CLIMATE CHANGE ADAPTATION IN POST-DISASTER RECOVERY - POLICY BRIEF 1

COMMUNITY-BASED ADAPTATION TO CLIMATE CHANGE AND ENVIRONMENTAL HAZARDS: RESULTS FROM PARTICIPATORY APPROACHES IN PREK PRASOP DISTRICT, KRATIE PROVINCE, CAMBODIA

This policy brief presents the perceptions, resilience and adaptive capacity of flood-affected communities in Prek Prasop District, Kratie province, Cambodia. It also shows the perceived causes, actual impacts and local responses to hazards at the community level. These are results from eight workshops conducted in June 2016 in four villages in two communes, which encompassed focus group discussions and participatory mapping. This brief confirms that local knowledge is as expert as scientific scholarship, and has complimentary features that hard-core scientific tools (such as satellites) cannot capture.

KEY MESSAGES

- Cambodia is one of the countries with high vulnerabilities to climate change. This susceptibility adversely affects agriculture, on which rural livelihoods depend. To address climate change, an integration of participatory approaches and local knowledge with policies and plans warrants both efficacy and efficiency.
- A combination of community-based focus group discussions and participatory mapping can provide valuable insights into the spatial and non-spatial knowledge of communities facing climate change and other hazards.
- These mixed approaches can map how the hazards affect local communities, how the hazards change over time, and identify the direct and indirect drivers of the perceived changes. They also support the transfer of ecological knowledge within the communities and between generations.
- Results from these approaches add value to scientific scholarship and can accurately inform policy making on external interventions concerning mitigation and adaptation measures.

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CONTEXT

About 90% of Cambodia's poor live in rural areas and depend on agriculture for their food and income activities. The agricultural sector, comprising primarily rice production that mainly relies on rainfall, in 2011 contributed 31 percent to the national GDP and employed 84 percent of the national labor force. However, the sector is under real and potential threats by climate change. Cambodia is currently in the grips of a severe drought due to the prolonged El Niño event that started in 2014. The drought has been attributed as the cause for no seasonal flooding in 2015 and the expected delay of the monsoon rains until late August, 2016. Further, research has found that an increase in temperature of 1°C in night time temperatures will reduce rice grain yield by 10%. The Cambodian government, in response to these threats, has introduced a Climate Change Strategic Plan for 2014-2023. The mission of this plan is to establish "a national framework for engaging...stakeholders in a participatory process" and "capitalize on... local knowledge..." with regards to climate change responses. This study thus has policy implications for this Strategic Plan.

COMMUNITIES' UNDERSTANDING OF SPATIAL AND TEMPORAL CHANGES IN ENVIRONMENTAL/CLIMATIC HAZARDS

In broad terms, communities were more concerned with droughts than floods since floods benefit their agricultural practices. Villagers identified deforestation as the chief cause of changes in the patterns of droughts and floods, particularly the hazard type and frequency (Figure 1). This conforms to a strong belief that forests can prevent or reduce floods. Other identified causes included natural/global change, agricultural irrigation and hydro-power dams.

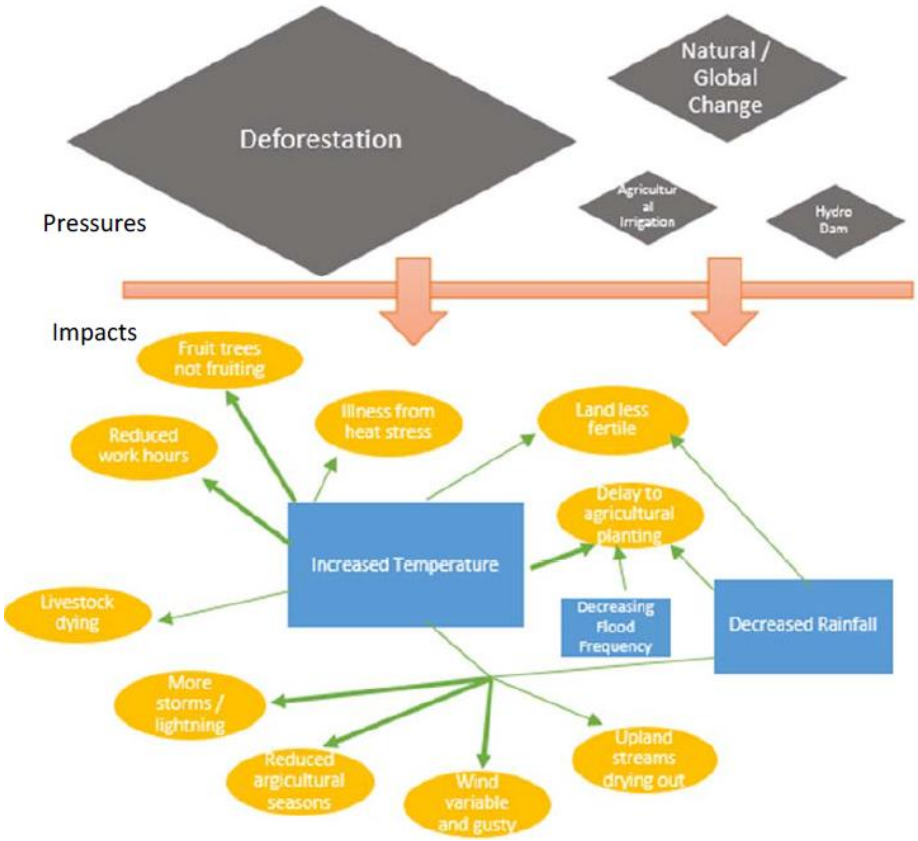

Figure 1. Illustration of participants' perceptions. Perceptions of why hazard frequency and intensity has changed (grey), how hazards have changed (blue) and how this has impacted communities (orange). Size of box and lines depicts number of identified by participants.

Villagers on a high level of consensus could also describe how seasonal flooding manifests in their areas, precisely outlining the original source, inflowing and outflowing routes, affected areas, and damages in and around the villages (Figure 2). Villagers could even show varying levels of flooding within their own villages. This demonstrates how local understanding of flooding processes is important for planning and adaptation as at this scale there is variability in flooding levels, which can be integrated into management strategies for flooding.

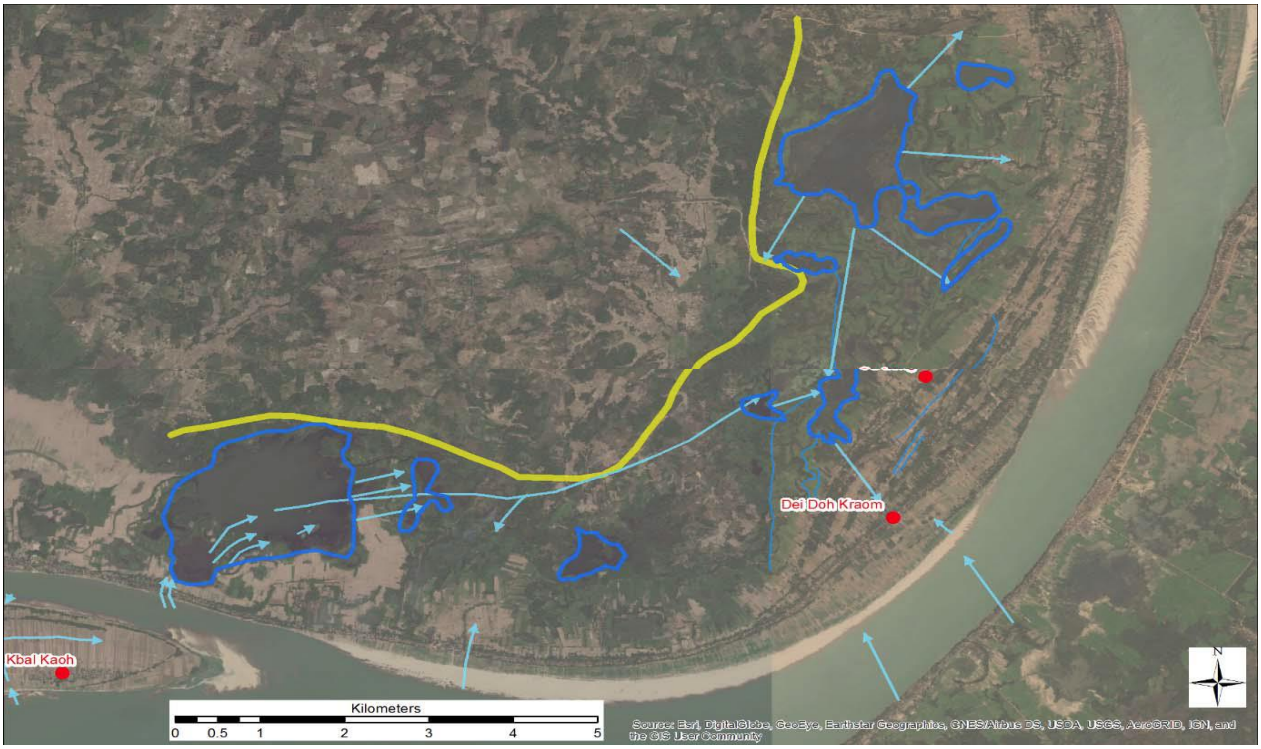

Figure 2. Participatory mapping: Hazard geography and flood extent
Flood direction (light blue arrows), flood extent (thick mustard-yellow line), lakes (blue shape). The flood comes directly from the Mekong then as the waters build, it flows into the large lake to the south west filling that then through the lake networks to the large lake behind the communities where it fills until it overflows back towards the Mekong, flooding the villages in the process.

Droughts were highlighted by all communities as impacting them in different ways. They thus adopted various methods to diversify crops to fit the changing climatic conditions. This highlights the adaptability of communities, changing from a process that is no longer working to another. Concerning temporal changes, villagers identified a reduction of rice cropping from two times during their childhood to one time presently in a season, culminating in insufficient harvest to support their families. Also, villagers could indicate the increase in temperature and reduced rainfall in specific times of their memory.

These results depict villagers' perceptions of climatic changes and causes to these changes and the changing processes in space and time. The participatory mapping could go beyond the spatial and add in the temporal aspects to the hazards. It highlighted how the floods occur on a local scale through time in a way that is a more complete picture of what is occurring when compared to satellite imagery alone. This detailed local knowledge could be incorporated into the Cambodia Climate Change Strategic Plan 2014 – 2023 in regard to climate change responses. It also could be useful for regional disaster responses and urban planning as it highlights the trajectory through time and space of how a flood occurs; this can be used in the flood mitigation planning of evacuation or infrastructure and social projects designed at reducing vulnerability.

COMMUNITIES' VULNERABILITIES TO RECENT ENVIRONMENTAL CHANGES

Villagers identified a number of vulnerabilities, ranging from crop failure, market price to socio-economic status, which were felt in their areas. Socio-economic status played a crucial role in coping with vulnerabilities. For example, villagers described that only the rich had access to pumps, enabling them to sell water to their neighbors who were unable to own and run pumps. This relationship indicates how incomes and access to resources moulds patterns of vulnerability to climate extremes. Influence of age on vulnerability was also brought up by villagers when talking about diseases. The elderly were identified as having more incidents of heat stroke and diarrhea, while the young had more incidents of dengue. Short-term employment loss during floods was experienced by most villagers, with the majority of working aged men moving out of the village for employment. Another vulnerability raised by all communities was the risk of commodity prices and over-supply of crops to the market, which negatively affected their crop sale. The volatility of the market had dire consequences, with failure leading to microfinance borrowing for most villagers.

Although drought was talked about as affecting everyone equally, combining focus group responses and participatory mapping highlight the nuances of drought impacts. Discussions emphasized the impacts on fruit crops due to increased temperatures (Figure 3). When put in its surrounding landscape, this highlights how other crops within their vicinity may also be under stress as well. The focus group participants identified that the increased temperature was resulting in crop failure. There is potential the increased temperature was having a similar effect to crops within close proximity, therefore the rice and cashew could be under stress. This demonstrates the depth of the method, for example, if a singular approach is used, say textual, the implications on the surrounding crops could be missed.

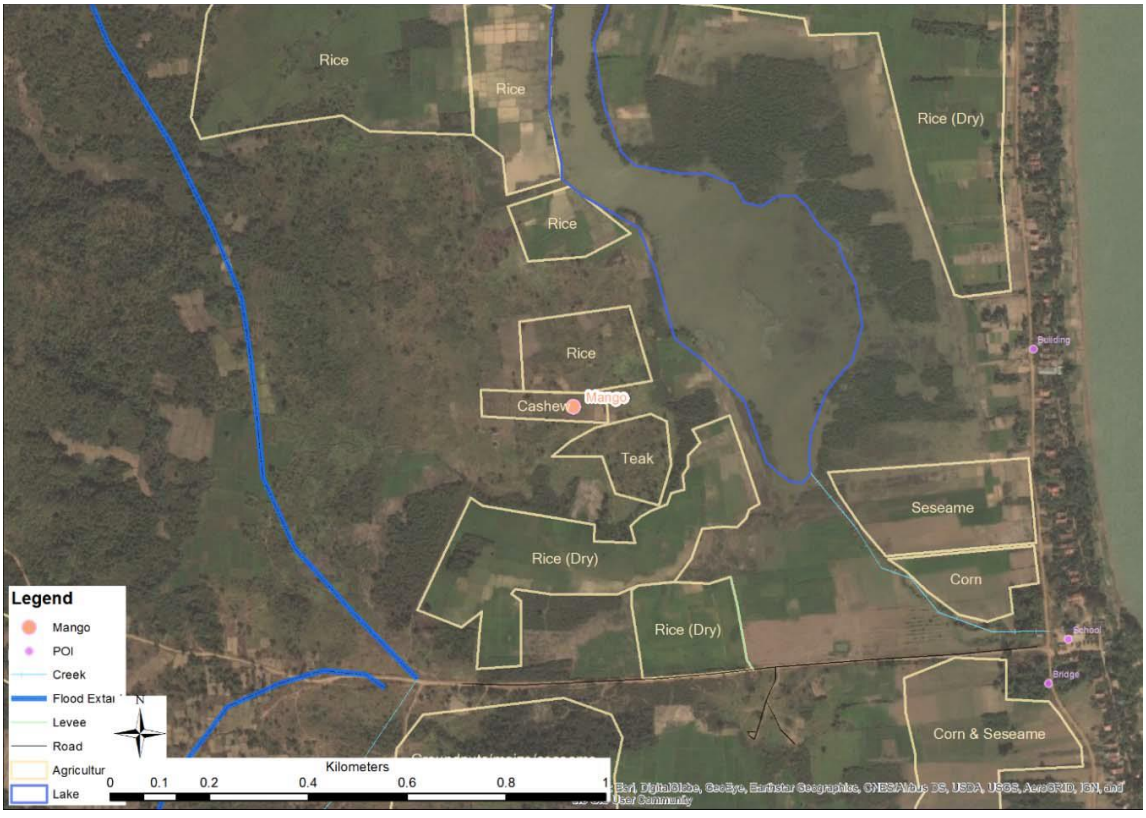

Figure 3: Participatory mapping: Increasing temperatures and fruit trees.
Mango tree (peach colored point) identified as not fruiting due to increasing temperature, surrounded by rice, cashew and teak. If mango not fruiting, probable other crops are also under stress from increasing temperatures.

Through the focus group discussions and participatory mapping, villagers unpacked the reasons for vulnerability, not just in the spatial realm but also in relation to social vulnerabilities that do not have such a strong spatial aspect. These insights would not have been garnered from using just one approach. The synergic power of these two approaches are highly important for localized impact and mitigation strategies and highlights the importance of participatory approaches and identification of threats to vulnerable people. Mapping is important, however, without the detailed information gained by speaking with people, the mapping data is less powerful.

COMMUNITIES' ADAPTATION STRATEGIES FOR ENVIRONMENTAL/CLIMATE-DRIVEN CHANGES

Villagers employed different mechanisms to cope with the hazards impacting them, depending on the geography and livelihood strategies of their villages. All villagers discussed the use of boats in times of flood, which has been found to be a livelihood-strengthening role. Some villagers harvested roots of lotus flowers for sale at the market, which provided a source of income, during times of drought when the lakes behind their villages became low and the fish stock declined. This showed an adaptive capacity that took advantage of and adjusted to the change in the status quo.

This study also shows a high level of synergy between the participatory mapping flood extent and the satellite-derived flood data. The close alignment of the participant-drawn flood extent and the satellite data is consistent with previous research which found that there was a greater risk perception in areas of moderate or substantial flood hazards. This unveils that local people and scientists have the same comprehension about the physical extent of the hazard, although they might have different understandings about the causes of flood (and drought) and coping strategies.

POLICY IMPLICATIONS

- Qualitative data on spatial and non-spatial knowledge of communities facing climatic hazards from community-based focus group discussions and participatory mapping can legitimize traditional knowledge within scientific and policy-making forums.
- Policies and plans of climate change mitigation and adaptation that signify participatory approaches and local knowledge have potential to tackle the root causes at grassroots level.
- Policies and plans can benefit from these approaches in terms of efficacy, efficiency and local expert knowledge.

SOURCE

This policy brief has been prepared by Dr. Chanrith Ngin, The University of Auckland, New Zealand, and Mr. Siphat Touch, Ministry of Rural Development Cambodia, and is based on the following material:

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