

Climate Change, Cambodia and Canals: Learn How Communities in Kampong Thom are Persevering in the Face of Drought and Flooding

Authors: Cassandra Jeffery and Samnang Yang, UNDP in Cambodia
Photographer: Manuth Buth

Over [80 percent](#) of agricultural production in Cambodia is sustained by rainwater. Traditional irrigation practices revolve around the wet and dry monsoon seasons of tropical Southeast Asia, but erratic rainfall patterns are leading to shorter wet seasons with heavier rainfalls, and longer and hotter dry seasons. Parched land heavily erodes soil viability, making it difficult to absorb and retain water. Meaning, after a long and hot dry season, heavier-than-usual rainfalls may lead to intense flooding in rural Cambodia.



Lush rice fields and sprawling urbanisation in Thnol Jeat village, Baray Commune, Kampong Thom Province.

Historically, the devastation from flooding and drought has been sporadic. For example, in 1984, flooding destroyed approximately 400,000 hectares of land in Cambodia. Meanwhile, in 2002, land devastated by flooding reached 100,000 hectares, [according to government data](#). Regardless, the irregular nature of flooding and drought has real and lasting impacts on rural communities that depend on agriculture to sustain their livelihoods.



Agriculture in this region of Cambodia depend on rainwater, but too much can devastate crop yield.

While on average poverty is declining in Cambodia and rural incomes are rising, the changing climate is impeding socio-economic gains in rural communities, particularly through heightened susceptibility to livestock disease, higher levels of salinity in soil found on coastal regions, and increased incidents of pest and invasive plant devastation. As a result, debt has become a pervasive issue in many agricultural-based communities, at least in part because rural households are spending more money and time to mitigate damage from climate-induced externalities. As those families work harder to grow enough food to survive and pay down their debts, less money is being funnelled into important development initiatives, such as continued education, family planning, business development, and community centres.

Every year, Lon Lim from Laak village in the Santouk district, Kampong Thom province, spends around 800,000 riels per hectare of farmland on fertilizer. He spends an additional chunk of money on labour, insecticides, and a few miscellaneous items needed for agricultural development. Lim is not entirely sure about the total amount he spends on farming his land, but he does know that after household consumption, he's left with around 400,000 riels. Using some of the money to pay down his debt—which he acquired to buy fertilizers—any remaining income is put towards supporting his two young children and wife.

Like many farmers in his village, Lon Lim is living with the effects of climate change every day. In our discussion, he explained that sustained drought and erratic rainfall patterns make it difficult for him to accurately plan his annual harvest.

“There have been some profitable years, and some years where I only grow enough food for my family to eat,” said Lim.



Farmer Lon Lim from Laak village, Kampong Thmor commune, Santouk district.

Climate change is an increasingly serious threat facing many communities in rural Cambodia; however, insufficient and outdated irrigation systems are also a cause for concern. Major barriers include weak institutional capacities of rural committees, low incentives for collective action, poor urban planning, and inadequate infrastructure.

For example, in a discussion with Commune Chief, Thuo Seng, from Thnol Jeat village in the Baray district, Kampong Thom province, he explained that the primary water source servicing 16,000 people across 12 villages in his commune is not equally accessible. In areas near the water source, extreme flooding during the rainy season is common and often catastrophic for rice fields in the region. On the other hand, household farms located far away from the communal pool are left desolate and barren during the dry season. Most of the 2,015 households in Chief Seng's commune rely on agriculture for domestic consumption, as well as a primary source of income.



Commune Chief Thuo Seng from Thnol Jeat village, Baray commune.



Commune Chief Thuo Seng from Baray district describes some of the challenges his community has been facing over the last decade.

Back in Laak, farmers are faced with similar accessibility issues. Thirty-eight-year-old Ly Vang said pumping water onto her small plot of land is a two-day, labour intensive burden. Vang is using her land for household consumption only, so she is not sure

how much it costs to farm her land on an annual basis. However, most of her finances are funding the rental of heavy farming machinery, labour, and fertilizer.

In 2018, drought devastated Vang's crops. Nearly an entire hectare of her 1.8 hectare plot of land was destroyed. An annual harvest typically yields three tonnes of rice, but last year's yield barely reached one tonne. Like many of her neighbours, Vang is left with large amounts of debt and not enough agricultural output to break even, let alone increase her profit margins.

Commune Chief, Heng Chea, from Kampong Thmor commune in the Santouk district, said his main concern moving forward is rising temperatures, erratic weather patterns, and water shortages. Of course, water shortages will cripple agricultural production, but he is also concerned it will have far-reaching implications on the health of his community members. Approximately 2,500 households, comprising 10,000 people, live in Kampong Thmor commune, and in the past, restricted access to water and erratic weather patterns has exacerbated the impact of infectious diseases, such as dengue fever.



Reservoir in Laak village, Kampong Thmor commune, Santouk district, Kampong Thom province. This reservoir is connected to community canals for irrigation purposes.

[Several studies](#) conducted on weather patterns and the spread of dengue illustrate a positive relationship between humidity, rain fall, and the impact of disease in rural communities. Research conducted by the Ministry of Health found a correlation between a one-millimetre increase in monthly rainfall and a nine percent increase of dengue cases. Moreover, results indicate a one percent bump in monthly humidity increases the dengue burden by three percent. There are several limitations to consider from the Ministry's report; however, [additional research](#) conducted in Siem Reap, Kampong Thom, and Banteay Meanchey found similar results, stating that

monthly cumulative rainfall influences the rate and impact of dengue fever in all three provinces. Although humidity and rainfall are tied to an increase in dengue, it is important to point out that all research reviewed found a negative relationship between increasing temperatures and rates of infection: increasingly dry and hot temperatures are not correlated to an increase in reported dengue cases. In other words, warming temperatures do not seem to be leading to increasing cases of dengue, but the erratic weather patterns induced by climate change are correlated with the spread of disease.

Erratic weather patterns in tropical and humid climates, such as in Cambodia, present an increasing urban health problem. Dengue is transmitted primarily through mosquitoes, which are sensitive to their environment. Irregular shifts in weather patterns caused by climate change can lead to devastating implications for communities ill-equipped to handle fluctuating outbreaks of dengue.

According to the [World Health Organization](#), dengue has spread to rural areas, “increasing the population at risk from 3.5 million to almost 11 million.” The spread of dengue into rural areas means that inadequate public health infrastructure, population growth, unplanned and uncontrolled urbanisation, and increased mobilisation can heighten the impact of dengue in these vulnerable communities. Collectively, these factors undeniably impact food security, social growth, and economic development. In 2019, Chea said there are a few people in his community, including a couple of his grandchildren, suffering from dengue fever.

Although climate change in rural Cambodia is a serious threat to vulnerable communities, there are several projects working to test viable solutions to this problem. In conjunction with the UNDP, the National Council for Sustainable Development (NCSD), together with the National Committee for Sub-National Democratic Development Secretariat (NCDDS) are implementing a project that aims to improve sub-national administration systems affecting investments in rural livelihoods. The project includes three pillars, which include intervention in the following categories:

- 1) Strengthened sub-national capacities in climate sensitive planning, budgeting, and execution of long-term strategies that mitigate risks associated to climate change.
- 2) Resilience building of the most vulnerable communities to mitigate the effects of erratic rainfall, floods, and droughts.
- 3) Creation and implementation of incentive mechanisms and financial planning strategies at the sub-national level to manage climate change adaptation initiatives.



Newly rehabilitated canal in Thnol Jeat village, Baray district. Although the irrigation system will help distribute water evenly, more rainfall is required to flood the canals.

The project, coined [Strengthening Resilient Livelihoods](#) (SRL), recently built and rehabilitated irrigation systems in Kampong Thom. The communes discussed in this article, Kampong Thmor and Baray, are hoping to increase agricultural production by a system of canals that will provide balanced and sustainable access to water. In a follow-up article, I will illustrate some of the impacts this project has had thus far, and how these communities are hoping to improve their futures moving forward.

For more information on projects currently under the UNDP umbrella, click [here](#).



Areal shot of parched, sprawling rice fields in Kampong Thom Province.



Newly rehabilitated canal system in Laak village, Kampong Thmor commune, Santouk district.