

*Promotion of Social Entrepreneurship in Disaster Risk Reduction to Build Community Resilience*

**Date: 14 September 2022**  
**To: Project Leader**  
**From: Pilot Project Leader**

**Re: Activities Report**

This report is to cover Project Outputs and Dissemination in Cambodia for the whole period of the Research Project on ‘Promotion of Social Entrepreneurship in Disaster Reduction to Build Community Resilience, in Cambodia. The aims of this report are threefold: a brief summary of research outputs, Capacity Building of researchers and students, and dissemination of research findings.

**1. Brief summary of research outputs**

There are three major outputs, two journal articles published international domain, and one in a local journal, from this research project. The following is a brief summary of each output.

**Article 1:** Chhinh, N., Sok, S., Sou, V., & Nguonphan, P. (2022). Local Engagement in the Agricultural Cooperatives (ACs) Operation in Cambodia. *Sustainability*, 14(24), 16515.

*Abstract*

Agricultural Cooperatives (ACs) have empowered farmers to develop resources sustainably. They transfer traditional subsistence agriculture to diversify crops and develop a value chain. This paper aims to analyze local engagement by focusing on the degree of participation, factors influencing local engagement in ACs operations, and the constraints of ACs operations to support communities. With a cohort of 421 farmer members in Cambodia's Kampong Speu and Pursat provinces, household surveys were designed to consider how factors influence local engagement. It was discovered that: (i) local engagement in ACs operations is limited, and management of boards of directors is a critical constraint to motivating local involvement; (ii) local engagement in ACs operations is associated with access to water, benefits from ACs, participation in ACs activities, risk control, and ACs management, and ACs operations do not promote access to agricultural inputs; and (iii) ACs operations have faced several constraints, including poor management, inadequate capital accumulation, unavailable loans, loan mismanagement, a lack of skills, high illiteracy levels, small share values, a lack of access to credit facilities, access to the competitive market and a lack of support from extension services. This empirical study, with implications from Structural Equation Modeling (SEM), addresses a gap in the literature by exploring engagement in ACs operations.

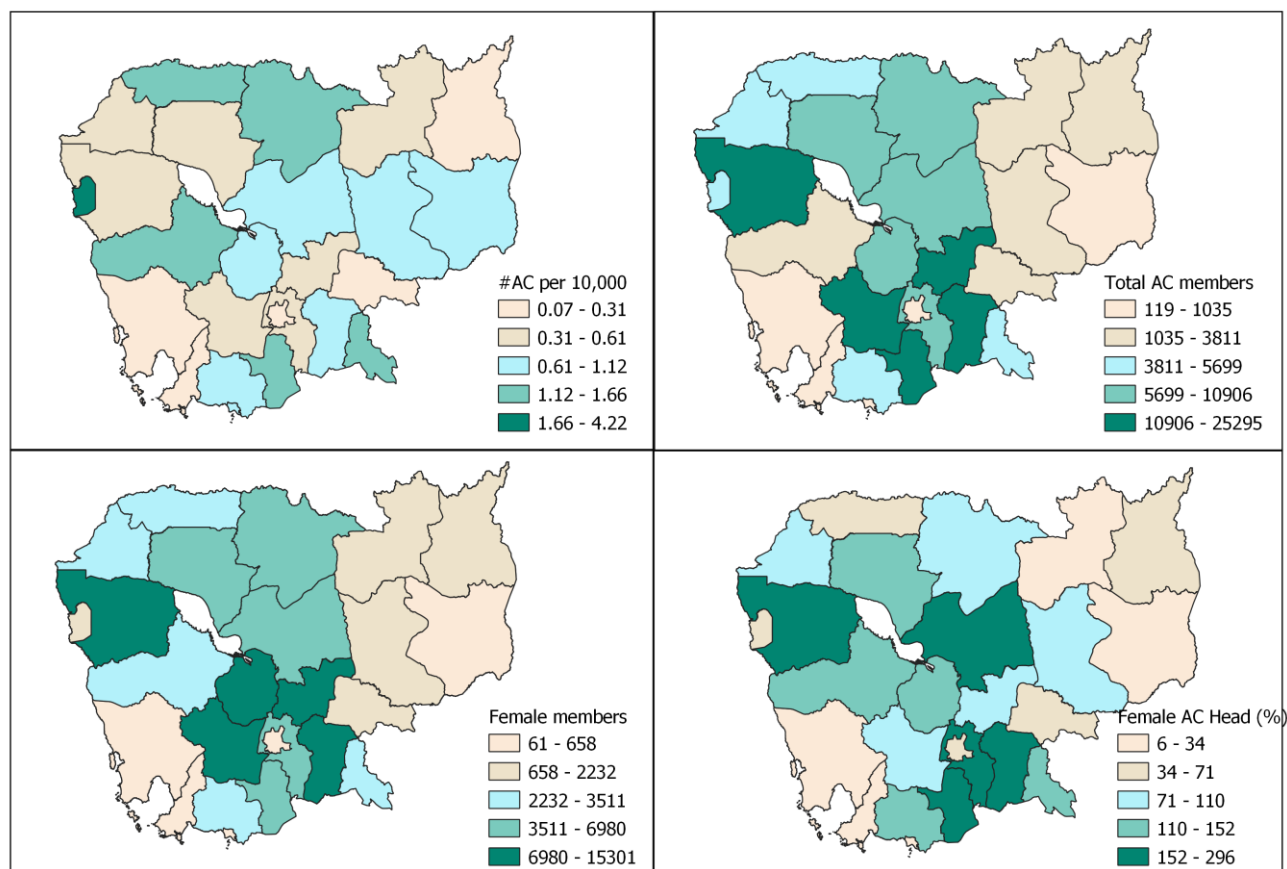
**Keywords:** agricultural cooperative; agricultural development; local engagement; smallholder farmer; Cambodia

The paper can be accessed at: <https://doi.org/10.3390/su142416515>

While the paper is well articulated about how agricultural cooperatives (AC) be more resilient to natural hazards and risks such as drought, this brief report would like to highlight the following.

There is no balance in Gender distribution in AC leadership in Cambodia, as shown in the following maps. While members of AC are mostly women, the lack of representatives of women in many decision bodies may undermine community resilience.

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**Fig 1:** Numer of AC’s boards of directors and members per province

Besides the challenges in Gender equity in AC, this farmer institution is highly expected to promote local engagement, reduce the cost of agricultural inputs, have access to water resources, receive benefits including financial access, participate in any decision-making, share risk, and partake in day-to-day AC management. Structural Equation Modeling (SEM) was used to perform statistical tests on how well the measured items represented a set of theoretical latent factors. For a study with more than 419 respondents and a questionnaire of 37 measurement items, the leading fit indices operated to assess the SEM model. The SEM model discloses that local engagement in ACs operations did not have a significant impact on access to agricultural inputs, which yielded  $\beta = 0.058$ ,  $p = 0.259$  ( $p > 0.05$ ) and  $t\text{-value} = 1.129$  ( $t\text{-value} < 1.96$ ). In contrast, the model confirms that local engagement in ACs operations had a significant positive relationship on access to water resources ( $\beta = 0.106$  \*\*,  $p = 0.040 < 0.05$  and  $t\text{-value} = 2.051 > 1.96$ ), benefits from ACs operations ( $\beta = 0.1.90$  \*\*\*,  $p = 0.000 < 0.001$  and  $t\text{-value} = 3.472 > 1.96$ ), participation in ACs activities ( $\beta = 0.632$  \*\*\*,  $p = 0.000 < 0.001$  and  $t\text{-value} = 15.662$ ), risk control ( $\beta = 0.197$  \*\*\*,  $p = 0.000 < 0.001$  and  $t\text{-value} = 3.765$ ) and ACs management ( $\beta = 0.147$  \*\*,  $p = 0.005 < 0.05$  and  $t\text{-value} = 2.791$ ).

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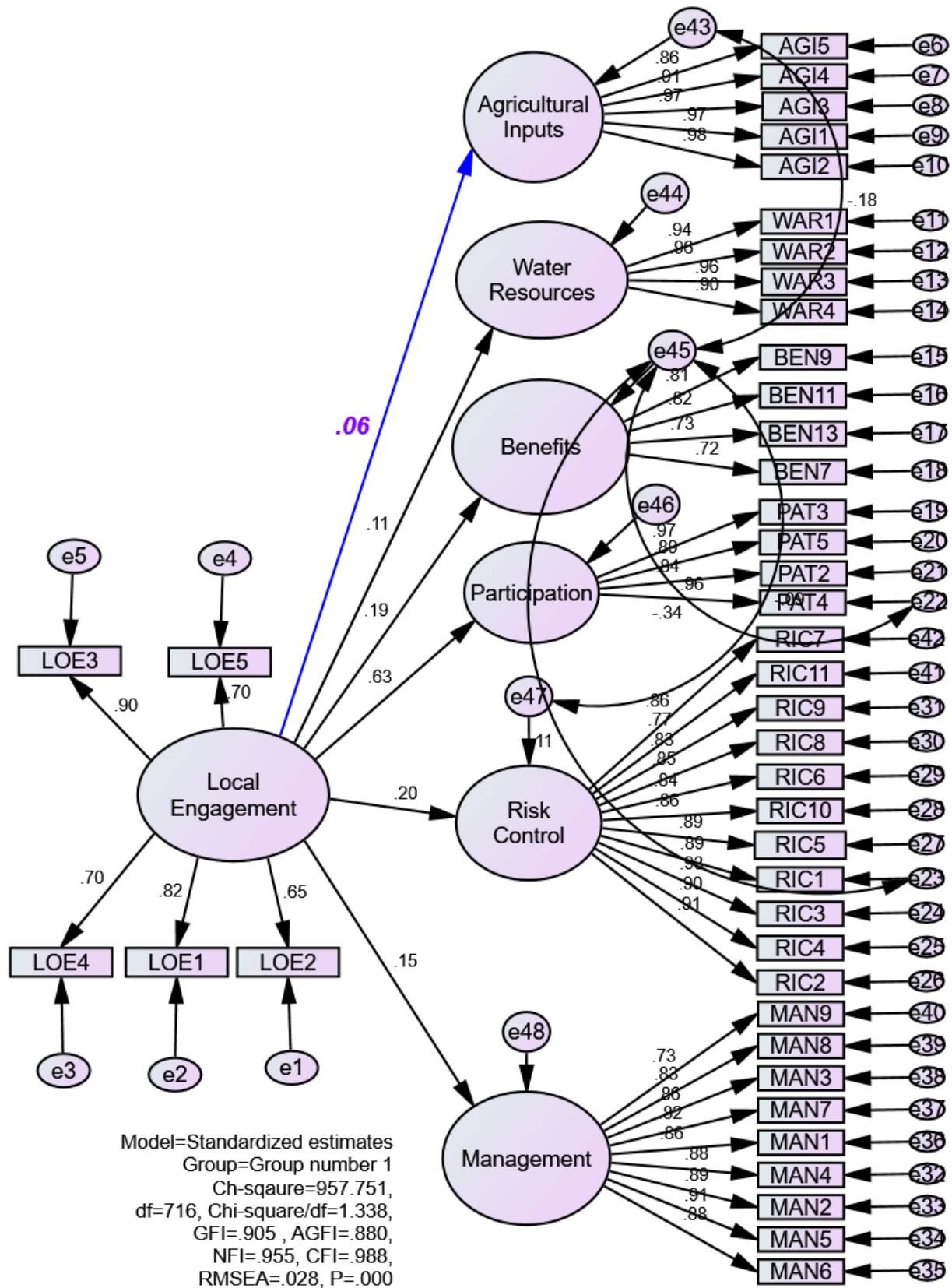


Fig 2. Analysis of factors contributing to AC engagement to promote resilience

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During the fieldwork, researchers also observed changes in AC agricultural practices. The below picture is a typical change among Cambodian farmers, mainly those who are members of AC. In the picture, it shows a plot of land with a greenhouse, a water tank for dripping irrigation, and an open field where they can grow seasonal vegetables. There is also a signpost next to the greenhouse to show that the farm is receiving support from NGOs to pilot their new agricultural techniques.



**Fig 3:** Changing farming practices in rural Cambodia to promote resilient

**Article 2:** Chhinh, N., Sok, S., Sou, V., & Nguonphan, P. (2023). Roles of Agricultural Cooperatives (ACs) in Drought Risk Management among Smallholder Farmers in Pursat and Kampong Speu Provinces, Cambodia. *Water*, 15(8), 1447.

#### *Abstract*

This research aims to investigate the roles of agricultural cooperatives (ACs) in the provinces Pursat and Kampong Speu, Cambodia, with respect to managing the drought risks among smallholder farmers, with particular focus on the following factors: (a) the impacts of drought on socio-economic development and livelihood; (b) the services delivered by AC operations in terms of increasing the five livelihood assets; and (c) the interactions between AC operations, adaptive capacity, and the impacts of drought. Household surveys were conducted among 421 smallholder farmers; in addition, case studies were also conducted with stakeholders in the Bakan district in Pursat Province and the Barsedth district in Kampong Speu Province. The study demonstrates that (i) both climatic and human-made factors contributed toward the impact of drought in the Bakan and Barsedth districts. Furthermore, this hazard affected smallholder farmers. (ii) AC operations increased the smallholder farmers' access to natural and physical assets. Currently, AC operations are constrained by a lack of willingness and commitment in AC committees, trust building in the communities, and human and financial resources after development projects, which are implemented by non-governmental organizations (NGOs). (iii) Adaptive capacity contributed to the drought impacts and participation in AC activities, but the involvement in AC activities did not contribute to AC operations nor to aiding

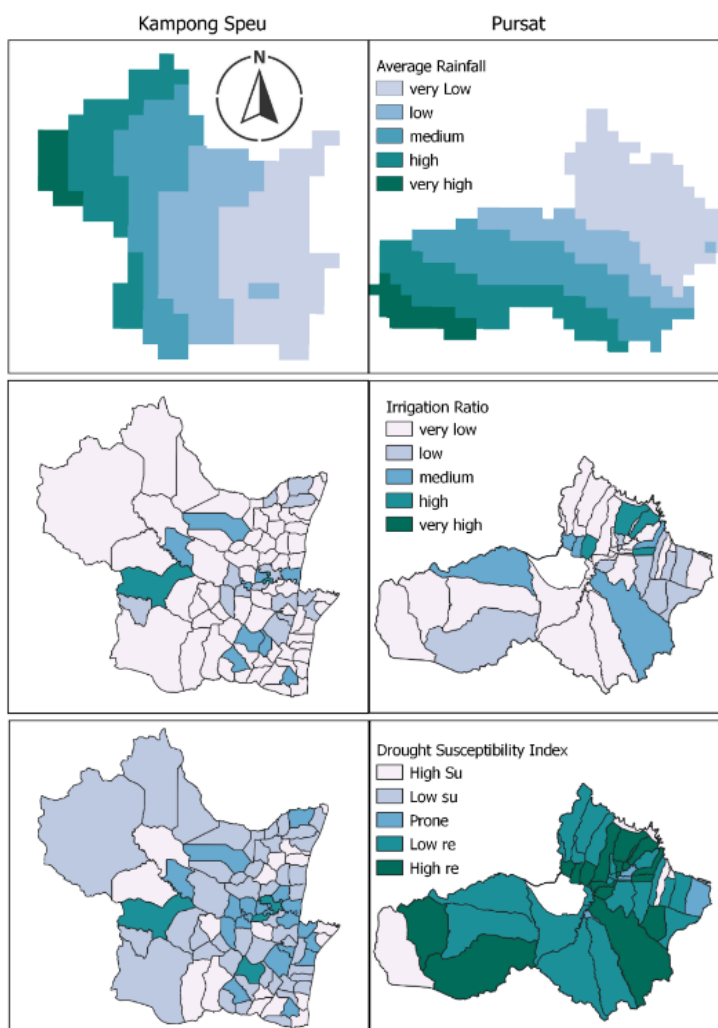
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with the impacts of drought. This empirical research, which was performed via structural equation modeling (SEM), fills a gap in the literature by increasing the understanding of the roles of AC operations in the context of drought risk management and their role in increasing access to the five livelihood assets.

Keywords: agricultural cooperative; agricultural development; local engagement; smallholder farmer; Cambodia

The paper can be accessed at: <https://doi.org/10.3390/w15081447>

The second paper examines how AC, as an entrepreneurial entity dealing with agricultural business, deals with drought risk management. It appears that smallholder farmers are very vulnerable to drought risk and that they have limited resources to cope with climate impacts. The paper highlighted that being a member of AC does not translate into drought resilience. The following are other key findings from the paper.

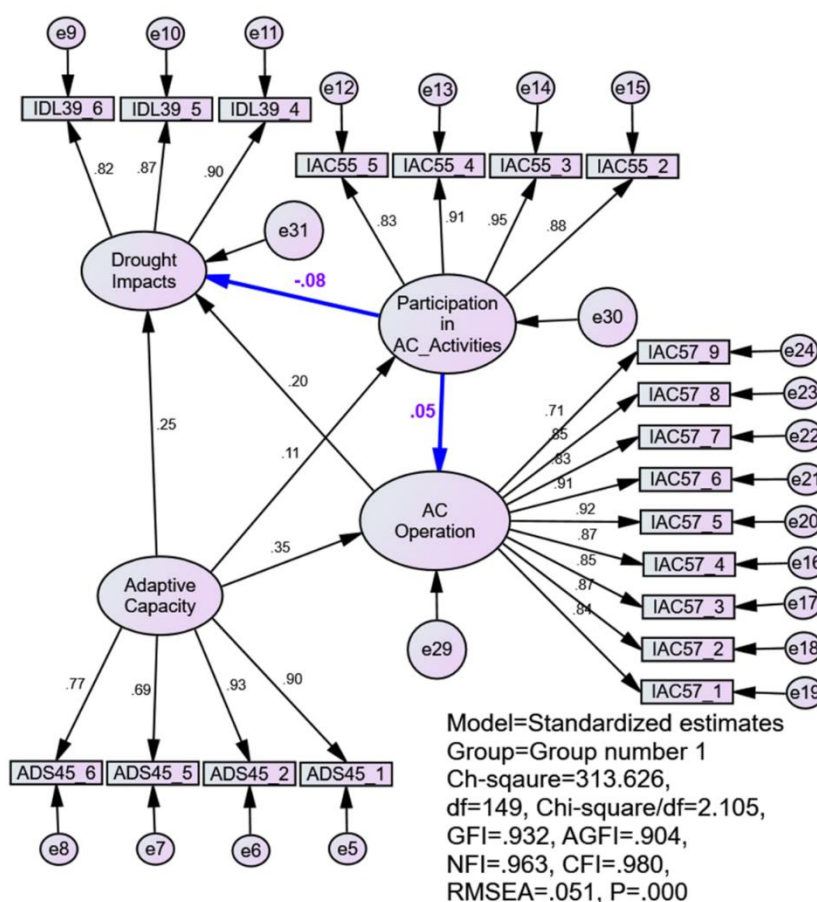


**Fig 3: Drought context of Kampong Speu and Pursat Province**

Figure suggested that compares the drought situation in the Kampong Speu and Pursat Province regarding average rainfall, irrigation ratio, and drought susceptibility index (DSI). In this analysis,

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supplementary irrigation referred to wells, pumps, ponds, drip, and sprinklers; they were widely accessible by smallholder farmers in the two study provinces. In Cambodia, smallholder farmers consider drought impacts when rainfall distribution is interrupted during cultivation. Drought was causing water shortages to fill in the paddy fields. If smallholder farmers used six-month rice varieties, it would take an entire wet season from seedling to harvesting between late May and early November. Cambodian smallholder farmers may face all stages of drought events, including early, middle, and end-season drought events. In other words, smallholder farmers were highly susceptible to drought events without access to supplementary irrigation because access to medium-scale irrigation remained limited. They saved their paddy when there was insufficient rainfall.



**Fig 5:** The Results of Structural Equation Modeling (SEM) on AC support on drought risk

Group discussions in the two study districts agree that increased access to the five livelihood assets helps smallholder farmers improve their adaptive capacity to reduce drought impacts [FGD 1 and FDI 2]. A committee at Agri-Productive Transport vehicle: non-cold Chain Truck worked to improve access to natural assets, human assets, physical assets, social assets, financial assets, and access to water during the dry season because they were crucial for smallholder farmers' livelihood [Pers. Comm. Interview-4]. ACs provided services among smallholder farmers under the technical support of government agencies, CoCs, and NGOs. Those institutions provided skill building and techniques and sought agricultural markets with the private sector, such as supermarkets and wholesale [Pers. Comm. K-2]. Multiple regression model shows that the services delivered by ACs

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helped to support smallholder farmers to access natural assets with  $\beta_1=0.226$  (22.6%),  $t$ -value =  $4.366 > 1.96$ , and  $p$ -value =  $0.000 < 0.05$ , and physical assets with  $\beta_3=0.206$ ,  $t$ -value =  $4.100 > 1.96$ , and  $p$ -value =  $0.000 < 0.05$ . In contrast, the model predicted significant negative contribution of the services delivered by ACs on the social asset with  $\beta_4=0.156^{**}$ ,  $t$ -value =  $3.132 > 1.96$ , and  $p$ -value =  $0.002 < 0.05$ . The services provided by ACs did not contribute to access to human assets with  $\beta_2=0.016$ ,  $t$ -value =  $0.345 < 1.96$ , and  $p$ -value =  $0.730 > 0.05$ , access to financial support with  $\beta_5=0.072$ ,  $t$ -value =  $1.545 < 1.96$ , and  $p$ -value =  $0.123 > 0.05$ ; and, access to water from January to May for consumption with  $\beta_6=0.077$ ,  $t$ -value =  $1.638 < 1.96$ , and  $p$ -value =  $0.102 > 0.05$  (Table 4).  
Table 4. Services delivered by ACS to support smallholder farmers.

The paper concluded that in the future, ACs should work closely with the Commune Council to empower smallholder farmers for livelihood development and drought risk reduction. Simultaneously, NGOs and government agencies continue building the capacity to generate sufficient revenues to operate activities for members alone. Actions implemented by ACs should be included as priorities with the annual budget under the commune investment plan. When activities implementation of ACs are aligned with the priority of the commune investment plan, they could mobilize government agencies and NGOs for routine activities.

**Article 3:** Nyda Chhinh, Rath Sethik, Pheakdey Nguonphan, Ponlue, T., & Tepsamol, C. ((forthcoming)). Promoting Agricultural Cooperative (ACs) for livelihood development among smallholder Farmers in Cambodia *Cambodia Journal of Basic and Applied Research*, 5(1).

This is a policy brief that was written to inform policymakers how to help AC so that they can be more resilient to shocks including drought. Since the paper is in the reviewing process, here is the abstract of the paper.

#### *Abstract*

In 2001, the Royal Decree on the establishment and functioning of Agricultural Cooperatives (ACs) was enacted to support farmers in enhancing agricultural production and creating job alternatives. The Law on Agricultural Cooperatives came into force in 2013, requiring all ACs to register with the Ministry of Agriculture, Forestry and Fisheries (MAFF). ACs are different from farmer associations (FAs). An FA is a profitable enterprise that is democratically supervised by its members, while an AC is a local association of natural persons that serves its members' material or moral interests without searching for private earnings. By 2020, there were 144,306 members of ACs, including 90,603 females and 53,703 males. However, only 39.5% of women were elected chairmen and board of directors members to operate ACs. The MAFF believes that establishing ACs is the best option to assist smallholder farmers because they can operate with a wide range of business scopes falling under the agricultural sector. This policy paper analyzes how ACs contribute to poverty alleviation by focusing on the types of services delivered by ACs in supporting agricultural development and the benefits gained by ACs in participating in AC operations so that they are more resilient to shocks including drought impacts.

## **2. Capacity Building of researchers and students**

Regarding capacity building, the project leader had a chance to be exposed to research sides in Malaysia where he learned a lot about how Malaysia conducts its research, how the local government manages disaster risk, and interacted with researchers in Malaysia. It was an invaluable experience

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that project leaders could bring back to Cambodia and execute the project with satisfactory results. Also, many researchers from Cambodia have a chance to study the Concept of Social Entrepreneurship online organized by UKM and RUPP. The concept was relatively new but the Cambodian research team can apply for the pilot site.

Moreover, the project engaged many students and lecturers of RUPP. Among them, the project funded one female Master's Student to help with projects and conduct research related to Social Entrepreneurship in Disaster Risk Reduction to Build Community Resilience, and a Bachelor Student to research Agricultural Organizations in Kampong Speu (our Pilot site), by using the Commune Database.

### **3. Dissemination of research findings.**

Project leaders are active in sharing the findings with many different stakeholders including one Major Organization known as HEIFER International Cambodia<sup>1</sup> via interacting with the Country Director (HEIFER is supporting AC to promote the livelihood of Cambodia) and with the Department of Agricultural Cooperative of the Ministry of Agriculture, Forestry and Fisheries. It is anticipated that the papers we published will be useful for lecturers, researchers, and policymakers to promote climate resilience here in Cambodia.

### **4. Annex**

The annexes are the two papers that we published internally.

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<sup>1</sup> <https://www.heifer.org/about-us/where-we-work/cambodia.html>