

**CGIAR Research Program on
Climate Change, Agriculture and Food Security (CCAFS)**

Village Baseline Study:

Site Analysis Report for Ma village Yen Binh district, Vietnam (VN01)

November 2015

**Do Trong Hieu, Le Khai Hoan, Le Viet San, Le Van Hai,
Duong Minh Tuan, Luu Ngoc Quyen, Pham Thi Sen,
Alice Ferrer and Bui Tan Yen**

**Edited by: Cu Thi Le Thuy, Peter Laderach and
Laura Cramer**



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Contact:

CCAFS Coordinating Unit - Department of Agriculture and Ecology, Faculty of Life Sciences, University of Copenhagen, Rolighedsvej 21, DK-1958 Frederiksberg C, Denmark. Tel: +45 35331046; Email: ccaafs@cgiar.org

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The tools and guidelines used for implementation of the village baseline study across all CCAFS sites, as well as the mapping outputs at a higher resolution can be accessed on our website (<http://ccaafs.cgiar.org/resources/baseline-surveys>).

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ABSTRACT

Ma village, Vinh Kien commune, Yen Binh district, Yen Bai province has been selected to be one of Climate Smart Villages (CSVs) under the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in Southeast Asia. The village baseline survey (VBS) of Ma village, was therefore conducted as part of the baseline effort. This VBS aimed to provide baseline information at the village level about some basic indicators of natural resource utilization, organizational landscapes, and information networks for weather and agricultural information, which can be compared across sites and monitored over time. The study was conducted using the method developed and provided by CCAFS. The study's findings show that Ma Village is rich and diverse in natural resources. There are three main resources of vital importance for the local people livelihoods, namely farmland, forest and water resources. However, improper exploitation and management have caused negative impacts on these resources. As mentioned by farmers, in the past, farmland of the village used to be very fertile, but has now become severely degraded due to over-exploitation and improper management. Regarding forest resources: before 1980s, natural forests existed in large areas and consisted of valuable timber and wild animals. Today, much of the forest area has been converted to production forests or to food crop production land. Water resources, including lakes, rivers and streams have been severely polluted with pollutants from processing cassava, wood and also from animal husbandry and crop production. Degradation of water, farmland and forest resources are causing increasing challenges to agricultural production and also to other human activities. Results of farmer group discussions also demonstrate that there are 34 organizations operating in the village. Most of them are governmental. Very few are private or non-governmental organizations. The number of organizations involving in food security accounts for nearly 50%, the figure for those involving food crisis is 41.6% and in natural resources management is 25%. Those organizations working in food security and food crisis focus mainly on providing support (financial, seed and agricultural inputs) to local farmers to implement some production activities. Insufficient attention and input spent for sustainable development by these 34 organizations, especially those working in the area of natural resources management, could be one of the main reasons for the degradation and erosion of natural resources. There was no activity supporting Ma Village to develop production systems which can respond well to climate change. The study findings however show that local people are very flexible and creative, especially in exploitation of information. Among media channels, television is the most popular. Nevertheless, organizations, in particular, extension networks, Farmers' Union, local authorities, etc., also have an important role in information dissemination. Exploitation of information from the internet and mobile phones has also been given attention, but mostly by young people only.

Keywords: Access to information; baseline; organization; participatory mapping; Vietnam; village study

About the Authors

Do Trong Hieu is working for Northern Mountainous Agriculture and Forest Science Institute (NOMAFSI) since 2009. He is the facilitator/community organiser of the CCAFS Climate Smart Village in Ma village, Yen Bai province and co-facilitated the VBS study in My Loi village. He holds a Bachelor degree in crop production from Hung Vuong University.

Le Khai Hoan is working for NOMAFSI since 2006 and has eight years' experience in implementing research and development projects in remote regions. He was notetaker in CCAFS Climate Smart Village in Ma village, Yen Bai and co-facilitated the VBS study in My Loi village. He earned a Bachelor degree in plant protection from Ha Noi University of Agriculture.

Le Viet San has agro-systems background, working for Northern Mountainous Agriculture and Forestry Science Institute, Vietnam (NOMAFSI)

Le Van Hai is a field staff at World Agroforestry Centre since 2014. Based in Ha Tinh, he is the facilitator/community organiser of CCAFS Climate Smart Village in My Loi village. He has three years' experience in rural development before earning a Masters degree in Agricultural Sciences from the University of Melbourne, Australia.

Duong Minh Tuan is a consultant at World Agroforestry Centre since 2014. He is based in Ha Tinh as notetaker for the CCAFS Climate Smart Village baseline surveys. He holds two Bachelor degrees in economics, one specializing in marketing from Vietnam National University and the other in management from Universite Paris Sud, France.

Luu Ngoc Quyen has agricultural production system background, working at the Northern Mountainous Agriculture and Forestry Science Institute, Vietnam (NOMAFSI)

Pham Thi Sen is an expert on applied agriculture science, working for the Northern Mountainous Agriculture and Forestry Science Institute, Vietnam (NOMAFSI)

Bui Tan Yen, PhD. He is a Science Officer of CCAFS program in Southeast Asia, based in Hanoi, Vietnam. He has 20 year experience in agronomist, Geographic Information System and land use planning.

Alice Ferrer, PhD. She works at the UP Visayas College of Arts and Sciences, majoring in economics and psychology. She has excellent experience in economics, gender and nutrition and fishery researches.

Abbreviations

CC	Climate Change
CCAFS	Climate Change, Agriculture and Food Security
CGIAR	Consultative Group on International Agricultural Research
CIAT	Center of International Tropical Agriculture
CPC	Commune People Committee
CSV	Climate smart village
DARD	Department of Agriculture and Rural Development
DOLISA	District Department of Labor, Invalids and Social Affairs
DoNRE	Department of Resources and Environment
DPC	District People Committee
FGD	Focus Group Discussion
ICRAF	World Agroforestry Center
NGO	Non-governmental organization
NOMAFSI	Northern Mountainous Agriculture and Forestry Science Institute
OBS	Organizational Baseline Survey
R&D	Research and Development
R4D	Research for development
SCJ	Science Council of Japan
VBS	Village Baseline Survey
VND	Vietnamese Dong (USD1= VND 21000)

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1. INTRODUCTION

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic ten-year partnership between the CGIAR and Future Earth to deal with the threats posed by a changing climate, to achieving food security, improve agriculture and livelihoods. In 2014, CCAFS South East Asia region identified sites for implementing Climate Smart Villages (CSVs). Six sites were selected in three countries of Vietnam, Cambodia and Lao PDR. The objectives of CCAFS CSV is to increase the adaptive capacity of small-holder farmers in light of climate change effects, improve livelihoods by sustainably increasing productivity and resilience, mitigate climate change by reducing greenhouse gases (GHGs), and enhance national food security and development goals. In Viet Nam, the baseline studies were conducted between September and November 2014 in three sites: Ma village in Yen Bai Province, My Loi village in Ha Tinh Province and Tra Hat in Bac Lieu. These villages are selected for the Climate Smart Villages (CSVs) initiative of the CCAFS SEA in Vietnam.

This report presents the results of the Village Baseline Study (VBS) that took place in Ma Village from October 30th to November 1st, 2014. The VBS is part of the baseline activities (including Household Baseline Survey and Organizational Study) done in target sites for CSVs. The VBS aims to provide baseline information at the village level about community resources, organizational landscapes, information networks, and the community's vision for the future.

The objectives of the village baseline study are to:

1. Collect baseline data on indicators that allow site comparability and monitor changes in the villages over time. In particular, these are changes that allow people to manage current climate risks, adapt to long –run climate change, and reduce/mitigate greenhouse gas emission;
2. Understand the enabling environment that mediates certain practices and behaviours and creates constraints and opportunities (policies, institutions, infrastructure, information and services) for communities to respond to change.
3. Gather information on the aspirations of the community in order to make future interventions more sustainable and easily adopted.
4. Explore gender differentiation.

This report is presented in five sections: the Introduction is followed by a brief overview of the methodologies used, brief profile of Ma village and the results relating to the three evaluated topics – community resources, organizational landscapes, and information networks. A conclusion and recommendations for CCAFS end this report.

2. METHODS

The study has been conducted using a method developed by CCAFS which is applied to all CCAFS sites. The information was mainly collected through focus group discussion (FGD). Besides this, individual interviews and a desk study of secondary resources were conducted to gather additional information and other necessary data.

Three FGDs were organized in the meeting hall of Ma Village. Each FGD has a specific topic. Farmers involved in the 3 days of discussion were 90 people who were randomly selected from 180 households of Ma Village, including 45 men and 45 women. In each day, a FGD was conducted with 30 people (15 men and 15 women), divided into 2 subgroups: one of 15 men and the other one of 15 women, separately.

On day 1, FGD focused on the natural resources. Participants were grouped into two subgroups, 15 men and 15 women. Each subgroup was facilitated to draw a village map and to discuss about current and past situations of local natural resources and infrastructure on satellite imagery. Outputs of the first day's discussion are a map describing village resources, infrastructure as well as current and past maps of the village. Also in the first working day, a team of 3 volunteers comprising two men and a woman were nominated to take photos of the resources and infrastructure which the community likes and dislikes. Before taking pictures, they were trained on how to use a camera and were provided with a camera. Those volunteers were invited to join the discussion in the third day to present and talk about the photos taken.

On day 2, the study team facilitated discussions in two separate subgroups to explore information about organizations/agencies operating in the village as well as their role in the local production, food security and food crisis. Thus, the subgroups also identified organizations involved in local natural resources management.

On day 3, FGD discussed the networks for villagers to gather and exchange information on weather, agricultural activities, market prices, etc. The second task of this 3rd day's discussion was to build up a long term vision of the village up to 2030 and to understand villagers' expectations about the images of Ma Village in the future. To build this vision, all 30 farmers, 15 men and 15 women, were facilitated to discuss together in one big group. The volunteered photographers from the first day also came and presented their photos.

Besides the above mentioned FGDs, key informant interviews were conducted with some staffs from Yen Bai provincial Department of Agriculture and Rural Development (DARD), Yen Binh District Department of Agriculture and Rural Development, Yen Binh Extension Station etc. for gathering additional information required. Also, secondary documents were collected and analyzed.

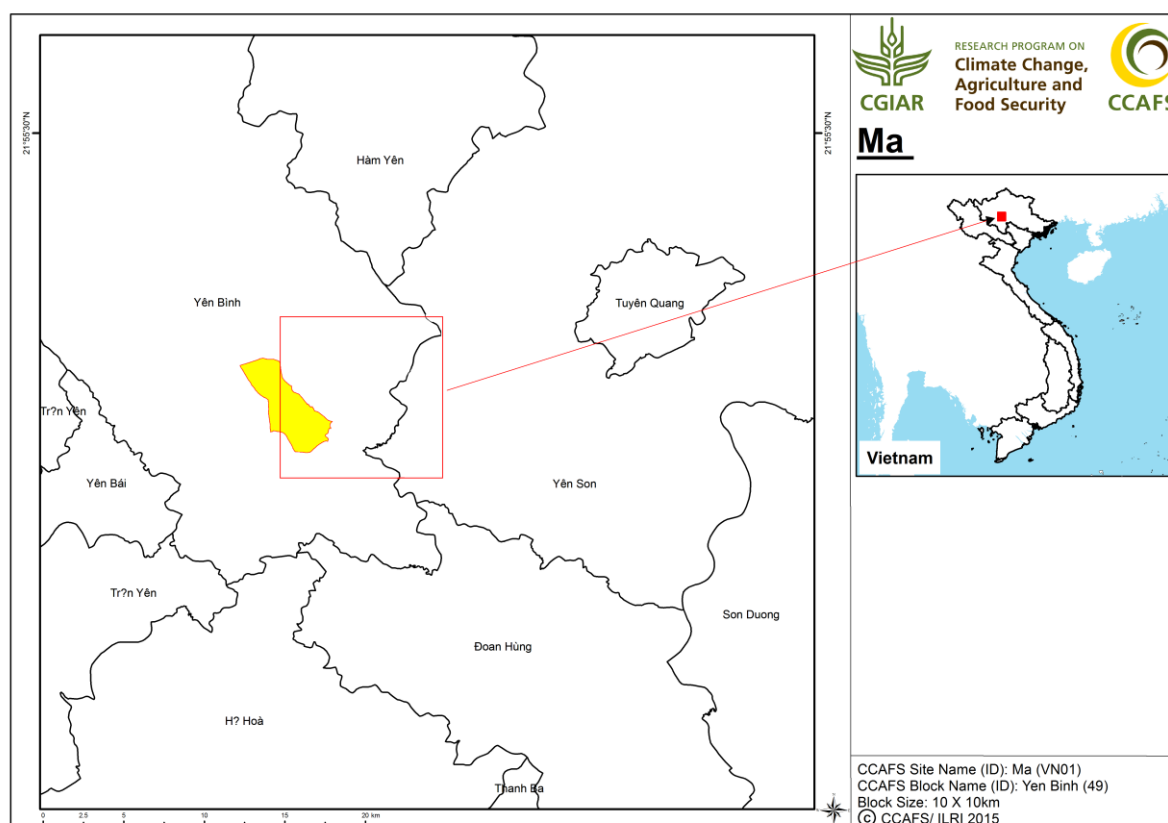
Final verification of the data was done on 30th December 2014 at a community meeting where the draft report of VBS was presented and discrepancies between data from different sources were discussed. Participants to the community meeting for data verification include: 14 farmers from Ma village who were also participants in the previous 3 FGDs, Ma village leader, Unit Head of Ma village women's union, Vinh Kien commune extension officer, and staff from the district DARD, district extension station and district DONRE.

Details on method to facilitate focus group discussion is described in CCAFS's guidelines on Village Baseline Study, which can be accessed at <http://ccaafs.cgiar.org/resources/baseline-surveys>).

3. BRIEF PROFILE OF MA VILLAGE

Ma is the largest village among 15 villages in Vinh Kien Commune, Yen Binh District, Yen Bai Province, having a geographical location at 21.74°N, 105.08°E, at a distance of about 160 km from Hanoi. Ma village has a total land area of about 350 ha, classified according to land use patterns into the following: double-crop rice land (12.34 ha), single-crop rice land (3 ha) other crops' land (over 100 ha), forestry land (220 ha), land for residential and flood plain (about 25 ha). About 501 ha of surface waters (of Thac Ba lake) for fishing and aquaculture are also under the management of Ma villagers.

By December 2014, Ma Village had 182 households with 729 people (statistic data provided by the head of Ma Village). Of which, 7 households (3.83% of the total households) were classified as poor with income lower than 500,000 VND per capita per month¹. In terms of ethnicity, Kinh people represent the highest ratio (49.94%), followed by Cao Lan people (48%). People from other minor ethnic groups, including Tay, Muong and Dao, represent the rest (2.06%).



Agriculture is the major source of household income and engages over 90% of the labor workforce. Due to diversity of natural resources, agricultural and forestry production systems in Ma village are also very diverse, including production and processing of agro-forestry products, of which wood and tapioca processing are among the most typical industrial activities in the village. Nevertheless, these activities are also the major causes of negative impacts on the local resources and environment. Animal husbandry and aquaculture

¹ Equivalent to approximately USD 23 at Dec. 2014 exchange rates.

are also important income generation sources for the local people. According to the statistics data of Vinh Kien Commune's People Committee, in 2014 Ma Village had 112 buffaloes, 50 cattle and about 1000 goats. There were 60 fish cages with an average yield of 0.5 tons/cage/year, bringing an income of about 30 million VND per cage per year.

The total agricultural land area of the village is about 120 ha, of which, rice land consist of 15.83 ha (12.34 ha of 2 rice crops and 3.47 ha of one rice crop), mainly located in lowland area. Land of other crops, such as maize, cassava and tea, accounts for approximately 100 ha. The agricultural lands are shared by 176 households. On average, the farm size is 0.68 ha.

There are 2200 ha of forest land (forestry land), which belong to Vinh Kien, Phuc An, Vu Linh communes in Yen Binh district. 220 ha of this forest are managed by Ma households and the remaining is managed by Thac Ba State Forestry Plantation. About 70% of total households in Ma village own forest land with land tenure period of 50 years.

According to 2013 statistical data of Vinh Kien commune, this commune has a total of 672 ha of water surface, mostly belong to ThacBa lake. About 501 ha of those areas are managed by 34 households in Ma village for fishing and aquaculture.

Climate conditions in Ma Village are similar to those in eastern part of Yen Bai province, characterizing by tropical monsoon condition, higher rainfall and higher temperature than other parts. The mean temperature varies from 20°C to 23°C. The average annual rainfall is about 1,800 - 2,000 mm but unevenly distributed through the year. The rainy season starts in late April and ends in early October, and most of the annual rainfall concentrate in this short period.

4. RESULTS

4.1. Topic 1: Community resources – participatory satellite imagery interpretation and visioning

Situation of community infrastructure and natural resources have been analyzed based on participatory visual interpretation of high resolution satellite image. Basic understanding of existing resources as well as community dynamics in relation to its environment has been explored.

4.1.1. Current resources

Discussions among members of men's and women's groups are organized separately. Map 2 and Map 3 below illustrate outputs of the two groups' discussion. More detailed information about resources is presented in Table 1.

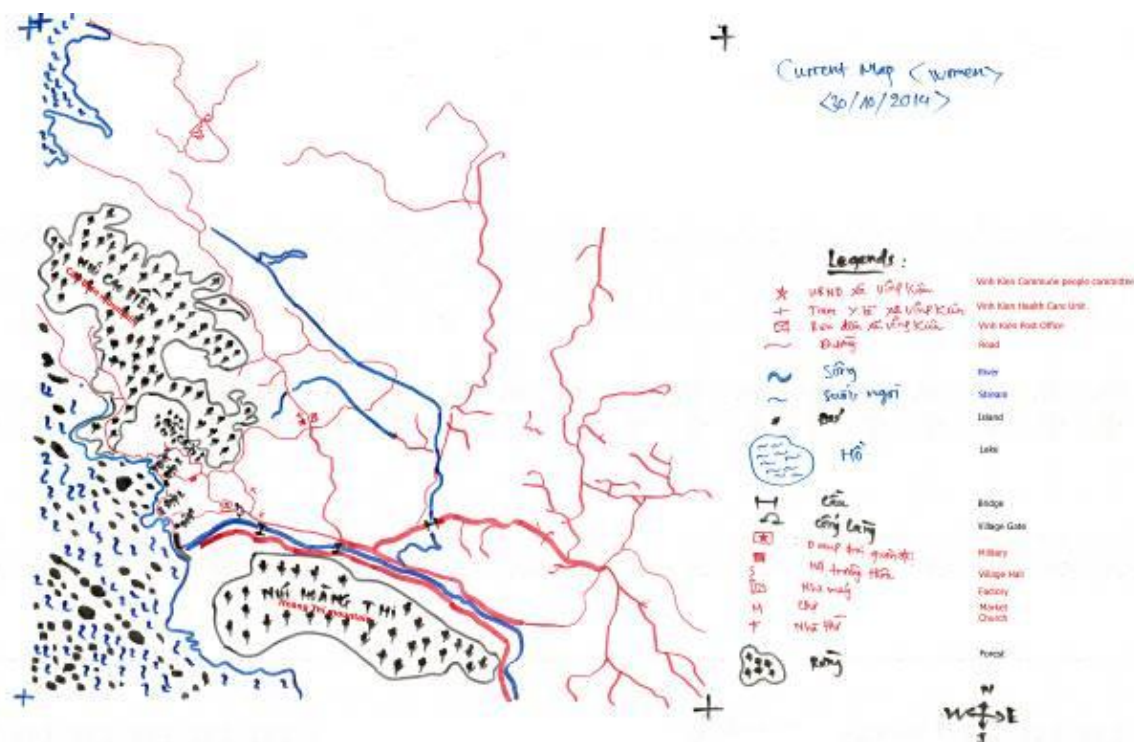


Photo 1. Current conditions mentioned by women regarding natural resources and infrastructure

Farmland: Land for rice cultivation is mainly located in lowland area of the village. In Ma, there are 2 rice seasons per year: spring rice and summer rice season. Agriculture land use right has been passed to households from cooperatives after Doi Moi program in the 1990s. Both men's and women's groups indicated that land degradation and shortage of irrigation water are main problems of farmlands. In addition, improper use of pesticides in farmlands is popularly seen in the region.

In-field irrigation canals: Irrigation canals play an important role in maintaining two or three cropping seasons per year. In addition to providing water for annual crops, canals also supplement water for fishponds within the village. Being funded from YenBinh DARD, about 500 m of this canal system has been concreted. Yen Binh DARD also has

responsibility to manage and maintain the system annually. However, this canal system only satisfies water demand of about 10 ha of agricultural land in Ma village, which accounts for 54% of total agricultural land.

Forest resources: Forests of Ma Village cover about 220 ha. Two species of timber tree popularly grown here are eucalyptus (growth cycle of 5 years) and acacia (growth cycle of 6-7 years). These planted forests are located mainly in Hoang Thi and Cao Bien mountains. In addition, planted forests are also found in islands within Thac Ba reservoir, which are mainly managed by Thac Ba Forest Plantation. Timber product is often sold to timber processing enterprises within the district. Planted forest contributes a considerable portion to household income and also brings environmental benefits to communities, such as covering bare land, reducing soil erosion, increasing soil water holding capacity.

River and stream: Chay River plays a very important role in the livelihoods of local communities. This river provides water for Thac Ba Hydropower Plant and for agricultural land in the region and plenty of fishes. Both discussion groups mentioned that water of the river is increasingly polluted and not safe for domestic uses. According to participants, the reasons are unsustainable exploitation of sand and gravel on river and improper management of waste water from cassava starch processing. Beside Chay river, there is a small stream crossing Ma village from Cao Bien mountain to Chay river. However, discharge of this stream is rather small and its water is also polluted.

Reservoir: A major part of Thac Ba reservoir managed by Vinh Kien Commune belongs to Ma Village. It takes about 10-15 minutes to walk from village center to the reservoir. Water surface of the reservoir create great opportunity for villager to do fishing and aquaculture, which remarkably contribute to household income. However, villagers mentioned that wild fish in the reservoir is become rare and cultural fish is not healthy. They expected to receive supports in terms of fish breeding and farming techniques.

Dam of Thac Ba Hydropower Plant: The dam is not far from village center, about 10-15 minute walk. It was constructed from 1960 to 1970. Main function of this dam is to keep efficient water level for generating electricity and to control irrigation water for downstream areas.

Roads: The village's transport systems include 2 big roads, 3.5 m in width and with good quality, which connect the village to Tuyen Quang and Lao Cai, the two neighboring provinces. These roads were built and managed by the government. Besides, there is another road linking Vinh Kien commune with Bach Ha and Yen Binh communes of Yen Binh district. This transport system facilitates transporting and trading much better than before. The roads connecting Ma village to Vinh Kien town and to national road has been widened and asphalted with a very good quality. Inter-village roads were constructed with contribution of both government and local communities. Thereby, government provided materials and local communities contributed labor. Proportion of concrete inter-village roads is still rather small (only 30%).

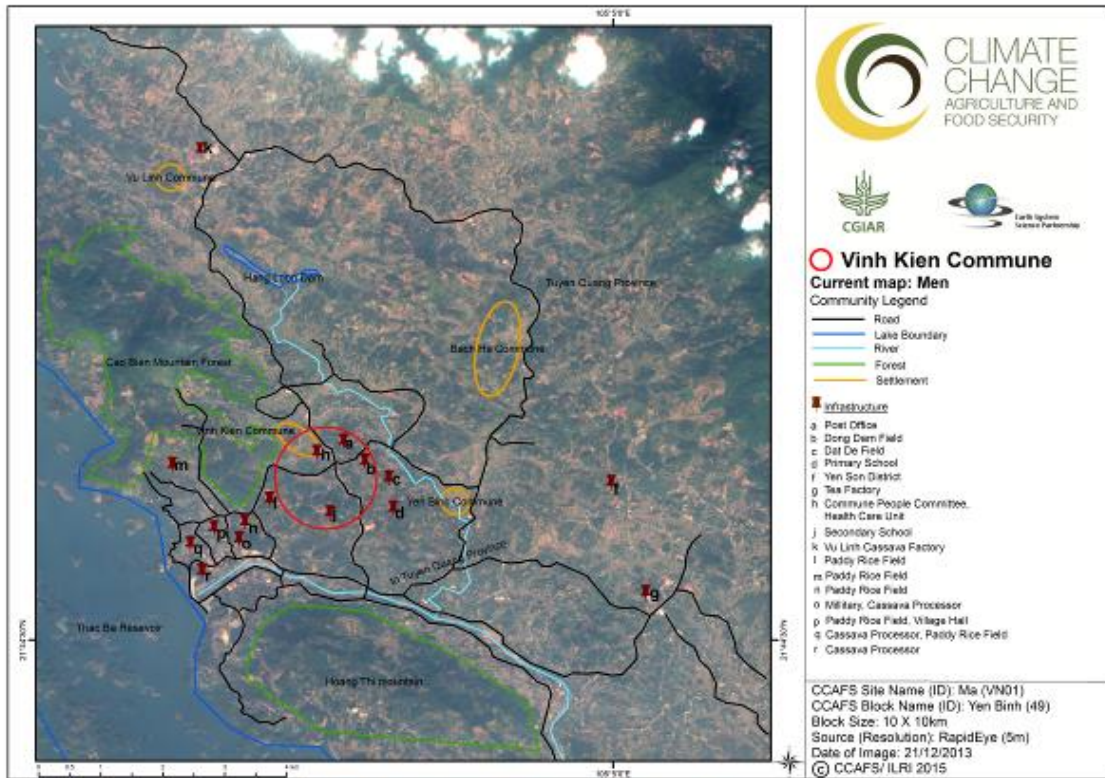
Schools: Vinh Kien commune has nursery, primary and secondary schools. All villages near the commune's center such as Ma, Phuc Khanh, Da Coc, Dong Dam and Dong Gio also have nursery and primary schools. This provides a good education opportunity for children. As a result, 100% of children in Ma and other villages are able to go to school. However, conditions in school still need to be improved. Schools do not have playground and classrooms are semi-permanent and narrow. In addition, the secondary school is quite far from the village, creating difficulty for children, especially for those who live far from the school.

Markets: Vinh Kien Commune has 2 markets. Thac Ong Market is about 1.5 km from Ma Village, and managed by the Commune's Peoples Committee. This market has been upgraded by the Commune's People's Committee with concrete pillars and metal-sheet roofs. However, there still temporary tents on roadsides, which often cause traffic problems. Vinh Kien Market is located near the Commune's center, about 5 km far from Ma Village. This market has also recently been upgraded, and privately managed. It now has kiosks with 10 m² each but there is no fire prevention system. Main goods in both markets are agricultural products such as fish, shrimp, livestock products, vegetables, rice, etc. and domestic commodities. These markets do not have waste collection and processing system. Wastes are often disposed directly to Chay river.

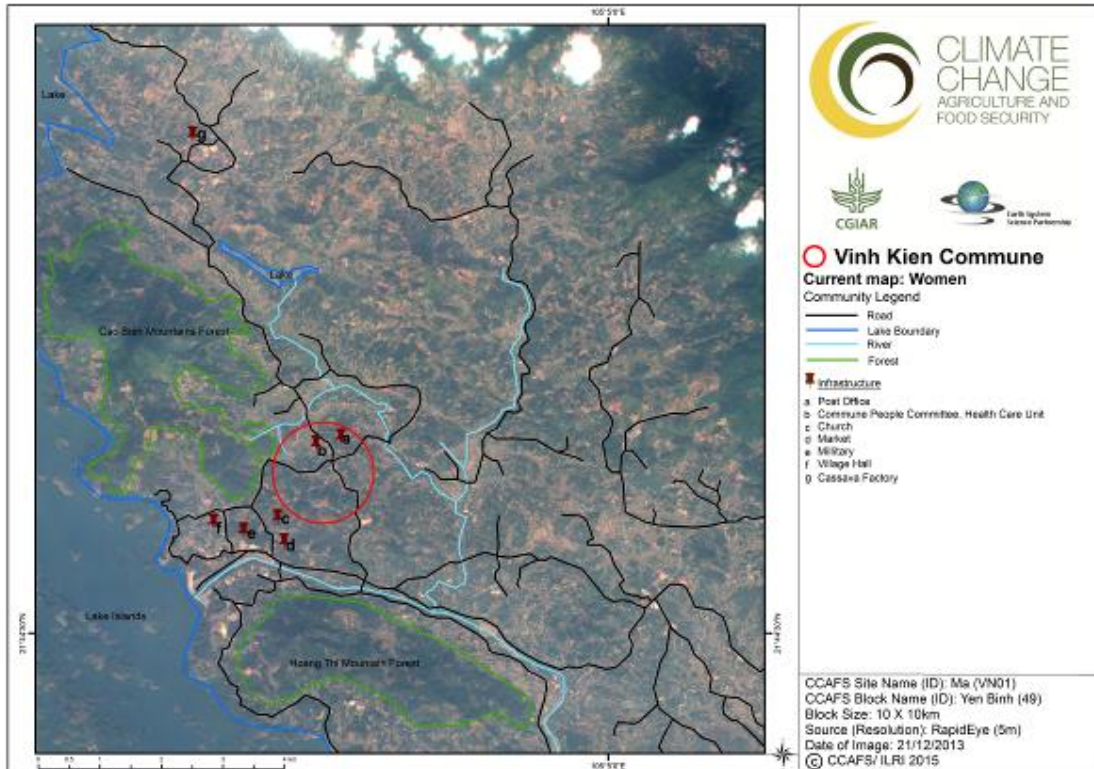
Vinh Kien's Health Station: The station is located in the center of the Commune, about 7 km far from Ma Village. Because of the distance, villagers often go to Thac Ba Town's health care station, which is nearer to Ma village. According to women discussion group, facilities in the Commune's health care station have been degraded. Equipment and medicines are not enough for medical treatment.

Bridges: There are two bridges, old Thac Ong and new Thac Ong, connecting Vinh Kien Commune to Thac Ba Tow. The new Thac Ong bridge is in good condition as it has recently been constructed while the old Thac Ong Bridge is being degraded. These two bridges are very important for Ma village as well as Vinh Kien and other neighboring communes in terms of transportation and trading.

Power supply: Presently, 100% households in the village have access to national power grid. Bamboo or woody posts have been replaced by the concreted pillars. Electricity creates a great advantage for livelihood of local people, particularly for those who are operating wood or cassava starch processing.



Map 2. Men's map of current community resources



Map 3. Women's map of current community resources

Table 1. Summary of the current mapping of the natural resources (layer 1), as perceived by men (M) and women (W)

Land cover class	Community determined land use	Location Names	Current state (quality)	Time to resource	Mgmt. and ownership issues	Environmental Benefits	Opportunities	Limitations
Farmland (W)	Food crop cultivation	Cay Si, CayChanh (water shortage), CaySau, SapNhim	Degrading	5 – 10 minutes on foot	Farmer households			Depending on rainfall (Spring season)
Farmland (M)	Paddy, maize, tuber crops, legumes, vegetables	Cay Si, SapNhim, CayGao, CayXoan, CoiMay, Dong Dinh, Ngoi Con, DocDa, Dam 4, CayChanh	2-crop rice: CayChanh, NgoiCon, CayGao 1-crop rice: SapNhim, Dam 4 producing 3 crops. Infertile land, terrace paddy field, not enough sunlight, lacking of water		Local people management	Polluting environment due to residues of herbicides and other plant protection products	Development of food production	Lacking of water, low quality farmland, limited technique, narrow farmland area
Forest (M)	Greening bared hills, economic development	Planted forests	Acacia, Eucalyptus		Local citizens (180 ha) and state farm (2000 ha)	Reducing soil erosion, greening bared land	Economic development	Many trees died due to cold spell, high temperature and disease
Forest (W)	Planted forests for wood production	Cao Bien, Hoang Thi	Acacia, Eucalyptus		70% by plantation farms, 30% by households	- Protect land sliding -Favorable climate - Water storage - Clean air	Increasing income and economic benefits	- High investment cost - Damaged by termites, requiring more caring labors
Rivers (M)	Waterways for the Hydropower Plant when release water	SongChay	Pollution, running out of water, flooded when releasing water from the Hydropower plant	1 km	District DONRE		Flood control	Not being used for aquaculture nor husbandry nor livelihood purposes, polluted by tapioca processing facilities
Rivers (F)	- Exploiting sand and gravel - Fishing	SongChay	Pollution(troubled) due to waste released from tapioca processing			More favorable climate	Fishing (shrimp and fish)	In rainy year, the hydropower plant releases much water, causing flooded in the area

Land cover class	Community determined land use	Location Names	Current state (quality)	Time to resource	Mgmt. and ownership issues	Environmental Benefits	Opportunities	Limitations
Streams (M)			Pollution of pesticides, herbicides, waste, tapioca processing residues, application of pesticides to control termites for dam protection	Near to village's center	Village and commune management		Serving for agricultural production	Not enough water
Canals (M)	Irrigating water for agricultural production	In-field canals	500 m were concreted, others were not concreted, annual maintenance	5 minutes	District management		Water for production, easier water taken, labor saving for water	Lacking of water due to low quality canals
Reservoir (M)	Power generation, aquaculture	Thac Ba Reservoir	Not clean water due to pollution from herbicides, causing disease for cultured fish	Near the village	Provincial DONRE	Air regulating, flood control	Preventing floods, aquaculture, tourism	Lose of forest and paddy land
Reservoir (W)	- Hydropower - Aquaculture, fishing (fish cage culture)	Thac Ba Reservoir	Erosion in aqua- resources	10 - 15 minutes walking	YenBai Electricity	Water storage for irrigation	- power generation	- Causing flooded in case of emergency water release (happened some years ago)
Dams (M)	power generation, regulating water in downstream areas	Thac Ba Dams	Good, regular maintenance and strict protection	10 minutes	Vietnam Electricity		Flood prevention, agro-product transportation, normal transport	Leaking water when treatment of termites
Hydro-power dams (W)	- Hold and store water - Hydropower	Thac Ba Dams (Dam 1 to dam 4)	Good quality, regular maintenance	10 – 15 minutes				Causing some difficulties for travelling from home to upland fields and forests in Cao Bien Mountain
Roads (M)	transport, connecting the Thac Ong Bridge to National Road 70 with YenThe, LaoCai	DongHo	Asphalt, 3.5 m width	30 minutes	Government		Easier transport, job creation (wood peeling)	

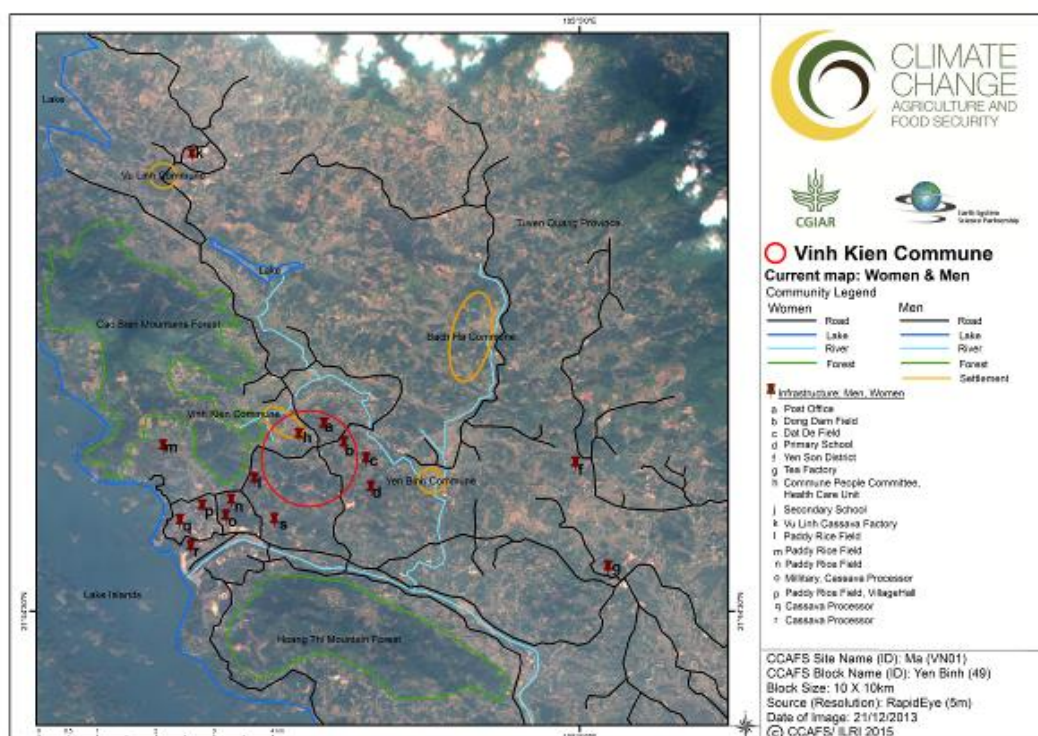
Land cover class	Community determined land use	Location Names	Current state (quality)	Time to resource	Mgmt. and ownership issues	Environmental Benefits	Opportunities	Limitations
	Transport from YenBai-Tuyen Quang	Inter-province	Asphalt, 3.5 m width	20 minutes	Government			
	Road connecting Vinh Kien-BachHa-YenBinh	Inter-commune	Asphalt, 3.5 m width	20 minutes	Government, Road transport company		Easier access and transport: travel, trading, health care...	Road degraded due to commutation of ore overloaded trucks; many accidents due to lacking of traffic light.
		Inter-village	Concrete, 3m width				Easier commuting, economic development	
Roads (W)	Transport	Inter-commune, Inter-village	Inter-commune: bad, degraded Inter-village: 30% concreted		District, Commune		Better for trading	
Schools (M)	Education	Nursery schools (5 points: Ma, Dong Gio, Vinh Kien, Dong Dam, PhucKhanh, Ba Chang)	Good, full day childcare	Center of each village	Commune's management, people's contribution		Children are sent to schools, Shorter travel for parents	Narrow areas, do not meet the standard, and do not have playgrounds and not enough toys.
		Primary school	Ma (year 1-2); PhucKhanh (year 1-3); DaCoc (year 1-5); Dong Dam; Dong Gio. Semi-permanent classrooms, full day care		Provincial Department of Education & Training and village/ hamlet		100% children are sent to schools	Pupils from 3 rd class have to travel a far distance to get to schools, travel in difficult weather
		Secondary school	DaCoc, 2-floor building, degrading, leaky, have not been repaired for years, 6 rooms, large playground, having a football station	5 km	District Department of Education and Commune's People Committee		Pupils going to school in better conditions	Infrastructure is degrading, badly influencing to schooling; pupils faced difficulties when going to school, especially in raining and storming conditions.

Land cover class	Community determined land use	Location Names	Current state (quality)	Time to resource	Mgmt. and ownership issues	Environmental Benefits	Opportunities	Limitations
Schools (W)	Education	Nursery school in VinhKien, Primary, Secondary	Degraded infrastructure	7 km	Government + local people			Pupils face difficulties to go to schools because of a far distance from the village to schools (only some families buying bicycle for their children, the rest of pupils going on foot)
Markets (M)	Goods trading and exchange	Vinh Kien	For leasing (for a period of 50 years), have been up-graded, having kiosk, each of 10 m ² , having tents erected by people without proper designing, no drainage systems	5 km	Private	Having no waste assigned places, waste is disposed directly to Chay River	Goods and agro-product exchange	Tax paying, causing environmental pollution
	Goods trading and exchange	Thac Ong	Up-graded, sheet-metal roofs, concreted pillars, waste is disposed directly to Chay River, no fire control system	1.5km	Commune's People Committee		Easier conditions for goods trading and exchange, open 24/24	No waste assigned places, no fire preventive system
Markets (W)	Goods trading and exchange	Thac Ong Market	Degraded	20 – 30 minutes	Commune	Waste pollution	Good condition for goods trading and exchange	Blocking the traffic
Health Station (W)	Health check and treatment	Vinh Kien Health Station	Degraded (lacking of equipment and medicine)	7 km	The State		Better conditions for health check and treatment	A little bit far for some households
Bridges (W)		Thac Ong Bridge (old) Thac Ong Bridge (new)	Degraded(having a sign for load limit for travelling vehicles)		The State		Better conditions for transportation	
Power supply (W)	Power supplied for manufacturing + domestic consumption		Good, concreted pillars(before they were bamboo)		Provincial Department of Electrics			

4.1.2. Gender-differentiated comparison of current conditions of resources

There are differences between men's and women's observation and perception about current conditions of resources. For example, women mentioned about more infrastructures than men did. While men considered rainfall level as the main factor that affects the crop production, women revealed that shortage of irrigation water, poor quality of farmland, traditional farming techniques, and small and scattered farmland plots are the main inhibiting factors. For forestry, the women's group identified impact factors including high investment cost, termites, and high labor cost, while the men's group considered other factors such as cold and hot spells and diseases. For reasons causing degradation of resources (farmland, rivers, streams, and the reservoir), only men's group mentioned improper use of biocides and pesticides.

Both groups mentioned that the river system is severely polluted due to waste from cassava processing. Sometimes, high volume of water released from the hydropower plant causes floods. They agreed that Thac Ba reservoir has a role in preventing floods and is a good place for aquaculture.

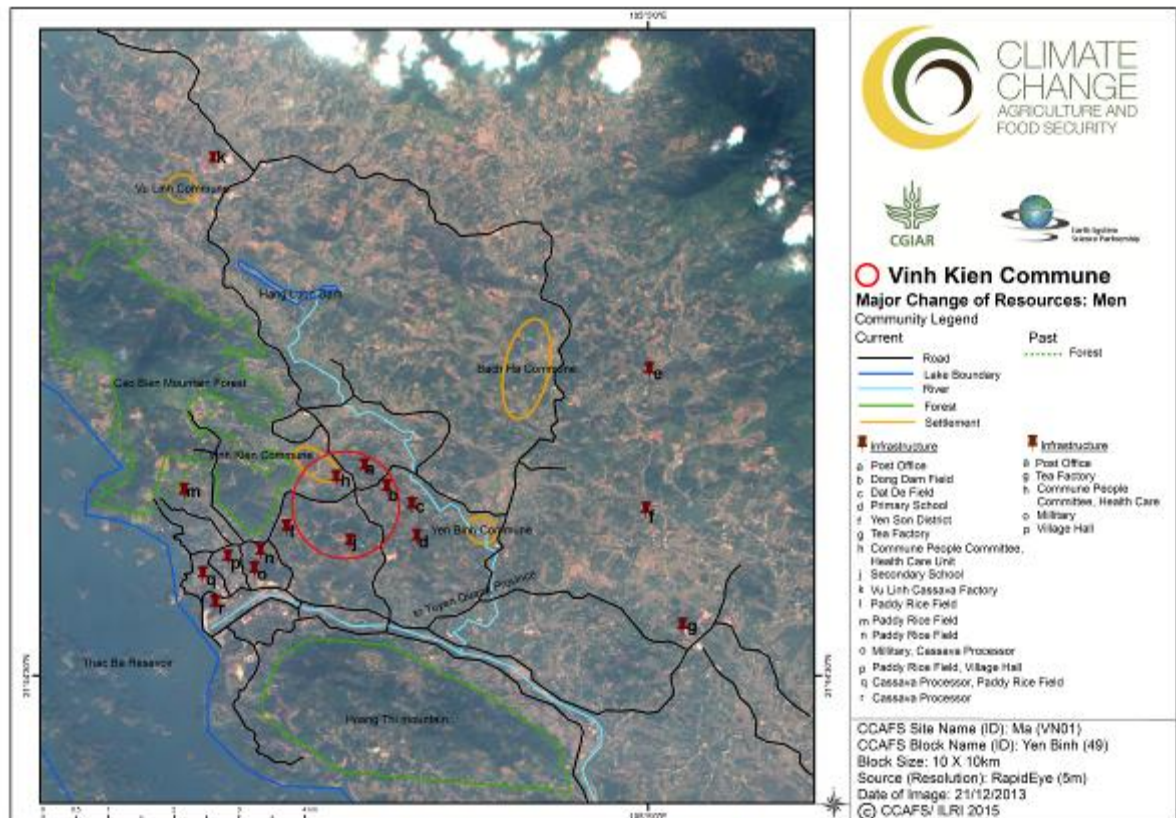


Map 4. Overlay of current conditions, comparing men's and women's maps

Men's and women's groups also have different opinions about natural resource management and ownership. Many participants did not fully understand the function and responsibility of organizations owning or managing resources. For example, when talking about Thac Ba reservoir, male participants said that it is managed by the Provincial DONRE while female participants believed that it is managed by the Provincial Department of Electricity.

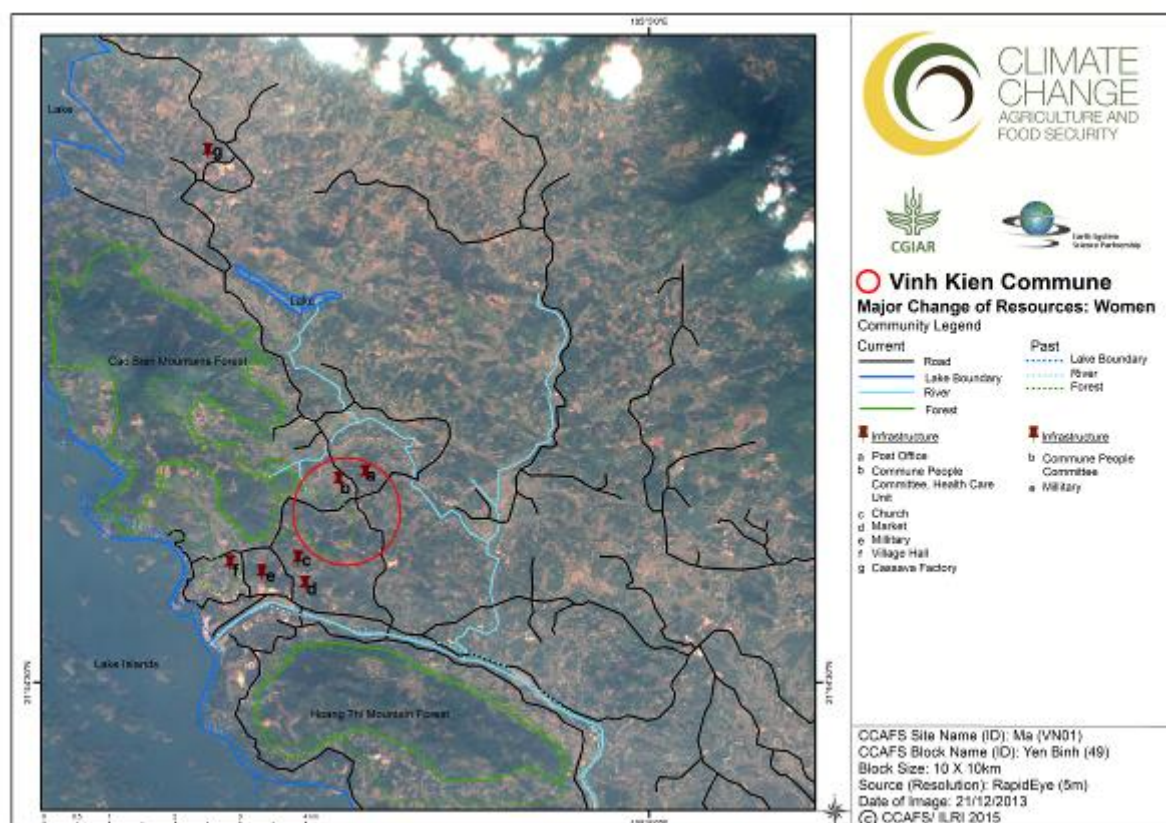
4.1.3. Major changes of resource conditions

Regarding changes in resources, men's group described that, before the 1980s, there were natural forests surrounding the village, which contained high value timber and provided good ecological conditions. Women's group mentioned that there were many wild animals, e.g. tiger and deer living in the forests in the past. After the 1980s, natural forests have been greatly degraded and destroyed due to the construction of the hydropower plant, rapid population growth and overexploitation of forest products. Nowadays, most of natural forests have been converted to planted forests. Remaining natural forests are being protected with newly planted areas under the national reforestation program.



Map 5. Major changes in resources (comparing past and present) for men

For farmland, participants of women's group indicated significant changes in soil quality. In the past, farmland of the village was fertile and crops could grow very well with much less fertilizer than present. The main reasons are improper farming practices, which caused soil erosion and degradation. Before, the village had 19 ha of 2 rice crops. According to villagers, due to land degradation, water shortage and pollution, on about 4 ha farmers can only grow one rice season per year. Currently, remaining land for two rice crops is 15 ha. Both men's and women's group stated that due to the rapid increase of population the average area of farmland per head was also reduced.



Map 6. Major changes in resources (comparing past and present) for women

The Thac Ba Hydropower Plant was built in 1960s. As a result, Thac Ba reservoir was formed and created a good opportunity for fishing and aquaculture. Before, water in the reservoir was very clean and good enough for domestic use. Nowadays, water is polluted resulted from aquaculture, animal husbandry, agro-product processing and other human activities. Unsustainable fishing methods also led to reduction of fish quantity and size. Chay river and other streams passing Ma Village are now also polluted by domestic waste, industrial waste from tapioca processing, as well as residues from improper application of plant protection products and fertilizers.

Contrarily to degradation of natural resources, infrastructures such as electricity, roads, schools and health care facilities, have improved remarkably. These made significant changes in living condition, livelihood of people as well as agricultural and forestry production.

Table 2. Major changes and drivers of change in the last 10 years, as perceived by men (M) and women (W)

Land cover class	Community determined land use	Location Names	Past state (quality)	Time to resource	Drivers of change	Management and ownership issues	Environmental Benefits
Roads (M)	Road connecting Vinh Kien-BachHa-YenBinh	Inter-commune	Dirt road, no bridge or drain system, flooded regularly, difficult for commuting	20 minutes	Roads upgraded	The State, Road company	
		Inter-village	Dirt road, no bridge or drainage system, flooded regularly, difficult for commuting, muddy when rained, dusty when it is sunny		Roads have been concreted		
Roads (W)	Transport	Inter-commune	It has not been asphalted in the last 10 years, just a aggregate road		Have been asphalted,	The State	
		Inter-village	Before 2009, 100% are dirt roads		30% have been concreted	The State, people	
Schools (M)	Teaching	Nursery (5 points: Ma, Dong Gio, Vinh Kien, Dong Dam, PhucKhanh, Ba Chang (village hall))	Bamboo roofed, contributed by parents, managed by villagers	10 minutes	Much better improved with more concrete parts	Managed by the commune, contributed by villagers	
		Primary	Classroom made from bamboo and other plant material.		Much better improved with more concrete parts	District Department of Education and village/hamlet	
		Secondary	Semi and less permanent houses and classrooms		5 km	Much better improved with more concrete parts	
Schools (W)	Education		In 6-7 years ago, facilities were in very poor conditions	7 km	Have been upgraded, with more concrete parts	District Department of Education and Commune's People Committee	

Land cover class	Community determined land use	Location Names	Past state (quality)	Time to resource	Drivers of change	Management and ownership issues	Environmental Benefits
Markets (M)	Goods trading and exchange	Vinh Kien	Tents with concrete pillars erected by traders, managed by the cooperative	5 km	Has been re-designed and re-constructed	Private	No waste collecting place, waste disposed to Chay River
	Goods trading and exchange	Thac Ong	Bamboo tents managed by the cooperative	1.5km	Has been re-designed, however still is small and not yet meeting the needs for goods exchange of the local people	Commune's People Committee	
Markets (W)	Goods trading and exchange	Thac Ong	4 years ago were simple and with poorly-equipped shops	20-30 minutes	Have been re-built, more concreted	Commune's People Committee	
Rivers (M)	Waterways for the Hydropower Plant when release water	Chay River	Clean water, more fishes, provided water for domestic use and for husbandry, regulated climate conditions	1 km	Polluted water	District DONRE	
Rivers (W)	Exploiting sand and gravel, hydropower	Chay River	water, more fishes		Polluted water, less fishes		Better climate
Streams (M)			Clean, clear, supply water for domestic use and for husbandry; causing flooded and damaging farm production in rainy season	Close to village's center	Polluted water caused by residues of plant protection products	Managed by the Village and Commune	
Canals (M)	Irrigation	In-field	All canals are earth-based (not concrete), labors needed for repairing and maintenance all the time	5 minutes	500 m have been concreted	Managed by the District	
Dams (M)	Generating electricity, regulating water for downstream basin	Thac Ba	Better, managed by Vietnam Electricity	10 minutes		Vietnam Electricity	

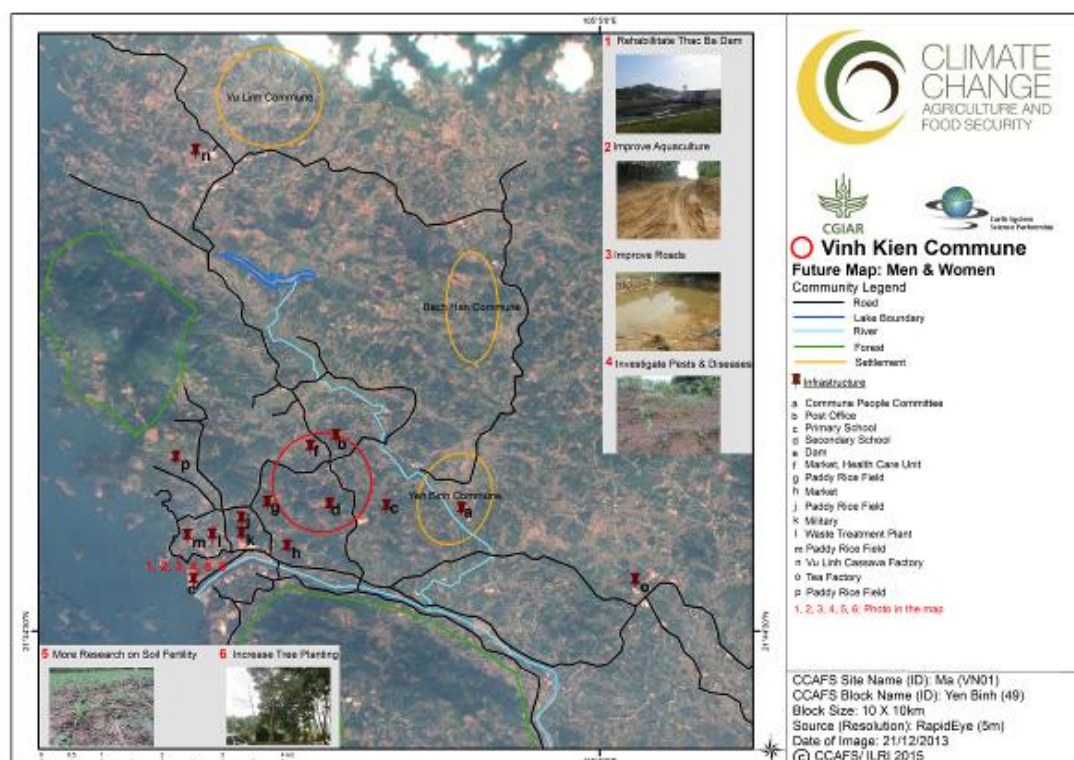
Land cover class	Community determined land use	Location Names	Past state (quality)	Time to resource	Drivers of change	Management and ownership issues	Environmental Benefits
Dams (W)	Help to store water for hydropower generation	Thac Ba dams (Include a main dam and saddle dams, dams 1-4)	The dams are still in good conditions as compared to before because of regular checking, maintenance and amendment.	10-15 minutes	Not much change		
Reservoir (M)	Electricity generation, aquaculture	Thac Ba	Clean water, more fishes, provided water for domestic use and for husbandry	Near the village		Resources and Environment department	Air regulation and flood control
Reservoir (W)	- Hydropower - Aquaculture and fishing - Store water for irrigation	Thac Ba	Before 1960 there used to be land for cropping, forest and people houses. After the dams were built in 1960, reservoir was formed, having lots of fishes. In 1972, an American aircraft boomed the reservoir, many fishes died, local people had to use buffalo-powered vehicles to transport fishes to home)	10-15 minutes	Fishery is not much as before	Yen Bai Electricity	Water storage for irrigation
Forests (M)	Land and soil erosion protection	Nature	Lots of high value timbers, all gone by 1980, cool climate, water storage, limit flash floods, managed by YenBinh Forest Protection Department		Converted to planted forests		
	Greening bared hills, economic development	Plantation	No		Have been widened	Managed by local households (180 ha) and State Farm (2000 ha)	Reducing soil erosion, Greening bared hills
Forests (W)	Exploitation, Wood harvesting	Plantation	Were natural forests in 27 years ago (cane, shrub...). No big trees				- Land slide protection - Cool climate - Water storage - Fresh air
	Protection, Environmental protection	Natural old forests (Cao Bien)	Having big trees and wild animals in the past	1 hour by boat	Have not big trees and wild animals.		

4.1.4. Vision of the future

Based on the results obtained from exploring past and current situation of resources in day 1 and day 2, participants discussed on their urgent needs, required infrastructures, sustainable management of the natural resources and then developed vision of village and surrounding areas as below:

Planted forest: Eucalyptus will be replaced with other trees or better Eucalyptus varieties that cause less negative effects to the soil. Acacia does not make soil degraded but the tree is easily damaged by pest and disease. Thus, participants also wished to replace it with other timer trees. On islands, beside planted forest, villager planned to develop livestock (cattle and goat).

Agricultural land: Paddy land was allocated to individual households in 1997 with the average area per capita was 265m². Due to the rapid population growth, current average paddy land per capita is only 120-140m². Thus, participants planned to maximize profits on their limited land area, which depend very much on irrigation water. They expect to have 5000m of irrigation system concreted in future.



Map 7. Future map of the community

Rural environment: Currently cassava starch processing cause pollution of natural flows in the region. Participants of the meeting expected that that waste from Vu Linh Cassava Company will be well managed. No waste water flows to Hang Luon dam and Chay river. A specific place for waste treatment should be built in Ma village to minimize pollution in rural environment.

Infrastructures: Local government and related organizations will support to improve infrastructures in Ma village as well as whole region.

Detailed descriptions of vision developed by participants are presented in Table 3.

Table 3. Vision of the future

Items from the 2 map legends	Preferred condition for 2030	Opportunities	Constraints	Organizations to involve
Forest	Increase the forest areas with forestry trees with higher value, more tolerant with pest and disease, having less negative impact to the soil condition.	Income improved from growing forest, covering bare forest lands, stop landslides, balance atmosphere.	High investment, requiring more labors cost to take care of the production area; Suitable alternative trees are yet to be identified; Local wood processing workshops are still demanding mainly wood from Acacia and Eucalyptus	DARD, DONRE; Thac Ba Forestry Plantation; CPC
Cropland	Re-structure of production systems; with new suitable plant varieties and cattle breeds	Increase productivities and improve income	Fixed crop land area; Low crop land per capita	DARD; Extension Station
Irrigation system	Entire irrigation system to be concreted	Increase the number of cropping seasons per year.	High input cost	Irrigation Departments; DARD
Hang Luon Damp	Uncontaminated water; clean water	Local people health improved thanks to uncontaminated water		Vu Linh cassava processing company
Streams in Ma Hamlet	Cleaner, unpolluted water	Improve fishery production	Hamlet cassava processing companies are intensively polluting the water resource; Improper use of pesticides by farmers	Processing factories in the hamlet; CPC
Waste treating area	Local cassava processing factories to invest in building a completed waste system linking all factories for better treatment.	Improve the air and water resources.	- High inputs cost	Hamlet processing factories; DONRE; CPC
Thac Ba lake	Enhance the cattle production in all islands within Vinh Kien commune Increase the fish farm size	Improve income and livelihood	Improper pest control for fishes	DARD, DONRE; Dept of Fishery; Fishery production cooperative; Thac Ba Forestry Plantation
Road system	Expand and improve the inter-commune roads, 100% road are concreted.	Improve the transportation, and commodity trading activities		Dept of communication and transportation; DPC; CPC
Bridges, Drainages	Build new systems; Improve current systems	Good transportation		Dept of communication and transportation; District PC; Commune PC
Markets	Larger area to provide more available kiosks for local seller; Enough space for gathering rubbish and waste;	Better environment, better health Transportation is not affected by local markets		Commune PC
Schools	Better conditions with larger playing grounds, well equipped with good facilities.	School with better conditions for local children	High input cost	Dept of Education and Training; CPC
Hamlet hall	Nicer	Hamlet people living condition is improved	High input cost	Commune PC

4.2. Topic 2: Organizational landscapes

This section presents the operational sphere and characteristics of formal and informal organizations that involve in the community food security, food crisis and natural resources management. Organizational landscape provides information on how target community responded to climate related challenges and suggests CCAFS partners for future interventions.

4.2.1. Basic spheres of operation

Photo 2 presents an output of participatory discussion for organizational landscape development in Ma village. During the discussion, the men's and women's groups identified 19 and 29 organizations operating in the region, respectively.

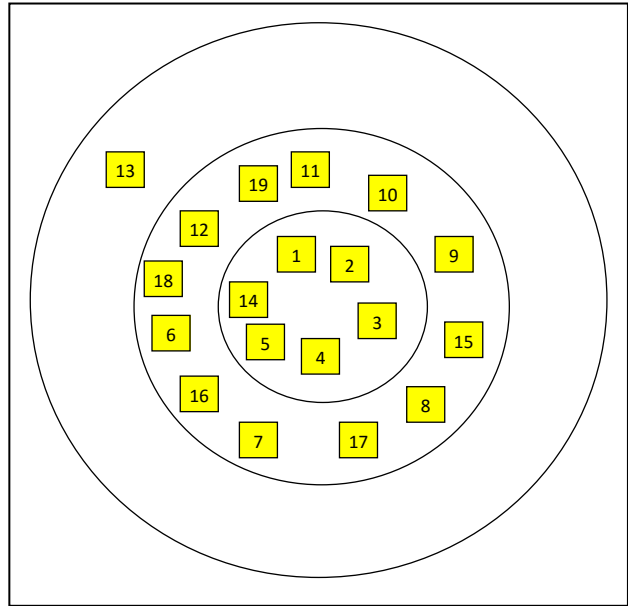


Photo 2. The organizational landscape activity in progress

Figure 3 shows the list and operational sphere of 19 organizations identified by men's group, of which, 6 organizations are operating within the Ma village (in most inner circle), 12 organizations in Yen Bai province (in second circle) and 1 international organization (in most outer circle). Similarly, Figure 4 shows discussion outputs of women's group. In the total of 29 organizations, 6 are operating in Ma village, 17 in Yen Bai province and 6 at national and international level.

Among organizations listed, each discussion group selected the 5 most important organizations based on scoring method. In general, AgriBank and Social Policy Bank were highly evaluated by both groups. In addition, the Farmers Union, district DARD and wood/cassava processing enterprises were selected by men's group and the Women Union, Aquaculture Unit, and Japan Development Organization-SJC were selected by women's group. Characteristics of the important organizations are described in Table 5 and Table 6.

1. Village council
2. Elderly association
3. Cage fish farm association
4. Veteran Union
5. Farmer union
6. District Woman Union
7. Provincial Aquaculture Department
8. District Extension Station
9. Agribank
10. Social policy bank
11. District DARD
12. Wood processing facility
13. CIAT
14. Commune people committee
15. Yen Binh DONRE
16. Thac Ba Forestry Plantation
17. Thac Ba Hydropower Plant
18. Red Cross
19. Cao Minh church



Note:

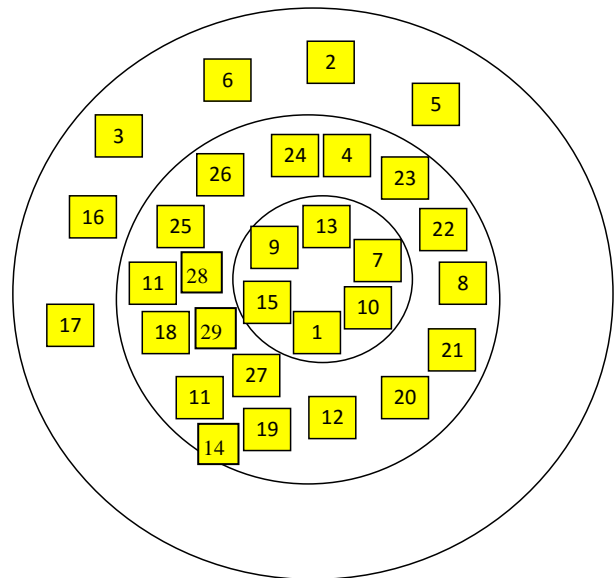
The most inner circle represents Ma Hamlet

The second inner circle represents the commune, district, province

The outside circle represents out-of – province scope

Figure 1. Organizational landscape of the men’s group

1. Village Woman Union
2. Agribank
3. Social policy Bank
4. Yen Bai Aquaculture Dept.
5. SCJ – Japan development organization
6. NOMAFSI
7. Village farmer union
8. District DARD
9. Elderly Union
10. Hamlet Fishery cooperative
11. District Extension Station
12. DOLISA
13. Youth Union
14. Commune national front
15. Commune veteran association
16. CIAT
17. Red Cross
18. Health care Station
19. Preventive medical centre
20. Military camp
21. Commune people committee
22. Provincial DARD
23. Thac Ba Hydropower plant
24. Thac Ba Forestry Plantation
25. Yen Bai fishery company
26. Yen Bai DONRE
27. Yen Binh DONRE
28. Commune Woman Union
29. District Woman Union



Note:

The most inner circle represents Ma Hamlet;

The second inner circle represents the commune, district, province;

The outside circle represents out-of-province scope

Figure 2. Organizational landscape of the women’s group

Table 4. Information on the first five organizations ranked by the men

Organization	Main activities	No. of members	Access (open or restricted to...)	Origin (indigenou s, state, NGO, project)	Operational sphere (community, locality, beyond locality)	For community groups		
						Sources of funding (members, external, both)	Existed how long (less than 1 yr, 1-5, longer)	Formal or informal
1 AGRIBANK	Credit loan	15	People with mortgage assets	State	district	State	Since 1970	Official
2 Farmers' Union	Participating in conducting project activities, answering to Dept of Agriculture directs, providing capital inputs and materials. They act as a bridge, linking farmers with Agriculture Dept	116; 66 Male. Commune Executive Committee 17 (1/2 Female)	Open	State	Vinh Kien commune	AGRIBANK and Social Policy bank provide loans and member's contribution	During the same time that the cooperative was formed	Official
3 District Social policy Bank	Credit loan (8 programs with favorable condition)	12 (9 Female)	Ranking (The poor, students, etc.)	State	District	State	More than 5 years	
4 Cassava/ wood processing facilities	Provide job for local people, Process products in the localities (Cassava, Accasia, Eucalyptus)	26 workshops	Open	Private		Private	More than 5 years	Official
5 District DARD	Provide technical support, seed varieties, training	More than 10 staff	Open	State	The whole district	State	More than 5 years	Official

Table 5. Information on the first five organizations ranked by the women

Organization	Main activities	No. of members	Access (open or restricted to...)	Origin (indigenous, state, NGO, project)	Operational sphere (community, locality, beyond locality)	Sources of funding (members, external, both)	Existed how long (less than 1 yr, 1-5, longer)	Formal or informal
1 Village Woman Union	Financial support (loans, seed varieties and capitals)	135 – 140	Restricted		Within hamlet	Contribution + bank loan	20 years	Official
2 AGRIBANK	Provide Loan	unclear	Open	State	District	Customers' saving + state	> 20 years	Official
3 Social bank	policy Provide Loan	unclear	Restricted only for people in the state supported lists	State	District	As above	> 20 years	Official
4 Aquaculture Dept.	Support fish farmers	unclear	Support fish farm only		Province	State	> 3 years	Official
5 SCJ (Japan Humanitarian) - NGO	Seedlings and breed Provide loans, technical support Support the prevention of kid malnutrition (Medicine + Food)		Restricted		District	NGO	~ 13 years	Unofficial

4.2.2. Organizational landscape of food security

Discussion results show that approximately 50% of the organizations mentioned by the men's and women's groups (Figure 3, Figure 4) were involved in activities related to food security.

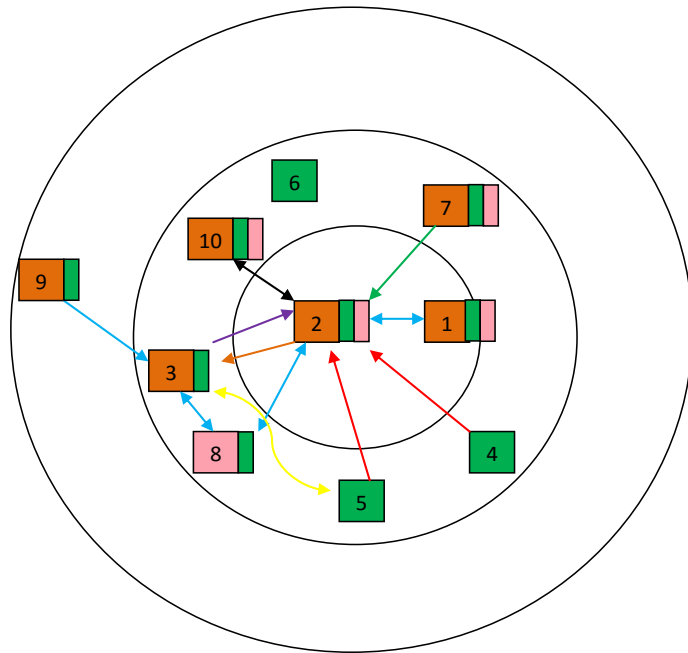
The men's group identified 10 organizations working in food security (Figure 5). All of these organizations have contributed to enhancing production and increasing food availability. Among these organizations, 6 have contributed to enabling access to capital investment; five have conducted training programs on food production and proper use of pesticides. Regarding operational sphere, seven are working at the provincial level, 2 at village level and only 1 at the national level. Participants recognized that agencies such as the Department of Agriculture and Rural Development, Extension Station, Department of Fisheries and CIAT mainly focus on supporting farming techniques. They help people in enhancing the ability to ensure food security through increasing crops' yield. Wood and cassava processing enterprises play an important role in local economy as they encourage agro-forestry production in the region. AgriBank and Social Policy Bank were also highly appreciated because they provide loans with low interest to farmers. Most of these organizations have worked in partnership with the Farmers' Union and/or the Women's Union or fish raising association in supporting farmers.

The women's group (Figure 6) identified 12 organizations working in the area for food security. Out of these, 6 organizations have been supporting farmers to improve production and increase food self-sufficiency. Nine organizations have been conducting activities to improve access to agricultural input (i.e. Farmers' Union, Women's Union, Elder associations, Aquaculture Cooperative, Agribank, District DARD, Social Policy bank, NOMAFSI and SCJ); 3 organizations have worked for improving the effective use of local foods (i.e. Farmers' Union, Agribank, Social Policy Bank).

Although there are differences between perceptions of men's and women's groups, both groups acknowledged the important liaison role of Farmers' Union in connecting farmers with the organizations working in the area.

1. Cage fish raising association
2. Farmers' Union
3. District DARD (Dept. Of Agriculture and Rural Development)
4. Bank of social policy
5. AgriBank
6. Cassava/ wood processing facilities
7. Provincial Aquaculture Department
8. District Extension Station
9. CIAT
10. District Women Union

- Availability
- Accessibility
- Usability



- Technical support
- Capital
- Production demonstration models
- Common membership
- Policy
- Management
- Feedbacks

Figure 3. Organizational landscape of food security – men

1. Village Farmers' Union
2. Village Women union
3. Elder Association
4. Aquaculture Cooperative
5. District Extension Station
6. AgriBank
7. District DARD
8. Bank of Social Policy
9. Fisheries Department
10. CIAT
11. NOMAFSI
12. SCJ

- capital

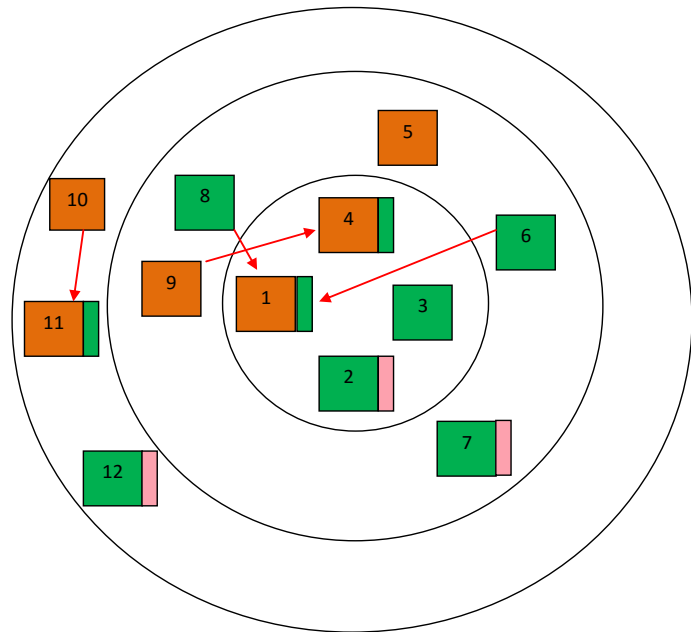


Figure 4. Organizational landscape of food security - women

4.2.3. Organizational landscape of food crisis

This section presents how organisations help people to cope with food crisis. Participants identified a food crisis events that they remember (e.g. a lean year or season), and which organisations have provided supports. The women's group understood food crisis as serious food shortage due to crop failures caused by floods, pests, diseases, drought or natural disasters. The men's group defined it as a phenomenon of natural disasters, crop failures, depressed varieties, water shortages and harmful diseases. Both groups said that the most recent food crisis of the village was in 2008, after a great flood that led to landslides and destroyed many buildings.

The men's group pointed out 7 organizations that participated in helping local people in the village to overcome difficulties caused by a flood crisis. Two of them worked only within the village (i.e. CPC and Farmers' Union), 5 other institutions operated at commune, district and provincial levels. The district DARD and Aquaculture Department supported farmers with varieties and techniques to recover production after the food crisis and to ensure food availability. Organizations such as the Red Cross, Veterans' association, Farmers' Association and Cao Minh Church supported with financial resources, medicines, clothes and support for rebuilding houses for victims.

Regarding relationship among organizations, most of organizations listed by men's and women's groups are working at district and province level but they cooperated with the Commune People Committee and/or Farmers' Union in providing support to farmers. The women's group agreed that there were 14 organizations supporting the village to overcome the food crisis, including 1 working at the national level (the Red Cross), two working within the village (the village Women's Union and village Farmers' Union) and 11 other organizations operating within the commune, district, and province. These organizations also supported villagers to improve access to or provide farmers varieties, fertilizers (District DARD and Extension Station) or loans (AgriBank and Social Policy Bank). In addition, there were also organizations, which provided medicines, foods in case of emergency and guidance on how to prevent diseases (Center of Preventive Medicine, Clinics, Commune People Committee and village Women's Unions at commune, district and province level).

The linkages among organizations identified by the women's group included capital, seed, fertilizers, foods and healthcare services. Organizations acting at the provincial or national level worked in cooperation with the Commune People Committee, and thus, the Commune People Committee plays a very important role in supporting local people to cope with food crisis.

The difference between discussion results of men and women groups is that they mentioned the same organization but referred to different administrative levels. For example, Farmers' Union exists at three administrative levels: province, district and commune. Women group usually referred to the village-level units, while men group often talked about the higher levels. However, both groups were consistent when mentioning the important role of the Commune People Committee as it liaises between farmers and organizations.

1. Veterans association
 2. Red Cross
 3. Farmers' Union
 4. Commune People Committee
 5. Yen Bai Aquaculture Department
 6. District DARD
 7. Cao Minh church
- Availability
 Accessibility
 Usability
- Report
 Support to implementation
 Support to individuals

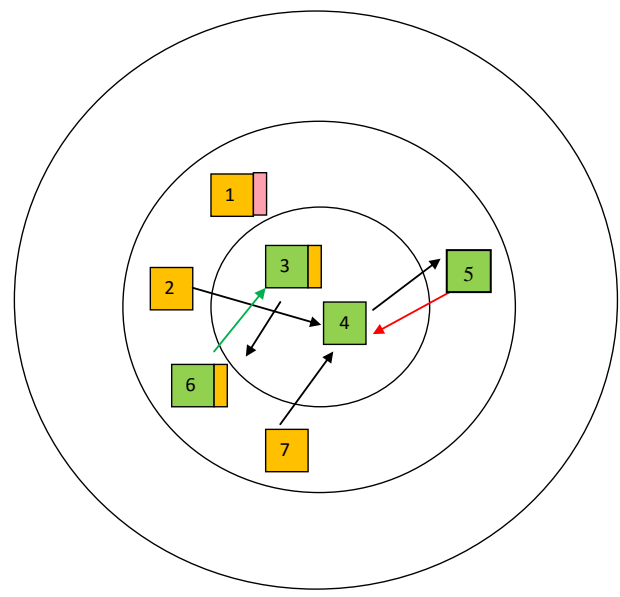
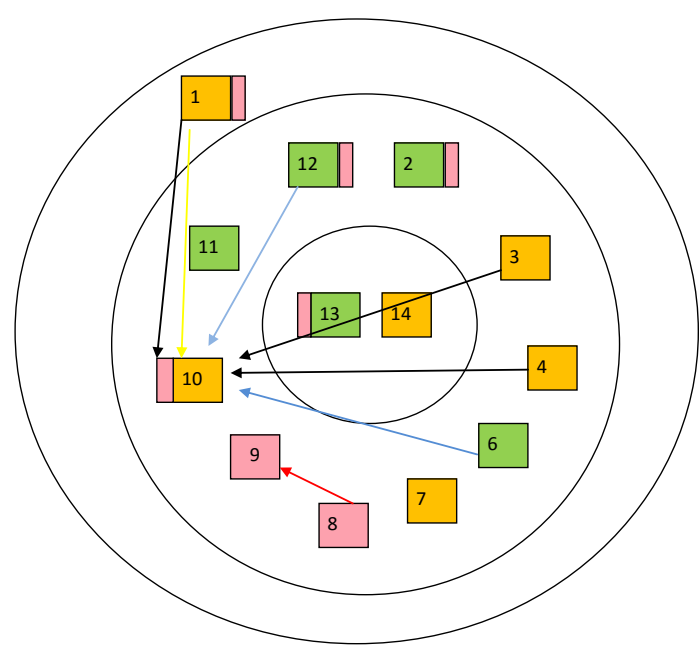


Figure 5. Organizational landscape of food crisis – men

1. Red Cross
 2. Commune Women union
 3. District Extension Station
 4. District DARD
 5. Army Barracks
 6. AgriBank
 7. Commune Farmers' Union
 8. Center of Preventive Medicine
 9. Commune health care station
 10. Commune People Committee
 11. Bank of Social Policy
 12. District Women Association
 13. Village Women Association
 14. Village Farmers' Union
- Availability
 Accessibility
 Usability



- Fertilizer, seeds, material inputs
 Capitals
 Foods
 Medicine

Figure 6. Organizational landscape of food crisis – women

4.2.4. Organizational landscape of natural resource management

Not many organizations are working on natural resources management. The men's group mentioned about land degradation, unsustainable farming practices, polluted water and waste management then discussed on organizations in-charge. The men's group identified 4 organizations involved in natural resource management, including CPC, district DoNRE, Thac Ba Hydropower Plant and Thac Ba Forestry Plantation. These organizations manage land, forests and water resources.

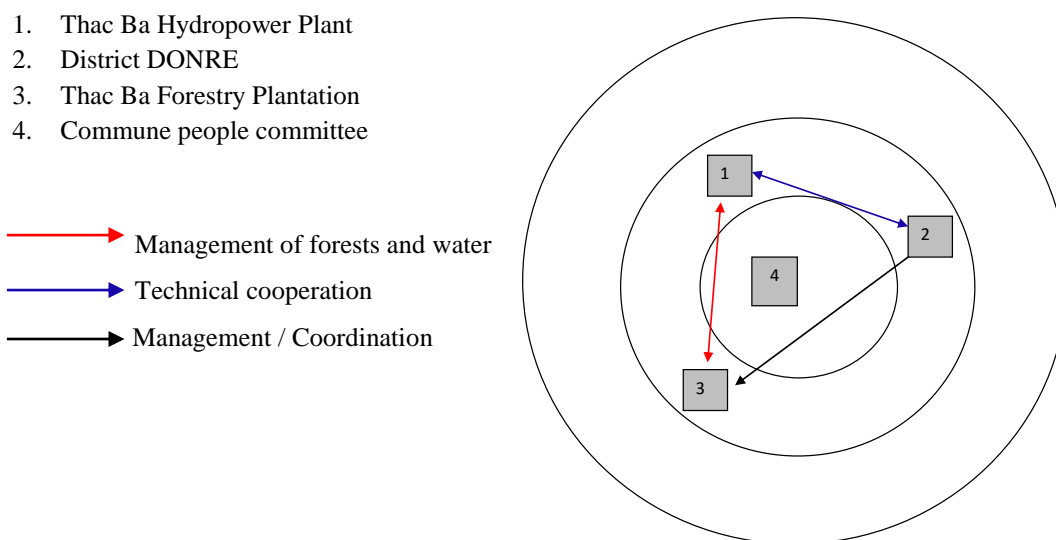


Figure 7. Organizational landscape of natural resource management – men

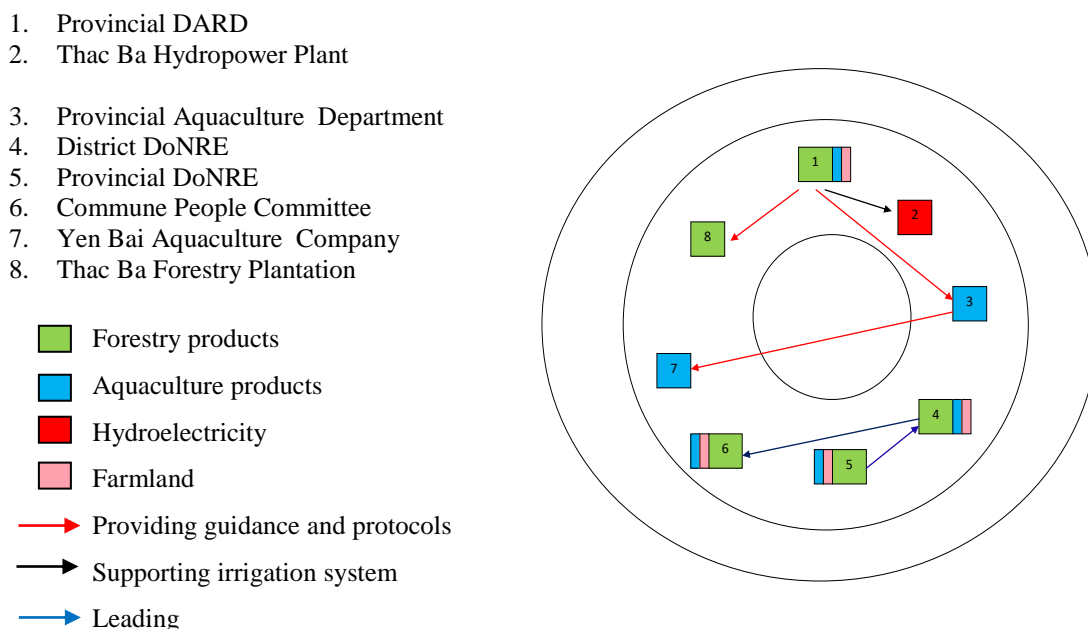


Figure 8. Organizational landscape of natural resource management – women

The women's group identified 8 organizations, about 26% of the listed organizations. All of these organizations have a wide operational sphere, from village to provincial level. In general, DARD, DoNRE and CPC play important roles in the management and exploitation

of natural resources. Forest is managed by the provincial DARD, district DoNRE, CPC and Thac Ba Forestry Plantation. Water bodies are managed by provincial Department of Aquaculture, provincial DARD, district DoNRE, CPC and Yen Bai Aquaculture Company. Agricultural land is managed by the provincial DARD, district and provincial DoNRE and CPC. The relationships among organizations described by the women's groups are shown in Figure 10, including providing guidance, supporting activities and leadership.

Table 6 below summarizes information on all the organizations identified by men's and women's groups. The organizations are classified according to their role in supporting food security (taking into account three dimensions: availability, access and utilization), food crisis and natural resource management.

Table 6. Information on highlighted organizations of men's and women's groups

Name of organization	Identified by men (1=yes, 0=no)	Sphere. (1=village 2=locality 3=Beyond locality)	Food security (1=yes, 0=no)	Food crisis (1=yes, 0=no)	NRM (1=yes, 0=no)	Identified by women (1=yes, 0=no)	Sphere. (1=village 2=locality 3=Beyond locality)	Food security (1=yes, 0=no)	Food crisis (1=yes, 0=no)	NRM (1=yes, 0=no)
1. Village Council	1	1	0	0	0	0	0	0	0	0
2. The Elders Assoc.	1	1	0	0	0	1	1	1	0	0
3. Cages fish raising Association	1	1	1	0	0	0	0	0	0	0
4. Veterans Association	1	1	0	1	0	1	1	0	0	0
5. Farmers' Union	1	1	1	1		0	0	0	1	0
6. Village Farmers' Union			0			1	1	1	1	0
7. District Women union.	1	2	1	0	0	1	0	0	1	0
8. Village Women union						1	1	1	1	0
9. Provincial aquaculture department	1	2	1	1	0	1	2	1	0	1
10. District Extension Station	1	2	1	0	0	1	2	1	1	0
11. Agribank	1	2	1	0	0	1	3	1	1	0
12. Bank of Social Policy	1	2	1	0	0	1	3	1	1	0
13. District DARD	1	2	1	1	0	1	2	1	1	0
14. Wood + cassava processing facilities	1	2	1	0	0	0	0	0	0	0
15. CIAT	1	3	1	0	0	1	3	1		0
16. Commune People Committee	1	1	0	1	1	1	2	0	1	1
17. District DONRE	1	2	0	0	1	1	2	0	0	1
18. Thac Ba Forestry Plantation	1	2	0	0	1	1	2	0	0	1
19. Thac Ba Hydropower plant	1	2	0	0	1	1	2	0	0	1
20. Red Cross	1	2	0	1	0	1	3	0	1	0

Name of organization	Identified by men (1=yes, 0=no)	Sphere. (1=village 2=locality 3=Beyond locality)	Food security (1=yes, 0=no)	Food crisis (1=yes, 0=no)	NRM (1=yes, 0=no)	Identified by women (1=yes, 0=no)	Sphere. (1=village 2=locality 3=Beyond locality)	Food security (1=yes, 0=no)	Food crisis (1=yes, 0=no)	NRM (1=yes, 0=no)
21. Cao Minh church	1	2	0	1	0	0	0	0	0	0
22. Village cooperative Fishery	0	0	0	0	0	1	1	1	0	0
23. SCJ	0	0	0	0	0	1	3	1	0	0
24. NOMAFSI	0	0	0	0	0	1	3	1	0	0
25. District DOLISA	0	0	0	0	0	1	2	0	0	0
26. Youth Association	0	0	0	0	0	1	1	0	0	0
27. Commune Fatherland Front	0	0	0	0	0	1	2	0	0	0
28. Commune Health care Station	0	0	0	0	0	1	2	0	1	0
29. Center of Preventive Medicine	0	0	0	0	0	1	2	0	1	0
30. Army Barracks	0	0	0	0	0	1	2	0	1	0
31. Provincial DARD	0	0	0	0	0	1	2	0	0	1
32. Yen Bai Seafood Company	0	0	0	0	0	1	2	0	0	1
33. Provincial DONRE	0	0	0	0	0	1	2	0	0	1
34. Commune Women Association	0	0	0	0	0	1	0	0	0	0
TOTAL	19	1=6 2=12 3=1	10	7	4	29	1=6 2=15 3=6	12	13	8

4.3. Topic 3: Information networks

Information networks show how people access to information required for their farming activities and efficiency of sources in disseminating information to target communities.

The information related to farming activities discussed by men's group were: cultivation calendar, crop varieties, crop management techniques, harvest and post-harvest technologies, markets and prices of inputs, weather, floods and landslides. The women's group looked at agricultural inputs (seed, fertilizer, etc.), techniques (cultivation, livestock, processing techniques, etc.), market and weather.

Results of the discussions showed that there are different sources of information that farmers in Ma village can access: Media (television, radio, newspapers, internet, telephone, etc.), organizations and agencies (District DARD, district agricultural Extension Station, CPC and processing factories), individuals (head of village, neighbors, traders, etc.) and other sources (information from the markets, from personal experience).

The most popular way to access information is through television, particularly through the news of the Vietnam television channels (VTV1, VTV2) and local television channel (Yen Bai TV). These are the communication channels for villagers to gather information related to weather and disasters. In addition to television, radio was also mentioned by participants, but not as common as television. Farmers can find detailed information related to crop cultivation and animal and fish raising from specific organizations, such as DARD, Agriculture Extension Station, CPC and others. These organizations often distribute announcements, leaflets, manuals or technical innovations to villagers. The information related to the market and prices are collected from the factories, traders, markets and companies. Sharing information and experience with persons like heads of village and neighbors is also of importance for local people.

In addition, some young farmers also mentioned using smart phones and the internet (using Google search tool and publications) to get information. Summary of discussions on the information sources of the two groups are combined in Table 7.

Table 7. Networks of information

Source	Topic (men)						Topic (women)			Total
	Crop calendar	Variety	Crop management	Harvest	Market	Weather	Production	Market	Weather	
Individuals										
<i>Neighbors</i>	0	1	0	0	0	0	0	0	0	1
<i>Relatives</i>	0	1	0	0	0	0	0	0	0	1
<i>Traders</i>	0	0	0	0	1	0	0	1	0	2
<i>Head of village</i>	0	0	0	0	0	0	0	1	0	1
Media										
<i>Television</i>	0	0	0	0	0	1	1	1	1	4
<i>Radio</i>	0	0	0	0	0	0	1	0	1	2
<i>Newspapers</i>	0	0	0	0	0	0	1	0	1	2
<i>Internet</i>	0	0	0	0	0	0	0	0	1	1
<i>Cell phone</i>	0	0	0	0	0	0	0	0	0	1
Organizations										
<i>District DARD</i>	1	0	0	0	0	0	1	0	0	2
<i>District Extension Station</i>	0	0	0	0	0	0	1	0	0	1
<i>Commune People Committee</i>	0	0	0	0	0	0	1	0	0	1
<i>Farmers' Union</i>	1	1	0	0	0	0	0	0	0	2
<i>Plants, factories, shops, restaurants</i>	0	1	0	0	1	0	0	1	0	3
Other										
<i>Personal experience</i>	1	0	1	1	0	0	0	0	1	4
<i>Markets</i>	0	0	0	0	0	0	0	1	0	1

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

Ma and surrounding villages have rich and diverse natural resources, of which, farmlands, forest and water surface (lakes, rivers, and streams) are of vital importance for the agricultural production and livelihood. However, improper exploitation and management led to serious degradation of these resources. The farmland of the village, which was fertile in the past, is largely eroded and degraded. The average cultivated land area per capita is being reduced due to rapid population growth.

Before the 1980s, natural forests occupied a large area with many ancient trees, precious timber and wild animals. At the present, natural forests almost no longer exist. Some of the area has been planted with forestry trees, and thus big trees and wild animals have disappeared. Water from Thac Ba Lake, rivers and streams has become seriously polluted with waste from production activities and also from processing of cassava and timber. The polluted water sources also seriously impact aquaculture in Thac Ba Lake. Although infrastructures such as electricity, roads, schools, and health care stations have been much improved, their quality are still low.

In future, people in Ma village wish to receive supports to be able to access good quality seeds, better crop and animal varieties, and advanced techniques so that they can increase and stabilize their crop and animal yields. For the infrastructure, improving the irrigation canal systems, upgrading schools, clinics, markets and waste management facilities for cassava processing factories are of high concern.

As identified by farmers, there are 34 organizations working in the region, including Ma village. Only 4 out of the 34 organizations were private organizations and NGOs. The organizations with activities related to food insecurity comprise nearly 50%, this ratio with regard to the food crisis is 42% and to the management of natural resources is 25%. The organizations involved in food security and food crisis mainly provide assistance in terms of capital, seed and production inputs to help farmers to improve/restore their production.

Villagers are very flexible and active in gathering and exploiting information related to agriculture. Television is the most commonly used communication channel for this purpose. As mentioned by farmers, information obtained from organizations and individuals (villagers, neighbors) are also of importance. And, young people have started to access information via internet and cell phones.

5.2. Implications for CCAFS

Agriculture production:

Paddy land is highly fragmented. The current average area of this land per capita is 120-140 m². Rice yield is low compared to the country's average because of the lack of suitable varieties, appropriate cultivation techniques and certified seeds, as listed by farmers in group discussions. Farmers, therefore, proposed that for improving paddy rice production, good varieties adapting well to the local conditions and tolerant to adverse climate conditions (cold for example) are needed. In addition, sustainable practices with effective use of fertilizers, pesticides and water are required. CCAFS can coordinate with relevant organizations to test and introduce appropriate rice varieties and rice cultivation techniques for increased rice yield, reduced greenhouse gas emissions from rice fields and increased economic efficiency to help ensure food security for farmers.

Livestock is one of the main products bringing a large share of income for the local households. However, profits from livestock remain low due to high input cost, unstable market prices of the animal products, pest problems, etc. Also, improper management of waste from animal husbandry badly impacts the environment and causes high GHG emission. CCAFS can help local farmers to develop appropriate animal husbandry systems with better waste management and higher profits.

Sloping land in the village is mainly used for cassava production and planting forests. Soil erosion caused by cassava monoculture is of great concern for local people. CCAFS can therefore work together with other organizations to design appropriate farming techniques to control soil erosion and at the same time to improve the crop yield. Integrated systems combining cultivation and livestock, or combining perennial and annual crops can be among the options.

Income from forest provides a significant part of the total income of households in Ma village. Besides economic benefits, planted forests also help protect environment and water resources, and reduce the impacts of natural disasters, especially floods and landslides. It is also possible to incorporate livestock with forestry to increase income for farmers. However, high input cost is required for forest planting and for developing livestock.

Another problem is due to pest problems on forestry trees. No inputs have been spent from pest control on forests. Thus, CCAFS, if possible can work with relevant organizations to develop suitable agro-forestry systems and multilayer planted forests for increasing both short- and long-term benefits.

Infrastructures and natural resources:

Most of the 5 km of in-farm canals are in poor condition and this causes low effectiveness of water and fertilizer use. Farmers, thus, expressed their wish that CCAFS can support the village to upgrade their canal system as well as to improve their capacity in the management of irrigation water and canal system.

Streams are an important water source for people, livestock and crops. However, the local stream system has been polluted heavily by processing factories. It is urgent to spend inputs for restoring the water quality and to take necessary measure to stop further pollution. CCAFS can support local authorities to define appropriate measures. Ma village manages a fairly large area of Thac Ba lake surface, and thus the village has good water area for developing aquaculture. Nevertheless, due to the lack of appropriate techniques for fish raising and pest control, and limited access to good quality fingerlings sources, local farmers are facing great problems. They therefore expressed the wish that CCAFS work in partnership with other organizations to support them to solve the problems so that they can increase the profits and sustainability of their aquaculture activities.

Table 8. Potential CCAFS partners

Organization	Operational sphere	Activities	Strength
Provincial DARD and Agriculture Extension Center	Whole Yen Bai province	Crop, animal, forestry production, validation and transfer of technologies; capacity building for farmers	Training of farmers; technology transfer
NOMAFSI	Whole northern mountainous region	R4D and R&D of sustainable farming technologies and systems	Linking different stakeholders; conducting participatory research
District extension station	Whole district of Yen Binh	Demonstration and dissemination of technologies	Community liaison, training for farmers.
District DARD	Whole district of Yen Binh	Provide professional advices to farmers	Community liaison,
Commune Farmers' Union	Whole commune of Vinh Kien	Playing the liaison between farmers and other organizations	Community liaison,
Animal husbandry Institute	Nation wide	Research and transfer techniques in animal husbandry	Techniques and breeding for animals
Institute of Agricultural Environment	Nation wide	R4D of solutions to overcome the harmful effects of agricultural activities to the environment.	Waste treatment
CIAT	Nation wide	Support to development of sustainable cultivation techniques and systems	Cassava research and development

5.3. Recommendations

Table 9 summarizes major gaps in knowledge and other current constraints that could provide opportunities/niches for CCAFS partners in terms of research, action/research and development interventions.

Table 9. Recommendations for major opportunities

Gaps in knowledge/ current constraints that could provide opportunities/niches for CCAFS and partners	Opportunities for research (CCAFS)	Opportunities for Action Research (CCAFS partners)	Development Interventions (Partners)
1. Lack of appropriate sustainable farming practices (varieties and techniques)	x	x	x
2. Low profits of production activities.	x	x	x
3. Poor quality and poor management of irrigation systems	x		
4. Aquaculture facing difficulty in terms of hatchling and techniques.		x	x
5. Pollution of water sources	x	x	
6. Improper pest control for crops, animal and forest trees	x	x	x
7. Cassava residue has not been used	x	x	
8. Lack of integrated farming systems with high and long-term economic benefits, increased climate resilience and reduced emission	x	x	x
9. Unstable markets for agro-products	x	x	x

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