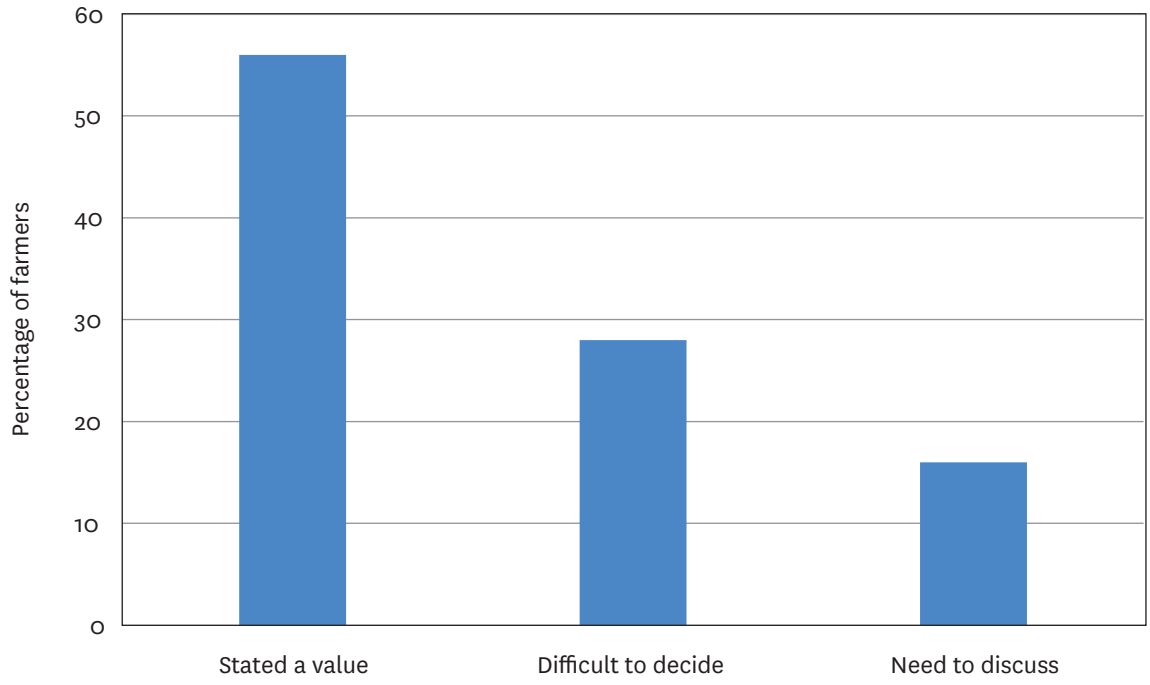

Figure 28. The amount farmers were willing to contribute to the WII premium (N=32).
Source: Authors' survey, 2021.

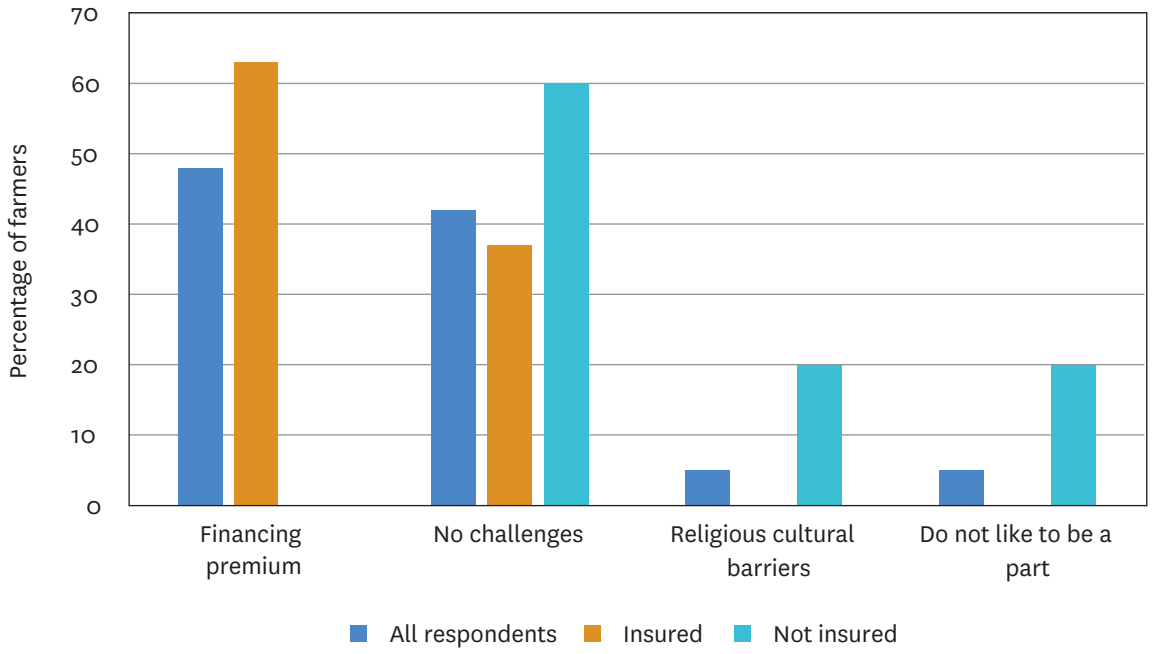

Figure 29. Challenges at the household level to enrolling in WII and making a contribution to the premium (insured N=30, not insured N=10).
Source: Authors' survey, 2021.

Lessons for Scaling Up and Future Inclusive Interventions

Understanding the Contextual Diversity at the Outset Helps Reach More Clients

Applying a social science approach through initial reconnaissance visits, key informant interviews, and baseline surveys greatly helped to identify the diversity of people, socioeconomic issues, agricultural challenges and institutional linkages. Understanding the contextual issues and challenges helped the project to identify strategies and rollout processes to reach diverse groups of farmers to access the WII product. The product reached landless farmers, women farmers, smallholders, farmers from different ethnicities and farmers with different levels of literacy. Informed decision-making was very low, relying instead on a group mentality, which may not be a sustainable model, especially when farmers are asked to pay higher premiums.

Enable Greater Understanding and Clarity of the Bundled Product

The Covid-19 pandemic significantly undermined the awareness-raising component of the project and the survey findings show clear negative implications, including the willingness of farmers to engage in future insurance schemes. The one-off community meeting that was possible before the escalation of Covid-19 was not sufficient to provide the necessary understanding and clarity of the product, since about 88% of the non-insured farmers had not heard about the project. Even among farmers aware of the project and who attended the community meeting, only the farmer leader understood some features of the insurance, for example, entitlement to make a claim when there is excess or deficit rainfall, but not the trigger points, insurance coverage, or other product features. While most farmers (both insured and not insured) said they would purchase insurance in principle, their decisions would be based on a clear understanding of the value of the premium, the payout system and the insured amount. As the survey results show, for those unwilling to pay, the lack of clarity and awareness of the insurance product is a primary influencer. This illustrates the consequences of failing to invest in sufficient comprehensive and socially nuanced engagement and awareness raising at the outset, and the risks this poses to both scaling and sustainability of the insurance program.

Pilot projects, therefore, need to consider multiple tools to provide a broader understanding of the technical features of an insurance product with due attention to community diversity. Clear knowledge of the product features and claim trigger points should be provided to the selected partner organization representatives (in this case the farmer organization) and local government officers (for example, Agricultural Research and Production Assistants, Divisional Officers, and Agricultural Instructors) to enable them to educate beneficiaries and troubleshoot problems. It is recommended to provide a monthly honorarium for selected volunteers for community mobilization and awareness raising. Although comprehensive awareness raising will add to the cost in the early stages of a project, over time an enlarged customer base will provide a return on that investment. For example, the index-based livestock insurance project rolled out in Ethiopia invested heavily in the early stages to enhance the awareness of farmers, government officials, and insurance company staff (Erena et al. 2019).

The pilot should plan for future rollouts with sufficient time and resources set aside for awareness raising to contact the farmers who need personal attention given the differences in literacy. In this pilot, although resources were allocated for community mobilization and awareness raising, it was curtailed because of the Covid-19 restrictions. The project should also send mobile text messages during the project period about updates on the insurance product performance along with weather parameters. It should also partner with community mobilization agents such as nongovernmental organizations and community-based organizations that understand the importance of and can undertake extended awareness-raising work.

The public ceremony organized to distribute the insurance payouts against claims generated considerable visibility for the pilot project and the partnership and enhanced trust among non-insurers who were convinced of the value of the program through peer learning.

Partnerships with Farmer Organizations Help Reach Many Farmers but They Alone Cannot Undertake Socially Nuanced Stakeholder Engagement

Working with a trusted farmer organization proved to be cost-effective in a project implemented by SUM Africa in 2017 and resulted in good subscription rates for insurance (Erena et al. 2019). In this pilot, working through a trusted farmer organization created confidence in the product while helping to reach a good number of farmers, although the Covid-19 restrictions undermined the full potential of reaching farmers without added transaction costs to the insurer. The insurer was able to reach the community and pass the insurance-related messages on to the beneficiaries and vice versa, reducing the communication gap. The insurer benefitted from the established link and trust between the community and the farmer organization to reach the farmers during the Covid-19 lockdown conditions, otherwise, it would have been a huge challenge. The farmer organization facilitated communication with farmers during the insurance period. However, the role of the farmer organization should

not undermine the agency of individual farmers to make informed decisions and should not be used simply as a cost-saving strategy by the insurance company. Instead, it should be a channel to ensure farmers understand the product well enough to make informed decisions. The finding that most farmers who did sign up for the insurance had limited awareness of the product, suggests that the role of the farmer organization should be further strengthened by ensuring that several farmer organization members are thoroughly trained and thus can act as local knowledge hubs for other farmers. Such a strategy should include some explicit benefits to these farmer organization members as incentives for their extended services.

Insurance programs cannot rely wholly on farmer organizations to ensure that the full range of stakeholder groups are equally engaged. Divisions embedded in the social fabric of a community, and hence its farmer organization, mean that an insurance program will need to hire a full-time social scientist/mobilizer (at least in the initial stages of an intervention) who would work with and through the farmer organization to independently monitor farmer engagement and awareness.

Application of an Aggregator Model

Although there were a large number of landless and encroached-land operators in the village, the aggregator model facilitated their enrollment without the requirement of legal land documents. Enrolling landless and tenant farmers into a WII has been a challenge in the past given the many farmers cultivating land under various tenure arrangements. The success of applying an aggregator model in Bangladesh has been reported by Aheeyar et al. (2020). Also, a drought insurance pilot implemented in Uganda under the SUM Africa project with the Agro Insurance Consortium (AIC) reported a success story. According to the project director, "*Satellite technology is only part of the story. Our success so far is based on local actors, AIC foremost, with an understanding of Ugandan realities and access to the right players in the agri-market*" (G4AW Netherlands Space Office 2019).

Bundled Insurance with Weather and Agronomic Advisories

Insurance was bundled with access to weather information services and agronomic advisories targeting maize cultivating farmers. Bundling insurance with other agricultural support services and inputs has been proven to increase the uptake of crop insurance compared to standalone insurance products (Erena et al. 2019). The project used satellite-based drought index insurance to protect smallholders while mobile phones have been the key enabling technology to add value to farmer resilience capacity. Early understanding of farmers' mobile use patterns through a baseline survey helped to identify the appropriate platform for sending advisories. However, the low level of mobile technology literacy of some farmers caused difficulties in understanding and interpreting the weather forecast messages. These farmers needed additional support to use the information provided to make informed decisions. This will be an issue if farmers are paying for advisories. Mobilizing field extension workers and subscribing them to receive weather and agronomic advisories could play an important role in helping farmers interpret advisories, even those who are not on the digital platform.

Making the Product More Affordable

Maize cultivation, like most cash crops, requires considerable investment for hybrid seeds, fertilizers, and agrochemicals. Infrequent and severe drought hazards are a significant disincentive for smallholder farmers for high-input agriculture. Therefore, affordability of an insurance product is a key determinant in their willingness to invest in insurance.

Financing insurance premiums and concerns about affordability were challenges for most farmers in this pilot. About 44% could not express a value for willingness to contribute to the premium in a future WII, primarily due to lack of understanding of the product features or they were unable to decide a value themselves due to lack of past insurance experience. The cost of the premium and affordability were also a concern for over 60% of the farmers. It is recommended to use digital tools to reduce the transaction costs of the insurance for premium collection and claim settlement. Paying the premium on an installment basis (at least two installments) was one suggestion offered by farmers. Some farmers expressed their preference to pay more for insurance if it is bundled with weather and agronomic advisories, indicating the value of the free advisories provided.

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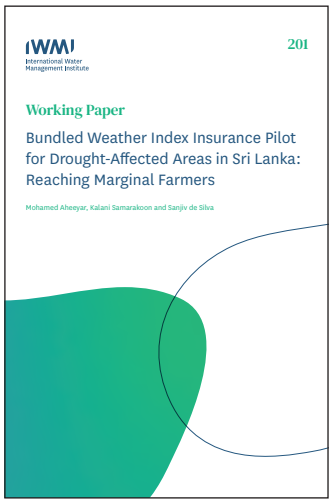

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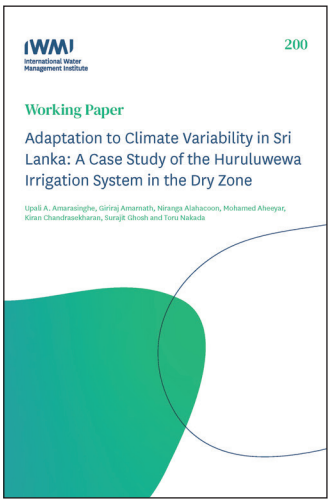

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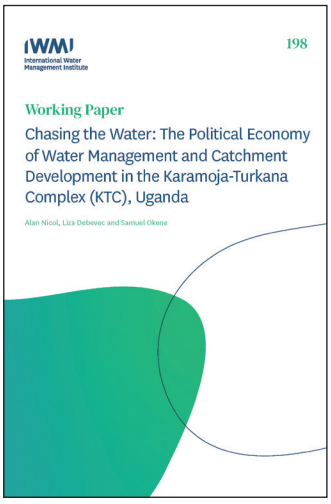

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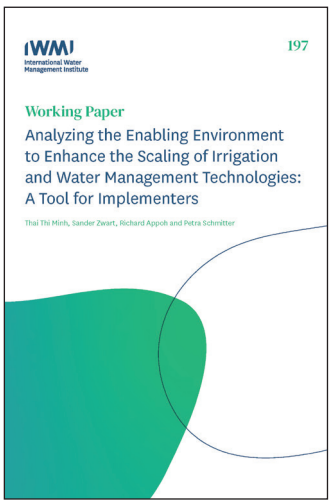

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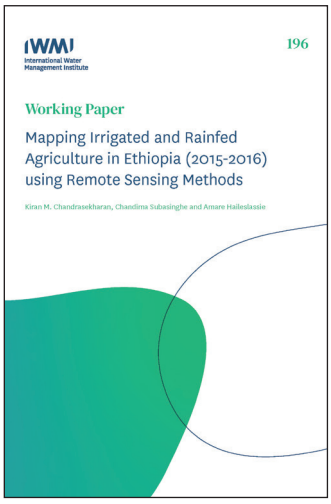

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