

## Chapter 2

# The Role of Indigenous Knowledge in Adaptation to Climate Change in the Northern Mountain of Vietnam

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### **ABSTRACT**

*Climate change has adversely affected the indigenous farmers in the mountainous regions not only in Vietnam but also in other countries. This chapter provides the indigenous farmer perception and use of indigenous knowledge to adapt to climate change. The authors reviewed many previous studies related to the indigenous farmer application of indigenous knowledge to adapt to climate change and combined with the data of 362 randomly selected indigenous farmers in Vietnam by using surveys, key informant interviews, and focus group discussions. They have found that indigenous farmers were aware of climate change and the negative impacts of climate change on their life both in Vietnam and in many other countries such as India, Bangladesh, and the USA. Furthermore, indigenous farmers have used different indigenous knowledge to adapt to climate change. This chapter also suggested that policymakers should consider indigenous farmer perceptions and indigenous knowledge when designing and formulating climate change policies for indigenous farmers in the future.*

### **INTRODUCTION**

Climate change is a major challenge to agriculture for many developing countries, which works as a threat to all aspects of society around the world (Li et al., 2017; Thoai et al., 2018). In developing countries, smallholder farmers, particularly indigenous farmers, are heavily affected by climate change.

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Furthermore, Ali & Erenstein (2017) report that in developing countries climate change affected most poor people living in agricultural communities. Climate change could worsen certain natural disasters, shifting the frequency, intensity, duration, and timing of many weather-related extreme events (Arouri et al., 2015; Thoai et al., 2018).

Agriculture, playing a vital role in the rural economy, is the major livelihood option for the farmers of the mountainous region, most of them (>90%) depend on agricultural activities. However, agriculture, particularly in developing countries, is most vulnerable to climate change impact due to low adaptive capacity (Huong et al., 2017; IPCC, 2014). Climate change reduced crop yield and productivity, resulting in increases in poverty and food insecurity for farmers (Arbuckle et al., 2013), and it has also affected soil, livestock mortality, and the health of the farmers. The negative impacts of climate change on agriculture are likely to be intense and uncertain, for example, by 2050, rice yield could decline from 6% to 42%, and other crops between about 3% and 47% (Smyl & Cooke, 2017). To reduce the adverse impacts, adaptation practices are the key responses and have played an important role in the livelihoods of farmers (Ali & Erenstein, 2017). Adaptation is, “the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC, 2014; Nkomwa et al., 2014).

In the context of agriculture, adaptation to climate change includes several aspects, such as farmers’ perception of climate change, adaptation strategies, effective factors, and barriers to farmers’ adaptation (Esfandiari et al., 2020). These strategies might include changing farm production practices such as planting and harvesting times, crop protection methods, irrigation and fertilizer control, tillage practices, and farm financial management (Menapace et al., 2015). Furthermore, adaptation strategies such as an adjustment in sowing time, use of stress-tolerant crops, change fertilizer types and use, and irrigation systems (Challinor et al., 2014), could significantly reduce vulnerability to climate change (Smit and Skinner, 2002), and generate benefit for farmers, and even more likely to minimize the adverse impacts of climate change (Ali & Erenstein, 2017; Zamasiya et al., 2017). In particular, using indigenous knowledge to predict the weather to avoid bad weather for crop cultivation and cope with climate change plays an important role for indigenous farmers in mountainous regions. However, the value of indigenous knowledge in climate change adaptation studies has received less consideration world wide Mertz et al. (2009).

Indigenous knowledge plays a significant role in the lives of the indigenous communities, helping indigenous farmers to cope with the changing climate (IPCC, 2014). Indigenous knowledge has been effective in developing adaptation measures to cope with climate change and has contributed to increased food security in many parts of the world (IPCC, 2014). In particular, indigenous people can assist in providing solutions to mitigate and adapt to climate change. According to the International Indigenous Peoples’ Forum on Climate Change (IIPFCC) and UNEP (2012), indigenous people can contribute to many potential adaptation strategies through their traditional knowledge such as climate monitoring and reporting, traditional fire management, disaster preparedness and response, early warning systems, rainwater harvesting, traditional agricultural techniques, and the development of sustainable livelihoods.

The IPCC realized the importance of indigenous knowledge and has made attempts to include this knowledge. Borne out of their long-term experience and experimentation, indigenous people have often adapted to environmental change through techniques and approaches using knowledge transmitted both orally and in practice from one generation to generation, based on this process, they can develop or enhance and maintain locally or regionally, a wide array of coping strategies. Arguably, their knowledge and practices can provide an important basis for today’s efforts to cope with even greater challenges of climate change (Makondo & Thomas, 2018).

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