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FACTORS HINDERING SUCCESSFUL BENEFITS REALISATION OF CAMBODIA'S CLIMATE CHANGE PROGRAM: CASE STUDY OF A WATER AND SANITATION PROJECT, KAMPONG SVAY DISTRICT, KAMPONG THOM PROVINCE

Introduction

Climate change and poverty continue to pose ever more formidable and pressing challenges for developing countries. Although huge strides made over the last decades have lifted millions of people out of poverty, without concerted action to mitigate climate change, those gains could be quickly lost. The outlook is alarming. Recent estimates claim that by 2030 climate change could tip some 100 million people back into extreme poverty and climatic disasters could displace around 200 million (Khoday and Ali, 2018). In response, governments, international development organisations and nongovernmental organisations are accelerating intervention programs at the local level to reduce poverty and build local communities' adaptive capacities to increase livelihood resilience to climate change.

A successful home garden in the Ministry of Rural Development of program Kampong Thom, October 2018

More and more climate change programs being implemented in developing countries focus on building the resilience of vulnerable groups at the local level, including the poor, female-headed households, elderly, disabled, and children. Paradoxically, vulnerable groups can be very hard to reach or help, even through well-planned and well-executed targeted interventions. Some of the main barriers hampering successful benefits realisation are inadequate irrigation and drainage, low level of skills and education, inaccessible water sources, food insecurity, lack of climate change education and awareness and consequent lack of disaster (drought/flood) preparedness, limited networking and information sharing, land ownership dynamics and landlessness, and no or limited access to financial resources and services (Nang and Ouch 2014; Nyahunda and Tirivangasi 2019).

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In this Issue

Cambodia is among the countries most affected by natural disasters worldwide, and suffers the consequences of floods, droughts and storms on an almost seasonal basis. Underpinning the country's vulnerability to climate change is the fact that 77 percent of the population, including the majority of people in poverty, live in rural areas and are highly dependent on rainfed agriculture (mostly rice) and natural resources for food and income (Yusuf and Francisco 2009; NIS 2019). Kampong Thom, adjacent to the Tonle Sap Lake in central Cambodia, is among the provinces most severely affected by flooding and drought and is also one of the poorest. Frequent floods and droughts cause major damage, especially to unimproved water and sanitation sources, physical infrastructure, crop yields and livestock production, let alone loss of human life (NCDM 2020).

Within Kampong Thom province, Kampong Svay district is prone to persistent severe drought. In response, the Ministry of Rural Development (MRD), with financial and technical support from Cambodia Climate Change Alliance and Caritas Cambodia, has implemented a pilot program (including small projects) in the most affected communities to improve small-scale water supply and sanitation, and food security in the dry season. Specifically, the aim was to build climate-resilient water infrastructure (wells and rainwater collection/ storage systems), install improved latrines and establish home gardens.

This article draws on a qualitative study conducted to assess the impact of climate change programs in Cambodia, including the MRD's pilot program in Kampong Svay district (CDRI, MRD and UNDP 2019). It summarises the main lessons learned and discusses the main factors hindering poor and vulnerable program beneficiaries from replicating demonstration activities of building the resilient infrastructure (dug well, drilled well, latrine, home garden) after the program intervention ends. The discussion concludes with some recommendations for future climate change programs.

Program background

The MRD's resilient infrastructure pilot program was implemented in eight villages in eight communes (one village per commune) in Kampong Svay district, Kampong Thom province, from 2015 to 2019. The purpose was to improve year-round access to clean drinking water and improved sanitation, and support the capacity of local people to develop and plan for climate-resilient livelihoods. The program was targeted at poor households, female-headed households, the elderly, general households, and MRD officials at the national and subnational level (Khim and Chin 2016). There were clear criteria for identifying the beneficiaries: the poor, the elderly, the female-household heads. They must also work in or near the village (i.e. do not migrate for work), have enough labour to ensure equipment maintenance, be willing to maintain a home garden, and be willing to participate after direct support has ended.

The climate-resilient infrastructure provided under the program amounted to 11 dug wells, 5 drilled wells, 8 latrines and rainwater collection/ storage systems, and 16 home gardens. Drilling

Figure 1: Dug well

Figure 2: Deep drilled well for year-round water supply

Figure 3: Latrine and rainwater collection/storage system for improved sanitation

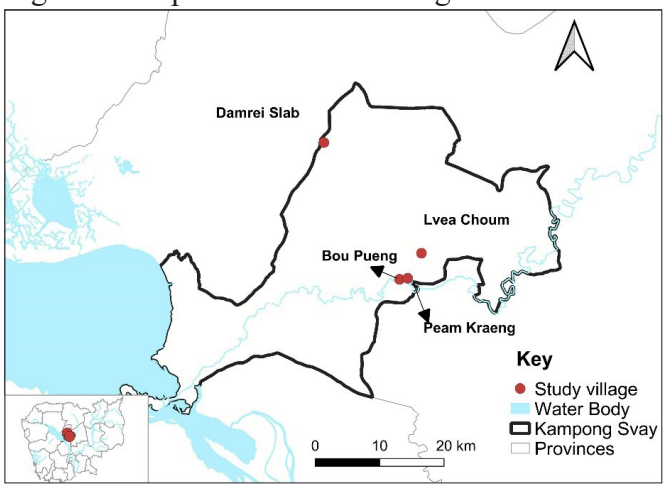
Figure 4: Home garden with drip irrigation system

allows wells to be deeper and produce water that is uncontaminated and available year-round (Figures 1 and 2). The latrines were built on land at lowest risk of flooding at schools and traditional ceremony venues that are accessible to all villagers (Figure 3). The home gardens were set up with a drip irrigation system (designed for low water usage and ease of maintenance) for both dry and rainy season vegetable production (Figure 4).

Study site selection and data collection

Four of the eight project target villages in four communes of Kampong Svay district were selected for study (Figure 5). Three of the villages are located close to Stung Saen River (more accessible for water and fishing), which flows into the Tonle Sap Lake. The other village is far from the water source. The entire district has severe drought and water shortages.

Figure 5: Map of the studied villages



Source: Compiled by authors based on NIS 2010

Primary data was collected from 13 key informant interviews and three focus group discussions (each with six to ten people) with program beneficiaries. Secondary data came from Commune Database 2018, Census 2019 and Census Database 2008 (NIS 2018, 2019, 2010). The study participants were selected to represent stakeholders of all types: poor households, female-headed households, children (under 15-year olds), elderly (65–70 years old), disabled people, general households, village and commune authorities, and MRD technical staff. The data was analysed using thematic analysis.

Demographics in the study sites

The four villages comprise 938 households and have a combined population of 4,694, half of whom are female and 67 percent are of working age (15–65 years old) (Table 1). About 76 percent are literate, 51 percent finished primary school and 21 percent graduated from high school (NIS 2018). Average household size is four people (NIS 2019).

The primary occupation of the villagers is rice farming. Only a small minority (10 percent) of them can plant two rice crops a year, because their rice fields are either irrigated or near the drainage canal. Chickens, pigs and cows are raised as a second source of income and for meat. In addition, villagers usually grow vegetables and fruit trees such as garlic, water spinach, banana, papaya, jackfruit and mango around their house. In Damrey Slab village, around 20 families had migrated to work in Thailand for the whole year, according to the village chief. Villagers also rely on fishing to support household food security. The villages are not connected to the electricity grid. Car

Table 1: The studied villages in Kampong Svay district, Kampong Thom province

Commune	Village	Total households	Total males	Total females
Kampong Kou	Bou Pueng	192	449	468
Damrey Slab	Damrei Slab	181	391	394
Trapeang Ruessei	Lvea Choum	230	640	565
Kdei Doung	Peam Kraeng	335	873	914
Total		**938**	**2353**	**2341**

Source: (NIS, 2018)

batteries (66 percent) and solar panels are the common sources of energy for lighting, and wood is the fuel commonly used for cooking (NIS 2018). About 50 percent of households have a latrine at home.

Findings – key factors hindering benefits realisation

The studied participants expressed satisfaction with the pilot program and requested that it be expanded to all other villages in the province. The home garden benefited from the commitment of women and children because they mostly stayed at home and could maintain it. However, the study identified four inhibiting factors that affect beneficiary participation: high temperatures linked to climate change, household structure/capacity (household labour supply and finances), fixing equipment faults or problems (reliance on technical support from government), and livelihood strategies and priorities of poor households. These factors are elaborated below.

High temperatures linked to climate change

Maintaining home vegetable gardens, according to an official from the Provincial Department of Rural Development, has been challenging due to extremely high temperatures. During the heatwave in May 2019, temperature rose to 42°C compared to the average monthly temperature of 30°C with highs of 34°C. Water is almost always limited in the dry season because most wells, even the deep ones, dry up. Villagers reported that the onset of the rainy season is becoming increasingly delayed, with the traditionally wet months of June and July staying completely dry. A village chief said:

> The MRD's development project has helped to improve hygiene. However, the new wells only solve part of the water shortage issue because the project provided only eight wells. The villagers built the other 13 wells. To solve this issue, people buy water from the private supplier, which cost 13,000 riels per 5,000-litre-tank Nearly 100 percent of the villagers use wells [as the main water source].

According to MRD staff:

> Digging and restoring more ponds is helpful for coping with extreme heat in the area. Ponds can store a large amount of water for commune consumption during the dry season.

Household structure/capacity (available labour and access to finance)

The pilot program offering home gardens to the poor and older households had a low success rate of 30 percent to 40 percent. This is because maintaining a home garden – taking care of seedlings, watering, weeding, filling the water tank, making compost, and so on – involves a fair amount of manual work and so requires a certain level of physical capability. Therefore, households with disabled and/or older adults, or households that lack sufficient family labour, could find it quite challenging to manage a home garden.

According to a female householder in Damrey Slap village:

> I got a home garden from the MRD project and I had some challenges. First, both my husband and I are getting old and we have not had enough energy for vegetable gardening since before the project started. Growing vegetables is quite hard work. We planted up the home garden twice but unfortunately all the plants were damaged, we don't know how or why, even though we followed the instructions from training. When the project staff came to check, I told them the truth and let them take back the home garden and offer it to other households who have the energy to grow vegetables.

The high cost of pilot drip irrigation systems for watering home gardens can be a challenge for the community to build in other villages. However,

MRD staff suggested that the villagers can use local resources such as poles rather than buy expensive equipment and materials.

Technical support from the government

Most people living in poor households have low educational attainment and no or low-level qualifications and need financial support. At the lowest threshold, the poorest households need continuous and direct household-level support to improve their situation. There is a glaring need for some villagers to be able to repair broken wells and manage home gardens, and for a planned budget to buy spare parts. Even though village committees (one per each commune) had been established to take care of and repair the infrastructure, maintenance has been restricted by lack of knowhow and the costs involved.

According to the FGD with commune councillors in Sangkor Commune:

> The well is far from home. Some villagers use it, but they are not willing to do the maintenance. "The difficulties with the project include the broken well, there are no spare parts and no one can fix it", said the commune chief in Sangkor commune.

Maintaining the wells, latrines, water collection and storage systems, and home gardens are the main challenges and those maintenance activities need cooperation from the beneficiaries, other users, and local authorities.

Livelihood strategies of poor and very poor households (different priorities)

Poor households usually prioritised earnings from paid work. Some households had left their village to find jobs in other areas, which was at variance with the criterion "must work in or near the village" for selecting the most relevant program beneficiaries. Other households lost commitment and prioritised daily wages as ricefield workers instead. The home gardens clearly did not work well for poor households. In contrast, medium and better-off households have more labour and more diverse income sources and therefore had the means to set up and manage successful home gardens.

According to an MRD official:

> There are several reasons why [some] villagers failed in the home gardens. They consider this home garden as a second or third income source, not a primary one. They have other options to earn a much higher income from paid work, garment factory jobs in the city, or work in the forests. It's not necessary for them to take care of this home garden because they can survive without it.

According to the district governor in Kampong Svay,

> "The highest priority for communities in this district is rehabilitating the road along the canal 30 Kanha because it is the main road for transporting rice to the market, and will benefit the whole district."

Conclusion

The beneficiaries of the Climate Change Intervention Program in Kampong Svay district, Kampong Thom province, voiced their support for the program and requested that the provision of wells, latrines, home gardens and rainwater collection and storage systems be expanded throughout the province. However, some aspects of the program did not work as well as envisioned in that the intended benefits were not fully realised. Four factors are found to hinder the ability of vulnerable households to benefit fully from the intervention: lack of labour in older households, extreme heat, different priorities/loss of commitment among poor households, and lack of technical knowhow and financial support.

The findings suggest that future interventions to build the adaptive capacity of people living in poverty and other vulnerable groups to develop climate-resilient livelihood strategies should consider the following:

1. **Climate-resilient infrastructure:** Improving the climate resilience of roads that make accessible the places where local people want to go and increasing access to improved water sources are the two key elements. Digging more ponds to store water for use in the dry season is also a priority because most wells dry up. Rehabilitating the road along the canal 30 Kahna in Kampong Svay district will elevate livelihood stability because it is the main road for transporting rice to the market.

2. **Wider range of livelihood options:** Because poorer households prioritise paid work, including migration to find work, adaptation interventions should help create sustainable paid work options for poor households in the community.
3. **Equipment maintenance training:** Selected local beneficiaries of the program and the commune maintenance committee should continue to be trained on how to maintain and repair equipment and facilities provided by the project – wells/water pumps, home gardens, latrines, rain collection/storage system. Doing so would reduce reliance on MRD's technical support and allow communities to be more independent during project implementation. A planned budget for spare parts, with financial support from the government, development partners and the community, should also be put in place.

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