

A Flooded Forest on Fire: Adapting to Climate Change

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Background

In 2016, a fire consumed over *one third* of the 640,000 hectares of flooded forest in the Tonle Sap Biosphere Reserve in Cambodia. Over 8,000 hectares of flooded forest was lost in the Prek Toal Core Area. Ecological and socio-economic impacts from the fire have drawn attention to the need to develop adaptive management strategies to the increased risk of fire in Prek Toal. This study analyzes the biophysical and socioeconomic drivers of wildfire in a **vulnerability assessment** and creates a **pathway towards adaptation** by bringing together the physical, natural and human dimensions in the Prek Toal socio-ecological system. Managers in Prek Toal must couple sociological and ecological systems and adopt the **adaptation process** to manage in the face of uncertainty to prepare for the possibility of another future fire scenario.



"Honestly I'm ashamed to say [the fire] was a surprise, not just to me, but to everyone ... Nobody had a point of reference for this."
 – Prek Toal Director

A volunteer firefighter stands in a wetland laid to waste in the flooded forest of Prek Toal equipped with firefighting equipment during the 2016 fire. Image Source Phnom Pehn Post (2016).

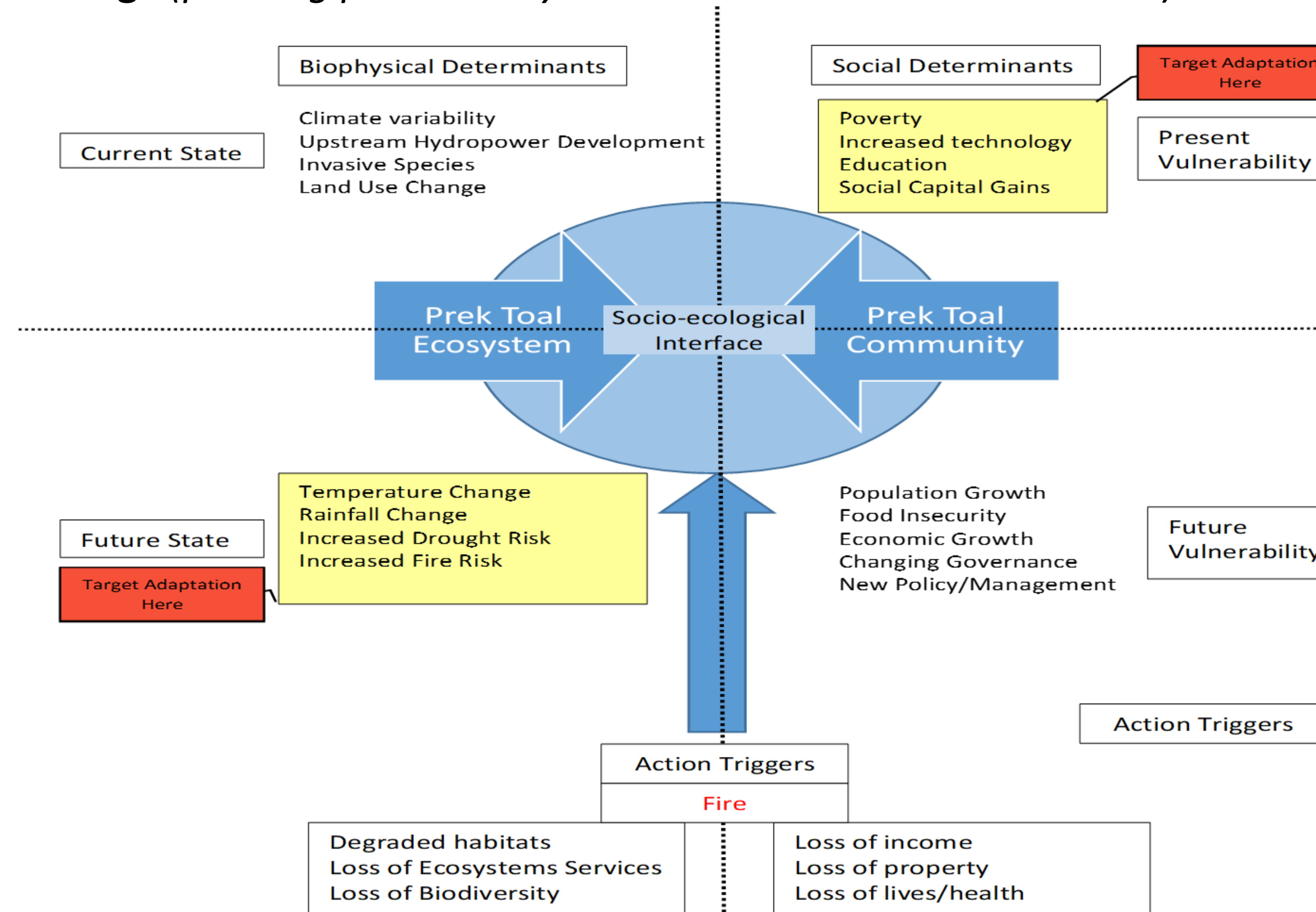
Vulnerability Assessment

This vulnerability study utilized a semi-structured qualitative survey methodology to gather data regarding fire history, local firefighting techniques, local causes to fire, and fire impacts in the village of Prek Toal. This study adopted the FAO's Community-Based Fire Management Participatory Rural Appraisal toolkit (Myers, 2006). Interviews were conducted between February and June, 2018 and were conducted verbally with the consent of the participants. In total, 30 households were interviewed using a convenience sampling approach until the study reached a saturation point. This study also surveyed local and national stakeholders regarding the capacity to manage the threat of fires and their perceived causes and impacts from 11 stakeholder interviews ranging from the local level (n = 5) to the national level (n = 6).

Pathways towards Adaptation

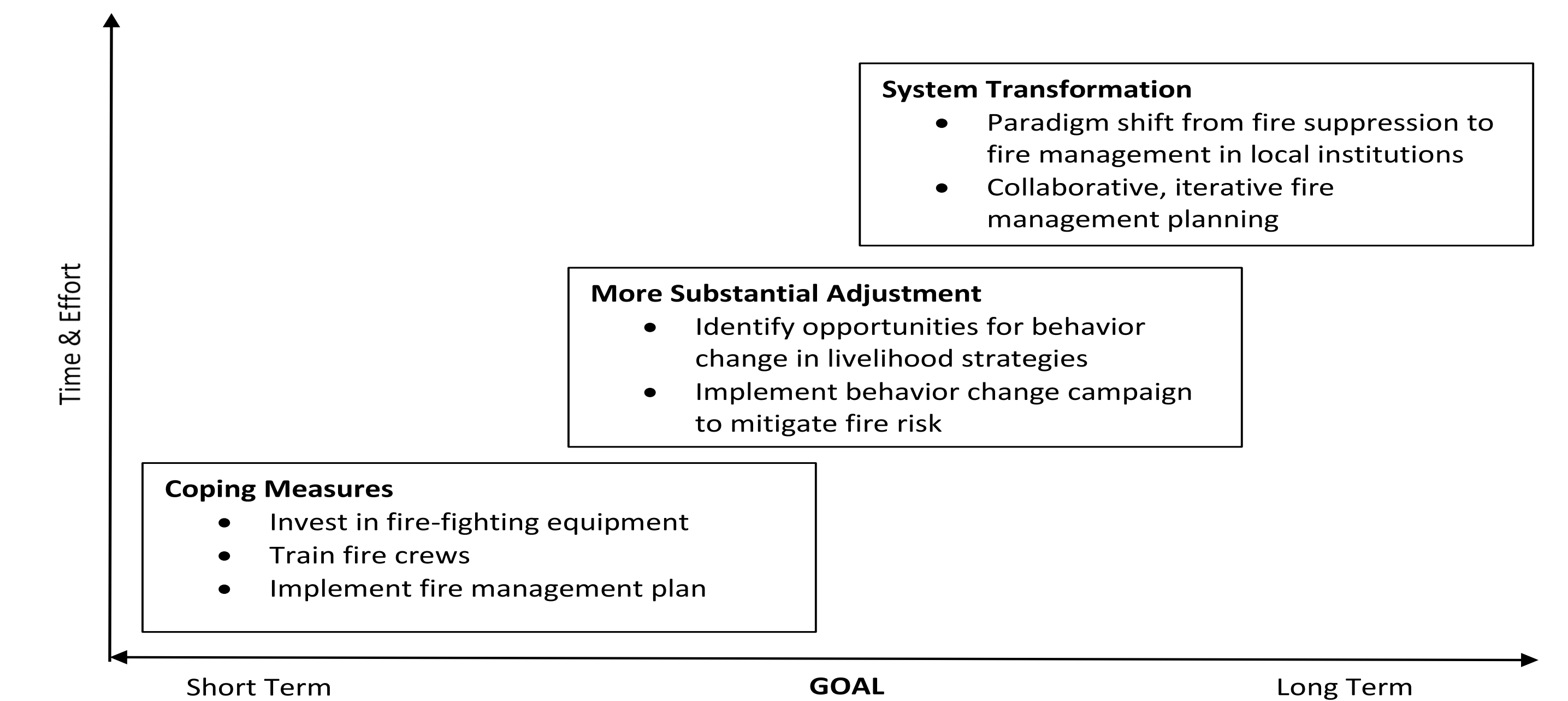


Vulnerability assessment identified the following fire-dependent activities that community members depend on for their livelihoods: honey harvesting, smoking, cooking, poaching wildlife, and land use change (painting produced by commissioned artist in Cambodia).



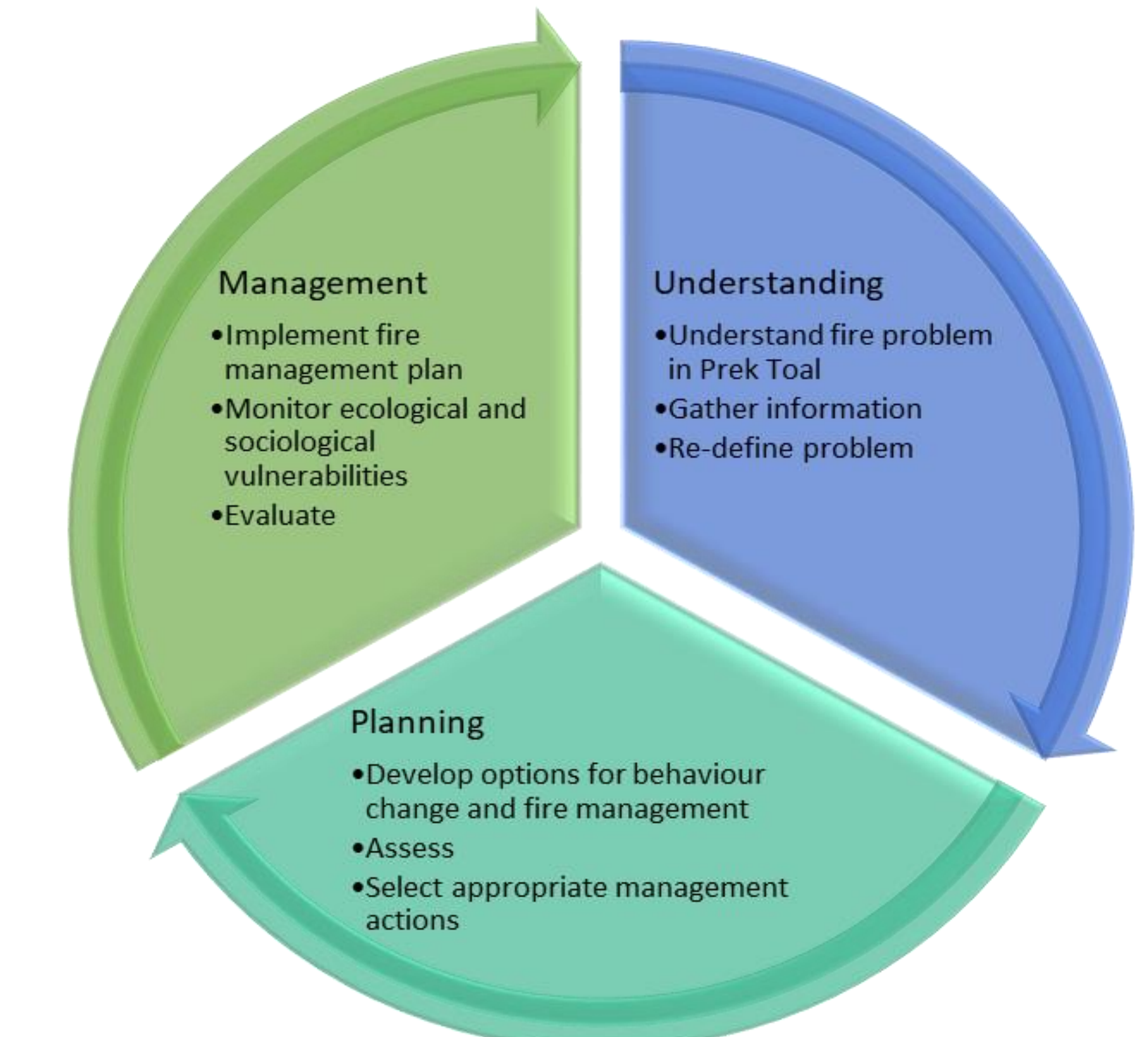
Relationship between present and future detriments of vulnerability in Prek Toal. Adaptation measures must incorporate both future biophysical changes and current sociological conditions to enable the spatial socio-ecological interface at Prek Toal to coexist with fires. Linking socioeconomic and ecological systems creates pathways to resilience in coupled systems affected by climate-change induced fire (Adapted from Preston & Stafford Smith, 2009 and Moritz et al., 2014).

Adopting the Adaptation Process



Scope and scale of adaptation to climate change required for Prek Toal in the context of fire management (adopted from Moser & Ekstrom, 2010).

As climate change continues to make the threat of wildfires inevitable in Prek Toal, this new perspective of coexisting with fires while understanding its effects on multiple ecological and sociological scales is essential. In order to achieve greater resilience against wildfires in a changing climate, Prek Toal managers must adopt the adaptation process and view fire as an inevitable natural hazard that is driven by climatic changes and socio-economic stressors.



The adaptation process consists of three phases: understanding, planning, and management (adopted from Moser & Ekstrom, 2010).

Acknowledgements

I would like to thank the Wildlife Conservation Society and the Cambodian Ministry of Environment for their logistical support and access to Prek Toal, and to the Fulbright U.S. Student Program for funding this study.

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