



International Workshop
Climate-Smart Agriculture in Highlands: Best Practices and Lessons Learned
 29-30 October 2024




Climate Vulnerability and Adaptive Capacity of Nan Highland Communities

Sivapuram Venkata Rama Krishna Prabhakar
 Institute for Global Environmental Strategies, Hayama, Japan

ADB TA-9993 THA: Climate Change Adaptation in Agriculture for Enhanced Recovery and Sustainability of Highlands



AIT
 Asian Institute of Technology

Contents

ADB TA-9993 THA:
 Climate Change Adaptation in Agriculture for Enhanced Recovery and Sustainability of Highlands

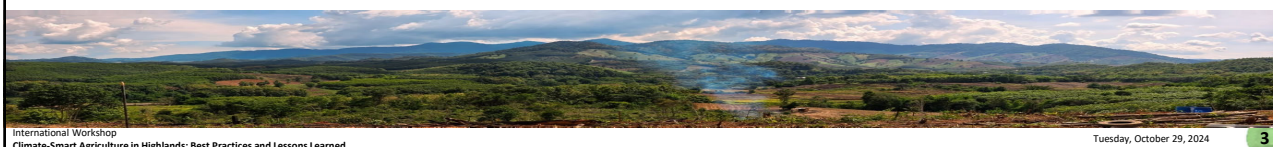
- Introduction
- Methodology
- Vulnerabilities and capacities
 - Land ownership and management
 - Cropping systems and livestock
 - Household income
- Capacity Needs
 - Technological needs
 - Mapping community capacity needs
 - Mapping local governments capacity needs
- Key recommendations

International Workshop
 Climate-Smart Agriculture in Highlands: Best Practices and Lessons Learned

2

Introduction: Four Distinguishing Characteristics of Highlands

- Thai highlands are characterized by **high heterogeneity** in vertical and horizontal planes in terms of microclimate, geographical, and socio-economic factors that determine the nature of agriculture practiced and livelihoods.
- The highland agriculture is **rapidly changing** as commercial farming and plantations are being introduced with detrimental impact on local ecosystems. Due to the fragile nature of mountain ecosystems, there is a need to preserve the traditional and low-input agriculture systems.
- Shallow soils, depletion of nutrients due to **runoff and leaching** makes them poor in fertility.
- Due to physical isolation, **access to markets** is often challenging and long distance transportation contributes to high marketing costs.



Methodology: Qualitative VCA of Nan Highlands

- The previous presentation is focused on **quantitative analysis** climate change vulnerability and risks which do not capture many socio-economic elements.
- To capture the qualitative aspects of highland vulnerabilities and capacities, **questionnaire surveys** (especially the baseline survey), and **focus-group discussions** were carried out with various stakeholders in the Nan province.
- The **objective** was to understand important elements of climate change vulnerability and capacity needs.



Household Survey in Bua Yai subdistrict

Population and sample characteristics in the subdistrict

Village	n	Sample population (N=1051)			Mean HH size	Main respondent gender (n=320)			
		Male	Female	Total		Female	Male	n	row%
V1 B. Oi	40	62	75	137	3.4	16	40%	24	60%
V2 B. Mai Mongkol	40	65	80	145	3.6	13	33%	27	67%
V3 B. Na Haen	40	63	63	126	3.2	11	28%	29	72%
V4 B. Tabman	40	65	62	127	3.2	8	20%	32	80%
V5 B. Nakai	40	54	69	123	3.1	13	33%	27	67%
V6 B. Tong Muang	40	62	63	125	3.1	11	28%	29	72%
V7 B. San Payom	40	59	63	122	3.1	10	25%	30	75%
V8 B. Nong Ha	40	68	78	146	3.7	8	20%	32	80%
Total	320	498	553	1051	3.3	90	28%	230	72%



Sample location

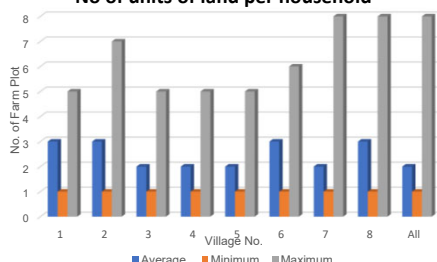
- A total of **320 household** samples were collected.
- The survey was conducted using digital tablet-based face to face interviews
- The draft questionnaire was formulated and tested
- The survey interviews were conducted in the Thai language
- Pilot testing was done to assess the questionnaire
- Eight enumerators were trained for two days prior to implementation
- The average household size was 3.3
- The sample consists of predominant male population

Tuesday, October 29, 2024

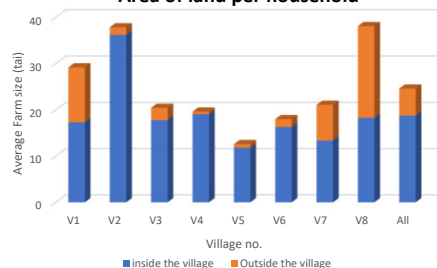
5

Land Ownership & Management

No of units of land per household



Area of land per household



- **Most owned the land** and a very negligible farmers leased in the land. **High land ownership is an important capacity factor.**
- The landholding is **highly fragmented**. Number of plots owned by each family range between 1-8. The highest difference between the max and min number of plots was in B Nong Ha and the least was in Na Haen, Tabman, and Nakai.
- In terms of the land holding size, the highest landholding size was reported in the B Mai Mongkol and the least was in Nakai.
- However, the **large variation in the landholding size** indicates a wide economic disparity among the villages. It can pose challenges in terms of technology adoption as different land holding sizes may allow different kinds of technologies to be employed.

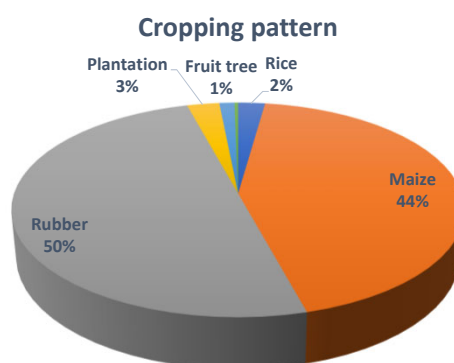
Cultivation along the slope is highly prevalent



6

Cropping and Livestock

- A **very narrow cropping pattern** could be found in the region highly dominated by rubber and maize. This indicates a presence of monocropping.
 - This also indicates the **absence of capacity** to take advantage of wide varied environments in the region to adopt diverse cropping pattern.
- **Income potential** seems to drive the cropping pattern in the region as against the **environmental sustainability** and this could pose serious long term consequences for the natural resources.
- At the same time, the adoption of **animal husbandry** appears to be poor since only 14% of households raise poultry and less than 5% of households own buffaloes and pig.
- The poor adoption of livestock can have important **resilience implications** against climatic and economic shocks.



Livestock	Number of livestock	% of Households
Buffalo	2	4
Cow	5	5
Pig	18	4
Poultry	32	14

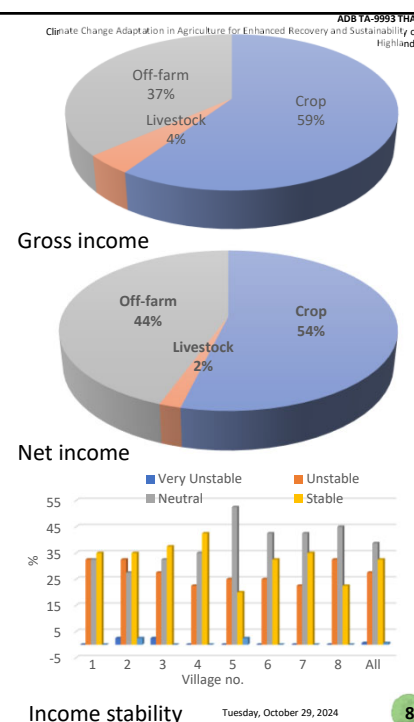
International Workshop
Climate-Smart Agriculture in Highlands: Best Practices and Lessons Learned

Tuesday, October 29, 2024

7

Household income

- Household income is an **important indicator of the capacity** of the household to provide quality of life to its members. While the amount of income is important indicator, even more important is the proportion of income coming from diversified sources.
- Though households reported fewer non-agricultural income sources, the **off-farm income appears to be relatively high**, on an average 37% of gross income comes from off-farm sources while only 4% income comes from animal husbandry.
- It is not clear how animal husbandry is complementing the nutritional security of households, though very few households reported following some kind of animal husbandry.
- **33% households reported stable income** (in the past 10 years) and 80% reported sufficient income, while 28% reported unstable income with highest unstable income reported in Oi, Moi Mongkol, and Nong Ha.

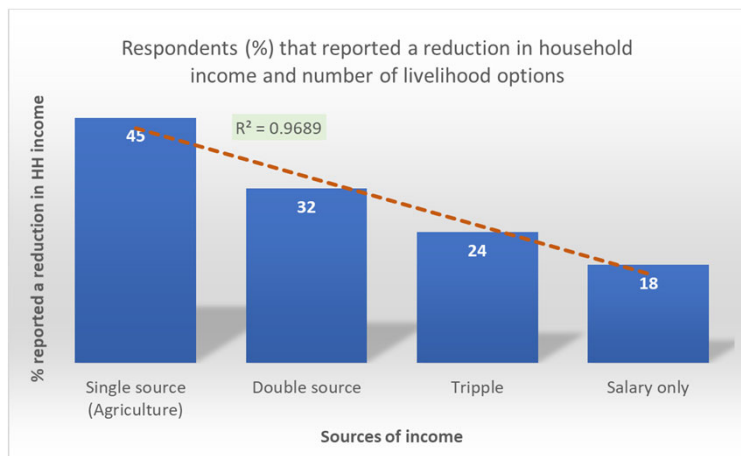


International Workshop
Climate-Smart Agriculture in Highlands: Best Practices and Lessons Learned

Tuesday, October 29, 2024

8

Income Stability vs Number of Alternative Livelihoods

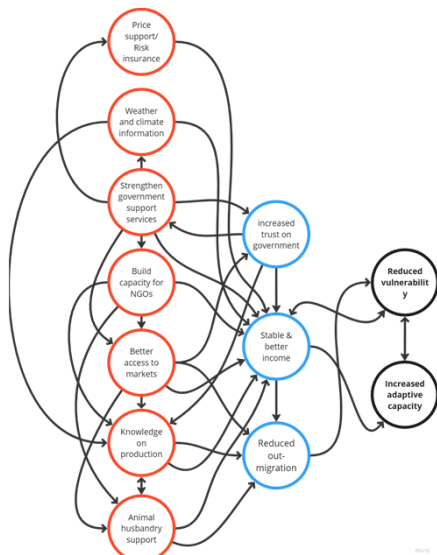


- There was a **clear and significant association** between number of alternative livelihoods and the propensity to report a reduction in household income due to weather and market uncertainties.
- Single livelihoods are agriculture livelihoods.
- **Remittances** are an important source of income during weather vagaries.

Technological Needs of Nan

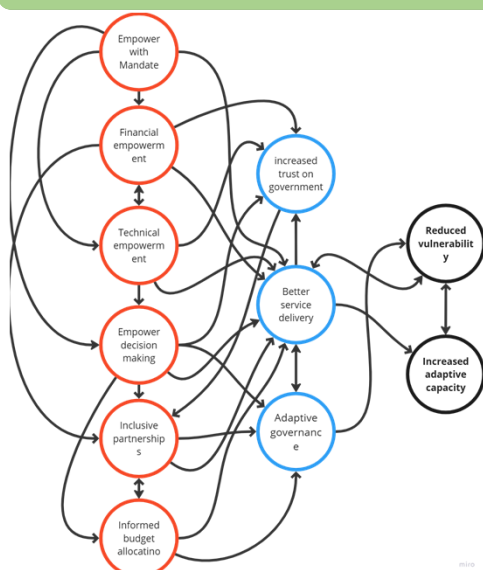
Category	Technology Options
Agriculture	Climate controlled storage facilities
	Drought and low-temperature tolerant crop varieties
	Weather & forest fire forecasting
	Effective dissemination of weather information and guidance on usage
	Crop insurance
	New and improved integrated pest and disease management methods
	Expansion of irrigation facilities including solar irrigation
	New and alternative crops suitable for future climate change
	Capacity building on low input and organic farming methods
	Support services including market price forecasting and market linkage development
Animal husbandry	Farm financial management strategies
	Disease management through vaccinations
	Improved breeds
	Measures to mitigate GHG gas emissions in animal husbandry
	Commercial methods of growing animal husbandry
Plantations	Market linkages, branding and value addition
	Effective use of vertical space of plantations
	Improved plantation management for climate change resilience and GHG mitigation
	Address slope stabilization and soil erosion issues
	Supply chain management and access to better markets and prices

Mapping Capacity Needs of Farmers



- **Production and price support** along with risk insurance
- Timely **weather and climate information** for cropping and marketing decision making
- Strengthening **access to the government** support services
 - Engagement with NGOs and other stakeholders by local governments
- Better **access to markets**, both in terms of physical access and timely provision of market information
- Enhanced support for **animal husbandry**

Mapping Capacity Needs of Local Governments



- **Empowerment of local governments**
 - **Mandate:** Adaptation plans for CCA as a core mandate
 - **Financial:** Bottom-up budget allocation, dedicated funding for adaptation
 - **Technical:** Manpower and training
 - **Decision-making:** Autonomy
- **Inclusive partnerships** with NGOs, universities, private sector and communities
 - **Participatory processes** at the local level with focus on marginalized and vulnerable communities
 - **Grassroots initiatives** that promote local actions
 - **Open and regular sharing** of information with stakeholders

Key Recommendations

- **Empowerment of local governments** is an important first step in building the capacities of local communities in Thai highlands. The local governments should be provided with necessary capacity, both technical and financial, to be able to implement a locally-developed adaptation agenda/plan in consultation with various stakeholders.
- **Important considerations**
 - **Enhance income resilience** through livelihood diversification
 - **Multi-stakeholder engagement** in implementing the adaptation agenda at the local level especially keeping in view the resilience needs of local communities
 - **Ensuring equity and justice** elements through addressing the concerns of marginalized and vulnerable communities including gender considerations
 - Put in place a **monitoring and evaluation (M&E)** framework to track local adaptation inline with national adaptation goals







International Workshop
Climate-Smart Agriculture in Highlands: Best Practices and Lessons Learned
 29-30 October 2024



THANK YOU

ADB TA-9993 THA: Climate Change Adaptation in Agriculture for Enhanced Recovery and Sustainability of Highlands



AIT
Asian Institute of Technology




Important References

- Mapping the vulnerability of mountain peoples to food insecurity. FAO, 2015.
- Projected Climate Change Impact on Hydrology, Bioclimatic Conditions, and Terrestrial Ecosystems in the Asian Highlands. Robert Zomer, Antonio Trabucco, Mingcheng Wang, Jianchu Xu. ICRAF Working Paper 222.
- ADB TA 9993-THA documentation
- Baseline survey conducted by the project team (TA 9993-THA: Climate Change Adaptation in Agriculture for Enhanced Recovery and Sustainability of Highlands)