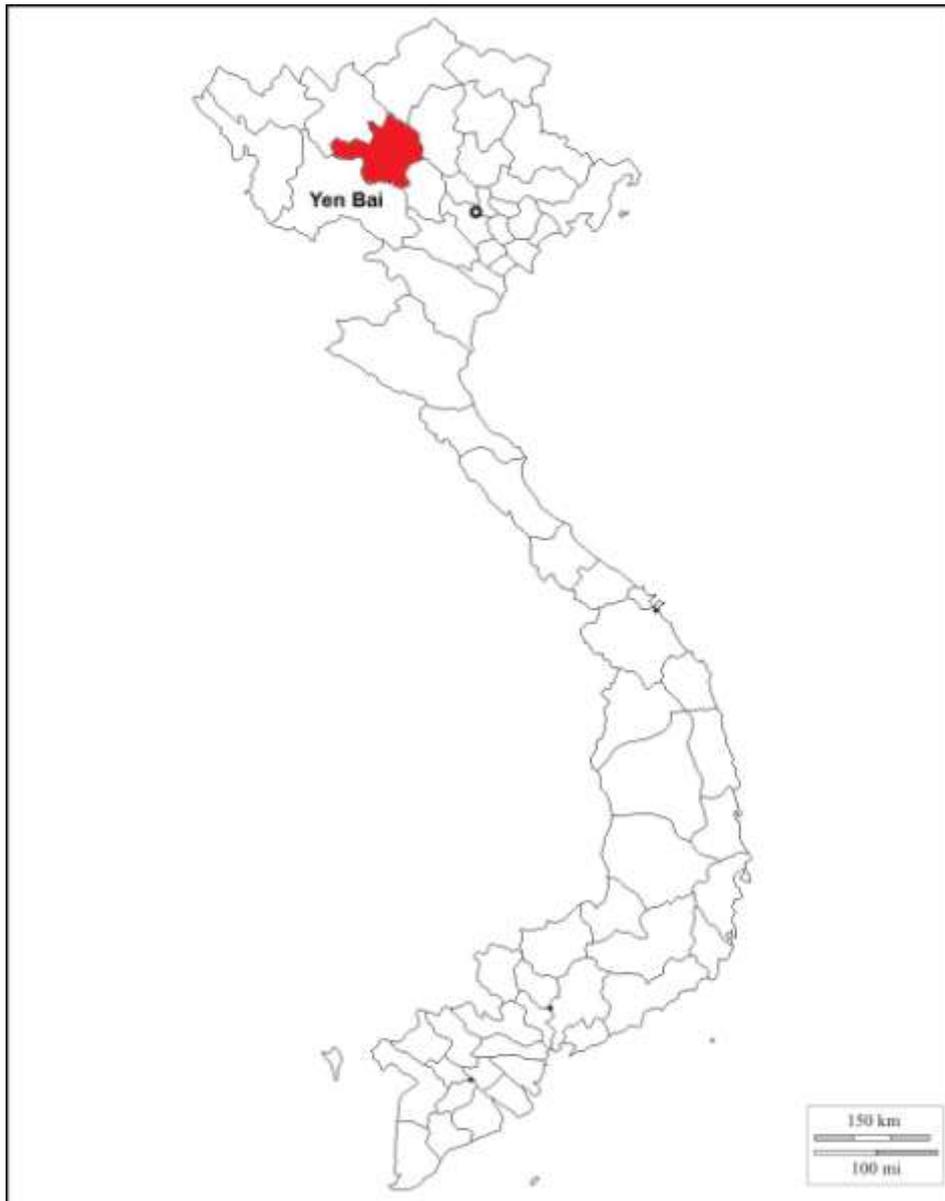




Food and Agriculture Organization

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*“Strengthening Capacities to Enhance Coordinated and Integrated Disaster Risk Reduction Actions and Adaptation to Climate Change in Agriculture in the Northern Mountain Regions of Viet Nam”*



**Baseline Survey of Yen Bai Province**

Yen Bai, 2012

## 1. Introduction

A detailed study was conducted in each of the 6 selected districts of the 3 provinces (Bao Thang and Bat Xat districts of Lao Cai, Ha Hoa and Doan Hung of Phu Tho, and Van Yen and Yen Binh of Yen Bai province) to deepen the understanding about local vulnerabilities, natural resource endowments, institutional setting in order to address climate risks and on locally available natural disaster prevention/preparedness strategies, and their existing strengths and demands. The findings show that communities depend largely on external suppliers for rice seeds, and thus often face problems caused by poor seed quality, untimely seed supply, especially when extra volumes are required for restoring production after natural disasters. In term of disasters, the target locations face problems of storms, floods, flash floods, whirlwind, drought, landslide, forest fire and failure of water reservoir. Up to the present, in order to mitigate risks and exposure to natural disasters, the local authorities are actively implementing the national policies as expressed in the “National Strategy for natural disaster prevention, response and mitigation to 2020”, including:

- Integrating into local socio- economic development plans the issues of disaster risk reduction (DRR) and management (DRM);
- Giving priorities to disaster preparedness, study of impacts of the global climate change, storm surge and other extreme climate phenomena in order to define and take appropriate response actions in time.
- Considering traditional experiences and lessons learnt from other regions/nations and previous activities, combining them with modern knowledge and technologies for effective DRM.
- Flowing the principles of:
  - the “four-on-the-spot” (commands, man-power, materials and logistics),
  - proactive prevention,
  - timely response, and
  - quick and effective recovery

However, in fact, there are still great limitations in DRM, and the most important are as below:

- Disaster prevention, response and mitigation activities are still passive and mainly focus on addressing their impacts and effects;
- Response to disasters is slow;
- Production systems are inappropriate in terms of preparedness to disaster risk reduction;
- Infrastructure is poor and in various locations are vulnerable to disasters;
- Forecast and warning systems do not meet the requirements, particularly with regards to disasters like flash floods, landslides, whirlwinds, etc.;
- emergency relief, damage recovery and rehabilitation are limited, sometimes are disconcerted and lack of coordination;
- Search and rescue activities are limited.

The main reasons for this include poor awareness, lack of appropriate long term development plans, poor management of natural resources and other activities, lack of supportive policies encouraging farming communities to be more proactive etc.

In partnerships with local DARD, relevant officers and staff, based on the survey findings, 6 communes were selected as target for further activities, including:

1. Dai Phac commune of Van Yen district, Yen Bai province
2. Yen Binh commune of Yen Binh district, Yen Bai province
3. Son Hai commune of Bao Thang district, Lao Cai province
4. Muong Vi commune of Bat Xat district, Lao Cai province
5. Minh Hac commune of Ha Hoa district, Phu Tho province
6. Chan Mong commune of Doan Hung district, Phu Tho province

## **Introduction**

To deepen the understanding about local vulnerabilities, natural resource endowments, institutional setting to address climate risks and on locally available and applied natural disaster prevention/preparedness strategies, and their existing strengths and demands.

## **Survey Aspects:**

- Situation of agricultural land use;
- Main features of climate conditions;
- Situation of disasters;
- Disaster risk reduction (DRR) measures, practices;
- Policies for prevention (preparedness) disaster risks and DRR.

## **Surveyed sites:**

- Ha Hoa district, Phu Tho province;
- Doan Hung district, Phu Tho province;
- Yen Binh district, Yen Bai province;
- Van Yen district, Yen Bai province;
- Bao Thang district, Lao Cai province;
- Bat Xat district, Lao Cai province;

## 2. General Assessment

Vietnam is located in the tropical monsoon area, one of the five storm-prone areas of the Asia Pacific region. Therefore the country often faces natural disasters of various types. Viet Nam is prone to natural disasters, with typhoons, storms, floods, droughts, mudslides, forest fires and salt-water intrusion presenting recurring risks, especially for children, women, and the elderly. The poorest people in society are the most vulnerable to natural disasters. More than one million people require emergency relief each year. Climate change models predict that Viet Nam is one of the worst affected countries globally, because of sea level rise and because natural disasters such as typhoons, floods and droughts are expected to intensify and occur more frequently.

In recent years, disasters have continually occurred all over the country, causing vast losses in human life, property, socio-economic and cultural infrastructure as well as environmental degradation. In the last decade, natural disasters such as typhoons, floods and droughts have caused significant losses. According to available data, about 8,000 people were missing or killed, and asset damage is equivalent to 1.5% of GDP. Natural disasters in Vietnam have been increasingly severe in terms of magnitude, frequency and volatility. More than 80% of Vietnam's population are living at risk of direct impacts of natural disasters.

So, the effective planning, preparedness and public investment are needed to minimise the adverse impacts of natural disasters and adapt to the reality of climate change.

### a. The Northern mountainous region

has the most complicated geological structure compared with other regions in the country. One third of the northern mountains consist of rocks with a thin weathered layer, which is infertile and poorly water-absorption, resulting in strong surface flow of the rain water. Mountains and hills occupy 80% of the region's land area. The forest coverage in this region is lowest in the country. The northern mountains and highlands still have much bare land and hills that cannot keep the rain water, contributing to formation of severe flash floods.

At present, mountainous regions are facing a lot of difficulties due to more and unpredictable natural calamities, longer droughts and the biggest limitation are low and unstable crop yields, under-utilization of flat lands, hunger, poverty and inappropriate exploitation of natural resources in consequence of all above stated.

Regarding 3 selected provinces (Phu Tho, Yen Bai and Lao Cai), all of them are located along the Red river. Though different in agro-climatic and socio-economic conditions, they are facing the same kinds of natural hazards like: Storms, whirlwinds, flash floods, landslides, drought, forest fires, etc. (table 1).

Table 1. Common disasters in Northern mountainous region and their vulnerability level<sup>1</sup>

Types of hazards	Geographical region	
	<i>Northwest mountain region</i>	<i>Northeast mountain region</i>
Storms	+	+++
Flood	++++	++++
Flash flood	++++	++++
Whirlwind	++++	++++
Drought	+++	+++

<sup>1</sup> Adapted from MARD

Inundation	-	-
Landslide	+++	++
Forest fire	++++	++++
Earth quake	+++	+++
Failure of water reservoir	+++	+++

In order to mitigate risk and exposure to natural disasters as indicated above, the local authorities are actively implementing the national policies expressed in “National Strategy for natural disaster prevention, response and mitigation to 2020”, including the following musts:

- Be integrated into socio- economic development master planning and plans of every region, sector, and nation-wide.
- Give priority to disaster preparedness, study of impacts of the global climate change, storm surge and other extreme climate phenomena for appropriate response actions.
- Consider traditional experience, learnt lessons, combining them with modern knowledge and technologies.
- Include the principles:
  - Of the “four-on-the-spot” (commands, man-power, materials and logistics),
  - Proactive prevention,
  - Timely response,
  - And quick and effective recovery.

In recent years, Vietnam has made considerable efforts in improving physical and technical infrastructures for disaster preparedness. The leadership and coordination in response to natural disasters from central to local levels have made substantial progress. However, with regards to the consequences of natural disasters and the socio-economic development goals in the near future, the following limitations need to be addressed:

- Disaster prevention, response and mitigation activities are still passive and mainly focus on addressing the consequences;
- Response to disasters is slow;
- Production systems are inappropriate in terms of preparedness to disaster risk reduction;
- Infrastructure is poor in in vulnerable to disaster places;
- Forecast and warning systems do not meet the requirements, particularly with regards to disasters like flash floods, landslides, whirlwinds, etc;
- Emergency relief, damage recovery and rehabilitation are limited, sometimes disconcerted and lack of coordination;
- Search and rescue activities are limited.

The above weaknesses are due to the following reasons:

**+ Awareness:**

- Inadequate awareness of natural disasters and sustainable development, especially in terms of living in harmony with the nature;
- Dependent and inactive attitude like waiting for support rather than self-preparedness to disaster risk prevention and reduction;

- Disseminating, training and raising community awareness of disaster prevention, response and mitigation are infrequent and unsystematic; training programs of natural disaster preparedness have not been included in school curriculum.

+ *Planning:*

- Lack of synchronous planning and short of coordination among ministries, sectors and localities. Lack of due attention to the integration of natural disaster prevention, response and mitigation into local and sector's socio-economic development programs;
- Construction planning is lacking due attention to safety and flood and storm avoidance, particularly in industrial zones, tourism areas, mountainous areas, residential areas and transportation roads;
- Development planning has not been linked with environment and landscape protection and preservation. For example, upstream protective forests have been destroyed for agriculture, mining, etc.

+ *Policy and mechanism:*

- Lack of penalties for failure to obey legal regulations, and the orders of relevant authorities;
- Overlaps of functions and duties due to lack of clear responsibility assignment;
- Lack of policies to encourage disaster-related insurance purchases;
- Lack of policies to encourage individuals and organizations volunteering and participating in search, rescue and response activities;
- Lack of timely adjustment in policies on mobilization of resources for disaster prevention and mitigation.

+ *Investment:*

- Investment in natural disaster prevention, response and mitigation has not been synchronous and not met the requirements of the given situation of disaster;
- Investment in the maintenance, management and utilization of existing structures is not correspondent to the new construction investment;
- Financial allocation to some critical, approved projects such as reservoirs, dyke systems, etc. is slow and does not meet current requirements.

+ *Direction and management:*

- The directions and orders in response to natural disasters have not yet been seriously executed; the implementation is slow; dependence on leaders still exists;
- The inspection and direction of four "on-the-spot" principles are not determinedly;
- There have been wrong directions of economic development without linking with natural disaster prevention, response and mitigation;
- The lax management and protection of watershed forests, coastal and riverside protective forests have led to the degradation of forest coverage in some areas, restraining the effectiveness of flood, storm and drought control and causing unexpected dangers;
- The lax management of sand exploitation on rives and other activities on river banks have resulted in harmful impacts on flood discharge and caused erosion;
- The quality control in some particular structures was insufficient, hence, damaged structures even in case of low intensity disaster. Some structures have even hindered flood discharge or made flood more serious.

- Management of implementing progress and operation of disbursement's procedures are still slow, especially ODA;
- The management and utilization of resources for disaster recovery are sometimes lax, lack of transparency or for inappropriate purposes;
- Lack of equipments and facilities for early warning and forecasting, risk prone mapping, unprofessional operations, not bringing the combined strengths of all forces and communities into full play.

*Regarding DRR in agricultural production:*

Our National Strategies oriented to enhance farmers to produce enough food for them, improving their food security status. Once food security is achieved, local people will have more ability to cope with disasters. Emergency supply is important, but may result in producing "dependency from external aids" that needs to be addressed and overcome with by empowering farmers' capacity (both mental and physical capacities) for disaster preparedness and mitigation, especially important is to achieve seed security.

Our survey findings indicate that there are good practices which can be re-developed and applied DRR in agriculture:

- Older farmers have good knowledge and skills in production of conventional rice seeds. Before, particularly during 1960-1980, most communities were self-sufficient in rice seeds: each agricultural cooperative established a rice seed production group comprising most experienced and skillful farmers, trained them in relevant techniques and provided them with appropriate land areas and necessary supplies to produce rice seeds for the whole cooperative. This is a useful lesson and great advantage for the project to build community-based rice seed production and supply systems for overcoming the above mentioned problems of seed supply towards disaster risk management. Recorded traditional knowledge is of high values for developing advanced technology for rice seed production at household level.
- Different newly improved pure-line rice varieties are adaptable to the local growth conditions, and some local rice varieties are with good/specialty quality; and their production brings higher income to farmers. However, supports from both scientists and local authorities are necessary for communities to propagate and develop/restore these valuable rice varieties, because seed companies often consider them "rare" varieties, and hence do not trade their seeds.

To this end, we propose the following activities in the communes of the project intervention:

- Establishment of farmers' groups specialized on quality rice seed production, storage and distribution;
- Establishment of systems for sustainable production through participatory on-farm demonstration and farmers field schools on integrated rice crop management technologies; through improving capacity of local institutions including research and training ones, extension staff and farmers in rice crop management;
- Improving systems for supporting community seed production and storage, ensuring supply of quality seeds for sowing and seeds reserved for emergency cases;
- Improving agricultural production systems in such a way that enhances the local preparedness, their resilience against the impacts of extremes climate change with proactive participation of the most vulnerable groups.



### 3. Brief Description of Yen Bai Province

#### *a. Brief description of Yen Bai province*

**Geographical position:** Yen Bai is located at 21°24'40" to 22°16'32" North and from 103°56'26" to 105°03'07" East. Yen Bai borders with Ha Giang and Tuyen Quang in the east, with Son La in the west, with Phu Tho in south and Lao Cai in the north. Yen Bai is located in the middle of roads, railways and water ways from Hanoi to the Vietnam-China border gate in Lao Cai. This is a good opportunity to exchange with other provinces.

Like other mountainous provinces, different regions of Yen Bai greatly differ from one another in both overall socio-economic development and agricultural production. As usual, the low-altitude regions (Yen Bai city, Nghia Lo town, Tran Yen district) are better developed and face less food shortage problems (with food production per capita of 300 – 330 kg annually), while for the districts located at higher elevations (Mu Cang Chai, Tram Tau and some part of Van Chan) to achieve food security is still a great challenge.

The food insecurity is also considerably affected by the vulnerability to floods, land slides and many other calamities.

**Topography:** The main feature related to vulnerability to floods in Yen Bai province is its topography being elevated from Southeast to the Northwest of the province. In addition, the Hoang Lien Son mountain range in the West is located in between the Red and Da rivers; then the Elephant mountain range is located in between the Chay and Lo rivers in the East of the province. The province is divided into two regions according to elevation, that are the highland and lowland regions. The highland region has the average altitude of more than 600 m asl and occupies 67.56% of the province' territory. This region, though with low population density, has high potential for economic development (rich in land, forest, minerals and genetic resources). The lowland region has the average elevation of lower than 600 m, including mainly low mountains and hills, inter-located with valleys. The region occupies 32.44 % of the province' territory and is more developed than the other region.

**Climate:** Yen Bai is also located in the tropical monsoon region. The average temperature is 22 - 23°C; the average annual rainfall is 1,500 – 2,200 mm/annum; the relative air humidity is 83 - 87%, good for agriculture and forestry development. However, the climatic conditions in Yen Bai is affected by many factors, especially due to complicated topography and high altitudes.

Yen Bai has 2 distinct seasons. The summer season from April to October and winter season from November to March. The summer season is hot and humid with the average temperature of higher than 25°C. There are a lot of rains, accompanied by whirlwinds, cyclones, flash floods, that cause severe damages affecting people living conditions and livelihood. The rain fall intensity and distribution are much dependent on topography. The rain fall is decreasing from East to West. In the highland regions, the winter or also called dry season, comes earlier but finishes latter than the lowland region.

#### **Natural resources:**

The soils in Yen Bai include 8 groups: alluvial, clay, black, grey, red, humus and soil with thin layers. Most of soils in Yen Bai are favorable for food, short-term industrial crops, and also for forest trees. Out of its total natural area of about 6,883 km<sup>2</sup>, agriculture lands account for only 10.7 % (ca. 69,315.12 ha). The limitation in the cultivable land source and other disadvantages, such as complicated topography, poorly developed transport system, unfavorable climatic conditions and lack of know-how in appropriate integrated crop management, are the main causes of food shortage problems affecting a large proportion of the province's 680,000 people. The forestry lands occupy 282,241.86 ha (accounting for 41%); The special use land – 29,199.78 ha (4.25%); The living lands - 3,804,54 ha (0.55%) and unused lands occupy 303,730.7 ha (amounting to 44.13%).

Among the last, 1,358.26 ha are potential for agriculture and that for forestry is 278,729.14 ha.

### **Forestry resources:**

Forest resources are closely related to the province' people livelihoods. Yen Bai forests are rich and diverse, including more than 500 plant species, belonging to 210 families; There are more than 200 timber species, particularly from the following families: lauraceae, cameliaceae, magnoliaceae, leguminose,... The province has large planted forests that serve as protection forests and raw material forests for paper and wood processing factories. There are also rich diversity of animal genetic resources but the wild animals are often in danger of uncontrolled hunting.

Of the total of 296,990 ha of forests, there are 193,928 ha of natural forests and 103,062 ha of planted forests, making the forest coverage 42.7%. The total volume of woods is estimated to reach 18 million m<sup>3</sup> with many kinds of precious woods like *Fokenia hodginsii*, *Afzelia xylocarpa*, *Cinnamomum balansae*, *Vatica odorata*, *Parashorea chinensis*, *Madhuca pasquieri*, etc.

### **Mineral resources**

Mineral resources in Yen Bai are rich and diverse. At present, there are 176 sites of mineral mining. Minerals are divided into minerals for energy, construction, industry, metals and mineral waters. The river and stream systems in Yen Bai are also diverse and complicated. There are 2 big river systems: the Red river and the Chay river. In addition, the province has hundreds of streams and canals. The area of Thac Ba lake is 19,050 ha of water surface. However, all the rivers and streams come from high mountains, so the flow is strong and the flow volume varies unevenly, causing sudden floods. Even though, there is high potential for hydro-electric power development.

### ***b. Situation of agricultural production and natural disasters in Yen Binh district of Yen Bai province***

Table 3. Agricultural land use in Yen Binh district

<b>No</b>	<b>Land use situation</b>	<b>Area by march 2010 ( ha)</b>
	Total natural area	77,319.67
<b>1</b>	Agricultural lands	9,750.48
1.1	Annual crop lands	4,518.08
	- Agricultural lands	12,667.22
	- Rice area	3,515.13
	- Area for fodder crops	134.86
	- Other annual crops' area	868.09
<b>2</b>	Perennial crops' area	5,232.4
<b>3</b>	Aquaculture area	

( Statistical data of the district)

Yen Binh is a mountainous province with total natural area of 77,319.67 ha. The district is located in tropical monsoon climate with 4 distinct seasons: Spring, Summer, Autumn and Winter.

**Storms:** Storms occur from April to October. There are localized storms in some places in the district.

**Rainfall:** Rains are concentrated in July-August. The rainfall in the district is comparatively low, so the water level in reservoirs is not as high as designed. After floods, the water volume in streams is rapidly reduced, causing difficulties for agricultural production in summer and winter seasons.

**Climatic condition changes affecting agricultural production:** Every year, there are heavy many flash floods accompanied by storms and whirlwinds causing big damages to people's

lives and assets. From the beginning of 2007 to May 2010, the following are noticeable storms and floods:

+ In 2007: Heavy rains on July 6, 2007 caused severe damages to Cam An, Bao Ai and Tan Huong communes.

Heavy rains on August 25, 2007 caused severe damages to the upper part of the district. Flash floods killed 1 person; people's assets were severely damaged or destroyed.

+ In 2008: The storm number 4, known as Kammuri Storm occurred from 6 to 10 of August 2008, causing heaviest rains and flash flood since 1961. Land slides occurred in many communes, especially Yen Binh town, lower part and east part of Thac Ba lake causing severe damages to people lives and properties.

To agriculture, 16.9 ha of rice were wiped away by flash floods; other 10.3 ha were buried under soil and sands; secondary crops were damaged on 6 ha (mainly cassava); the area of collapsed forest trees was 5 ha.

Heavy rains from September 24 to 26, 2008 caused flash floods in lower part and along the way number 7 of the district.

Heavy rains from November 7, 2008 flooded the lower part and east of Thac Ba lake of the district, causing big losses to agricultural production. About 180 ha of rice were buried; 20 ha of maize were destroyed; 17 ha of other crops were also severely damaged.

+ In 2009: With 3 heavy rains accompanied by whirlwinds from April to July, concentrated to the upper part of the district and the region surrounding Cam Nhan commune, the total area of damaged crops was 109.27 ha, of which 63.5 ha of rice were wiped away by floods; 40.67 ha were buried; 74 ha of forest trees were damaged.

#### **Measures to disaster prevention and reduction:**

Again, the most effective measures are prevention and avoidance. It is necessary to promote the propaganda and persuade local people to properly carry out the prevention activities, meanwhile the responsible offices should make correct early warning and forecasting of natural hazards, so that people have enough time to take prevention and avoidance measures.

Local authorities have to prepare different options for disaster prevention, following the "four-on-the-spot" principle: commands, man-power, materials and logistics on-the-spot. Upgrading information systems, keeping information flow continuous in all situations; allocation of standing officers 24/24 h in rainy season; cleaning drainage canals; destruction of structures that prevent water flow are good measures for disaster risk reduction.

#### ***c. Situation of agricultural production and natural disasters in Van Yen district of Yen Bai province***

Van Yen is a northern mountainous district of Yen Bai province. Mau A town - the district capital - is 40 km far from Yen Bai city. The district is located along the Red river. Van Yen has borders with Van Ban district of Lao Cai province in the North, with Luc Yen district in the east, with Van Chan district in the west and with Tran Yen district in the south.

The total natural area of the district is 1,391.54 km<sup>2</sup>, with 26 communes and 1 town, of which 13 communes are in the highlands and 8 communes belong to the group of specially difficult communes.

In 2010, the rice area amounts to 3,168.05 ha; that of maize is 1,792 ha; that of sweet potato is 101 ha; soybean 95 ha and 334 ha of other crops.

**Topography:** The district topography is consisted mainly of hills and mountains with steep slopes. There are many streams, creeks, particularly the Red river running along the district

length. There are 17 communes in the right and 9 communes and 1 town in the left of sides of the river. Every year, the occurrence of flash floods, whirlwinds, cyclones, inundation, floods, land slides is quite often.

**Climatic condition changes affecting agricultural production:** In recent years, the climate is changing unexpectedly. Drought occurred longly and widely. No water can be found in upper streams. The water level is extremely low in ponds, lakes, reservoirs and rivers. The district is often suffered from natural hazards like whirlwinds, tornadoes, hails, floods, landslides causing great losses.

The most vulnerable to flash floods communes are those located along the Hut, Thia, Nhuoc streams; those located in the foot of the Elephant mountain from Lang Thiep to Yen Hung communes.

The water in the Red river often rises to very high level in rainy season, causing floods in low communes. The most vulnerable commune are Mau Dong, Mau A, An Thinh and Dong Cuong. Due to water flow from Thia stream to the Red river, the water from upper parts of the Red river gets stuck at the junction point, causing floods that damage crops in Yen Phu, Dai Phac and An Thinh communes.

Heavy rains often cause land slides, burying houses, causing great losses to agriculture and traffic jam. Tornadoes may occur quite often in some communes like Lam Giang, An Binh, Quang Minh, Ngoi A, Yen Thai, Yen Hung, Yen Hop, Xuan Ai and Yen Phu.

The district was one of the most damaged by the Kammuri Storm in August 2008.

The storm number 5 on July 20, 2009 caused heavy rains in some communes like Yen Hop, Yen Hung, Xuan Ai, Vien Son, Mau Dong. The storm and flood collapsed 2 houses, damaged 42 houses of people and 4 community units; 38.4 ha of rice; 3.7 ha of maize; 57 ha of cassava and 42 ha of industrial crops were damaged. On the April 7th 2010, rains and whirlwinds accompanied with hails caused severe damage to 91.6 ha of rice, 127 ha of maize, 46.3 ha of vegetables and 186 ha of cassava.

#### **Measures for disaster risk prevention and reduction:**

+ Prevention of and coping with flash floods and landslides: Flash floods often occur in Thia, Hut, Cai, Truc, Trang, Nhuoc streams... because of sloping topography, the bottom of the streams are narrow, upper forests were destroyed. So, cleaning the stream bottom to ease the water flow; moving people houses to safe places; replanting upper forests are considered very effective measures for DRR.

+ Prevention of flood and inundation: Repairing dykes, scraping off canals, sluices; buying equipment for controlling inundation; improving watershed management and reserving water are not only good for prevention of flash floods, land slides, but also for agricultural production.

Reserving enough seeds of rice, maize and other secondary crops for re-growing after floods is a very important practice of local farmers.

Reinforcing house by tying, putting more support poles, upgrading storage, warehouse, making boats, rafts, moving properties to safe places, as well as protection of animals are important measures for DRR.