

Building a Dam and Irrigation System to Help Farmers in Isabela, the Philippines, Adapt to Climate Change, 2011–18

Introduction

Farmers in Isabela, a province in the Philippines, have long suffered from natural disasters such as flooding and drought. In recent years, climate change has made life even more difficult for farmers in the area. Droughts lasted longer, typhoons became more frequent, and the timing of seasons varied unexpectedly, making it difficult for farmers to predict rainfall. Most farmers in the region depended solely on rainfall to cultivate crops, which meant they could harvest only once a year. As a consequence, farms had low productivity, and many farmers struggled to get by.

In 2009, the Korea International Cooperation Agency (KOICA), the Republic of Korea’s international aid organization, launched the East Asia Climate Partnership (EACP), and the Philippines became a partner country of the EACP. In 2010, the government of the Philippines requested EACP support for areas in the Philippines suffering the effects of climate change. The government wanted to build irrigation structures and better manage watersheds, areas of land that drain or “shed” water into rivers and lakes, to prevent flooding and provide farmers with a more consistent water supply. The irrigation structures would impound and store excess water to be used for agriculture or domestic purposes.

The governments of Korea and the Philippines together selected Isabela as the site where they would build a dam and irrigation canals. The province was the second largest rice and corn production region in the Philippines, and irrigation systems could help farmers in Isabela increase crop yields and improve the area’s resilience to climate change.

Development Challenge

Farmers in the Philippines regularly suffer the effects of typhoons, which bring flooding, and the global phenomenon El Niño, which is associated with droughts. Climate change has made these weather events both more frequent and more intense, and farms are sometimes affected by both droughts and floods during the same season (REECS). Unpredictable and extreme weather negatively affects crop yields, which can threaten farmers’ livelihoods.

Intervention

In 2011, the government of the Philippines launched the Pasa Dam project. The project consisted of four activities: construction of access roads, construction of dam and irrigation canals, introduction of better management practices in the watershed, and training of Philippine government officials and farmers (KOICA 2018). The project team from Korea was in charge of construction and training, and the Philippine government implemented the watershed management activities (KOICA 2018).



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Ministry of Economy
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PROJECT DATA

SECTOR:

Climate Change, Agriculture, Water

DEVELOPMENT CHALLENGE:

Climate Change–Resilient Agriculture

DELIVERY CHALLENGES:

Natural Disasters; Coordination and Engagement; Organizational Capacity; Civil Unrest and Armed Conflict; Market Deterioration

COUNTRY:

The Philippines

REGION:

Southeast Asia

PROJECT DURATION:

2011–2018

Sooyoung Choi authored this delivery note on the basis of interviews conducted in July 2019. This research was supported by the Korea Program for Operational Knowledge, a partnership between the Ministry of Economy and Finance of the Republic of Korea and the World Bank Group.

KOICA contracted the Korea Rural Community Corporation (KRC) and Gumgwang, a Korean construction company, to construct the roads, dam, and irrigation canals. The National Irrigation Administration (NIA) of the Philippines was KOICA's key local counterpart (KOICA 2018).

Addressing Delivery Challenges

Coordination between Stakeholders

Because the Pasa Dam project was the first project that KOICA and NIA had worked on together, building understanding and trust between the two counterparts was initially difficult. In addition, the project was the first overseas project for the contracted construction company. To ensure effective communication among stakeholders, KOICA requested that KRC oversee operations and provide technical supervision in the field. KRC was Korea's most experienced agency in irrigation system construction, and it also had experience in international agriculture projects. Incheol Hwang, an experienced project manager from KRC, took a liaison role among stakeholders, which helped to ensure mutual understanding throughout implementation.

Organizational Capacity

Ensuring proper maintenance of the dam and canals was critical to the sustainability of the irrigation system. After the completion of the facility, the Irrigation Association, a voluntary organization of farmers, would be responsible for resolving any blockages in the canals. However, the group of volunteer farmers did not have funding for such maintenance work. Furthermore, it was NIA's first time working with an automatically operated irrigation facility, and the NIA officials who would be in charge of the dam did not have the technical expertise to operate and maintain it. Ensuring that each group had the financial resources and expertise to take on their new responsibilities was critical to the project's success.

Through trainings and a field trip to see similar facilities in Korea, KOICA ensured that NIA officials had the technical knowledge to operate and manage the dam and irrigation structures. KRC also held workshops for the local community to build awareness about the facilities and how to manage them. However, as of late 2019, the Irrigation Association still lacked funding for maintenance work and was awaiting a budget allocation from NIA and the local government.

Natural Disasters: Heavy Rains and Typhoons

To cope with the risks of adverse weather and natural disasters, the project implementation team planned the construction schedule to avoid the rainy season on the basis of rainfall data from the past 20 years. However, there was far more rain than predicted, which resulted in frequent construction delays, as well as financial and administrative burdens. In addition, in 2016, a typhoon hit the nearly completed dam, causing almost US\$1 million of damage. KOICA had to allocate funds for repairs and extend the schedule beyond what had been planned to complete construction of the dam and irrigation canals.

Lack of Awareness of the Drivers of Flooding

Around Isabela, most farmers grew corn because it could survive with low and irregular amounts of rainfall. Because corn was less lucrative than were other crops, such as rice, farmers had to devote large areas to production. Sometimes farmers would resort to burning the forest to create extra farmland, or they would plant corn right up to the edge of waterways. These practices caused soil erosion and exacerbated flooding. To counter this practice, NIA tried to improve watershed management by planting trees in areas with severe deforestation and next to waterways. In addition, KRC held workshops with local communities to educate farmers on drivers of flooding and the importance of sustainably managing the watershed area.

Lessons Learned

Importance of Watershed Management

Local farmers and NIA regional staff said that it was impossible to fully prevent the damage caused by natural disasters. However, managing the watershed sustainably could reduce the risks of flooding, drought, and land degradation over the long term. Although the government and experts on the impact of climate change in the Philippines have long been aware of the importance of watershed management, the Pasa Dam initiative was the first international development project in the Philippines to include watershed management activities.

Synergies between Climate Adaptation and Economic Development

The main goal of the Pasa Dam initiative was to mitigate the impact of extreme weather events by reducing soil erosion and flooding, but it was able to build local support (from the government and the community) because it promised to boost economic development in the area. In the two years after the dam was completed, there was no flood or drought damage despite two typhoons hitting the area in 2018. At the same time, crop yields more than doubled because farmers could cultivate crops twice per year using the irrigation water, which was impossible when they depended solely on rainfall. In addition, the community expected to generate extra income aside from agriculture, for example, by developing tourism around the dam.

Consistent Leadership

The key to overcoming the numerous implementation challenges was active stakeholder engagement, which was led by Hwang, who managed the project from design through completion. Hwang's understanding of the project's history and long-standing relationship with the local community and other stakeholders proved critical in pushing implementation forward during trying circumstances.

References

- KOICA (Korea International Cooperation Agency). 2018. *Final Report of the Project on Adapting to Climate Change Impacts through the Construction of Water Impounding Facilities in the Philippines*. Seongnam-Si, Korea: KOICA.
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