

SOCIALIST REPUBLIC OF VIETNAM
MINISTRY OF AGRICULTURE
AND RURAL DEVELOPMENT

**DATA COLLECTION SURVEY
ON
THE NEEDS FOR AGRICULTURE
PRODUCTIVITY IMPROVEMENT
IN NORTHERN SIX PROVINCES**

FINAL REPORT

JUNE 2016

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

NIPPON KOEI CO., LTD.
KRI INTERNAIONAL CORP.

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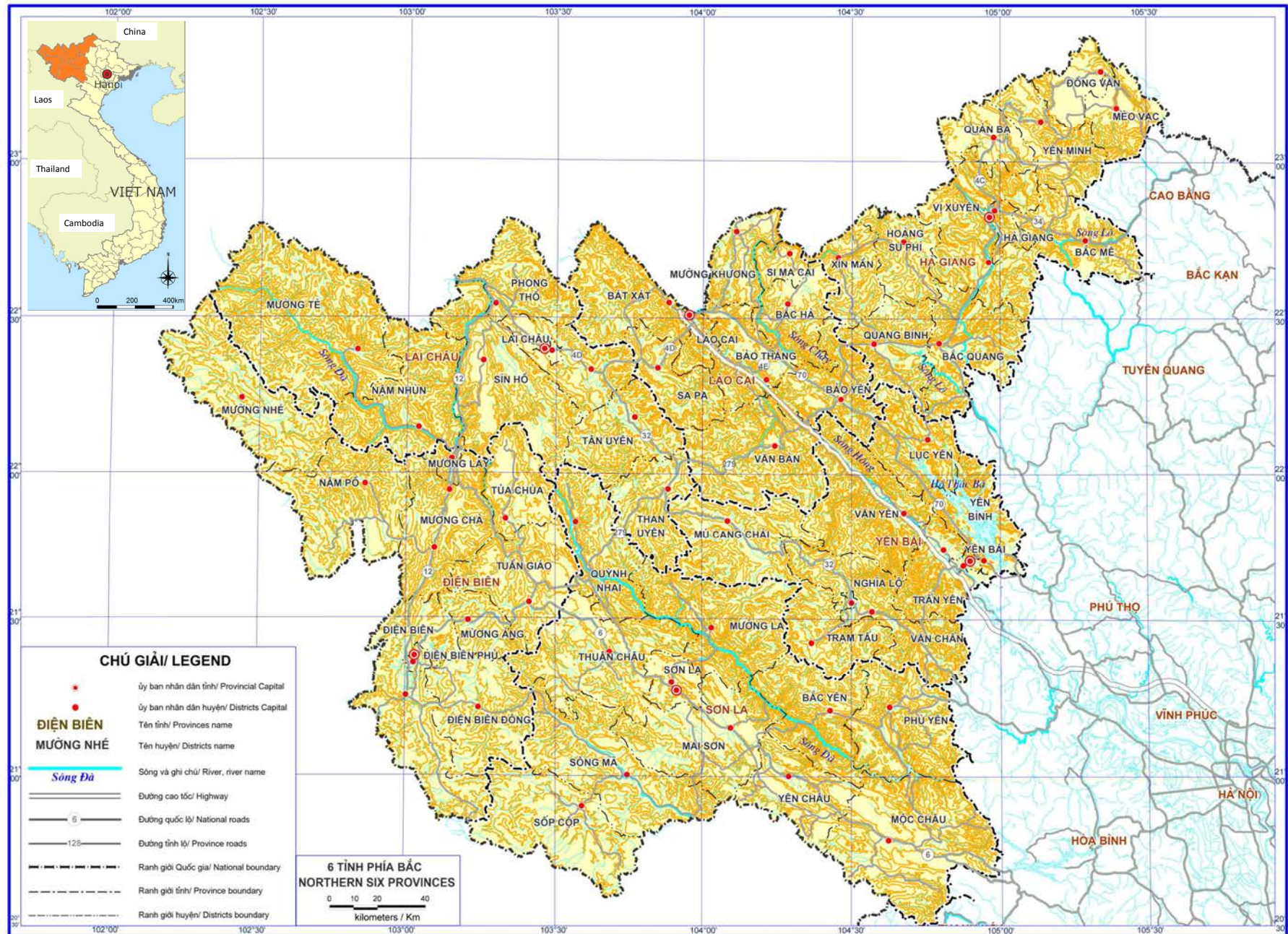
Currency Equivalents (average rate from October 2015 to June 2016)

US\$1.00= VND 22,318

US\$1.00= JPY 116.825

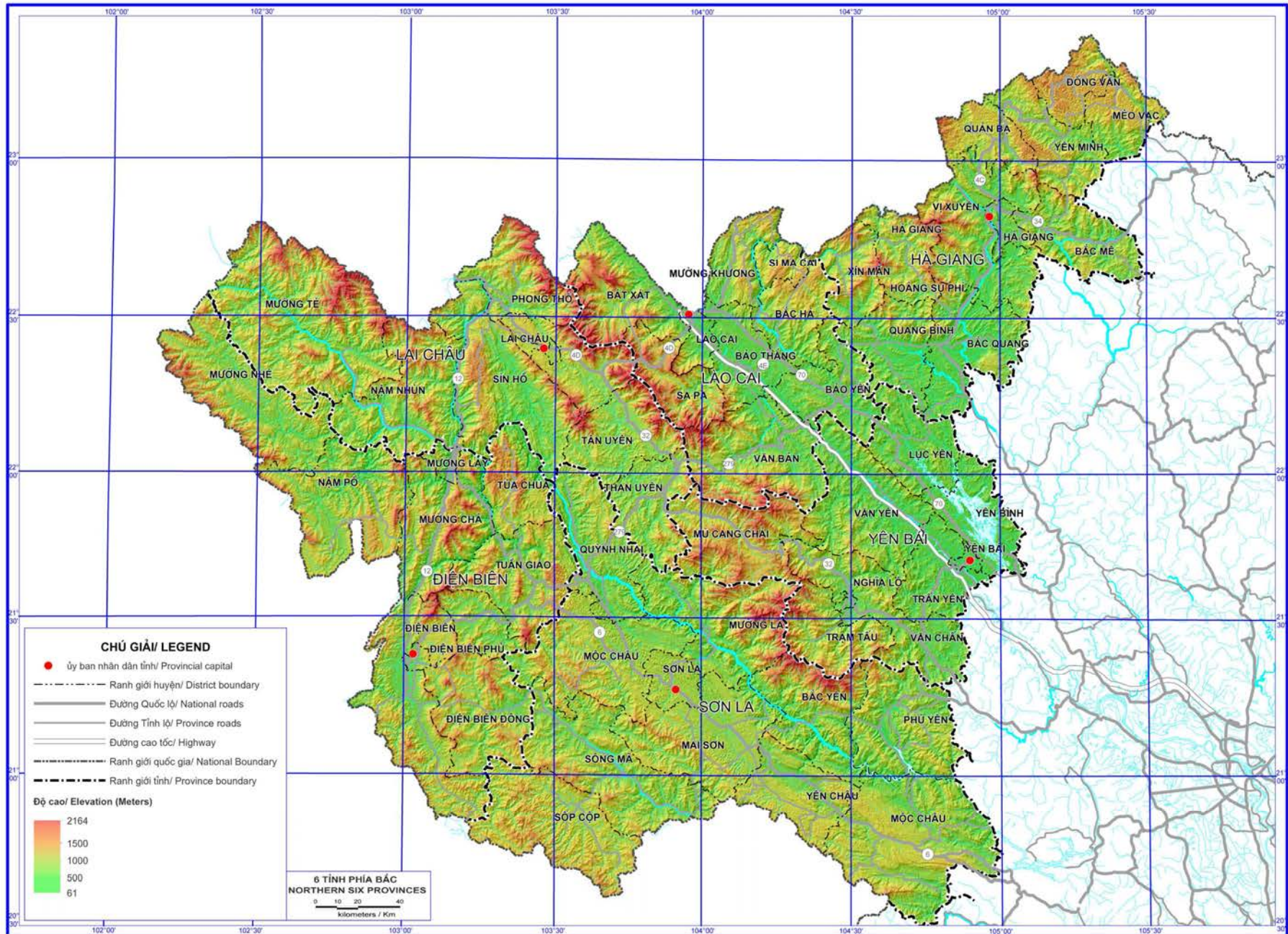
VND1.00= JPY 0.00523

Source: Monthly exchange rate, JICA



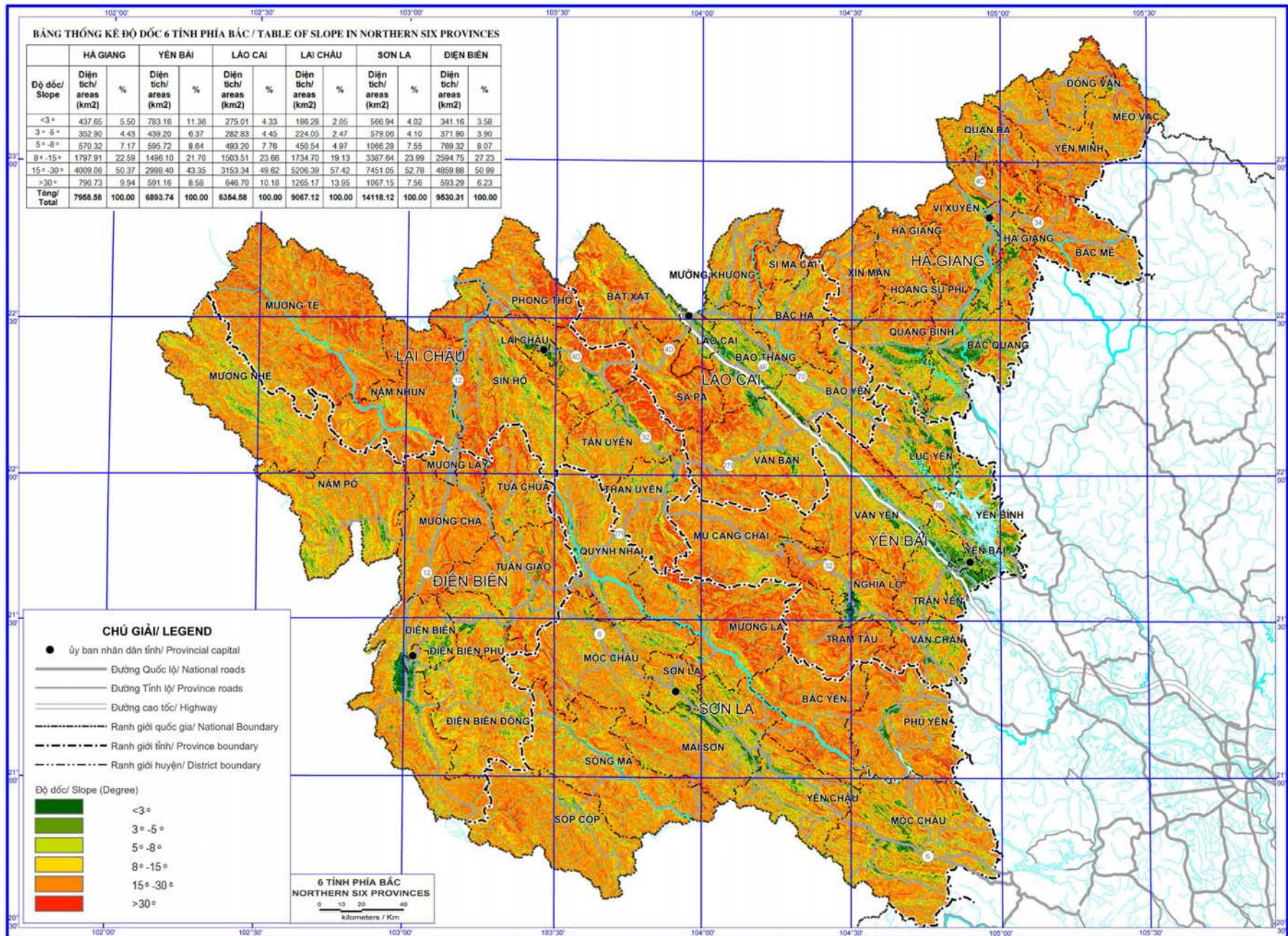
Source: JICA Survey Team

General Location Map of the Six Target Provinces



Source: JICA Survey Team

Elevation Map of the Six Target Provinces



Source: JICA Survey Team

Slope Map of the Six Target Provinces

Photographs

Meetings



Source: JICA Survey Team

Inception Meeting in MARD
(MARD, JICA Vietnam Office, Survey Team)



Source: JICA Survey Team

Meeting in Dien Bien Province
(DARD and related Division)



Source: JICA Survey Team

Meeting in Son La Province
(PPC, DARD, Other Departments)



Source: JICA Survey Team

Meeting in Lai Chau Province
(PPC, DARD, Other Departments)



Source: JICA Survey Team

Meeting in Lao Cai Province
(PPC, DARD, Other Departments)



Source: JICA Survey Team

Meeting in Ha Giang Province
(PPC, DARD, Other Departments)

Photographs



Source: JICA Survey Team

Meeting in Yen Bai Province
(PPC, DARD, Other Departments)



Source: JICA Survey Team

Explanation Meeting on the Phase 1 work
(MARD, PPC Vice Chairpersons from 6 Provinces,
JICA Vietnam Office, Survey Team)

The NORRD Project in Dien Bien Province

Pilot Project Sites



Source: JICA Survey Team

NORRD demonstration farm for paddy at Pom Cai pilot site
in Muong Cha District, Dien Bien Province



Source: JICA Survey Team

NORRD demonstration farm for soybean at Cuong pilot site
in Tuan Giao District, Dien Bien Province



Source: JICA Survey Team

NORRD demonstration farm for maize at Cuong pilot site
in Tuan Giao District, Dien Bien Province



Source: JICA Survey Team

Intake structure constructed by NORRD project
at Pom Cai pilot site in Muong Cha District, Dien Bien Province

Photographs



Source: JICA Survey Team

Division box constructed by NORRD project at Ho Chim 2 pilot site in Muong Cha District, Dien Bien Province



Source: JICA Survey Team

Intake structure constructed by NORRD project at Muong 1 pilot site in Tuan Giao District, Dien Bien Province

Interview Survey on the NORRD Activities in Dien Bien Province



Source: JICA Survey Team

Interview survey with hamlet leaders at Cuong pilot site in Tuan Giao District, Dien Ben Province



Source: JICA Survey Team

Interview survey with farmers at Cuong pilot site in Tuan Giao District, Dien Bien Province

Performance-based Rural Development Project

Agriculture Extension Activities



Source: JICA Survey Team

Demonstration site at Muong Sang Commune in Moc Chau District, Son La Province



Source: JICA Survey Team

Demonstration site at Phuc Than Commune in Than Uyen District, Lai Chau Province

Photographs



Source: JICA Survey Team

Demonstration site at Phu Nhuan Commune
in Bao Thang District, Lao Cai Province



Source: JICA Survey Team

Demonstration site at Xuan Giang Commune
in Quang Binh District, Ha Giang Province

Infrastructure Development



Source: JICA Survey Team

Demonstration site at An Thinh Commune in Van Yen District,
Yen Bai Province



Source: JICA Survey Team

Downstream of Weir, Nam Rom irrigation system subproject
(Rehabilitation), Dien Bien Province



Source: JICA Survey Team

Existing intake sluice , Noong Chay irrigation system,
(Rehabilitation), Son La Province



Source: JICA Survey Team

Existing weir, Lung Tham irrigation system (Rehabilitation),
Ha Giang Province

Photographs



Source: JICA Survey Team

Existing weir, Nang Phai irrigation system (Rehabilitation),
Yen Bai Province



Source: JICA Survey Team

Existing cross section, Dong Tam - Trung Thanh road,
Ha Giang Province



Source: JICA Survey Team

Existing cross section, Pa Bon - Ma Sang road Subproject,
Lai Chau Province



Source: JICA Survey Team

Existing treatment facility (Improve), Upgrade Khanh Yen town
water supply system, Lao Cai Province



Source: JICA Survey Team

Existing situation of water intake for the area - Inter-village water
supply system, Son La Province



Source: JICA Survey Team

Benefited area - Electricity distribution to Vinh Yen commune,
Lao Cai Province

EXECUTIVE SUMMARY

I: GENERAL INFORMATION AND NEEDS ASSESSMENT

I-1 Background

General

This is the final report prepared by the Survey team in accordance with the contract for the “Data Collection Survey on the Needs for Agriculture Productivity Improvement in Northern Six Provinces”, defined as “the Survey”, agreed upon between the Japan International Cooperation Agency (JICA) and the joint venture of Nippon Koei Co., Ltd. and KRI International Corp. on September 29, 2015. The Survey team commenced the work in September 2015 to undertake various activities for the Survey. The Survey team compiled all information collected, and prepare the final report to present the results of the work.

Background

While the Socialist Republic of Vietnam has achieved the remarkable economic growth by introduction of the market economy, it tends to expand the economic difference between urban and rural areas. The three fourth (3/4) of the population live in rural areas and most of them rely on unstable agricultural income. In the six provinces (Dien Bien, Lai Chau, Son La, Lao Cai, Yen Bai, and Ha Giang), ethnic minority groups occupy 80% of people living there, and the poverty rate of these provinces is high (25~47%). To prevent social destabilization due to widening income disparity and to promote sustainable growth, the Government of Vietnam (GOV) regarded the agricultural development as important policy in the areas. In this connection, JICA implemented “The Northwest Region Rural Development Project in Vietnam for five years, from August 2010 to July 2015, hereinafter called the NORRD Project” aiming at agricultural development in Dien Bien Province. The achievements of the NORRD Project were compiled as the “Agriculture Extension Guideline/Water Management Development Manual”. Dien Bien province People's Committee approved them in July, 2015 as the provincial official technical documents to be used for further application.

JICA implemented “Rural Infrastructure Development and Living Standard Improve” as yen loan projects and has implemented “Small-Scale Pro Poor Infrastructure Development Project (SPL) from 1996 to March 2016”. In SPL, infrastructure has been improved, including roads, water supply, irrigation facilities, electricity distribution lines. However, further development is necessary for development of the regional economies.

Under the circumstances, a yen loan project for local infrastructure development along with dissemination of both the guideline/manual was requested by Ministry of Agriculture and Rural Development (MARD) of GOV to JICA Vietnam Office for promotion of agriculture in the northern areas. As a response to this request, JICA decided to implement the Survey to collect basic information for promotion of agriculture in the six provinces.

Objective

The objectives are to collect comprehensive information concerning local/rural development, including natural environment, social and economic conditions, social infrastructure development, states of agriculture, and budgetary conditions of local governments and to study/examine the GOV's capacity and budget so as to disseminate the outputs of the Northwest Region Rural Development Project in Vietnam. Also, to introduce the performance-based budgeting and financing system that finances as per results. The target organizations and provinces of the Survey are organizations related to MARD, and six provinces (Ha Giang, Lao Cai, Yen Bai, Dien Bien, Lai Chau, and Son La).

I-2 General Information of Vietnam and Positioning of the Target Areas

Natural Condition

The six target provinces for the Survey are located in the north eastern and western area of Vietnam with the area of 53,990 km², occupies 16% of the total area of Vietnam. Vietnam has the tropical

climate in general, although regional differences are observed due to its long land shape. The rainy seasons are normally from April/May to September/October generated by the tropical monsoons. Total annual rainfall varies from station to station, and from year to year; and it can range from around 1,000 mm (Vung Tau) to more than 4,000 mm (Hue). Average annual mean temperature is from around 18°C to 28°C.

Socioeconomic Condition

There are 63 provinces in the country with population of 90,728,900 (2014). Total population in the six target provinces are 4,357,300 with only 5% share to the total population of Vietnam. The share of rural population at national level in 2014 is 67%, lower than that of the six target provinces (83%). Average population density is 274 people/km² for the whole country; on the other hand, the one in the six target provinces is 80, much lower than the national average. Total regional GDP for the six target provinces at current price was 100,627 billion Dongs in 2014 with only 3% of the total GDP of the whole country.

Currently, 54 ethnic groups are officially identified in Vietnam. The majority Kinh group dominates 87% of the whole population. Moreover, about 75% of 53 ethnic minority groups are concentrated in the Northern Mountains and the Central Highlands and mostly live in rural areas.

Vietnam has experienced decrease in poverty rate from 9.8% in 2013 to 8.4% in 2014 but the rate is low in more developed regions such as the Red River Delta and in the southeast. There has been still intensified inequality in poverty level in the northern midlands and mountain areas where the six provinces are located (18.4%, 2.19 times higher than the national average) and in the central highlands, and the north central area and central coastal area.

Despite of the fact that living standards has been improved across every geographic region, Northern Midland and Mountainous Areas (say the six provinces) have seen unequal progress compared to other regions across social-economic indicators: living conditions, education and health. This is partly because investment in public infrastructure such as rural roads has not been sufficient enough to provide these social services in remote areas.

Agriculture and Rural Condition

The share of forestry land and agriculture production land to total land of the six target provinces are 63%, 16% (both in 2013), respectively. Compared with the national figures (48%, 31% in 2014 respectively), the target area is characterized as the area with more forest and less agriculture production land.

The labour force in the six target provinces is 2,702,293 (5% of national labour force in 2013). Rural labour force in the target provinces in the same year is 2,258,434, and share is 84% of total labour force, which is higher than the national level figure (69% in 2014).

National average of monthly income per capita is VND 2,640 thousand, of which the one in rural areas is VND 2,041 thousand. The figure in the northern midlands and mountain areas, where the six target provinces are located, is VND 1,613 thousand, which is 61% of the national average and even lower than the rural average. Assumed five members in the family, annual household income can be estimated as VND 158 million, VND 122 million, and VND 97 million for a whole nation, in rural areas, and in the northern midlands and mountain areas, respectively.

The share of annual crop land to total agriculture production land in the six target provinces is 80%, more than the national share of 63%. This indicates that annual crops are still dominant crops in the target provinces in agriculture land, and perennial crops are less developed despite their topography considered favourable for perennial crops. Total planted area of paddy, maize and soybean in the six target provinces in 2014 is 243,222 ha (3% to total paddy planted area), 336,858 ha (29% to total maize area), 39,220 ha (36% to total soybean area) respectively. It should be noted that the planted area of maize and soybean in the target provinces has significant share to total planted area of these two crops, compared with land share (16%).

Yield of paddy at national average in 2014 is 5.76 ton/ha, with 36% increase from 2000. The same data for maize is 4.41 ton/ha with 60% increase. Except cotton, increased yields of all other main crops indicate improvement of productivity. Yield of paddy, maize and soybean in the six target provinces in 2014 is 4.27 ton/ha, 3.5 ton/ha, 1.2 ton/ha respectively, all lower than the national averages. Total production of paddy, maize and soybean in the six target provinces in 2014 is 1,039,695 tons (2.3% to total paddy production), 1,179,785 tons (22.5% to total maize production), 48,974 tons (31.0% to total soybean production) respectively. Agriculture production area of the six target provinces is 873,955 ha with 8% to total agriculture areas, while irrigation service area in the six target provinces is 121,960 ha, which is 3% of the total area equipped for irrigation. Irrigation in the target provinces is not well developed compared to the national average mostly due to their mountainous topography and fragmented flat areas.

Water pump, insecticide sprayers, middle and small sized tractors, rice mowing machine, and milling machine are the major machinery in Vietnam. Agricultural mechanization in the Northern midland and mountainous region are left behind at less than half from the national average.

I-3 Related Development Policies in Vietnam

Vietnam's Socio-economic Development Strategy (SEDS) from 2011 to 2020

The general objective is to strive to make the country an modern oriented industrial one by 2020 with socio-political stability, agreement, democracy, and discipline; people's physical and spiritual life is clearly improved; the independence and territorial unification are firmly maintained; and Vietnam's position in international arena is continually improved, creating firm premises for higher development in the next period.

As its strategic breakthroughs, it specifies three areas, (i) promoting human resources/skills development (particularly skills for modern industry and innovation), (ii) improving market institutions, and (iii) infrastructure development. As for agriculture sector, it states that development goes towards modern, effective and sustainable directions.

As more concretized plans to realize SEDS, there was the previous socio-economic development plan (SEDP) 2011-2015 which has just ended. The previous plan elaborated objectives for the first five years of the SEDP including high quality and sustainable economic growth, improved living standards of ethnic minority populations, strengthened environmental protection; and mitigation and prevention of the adverse impacts of climate change. The new socio-economic development plan 2016-2020 is to soon take place. It is said that the slow progress of the reform stipulated in the previous plan is observed, and therefore it is necessary to accelerate the reforms during 2016-2020 period to achieve the target set in SEDS.

National Target Program on New Rural Development Program (NTP on NRD) from 2010 to 2020

The National Target Program (NTP) on NRD was approved by the Decision No. 800/QDTTg dated 04 June 2010. This program is to be implemented in all over 9,071 communes for the period from 2010-2020. Currently the first half has just been completed. As its specific targets, 20% of all communes is expected to achieve full new rural criteria set by 2015, and by 2020, 50% of all communes reached new rural criteria. This program has been implemented in the six target provinces, and the mid-term evaluation is on-going. MARD is the implementing agency, and Department of Cooperative and Rural Development is the secretariat.

Program 135

Program 135 was established in 1998 to implement government policies targeting the most vulnerable communes, promoting production and access to basic infrastructure, improving education, training local officials and raising people's awareness for better living standards and quality of life. This program was extended to implement another two periods, namely the Period 2012-2015, and the Period 2016-2020, by Decision No. 551/QD-TTg of Prime Minister dated 4 April 2013 as part of National Target Program on Sustainable Poverty Reduction and period 2016-2020. The objective of the upcoming Period 2016-2020 is to enhance major infrastructure to serve for production, business

and welfare of the people in extremely difficult communes, border communes, safe area communes, towns under district, and mountain villages, thereby expecting to help to impulse socio-economic development, improve people's living standard and reduce poverty sustainably and fast. The components are two; production development and infrastructure development including rural road system, electricity, health stations, education associated buildings, irrigation systems, and small infrastructures consistent with ethnic minority people.

Strategy on Agriculture and Rural Development for 2011-2020

The overall objectives of Strategy on Agriculture and Rural Development for 2011-2020 are 1) to build a comprehensive agricultural development towards modernization and sustainable, large-scale commodity production, productivity, quality, efficiency and competitiveness, ensuring food security both short and long term; 2) to construct new rural with modern economic infrastructure; reasonable economic structures and production organizing, associate agriculture and industry, services, urban by planning; stable rural society, rich national cultural characters; enhanced intellectual, ecological environment is protected; political system in rural areas under the leadership of the Party is strengthening; and 3) to improve the living standard, creating a fast change in difficult areas; trained farmers in production.

The strategy states the specific objectives for two five-year periods. The objective of the new Period 2016-2020 is agricultural development towards a comprehensive, modern, large-scale commodity production, sustainability; rural development associated with the process of industrialization and urbanization of the country, increase income and improve the basic living conditions of rural residents, environmental protection. For the northern mountainous areas, intensification of rice and vegetables, industrial crops, fruit trees, flowers, fodder crops for livestock, etc. are specified.

Current Condition of Participatory Irrigation Management

In many decades, the Government and water users concentrated investment on construction and rehabilitation of irrigation systems. Following the policy on "the Government and water users working together", farmers in different regions have contributed significantly to the investments in irrigation systems with various levels ranging from 12% of the total investment in the Red River Delta, 30-50% in other regions and to 80-100% for small-scale irrigation schemes managed by their own. In the six target provinces, the state own provincial organizations manage 5% of the irrigation systems covering 18% of the irrigated or service area. The 95% of the irrigation systems covering 82% of the service area in the six provinces are under the districts administration and managed by farmers' water users organizations (WUOs).

At present, many farmers' organizations for irrigation water management were organized in most of provinces to execute participatory irrigation management at various levels, mainly at levels of one hamlet, some hamlets or commune. In order to promote participation of local people in irrigation development, during recent decade, the Government has issued many policies to provide the legal framework for renovation and enhancement of management, promote irrigation works and promote PIM. One thing it should be noted is that in 2008, the prime minister issued Decree No.115 dated November 14., declaring abolishment of irrigation service fee for agriculture production of farmers, and provision of irrigation subsidy. Although this decree has a certain meaning on eliminating farmer's burden, but it seems there is some difficulties to promote PIM.

I-4 General Information of the Six Target Provinces

Natural Condition

Total area is from 6,384 km² of Lao Cai as the smallest to 14,174 km² of Son La as the largest. In terms of land use, Lai Chau has the largest percentage of forest area as 81%, on the other hand the smallest forest percentage of 45% is observed in Son La. Climate patterns are similar, though Lai Chau and Ha Giang have relatively more rainfall than the others; and Lai Chau is slightly cooler than the others.

As for elevation, there are several areas which are high altitudes at around 1,500 m and above. On the other hand, there are places with low elevation, mainly along with the big river flows. One of the large areas is laid in the east side of Yen Bai and the south side of Ha Giang. The share of the area with slope more than 15% ranges from 52% in Yen Bai to 71% Lai Chau, in terms of slope category, it can be generally said that all the provinces have similar land characteristics. The largest flat area is the same low altitude areas of Yen Bai and Ha Giang. Other areas are scattered among the mountainous areas.

Socioeconomic Condition

Number of districts is between 8 and 12 among the six provinces. Population are different from the smallest, 432,303 in Lai Chau to the largest 1,169,600 in Son La (around three-time difference). Share of rural population is similar more less 80% across the provinces. As for population density, three provinces, Yen Bai, Lao Cai, and Ha Giang, have the density with figures of more than 100 persons/km², although this is still much less than the national average at 274 persons/km².

The largest total nominal GDP of province is VND 28,088 billion in Son La (2014 preliminary), followed by Lao Cai and Yen Bai. In terms of GDP per capita, Lao Cai becomes the top (VND 36,670 thousand), followed by Son La, and Yen Bai. These three provinces can be economically developed among the six relatively.

As for the GDP share of agriculture, forestry, and fishing sector, Ha Giang and Son La have the figures which exceed 30%, indicating this sector is significant for their economies. On the other hand, this share of Lao Cai is the smallest, 16.13% indicating relatively other sectors have more impacts on its economy. The average annual growth rate of Yen Bai for GDP per capita at constant price (base year is 2010) is the highest at 8.5%, followed by Lao Cai (7.8%) and Son La (7.5%). Dien Bien shows the lowest growth of 3.7%.

Ethnic compositions are very diverse in the six provinces. Each has more than 10 ethnic groups. Only Son La and Yen Bai have an ethnic group accounting for more than 40% of each provincial population: the Thai (53%) and the Kinh (46%) respectively. The two patterns of lifestyles may reinforce long-held stereotype of the rich lowlanders and the poor highlanders that no longer reflect reality of ethnic groups. Nonetheless, they are worth understanding to capture broad characteristics of ethnic groups in the six provinces.

Among the six provinces, Lai Cai has been the most successful in poverty reduction (-11.8%) in the last five years and recorded the lowest poverty rate (17.61%). Meanwhile, Lai Chau can be ranked as the bottom with the highest poverty rate (38.82%) in 2014. Within the provincial population, the ethnic minorities are at considerable risk of poverty. Apart from Yen Bai having the majority Kinh group (46%), more than 90% of poor households were from ethnic minority backgrounds in all the five provinces in 2014.

Yen Bai was the richest province with literate human resources (15 years' of age and above) among Six Provinces for the last five years. Yen Bai recorded 87.6%, which was close to the country average of 94.7% in 2014. Lao Cai (78.5%) was put in the second and Son La (75.8%) in the third place. Regarding infant mortality rate, Son La has had the lowest record followed by Yen Bai and then Lao Cai for the last five years. It can be noted that economically disadvantaged provinces (Lai Chau, Dien Bien and Ha Giang) experienced poorer social conditions of both literacy rates and infant mortality rates. The UNDP's Vietnam Development Report 2011 claims, from the viewpoint of GDI, that Six Provinces were ranked in the bottom 7 provinces and lagged behind the Vietnam's wealthier provinces in 2008. While Lao Cai was the best in gender equality and women's empowerment, Lai Chau was the worst.

I-5 Development Plan and Donors' Assistance in the Six Target Provinces

Agriculture Development Plans

Among the six provinces, province agriculture production value added will be the highest in Son La, and followed by Lao Cai as planned figures for 2020. On the other hand, Lai Chau and Ha Giang will

be the lowest. Growth rate of agriculture production value added is set at the figures between 4.5 to 9.6%/year for all the provinces.

The share of agriculture in the economic sectors of provinces was 22%~37% in 2015. On the other hand, in 2020 agriculture will occupy 11%~32% of provincial economic sectors, which is slightly reduced as compared with in 2015, indicating development of secondary industry and tertiary industry such manufacturing and service sectors are expected in the plans. The highest ratio of agriculture in the economic sectors of provinces is observed in Son La, and the lowest will be in Lao Cai. This is supposed to be influenced by the characteristics of these two provinces. Son La is an advanced agriculture province, and Lao Cai develops the secondary and tertiary sectors characterized by trading with China.

Generally across the six provinces, the areas of these annual crops including cereals are not planned to be drastically increased most likely due to the topographical conditions. Instead, production increase is planned to be achieved mostly by unit yield increase. On the other hand, areas of industrial crops and fruit trees are planned to be increased. The six provinces have the objectives of the agriculture development plans to put emphasis on from quantity to quality of agricultural products, and to invest in agricultural production which has high economic efficiency and high added value.

Infrastructure Development Plans

The infrastructure development plan was prepared by the respective provinces based on SEDP for 2016-2020. The priority projects are basically nominated according to the infrastructure development plans in SEDP for 2016-2020. Based on the provincial SEDS, the six provinces prepared their infrastructure development projects for 2011-2020 and their necessary investment fund was estimated. The investment requirement of irrigation, road, water supply and electricity in the six provinces varied from VND 15,749 billion in Lai Chau to VND 26,294 billion in Yen Bai .

JICA's assistance

JICA's major assistance in the six provinces in the last ten years were the eight agricultural projects, the four forestry sector projects, the one health sector project, and the eight loan projects covering Rehabilitation Loan I-II and Sector Project Loan I-VI. The assistance projects include the development studies (three in number) and project type technical assistance (10). The Northwest Region Rural Development Project is one of the project type technical assistance. The two Japan Overseas Cooperation Volunteer (JOCV) were dispatched for Tay Back University in Son La city and Son La Rehabilitation Hospital.

Other Donor's Assistance

In terms of number of projects which include some components in the target provinces, WB and ADB targeted six provinces almost equally, and implement total nine projects. The project contents include access improvement (road), water supply (urban and rural), irrigation, urban infrastructure, and capacity building. Korean International Cooperation Agency (KOICA) implements "LAO CAI Hanh Phuc (Happiness) Program with Sharing Development Experience of Saemaul Undong in Vietnam" in Lao Cai Province. The program period is from December 2014 to February 2018 with 14 million USD covering 1) regional social development which include village road (481 km), 2) capacity building on education, 3) capacity building on health, and 4) capacity building on local government.

I-6 Current Condition of Agriculture in the Six Target Provinces

Agriculture Land Use

Among the six provinces, the percentage of land use for agriculture (about 20%) is high in Son La, which has the largest total land, and Ha Giang. On the other hand, the percentage is relatively low in Lai Chau, about 10%. The provinces with higher percentage of land use for "others" than agriculture are: Son La and Lao Cai, each are beyond 30%. On the other hand, the percentage of that in Lai Chau and Ha Giang is only about 9%. It can be inferred that the expansion of urban areas and the attraction of factories are progressing in Son La and Lao Cai considered with their high GDP, compared to other provinces.

Agriculture Working Population

The province with the largest labour force is Son La with 730,290. On other hand the lowest was Lai Chau with less than 250,000. The percentage of the labours in relation to the province's population is between 55 and 57% in Dien Bien and Lai Chau, respectively. The other four provinces are between 62 and 68%. The percentage of rural labours in relation to the total Province's labour force is as high as 79 and 87%. The rural inhabitants' livelihoods rely on the agriculture. Local agricultural development is important in order to improve the living conditions of farmers.

Agriculture Production

General

In the six provinces, it can be inferred that annual crops are the dominant crops more than perennial crops, even though the six target provinces are in the mountainous areas. The perennial crops area in Yen Bai has the largest share to its agriculture production land (41%), meaning that crops are diversified.

In the six provinces there are many different kinds of main production crops such paddy, maize, soybeans and upland paddy, cassava, sugar cane, sweet potato, peanuts, vegetables, and industrial crops such tea, coffee, rubber. These different specific crops are cultivated in different areas with suitable natural environment and social condition. Across the six province, maize and total paddy are the two main crops in terms of cultivated areas overall.

Target three crops of the NORRD guideline

Yen Bai has the largest dry-season cropping area of paddy (19,036 ha). On the other hand, Ha Giang has the largest area for rainy-season paddy cropping (27,163ha). The paddy yield for dry season in Dien Bien and Son La is 6.0t/ha, which is slightly lower than the national average. In the other Provinces, it's about 5.5t/ha.

Son La occupies 48% (162,510 ha) of the total maize area of the six provinces. Son La produces 56% of maize by forming a large production area. The maize yield is 4.06 t/ha, and it's close to the national average (4.4t/ha). In the other provinces, the area of maize cultivated are only between 15% and 33% of the area in Son La, and also have a low yield (2.5~3.3 t/ha). Recently, maize cultivation area in Son La has slightly reduced by 5% but production has increased at 22% compared with its production five years ago due to the provincial strategy of forest protection. In the other provinces cultivation area and production have been increased.

The largest cultivation area for soybeans is in Ha Giang, which is 23,758 ha. The other provinces have just 20% of Ha Giang's area. Ha Giang occupies 61% of the total soybean area of the six provinces and also occupies 62% of the soybean production in all the six. Soybean yield in the six provinces is between 1.09 to 1.30t/ha and this is below the national average (1.4t/ha). Recently, for soybean cultivation area, there has been an increase 14% in Ha Giang compared with 2010. In other provinces, there was either no change or a large decrease.

Cultivation technique

There is not much difference among the six provinces in the yield (5.3~6.0 t/ha) of paddy cultivation for dry season, and the yield is lower than the national average with 6.7 t/ha. Generally direct sowing is popular in Dien Bien, whereas transplanting method is widely spread in 95% of paddy area in the other five provinces. In Dien Bien F1 hybrid seeds are not so much used by farmers, but in the five provinces F1 hybrid seeds spread more than Dien Bien. And F1 hybrid seeds are produced at Seed Centers (especially Seed Center in Lao Cai. Yen Bai Seed Center also does seed multiplication). Ratio of proxy irrigated area to paddy area in dry seasons is the highest in Yen Bai with 87%, followed by Son La with 63%, assuming dry season paddy needs irrigation facilities. In these two provinces, paddy cultivation is generally practiced twice a year in the irrigated field. Furthermore, three cropping system per year with two-time paddy and one maize cultivation has been gradually introduced to the farmers in these two provinces.

The cultivation area and yield of the maize is the largest in Son La (162,500 ha and 4.06 t/ha) among the six provinces and its yield is almost similar to the national average with 4.4 t/ha. On the other hand, yield of the other five provinces is 2.8~3.2 t/ha, and lower than the national average. F1 hybrids are used in all provinces, but cultivation trial of GMO seeds with high yield has started at the pilot farms in Son La. In terms of new techniques, seed treatment has started in Son La and Lai Chau to make germination faster, and young plant-cut cultivation for animal feed and the soil erosion protection method in the slope area have spread in Son La. And use of raising seedlings in pots for winter cropping has gradually spread in Yen Bai and Ha Giang, which is considered advanced.

Soybean cultivation area has gradually reduced in most of the provinces. Only in Ha Giang the soybean cultivation area has expanded and taken an overwhelming proportion of cultivation area and production. Yield is 1.0~1.3 t/ha and less than national average (1.4 t/ha). Some of reasons for low yield and low quality are rainy damage and self-produced seeds (not certified, qualified seeds).

Vegetable cultivation area has gradually increased and new techniques such developed seedlings raising (partially), mulching, tunnel cover, greenhouse, etc. have been disseminated in Son La, Lao Cai, Yen Bai. High profitable vegetable cultivation will be expanded to farmers in the provinces near to Hanoi.

Overall, it can be concluded that the level of cultivation techniques has not yet reached to the national average level. Among the six provinces, Son La, Lao Cai, Ha Giang, Yen Bai are thought to be rather higher than Dien Bien and Lai Chau. For the improvement of crop production and yield, it is necessary to disseminate suitable varieties for local areas, to improve irrigation facilities, to improve conventional techniques, to introduce useful new techniques, to use agricultural machines, etc. And also it is important to train the extension staffs for their capacity building.

Agriculture Marketing

Based on the estimation, no provinces have surplus production to meet demand of rice. Total deficit of rice is estimated 305,564 ton in 2014 of which Son La has the largest deficit 134 thousand ton because of its large population and relatively not much paddy production. Most of the rice produced in the six provinces is distributed within the provinces. The brand rice of Dien Bien and Lao Cai are distributed in Hanoi at a high price. Large amount of maize is imported from abroad primarily for livestock feed in Vietnam. Son La has a large-scale area and production of maize; however, it's mostly for domestic usage than export. Most of the maize products are shipped to major feed manufacturing companies. On the other hand, maize exports for China is carried out in Lao Cai and Yen Bai. Soybeans are also imported in large quantities in Vietnam. While Ha Giang is the largest producer of soybeans among the six provinces, it's not for exports, but for other provinces as the domestic consumption.

Export and Import

The six provinces are bordering China and Laos, and particularly trade with China is taking place. In the year 2014, the provinces with high export value were Lao Cai (USD 295,778,000) and Son La. For agricultural products exports, Lao Cai (USD 33,835,000) and Yen Bai are the largest. Export value of agricultural products of Son La and Lai Chau is about USD 100,000 each in 2014, which occupies less than 2.0% of the total export value. Main agricultural export products are tea, coffee, cassava, vegetables, maize, rice, rubber and timber. Imports related to agriculture were wheat, fertilizer, timber, rubber plants, cattle feeds, and chemicals.

Farm household income

In the year of 2014, the average monthly rural income per rural household in the six provinces was high in Yen Bai (VND 6,022,600) and Lao Cai, and it was low in Dien Bien (VND 4,057,600) and Lai Chau. Of the rural income, agricultural income was VND 2,000,000 in the five provinces, except Dien Bien (VND 1,741,300).

Based on the sampling survey made by JICA survey team, there are differences in agricultural income in the districts within the same province. The reason why the Tuan Giao District has the lower agricultural income than Dien Bien is due to the low income in crop cultivation. This is most likely attributed to low yield and the low sales revenue. The low yield is due to the low amount of fertilizer

and inappropriate cultivation management. The low sales income can also be due to the low prices caused by the low quality in the harvest.

Crop Profitability

To understand profitability of the target crops, crop budgets in Dien Bien and Yen Bai provinces were assessed. In Yen Bai, net incomes for all three crops are similar, but in Dien Bien, net income from paddy is higher than the others. The income from paddy shows the same trends in both provinces. On the other hand, net income from maize and soybeans is different between the two (high in Yen Bai). Farmers in Yen Bai Province ship their products to the market with high prices and are able to spend more on agricultural inputs such as seeds, fertilizer, and pesticide to achieve improvement of yield and quality. The agricultural materials investment as well as cultivation technique, as well as good markets are important in order to obtain more net income from crop cultivation. With regards to market price, for Tuan Giao District in Dien Bien Province, maize was VND 5,000/kg and soybean was VND 10,000/kg. In contrast, for Luc Yen District in Yen Bai Province, the price was high. Maize was VND 7,000/kg and soybeans were VND 19,000/kg. The factor for the difference in the price between the two locations is thought to be the difference in products quality and traffic accessibilities.

Farmer's Credit

As observed in most of the rural areas in the world, there are two loan sources in the Northern Mountainous areas, formal and informal sectors. The major banks in the formal sector are Vietnam Bank for Social Policy (VBSP), Vietnam bank for Agriculture and Rural Development (VBARD) and People's Credit Funds (PCFs). The informal sector includes shops (especially agriculture inputs shop), money lenders, friends, and relatives. VBARD is the biggest state owned commercial bank, which provides credit for agricultural and rural areas with more than 50% of its total outstanding loan. VBSP provides the extension preferential loans to low-income agricultural households as a major form of government intervention. According to the sample survey implemented in Dien Bien Province, 50% of the farmers in three districts in Dien Bien Province had loans. The lenders were Vietnam Bank and Agribank. The debt amount was between VND 26,800,000 and 33,500,000. The interest rate is as low as 6.5%. The large sum is needed for building and renovating new houses, purchasing motorbike, and others reasons.

Agriculture Machinery

Generally, agricultural machinery in the six provinces is not commonly used. Agricultural machinery used by the paddy farmers in the six provinces are small tractor, diesel engine, insecticide sprayer, rice mowing machine with engine, etc, though not common. High number of agricultural machinery used is observed in Son La and Ha Giang. Introduction of agriculture machinery is topographically not easy and low cost-effectiveness except in some of the flat land. Moreover, purchase cost of even a simple small tractor is high for many farmers. Due to these, number of agriculture machinery used in the six provinces is far below the national average.

I-7 Government Organizations of the Six Target Provinces

Central level related organization

Ministry of Agriculture and Rural Development (MARD) is a governmental agency performing state level management functions in the fields of agriculture, forestry, salt production, fishery, irrigation/water services and rural development, including delivery of public services in accordance with legal documents. Under MARD, there are 20 state management units and several non-productive units including APMB and "National Centre for Agriculture and Fisheries Extension" which support state management functions. They have officers of 1,943 for state management units and of 566 for non-productive units excluding the extension centre and three management boards. APMB is assigned by the Minister to govern ODA programs/projects (development investment, technical assistance, etc.) in the fields of agriculture, fisheries and rural development. APMB has four divisions of i) personnel and administration, ii) planning and techniques, iii) finance and accounting, and iv) consulting management and program/project development. Under APMB, a Project Management Unit is

established to perform assigned tasks and responsibilities for an ODA program/project. Eight PMUs are currently under APMB.

Provincial level organization

Administrative structures at local level are regulated in the Constitution and Law on the Organization of People's Council and People's Committee dated 26 November 2003. Vietnamese four-tier administrative structures. Districts/Cities/Towns (Thi xa) are set under Province, and Towns (Thi tran)/Communes/Wards are set under Districts/Cities/Towns (Thi xa). PPC (Provincial People's Committee) is established at provincial level as the executive agency of Provincial People's Council and the State administrative agency at local level. Members of PPC are selected by Provincial People's Council. Duties and responsibilities of PPC are regulated in the above Law on the Organization of People's Council and People's Committee. PPC is composed of nine to eleven members including one Chairperson and three - four Vice Chairpersons. Actual administrative operations are done by specialized departments or units with receiving guidance and supervisions from PPC and related State Ministries. PPC also have powers and authorities to direct lower level of administrative units such as Districts/Cities/Towns.

DARD is the specialized authority under the guidelines and management of organization, personnel and duty of PPC; at the same time is under the guidelines, checking and major instructions of MARD. DARD helps PPC to implement the local State management functions on: i) agriculture; ii) forestry; iii) salt; iv) aquaculture; v) irrigation; vi) rural development; vii) flood and typhoon prevention; viii) safe agricultural, forest, aquatic and salt products during the production process to the market; ix) public services of agriculture and rural development sector. In order to undertake these functions, there are several divisions (e.g. finance & planning, planting, inspection, etc.), sub-departments (e.g. irrigation, forestry, rural development, plant protection, veterinary, etc.), centers (e.g. extension, design & planning, plant seed, etc.), PMUs and other units under DARD.

DOT is a provincial agency under PPC's direction and Ministry of Transport's direction and supervision. DOT performs functions of advising and supporting PPC in implementing State management of roads, railways, inland waterways, and traffic safety throughout provincial area. Regarding transport infrastructure development, DOT shall submit PPC of drafts of decisions, directives, strategies, long-term/5-year/annual plans, and investment projects on transport, as well as execute powers and duties of those who decide investment and project owners.

DOC is a professional unit under PPC and under directions and control of Ministry of Construction (MOC). DOC assists PPC in implementing State administration in the fields of construction; architecture and construction planning; urban infrastructure, industrial areas, export processing areas, economic zones, hi-tech areas; urban development; houses and offices; real estate trading; building materials; public services relating to DOC's State administration; and implementing other duties and rights as allocated and/or authorized by PPC and the law.

Department of Finance (DOF) is the specialized authority under PPC and under the guidelines, checking and major instructions of Ministry of Finance (MOF). DOF helps PPC to implement the local State management functions on: finance; State budget; State properties; national financial funds; financial investment; enterprise finance; accounting; independent audit; tariff and financial service activities at the local pursuant to Law.

Department of Planning and Investment (DPI) is an agency under the administration of PPC on organization, personnel and activities; at the same time, under the administration, guidance, inspection and examination of Ministry of Planning and Investment (MPI). DPI functions state management of all activities related to planning and investment.

I-8. Government System to Allocate Local Development Budget

The State Budget of Vietnam comprises the central budget and local budgets which are composed of budgets of the local administrations at various levels (e.g. province, district, city, commune, town, etc.). The State Budget Law which was revised in December 2002 and effectuated in 2004 stipulates drafting, implementing, checking, inspecting, auditing and preparing final accounts of the State

Budgets as well as powers and duties of state agencies of various levels with respect to the State Budget. The Law also covers functions of decentralized budgets.

The revenues available for local budgets include those from taxes. Following three types of taxes are collected at local level. Revenues from local taxes and shared revenues from national taxes are retained at local budgets and usage of these revenues is not conditioned by the Central Government. There are two types of transfers from the central budget to local budgets, namely, balancing transfers and target transfers. Balancing transfers are general and unconditional. The provinces receiving balancing transfers as well as the annual transferred amount to each province is basically fixed for the stability period of three-to-five years. During the period of 2011-2015, 50 provinces out of all 63 provinces receive the balancing transfers. Transferred amounts are decided based on norms for allocation of the state budget for recurrent expenditures and development investment expenditures which consider such factors as population, geographic location, poverty levels, number of administrative units, specific circumstances and funding needs of respective provinces. The local governments could use the balancing transfers for any purposes assigned to them. Unlike balancing transfers, the recipient provinces have to use the funds of target transfers for specific purposes such as supporting new policies, implementing national programs/projects in the local areas, implementing significant socio-economic programs/projects, and dealing with emergency difficulties.

The amount of target transfers is subject to the capacity of the central budget. If there are revenue excesses at the central budget, additional target transfers could be realized in the course of the fiscal year after MOF and MPI would discuss, MPI would propose programs/projects and the Standing Committee would approve them. Thus, the executed target transfers are usually much higher than approved estimate budgets at the beginning of the year.

Local budget expenditures are prepared based on State Budget Law 2002, detailing and guiding the implementation of the State Budget Law (Decree No. 60/2003), Circular No. 3/2005 (Circular guideline of the regulation on financial publicity applicable to state budgets of all levels and the regime of reporting on financial publicity). Local budgets are executed also based on the above-mentioned State Budget Law 2002, Decree and Circular.

Revenues from local taxes (revenue with 100% entitlement) and shared revenues in percentage from national taxes are retained at local budgets as the decentralized revenues. Since there is possibility to increase these decentralized revenues by policies and efforts of Provinces and purposes of use of these revenues are decided by Provinces, share of these decentralized revenues against total revenue could be regarded as indicators on financial capacity of Provinces. According to these indicators, Son La is ranked first, then Lao Cai and Yen Bai are followed. Those shares of Dien Bien, Lai Chau and Ha Giang are relatively low.

Since Dien Bien, Lao Cai, and Ha Giang include "expenditure for target programs" in "expenditure on development investment", the Team cannot compare the six target provinces on these two expenditures separately. Thus, figures related to "aggregate actual expenditure for development investment" combined with these two expenditures, namely, the aggregate expenditures per person and their shares to total actual local expenditures are calculated for understanding priority and capacity of Provinces for development activities. Lai Chau is ranked first, then Lao Cai and Ha Giang are followed for the former (per person) while Lai Chau is also ranked first, then Lao Cai and Yen Bai are followed for the latter (shares). It seems that Lai Chau and Lao Cai have relatively higher priority and capacity for implementing development activities.

In descending order of local expenditures on recurrent per person, Dien Bien is ranked first, and Lai Chau, Ha Giang, Lao Cai, Son La, Yen Bai are followed. Since large parts of recurrent expenditures are spent for salaries of officers, their amounts could be criteria for judging whether necessary personnel are ensured or not. However, whether ensured personnel efficiently undertake local administrative services should be evaluated together with outputs and outcomes of these administrative services.

If budgets for certain expenditure items such as those for development investment, target programs, recurrent, etc. have been allocated but not yet spent by the end of the fiscal year, unspent amounts for

those expenditure items could be accounted as brought forward revenues in the following year's budget. Current State Budget Law (2002) does not stipulate ceilings of those brought forward expenditures/revenues.

Both actual local revenues and expenditures are exceeded over plan ones by around from 60% to 170% for the data in 2012, which was able to be collected for comparison in a uniformed way during the given Survey period. In addition, actual local revenues exceed actual local expenditure in all the six provinces, which proves that they at least secure revenues which could be used for necessary expenditures. Since actual decentralized revenues are exceed over plans ones by only from 0% to 30%, large gap between total actual local revenues and its plan ones is mainly caused by target transfers which are very much increased from plan ones.

Regarding execution rates (actual/plan) of local expenditures, those for development investment (from 170% to 250%) are much higher than those for recurrent (from 117% to 130%). Although expenditures for general investment and those for target programs are not divided in the final statement in some target provinces, it could be thought that increased actual total local expenditures are mainly caused by increased actual expenditures for target programs.

I-9 Government Institution of Extension Activities

Central level

The Vietnam Extension System was established in 1993. After merging the Ministry of Fishery with MARD in 2008, National Agriculture Extension Center (NAEC) was established. NAEC is an agency for providing non-profit service under Ministry of Agriculture and Rural Development (MARD). NAEC has its functions to implement extension activities on agriculture, forestry, salt production, irrigation, fishery, rural industries and other rural agricultural services throughout the country. In the Decree 02/2010ND-CP of the Government, Provincial-level People's Committees shall perform the state management of agricultural extension activities in their respective localities

NAEC has 80 employees. All 63 Provinces/cities have their own Agriculture Extension Center (AEC) with a total of 2,750 staff (15% of total), with an average 44 persons per Center. At the District level, they have Agriculture Extension Station (AES) which are directly under the control of the Provincial AEC or the District People's Committee. Total Number of extension workers at District accounts for 4,600 persons (26% of total), the average is 8 persons per station. At Commune level, there are 10,540 extension workers (59% of total), or one people per Commune.

In order to tackle agricultural challenges and improve agriculture in Vietnam, NAEC implements related agricultural projects in provinces all around the country. NAEC receives proposals from each District and decisions are made by all Divisions. Extension efforts are done in paddy, fruits, forestry, beekeeping, and many other areas. Until a few years ago, the budget was increasing 10 to 12%, but the budget has leveled off in the recent years. The annual budget is VND 240 billion (USD 10 million), which is VND 25,200 (USD 1)/agricultural household. Until four years ago, the budget was equally divided among Provinces. Now, the budget is allocated differently from province to province depending on the area of focus. Of the six provinces where NAEC's extension activities budget was allocated, Son La and Lao Cai received the most (VND 4.07 billion and VND 3.24 billion accordingly), and Lai Chau received the least (VND 0.31 billion). The allocated budget size differed from province to province.

Provincial level

Each Agriculture Extension Center (AEC) in the six provinces has 18 to 32 staff, which is fewer than the average number of AEC staffs each province across the country. The District Agriculture Extension Station (AES) has 5 to 10 staffs, which is somewhat less than the average size of AES staffs around the country. There are about 1 to 2 extension workers per commune as the same. The number of farm household each commune extension workers is largest in Yen Bai and Lao Cai. On the other hand, the number is lowest in Dien Bien and Ha Giang, half of the Yen Bai and Lao Cai. The agriculture land area per extension worker is largest in Lai Chau and Son La, and small is in Lao Cai and Ha Giang.

Son La and Lao Cai's AEC controls all of the extension budgets of the province including district activities. Therefore, the budget is large, and the AEC has much authority compared to other provinces. On the other hand, the other four provinces do not have large budgets, but each district also has an extension budget. Son La and Ha Giang have the large amount of the estimated activity expenditure, almost double of that of Lao Cai. On the other hand, the biggest expenditure per all staff related to extension works is observed in Lau Chau, followed by Dien Bien, and the expenditure per farmer is highest in Dien Bien, followed by Lai Chau. Son La, where cultivation techniques are considered higher, has the smaller budget per extension staff as well as farmers, indicating cost effectiveness of agriculture policy seems higher.

The AEC in Son La and in Lao Cai have strong authority to decide on the plans and budgets of extension programs. These provinces proactively lead extension activities such as pilot farm implementation, farmer trainings, planning of extension workers training, etc. The District Agriculture Extension Stations (AES) follow the plans of AEC. In the other four provinces, the AESs also have extension budget and implement both AEC activities and AES activities. While overall extension budget is declining, Yen Bai's AEC receive support from private as well as NGO support for the pilot farms. Commune extension workers monitor Hamlet farms and report on their activities every month at the district meetings. Extension workers receive support from AES for issues they cannot handle by themselves. Commune extension activities take place according to the district or province plans. Commune extension staff does not have individual budgets so it is difficult to implement extension activities by their own initiative.

In Son La and Lao Cai, employment of extension workers is decided by the provinces. Extension workers are employed permanently with social insurance. On the other hand, extension workers are employed by districts in the other four provinces. In Dien Bien, contracts are for one year with no social insurance. Lai Chau, Ha Giang, and Yen Bai staff is employed permanently with social insurance. In Dien Bien, extension workers' salaries range from VND 1,800,000 to VND 2,690,000/month, depending on the level of education received. This salary is somewhat lower than that of the other five provinces.

I-10 Government Budget and Expenditure System of Infrastructure Development

Shares of expenditures for all these four sectors against total development investment expenditure are around from 30% to 75%. It is found that road & bridge sector accounts for largest portion and irrigation sector follows although there is an exceptional case of Son La in 2011. Development expenditures for sectors of water supply and electricity distribution are relatively small. Based on the preliminary data from the respective DPIs, achievement of infrastructure development projects for irrigation, road, water supply and electricity planned in Social Economic Development Strategies in 2011-2020 was assessed. Lai Chau and Son La achieved 76% and 63% of the respective projects by using 51% and 61% of the respective construction fund planned. Achievement of Yen Bai, Ha Giang and Dien Bien are limited at 35%, 43% and 44% of the respective projects by using 32%, 39% and 42%.

For O&M of the road, "Provincial O&M fund" was created according to the Decree No.18/2012/ND-CP of the VN Government, dated 13/3/2012. O&M activities shall be implemented according to the Decision No.2196/QD/BGTVT of MOT, dated 29/7/2013. At the provincial level, the responsible organizations are Department of Transport (DOT) for provincial roads and DPCs for district roads. The communal roads shall be basically maintained by CPCs with the assistance of the respective DPCs. In case of irrigation, O&M budget at the provinces are sourcing from irrigation subsidy based on Decree 67/2012/ND-CP of the VN Government. The urban water supply systems are managed by the provincial water companies or DPC and the rural water supply systems are managed by CPCs in general. The O&M fund source is basically water fee collecting from users. Some districts allocate their own budget for assisting and supplementing O&M cost. The O&M of electricity system is made by the Electricity of Vietnam (EVN).

Based on the data collected from DOTs, the road O&M cost are estimated at VND 25 million/km/year for national roads and VND 40 to 53 million/km/year for provincial roads and frequency is monthly.

The O&M cost for district roads is limited at VND 4 to 6 million/km/year by 2 to 3 times annually. With comparison of minimum requirement of BPM pavement applied for the most of district road at VND 15–20 million/year, the present O&M expenditure at around VND 5 million/km/year is limited at less than 30% of the requirement.

The annual O&M cost for provincial irrigation systems varies by provinces, i.e. VND 32 million/system in Yen Bai to VND 495 million/system in Dien Bien. The annual rehabilitation expenditure of the provincial system ranges from VND 12 million to VND 228 million. The total of O&M and rehabilitation cost per hectare ranges from VND 1.3 to 4.9 million VND. The annual O&M cost for district and communal irrigation systems and below varies from VND 8 million/system in Yen Bai to VND 36 million/system in Lao Cai. The annual rehabilitation expenditure of district and communal systems is from none in Dien Bien to VND 28 million/system in Lao Cai. The total of O&M and rehabilitation cost per hectare ranges from VND 1.6 to VND 3.4 million.

The rural water supply systems are maintained by the commune or district by the limited maintenance staff (one or two persons/system) and the minimum O&M cost. The 593 urban water supply systems with necessary treatment functions in the six provinces are maintained by provincial water supply companies, water supply center under DARD or the O&M organizations under DPCs. The most of the urban systems generate net income from the water fee collected that are utilized for rehabilitation expenditure and extension of distribution lines.

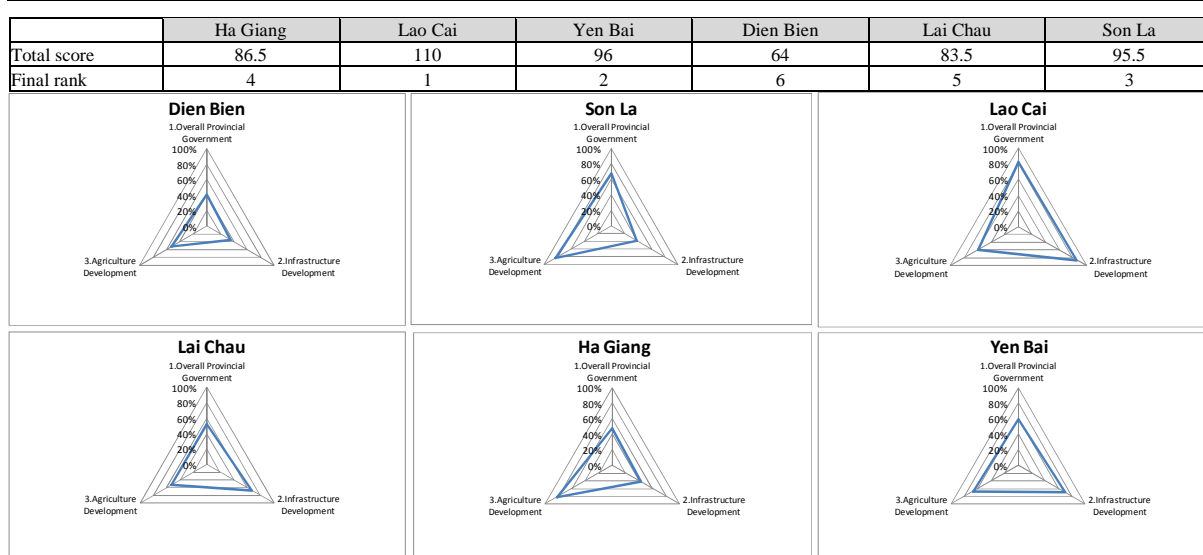
I-11. Evaluation of Governmental Capacity of the Target Provinces

In the new project, it is assumed that local development is realized through establishment of a new model to improve budget preparation execution by government administrations, infrastructure development, and extension of agriculture technology. It is necessary to assess government capacity of target provinces to see whether the provinces have enough capability to implement the project or not.

The approaches taken are as follows:

- In evaluating provincial government administrative capacity, achievements as of now by each province were considered, not potential capacity of provinces;
- To assess absolute capacities on whether provinces can really implement the project or not is difficult, capacities were relatively evaluated among provinces; and
- Referring to the several examples of measurement and evaluation of government capacity, the indicator were set considered with finance (actual expenditure, not budget), human resources (number and technical level), and performance (implementation of public policy, outcome, and performance of similar past projects), and public opinions.

Three large categories and nine small categories were set with 18 indicators. Each indicator has 6 score points. Scores of some indicators were weighted. All the score points were added by province; and provinces were ranked by total scores. Based on the evaluation result, the highest evaluated province is Lao Cai, followed by Yen Bai, Son La, Ha Giang, Lai Chau, and Dien Bien. As seen, differences are observed among six provinces. In terms of the overall provincial government, Lao Cai and Son La are highly evaluated mainly due high their own revenue sources and good performance of outcome. For the infrastructure development, Lao Cai and Yen Bai are highly evaluated. Son La and Ha Giang show good performance in the agriculture development category.



Remarks: % in the radar charts shows the share of the subtotal score for each large category to full score point of particular large category. Source: JICA Survey Team

Figure I-1 Results of the Evaluation of Governmental Capacity

I-12. Study on Extension Possibility of the NORRD Guideline/Manual

Background

JICA's "Northwest Region Rural Development Project in Vietnam" (NORRD) was implemented in Dien Bien Province for five years, from August 2010 to July 2015. Three districts namely Dien Bien, Muong Cha, Tuan Giao were selected as pilot districts. The project purpose of the NORRD Project is "The rural development in the pilot districts is promoted through strengthening the system, as district government being the core thrust force, to improve the production, post harvesting and marketing of market-oriented agricultural products". As a result of the NORRD Project activities, the guideline/manual were prepared incorporating improved cultivation techniques of paddy, maize, and soybean; and measures of improved water resource distribution and irrigation facility management referring to the concept of PIM. The guideline/manual was officially approved by Dien Bien PPC as a provincial official technical guideline/manual to be used for further application..

Survey results in Dien Bien Province

The Survey team conducted sample interview survey of local farmers and agricultural extension workers in six communes where pilots were implemented as well as six non pilot communes in the pilot district, and three communes in non-pilot District (Muong Luang, Muong Nhe, Muong Bang) where pilots were not implemented.

Agriculture Extension

The guideline was formulated in cooperation of NORRD and Dien Bien DARD, the pilot districts, and the pilot communes. The guideline consists of the outputs obtained through the activities of verification farms and trainings on the issues such as yield increase, optimization of fertilization, pest control, and production cost reduction of target crops namely paddy, maize and soybeans. The guideline contains explanations and many charts on cultivation and extension techniques. It is expected to be widely utilized by those who work in the agricultural field to contribute to better agricultural extension. All pilot hamlet farmers positively evaluated NORRD's recommended techniques as "very helpful" or "helpful," and most of the farmers stated that they would continue to implement the techniques taught. It is revealed that yield increased through acceleration of understanding on basic farming practices. The recommended techniques that the farmers adopted include field preparation, seed treatment, direct stripe seeding, fertilization, and pest control. These techniques have led to the reduction of production costs, reduction of agricultural labour, improvement of crop quality and increase of yield and production.

Pilot hamlet farmers were involved in the NORRD extension activities. 69~100% of farmers visited pilot farm. However, in Ma Thi Ho only 36% of farmers visited pilot farm due to only one paddy cropping yearly in this area, and different characteristics of ethnic group of Mong (they have own language and culture, and prefer upland crops). Participating in training was increased from 0~1 to 3.8~4.8 times. Farmers commented that it was difficult to understand the training contents first, but they could understand it gradually. Generally speaking, the NORRD Project is successful to change the target farmers' farming level and attitude for extension. It is noted that all non-pilot farmers didn't recognize NORRD Project. However, farmers are interested in the recommended techniques of NORRD Project when the team explained, and they are expecting the extension activities.

Extension workers at commune level, and staff of AES at district level were also interviewed. Commune level extension worker in the pilot communes in general think that the project is sustainable; and farmers adopting the recommended techniques will continue to use them because the recommended techniques are basic, easy and low cost. At commune level, in fact there is generally no extension budget. Therefore, district-level, and provincial-level budget preparation is important for continuation of dissemination activities. Other concerns are access and coverage, consideration to ethnic groups and poor farmers. Extension workers of non pilot communes in the pilot districts didn't directly attended any programs of the NORRD Project, but know the project. AESs' staff in the all non pilot districts knows the project.

AEC staffs of Dien Bien Province are 21, total staffs of AESs of 10 Districts are 87 and total no. of extension workers are 229 for 130 communes. Amount of AES extension budget is different among the districts. The extension budget of Tuan Giao, Dien Bien Don, Tua Chua was generally decreased as same as other districts. Amount of extension activities expenditure of all AESs and AEC in the province is estimated as 6,508 million VND per year (2014). Extension possibility of NORRD both pilot and non-pilot districts in Dien Bien is high. The extension of the guideline is possible in Dien Bien Province with the budget support and the extension worker's improved capacity.

Water Management

The NORRD Project had supported establishment of Water Users' Group (WUG) in the six pilot sites, i.e. Thanh Hung, Noong Het, Ma Thi Ho, Muong Tuong, Quai Cang and Muong Mun, since August 2012. The target WUGs conducted designing and construction of irrigation facilities jointly with JICA NORRD experts. The construction of irrigation facilities were implemented in 2013 and 2014. Based on the activities made, the manual on water management was prepared by the NORRD Project team. The DARD held the workshop to present the manual. The manual was distributed to all districts in Dien Bien province.

The JICA Survey Team conducted questionnaire survey in the pilot and non-pilot communes. The respondents covered representative of irrigation management staff, board members of WUGs and farmers. After the NORRD Project, irrigation facilities have been maintained well. The 86% of farmers feel that the irrigation facilities were improved and fairly maintained by WUGs. The water shortages in dry season were improved significantly. At least 90% of farmer followed the water distribution plan. That facilitates were improved and irrigation scheduling and distribution became more effectively. The majority of farmers practice and repair according to the maintenance plan. Before the NORRD Project, commune/hamlets collected water fee for O&M depending on the administrative staff. However, after the WUGs established, water fee was fixed and the collection rate reached 100%. The collect of water fee is made by the WUGs after harvest. The meeting of WUGs, was continued regularly, usually one time in two months except one time before wet and dry seasons. The rate of participation to the meeting became very high, ranging 75 to 100%. The WUGs' Board has a notebook to record discussion and decision made in the meeting. Regarding JICA's pilot activities on water management, all respondents felt the activities of irrigation management were useful.

JICA Survey Team conducted the questionnaire survey for nine non-pilot communes in the six districts in Dien Bien province. Irrigation Management in non-pilot communes are under developing. The existing WUGs at non-pilot communes have their hamlet rules including irrigation, not like the irrigation regulation set up by farmers in the NORRD Project. Of the nine WUGs in the non-pilot sites, three WUGs elect the board and management staff. The farming with irrigation water supply is

decided by the respective hamlet chief and operation and maintenance is made under instruction of hamlet (village) chief. There are no specific meeting on O&M of irrigation facilities due to a lot of subjects in the village meetings and no WUOs. Irrigation water fee in the systems organizing WUOs is decided on the basis of requirement for cost of manpower and repairing the facilities. In the non-pilot districts, WUOs' activities are limited and regular O&M works are not executed.

The most of WUOs at non-pilot sites at the provincial and district systems in Dien Bien requires improvement of their activities by applying PIM. Before initiation of investment works for irrigation systems, strengthening the existing WUOs including reorganization of WUOs will be indispensable to increase the sustainability of the facilities. In the non pilot communes interviewed, any water fee was not collected regularly. Even the minor repair of the facilities could not be made by own fund and the system function was decreased year by year. For the non-pilot systems, the irrigation division and the provincial agricultural extension centre under DARD will be a key player for PIM extension activities. The lesson-learned through NORRD activities are available in the staff involved in the NORRD Project in DARD, the pilot districts and communes. DARD shall prepare the activity plan and schedule with necessary budget for the PIM extension activities. Moreover, it is recommended that the identification of target small irrigation systems with WUOs in the non-pilot districts and arrangement of their rehabilitation investment plan be also prepared by DARD.

Social Consideration

JICA Survey Team interviewed as a variety of farmers as possible from ethnic and gender perspectives. Languages are different from area to area, from ethnic group to ethnic group. It is necessary for extension workers to study local dialects and ethnic languages. Agriculture extension workers are required to build the trusting relationship with the farmers in charge through placing themselves in their positions to understand what they need. In this regard, it is necessary for them to understand local languages and social customs varied according to area and ethnic group.

The survey revealed that, the vast majority of women were engaged in farming seasonally but, in addition to this economic activity, women were overloaded by house-keeping work every day in both pilot and non-pilot sites. Women worked for two to three hours per a day more than men irrespective of different ethnicities. NORRD had not seen any change in the share of workload itself between men and women according to all pilot farmers. However, about 42% of female farmers claimed that new skills and techniques (e.g., seeding in lane and proper timing of fertilizer) gained from the NORRD Project had helped them save time and money. These saved resources had then been redistributed to extra economic activities, typically undone household work. As a result, women had become more confident about what they did and been likely to have more voice in their family. Indeed, NORRD itself encouraged women to actively involve into the training. In the all pilot communes, women kept accounting for 50 to 70% of participants during the training. Key issues in gender are that men and women are equally benefitted in extension activities and water management in order to cover other areas in Dien Bien province. The extension of NORRD in Dien Bien Province can be made through its continuous efforts to get women actively involved in training. Women's representation should also be taken into account in water management.

Technical Applicability to Other Five Provinces

Agriculture Extension

The natural condition including climate and land use is more or less similar among six provinces including Dien Bien and may not influence cultivation of the three target crops significantly. With regards to cultivation technique, among the six provinces, Son La, Lao Cai, Ha Giang, Yen Bai are thought to be rather higher than Dien Bien and Lai Chau. Technical contents of NORRD manual, which are both extension techniques and cultivation techniques on paddy, maize and soybeans, are mostly mentioned in the manuals of the five provinces. About detail technical contents, some of them are not available in NORRD manual, but available in other provinces' manuals, and vice versa. The five provinces' manuals have been formulated in the different forms such books, leaflets, power point slides, documents, etc. according to crops and technical subjects. Common basic techniques of the NORRD manual, such as extension method, pest control, water management, post-harvest, etc., are

easily used for extension activities in the five provinces. The NORRD manual will be much effectively adopted to Lai Chau. And the NORRD manual is also useful for improvement of cultivation techniques and existent manuals in other provinces. There are some comments that the NORRD manual is described a lot of paddy cultivation but less soybeans, and is heavy for carrying.

AEC has 18 to 32 staffs whereas AES has five to ten staff. One extension worker is assigned in one Commune in Lao Cai, Lai Chau, Yen Bai. Other provinces have two extension workers per commune. In Ha Giang one of two extension workers is a temporary employee and one extension collaborator is assigned each hamlet. AEC of Son La and Lao Cai have a large amount of extension budget (VND 28,418 million, VND 27,893 million), because province extension budget includes the extension budget of all district AESs. On the other hand, province extension budget and district extension budget of other three provinces are independent individually.

The five provinces are located in mountainous area of the northern Vietnam, which is under appropriate climate condition, suitable for the cultivation of major crops such paddy, maize and soybeans. Natural environment conditions of the five provinces are similar to those of Dien Bien Province. The improvement of cultivation techniques and irrigation management, yield and production of maize and soybeans (even paddy) are possible to increase. Each province published technical manuals of extension and cultivation which have been already used in the extension activities. The NORRD guideline is possible to use as a supplement to their techniques and for improvement of the existent manuals. Overall, extension workers are much interested in the guideline. From the analysis of survey results, the extension of the guideline in the five provinces is large possibility.

Water Management

PIM extension in the other five provinces is also essential activities for sustainable irrigation development including investment and system management at present and in the future. The results of the survey show that most of the survey sites face a shortage of water in the dry season that might be worse due to irregular weather condition. Based on the survey results in the six provinces, the active WUOs are limited at 24% of the provincial systems and 18% of the district systems including Dien Bien. The majority of the existing WUOs in the six provinces are inactive. Considering the similar irrigation systems in the six provinces, technical applicability of the NORRD manual is also very high in the other five provinces as well. In order to promote sustainable irrigation management and increase efficiency of irrigation investment, promoting of PIM is highly demanded.

Extension possibility among the six target provinces

Agriculture Extension

The application of the guideline/manual is most likely necessary in Lai Chau, which does not have enough technical manuals yet, has natural condition similar to Dien Bien, and is suitable agricultural technical levels to apply NORRD one. On the other hand, the other provinces already have produced technical manuals specific to their local areas and use these manuals for extension. For such provinces, the guideline could be used to complement existing manuals and to improve existing techniques. The techniques in the guideline/manual that could be applied to any region are extension method, basic techniques of cultivation management, pest control, water management, etc.

Each province's technical manuals cover the extension techniques and cultivation techniques suitable for each region. In addition, the manuals need to look at the agricultural environment and technical issues that change every day. Issues that farmers commented on cultivation techniques are F1 hybrid variety, practical diagnosis and control of diseases and insects, water management at the water shortage, fertilization suitable for plant growth, prevention of maize and soybeans quality loss at the rainy time, etc. There is a demand for manuals that include not only general topics but also practical instructions appropriate for local farmer's fields. Manuals must be understood easily and be put into practice by extension workers and farmers.

Water Management

The capacity of PIM extension and the status of WUOs vary by the six provinces. The capacity development of DARD is indispensable especially in Ha Giang, Dien Bien, and Lau Chau. The

extension needs of PIM are high in the all provinces, but its necessity of the provinces at lower rate of active WUOs is higher. The overall extension potential of NORRD PIM is evaluated as big in the six provinces.

Social Consideration

Ethnic Board of each province claims that there are more than 10 ethnic races in each six target provinces. Moreover, the survey suggests that gender situations can be similar there. Given these conditions, the same lessons learnt from Dien Bien experience are applicable in extension activities to all six provinces. Especially, when the NORRD guideline/manual is merged to the current existing manuals in each province, all points proposed in consideration of ethnic groups and gender shall be incorporated.

I-13 Examination of Local Infrastructure Development Subprojects

Current Condition of Infrastructure in the Six Target Provinces

There are 921 roads registered with total length of around 15,100 km in the six provinces. The road density per 1,000 population and per economically used land (= used and forestry area) are 3.47 km/1,000 population, and 0.35 km/km² of economically used land that are higher than the national average of 2.07 km/ 1,000 population, and lower than the national average of 0.65 km/km² per economically used land. Considering the less population in the six provinces, the road density per population may be higher than the national average, but the road density per the economically used land in the six provinces is significantly lower than the national average. The traffic volume of the national and provincial roads is between 250 pcu/day and 4,283 pcu/day and between 110 pcu/day and 3,000 pcu/day, respectively. The traffic volume of district roads is from 10 pcu/day to 1,000 pcu/day. The traffic of some district roads is limited and less than 150 pcu/day. The 14% of the national roads, 19% of the provincial roads and 51% of the district roads in the six provinces are under bad condition that requires rehabilitation.

In the six provinces, 593 provincial irrigation systems with around 23,550 ha and 11,859 district managed systems with around 98,400 ha are existing. The average irrigation area is 40 ha in the provincial systems and eight (8) ha in the district systems. The provincial systems in Dien Bien are larger at 229 ha/system on average followed by Lai Chau with 92 ha/system and Son La with 61 ha/system. In Ha Giang and Lao Cai have no provincial systems and all systems are transferred under the district and commune administration.

The cropping intensity (cultivated area per irrigation service area per year) in the six provinces is 168% in the provincial systems and 140% in the district systems that are lower than the national average at 174% (= consolidated figures of both provincial and district systems). The irrigation development of the potential irrigable area in the six provinces is 62% ranging from 51% in Lai Chau to 73% in Lao Cai. Comparing with the whole nation at 69% development of the potential area, the irrigation development in the six provinces except Lao Cai is behind. In the dry season (winter-spring), the cropping intensity is limited at 75% in the provincial systems and 50% in the district systems in the six provinces.

The 93 urban and 5,419 rural water supply systems were established in the six provinces covering the population of around 881 thousand in the urban and around 2.0 million in the rural area in the six provinces. Their average design capacity is 2,664 m³/day/urban system and 56 m³/day/rural system. In the rural area, water supply systems sourcing water from springs, streams and wells. Some rural water supply systems are classified as sanitary water supply that requires boiling for drinking. The beneficiary population ratios are 95% in the urban area, which is the same as the national average, and 60% in the rural area, which is lower than the national average of 75%. The design capacity utilization of the urban water supply systems is around 72%. On the other hand, the utilization of rural water supply systems is limited at 59%. The design capacity of the system needs to be decided by the future and realistic demand of the target area.

The electrification rate in the six provinces is 84% ranging from 68% in Ha Giang to 98% in Yen Bai that is lower than the national average electrification rate of 98%. Mainly due to mountainous area and scattered population in the six provinces, the electrification development becomes slow in progress.

Examination of Selection Criteria

As seen, there are still needs to develop infrastructure in the target provinces. In the new project, it is anticipated that rural areas are to be developed through infrastructure improvement as well as raising agriculture productivity. To formulate the project, it was necessary to select subprojects to be implemented. Selection was supposed to be done by the provinces, and therefore it was necessary to examine selection criteria for the project.

Selection criteria of the target subprojects were assessed and decided on the basis of i) the applied criteria for JICA financed Sector Project Loan-VI (SPL-VI) and ii) implementation results of SPL-VI (2011 – 2015). The common condition for subprojects shall be i) Any subprojects classified as JICA Category A (the main condition is involuntary resettlement households more than 40) are not eligible. The number of households to be relocated under Category B (below 40 households' relocation) shall be minimum, less than 10 households, ii) the construction period of any subprojects shall be in two years under condition of three times' approval of subproject in six years period. and iii) subproject with excessive land acquisition cost will not be selected (land compensation cost is not exceed 20% of construction cost).

The six provinces submitted the 20 to 65 subprojects respectively with the total investment of VND 1.020 to 2,182 billion during the Phase 1 work. By sector, 31 road subprojects in the six provinces share VND 4,351 billion (46%) of the total construction cost, followed by 101 irrigation subprojects (VND 2,334 billion, 24%) and 44 urban water supply subprojects (VND 1,760 billion, 18%). Some of subprojects did not accord with the selection criteria for the respective sectors on the scale of facilities such as length of roads, capacity of the facility, total cost and unit costs. The some road subprojects with longer scope of length may not be completed in two years for their construction works. The unit construction costs of the priority subprojects varied. Considering their plans at the level of concept paper, the JICA Survey Team continued to investigate and assess the scope works of the priority subprojects during the Phase 2 work.

II: CONCLUSIONS

The development of the six target provinces located in the northern bordering areas has lagged behind the national average of Vietnam in terms of agriculture, infrastructure, and social aspects, although the six provinces, there are different characteristics among the six provinces.

The impacts of the NORRD Project in Dien Bien Province were surveyed, and yield and production, cultivation technique, and irrigation water management in the pilot sites are improved. Technical adaptability of the NORRD guideline/manual to the other five provinces was also studied, and it can be said that the guideline/manual is technically applicable, and needs to disseminate the guideline/manual are confirmed although there are some differences among the six provinces.

In addition, importance of creating awareness on safety agriculture product (e.g. with GAP) and improvement of the social condition (e.g. through maternal and child health, anti-trafficking in person (anti-TIP)) in the target provinces were also discussed and confirmed.

The new project intends to introduce the performance-based system which provides infrastructure finance to the provinces based on evaluation results of activities to be done by the provinces. The results of the Survey shown in this report are used to formulate the new project.

**DATA COLLECTION SURVEY
ON
THE NEEDS FOR AGRICULTURE PRODUCTIVITY
IMPROVEMENT IN NORTHERN SIX PROVINCES**

FINAL REPORT

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List of Abbreviation

ADB	:	Asian Development Bank
AEC	:	Agriculture Extension Center
AES	:	Agriculture Extension Station
AMC	:	Agriculture Management Cooperative
APMB	:	Agricultural Projects Management Board
ARDD	:	Agriculture and Rural Development Division
BWM	:	Board of Water Management
C/P	:	Counterpart
CEMA	:	Committee of Ethnic Minority Affairs
CPC	:	Commune People's Committee
CPMU	:	Central Project Management Unit
DARD	:	Department of Agriculture and Rural Development
DD	:	Detailed Design
DLI	:	Disbursed Linked Indicator
DOC	:	Department of Construction
DOET	:	Department of Education and Training
DOF	:	Department of Finance
DOH	:	Department of Health
DOIT	:	Department of Industry and Trade
DOLISA	:	Department of Labours, Invalids and Social Affairs
DONRE	:	Department of Natural Resources and Environment
DOT	:	Department of Transport
DPC	:	District People's Committee
DPI	:	Department of Planning and Investment
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
EPA	:	Environmental Protection Agency
EPP	:	Environmental Protection Plan
ESMS	:	Environmental and Social Management System
EVN	:	Electricity of Vietnam
F	:	Female
FS	:	Feasibility Study
GAP	:	Good Agriculture Practice
GDI	:	Gender Development Index
GDP	:	Gross Domestic Product
GII	:	Gender Inequality Index
GMO	:	Genetically Modified Organism
GOV	:	Government of Vietnam
GSO	:	General Statistical Office
HDI	:	Human Development Index
HH	:	Household
HQ	:	Headquarter
ICD	:	International Cooperation Department (MARD)
ID	:	Irrigation Division
IMC:	:	Irrigation Management Company
IMS	:	Irrigation Management Station
JICA	:	Japan International Cooperation Agency
JICA HQ	:	JICA Head Quarter
JOCV	:	Japan Overseas Cooperation Volunteer
JSIC	:	Joint-stock Irrigation Company
KOICA	:	Korean International Cooperation Agency
LARAP	:	Land Acquisition and Resettlement Action Plan
Lao PDR	:	Lao People's Democratic Republic
LEP	:	Law on Environmental Protection
M	:	Male
MARD	:	Ministry of Agriculture and Rural Development
MCHHB	:	Maternal and Child Health Handbook
MI	:	Monitoring Indicators
MIC	:	Ministry of Information and Communication

MOC	:	Ministry of Construction
MoCST	:	Ministry of Culture, Sports and Tourism
MoET	:	Ministry of Education and Training
MOF	:	Ministry of Finance
MoH	:	Ministry of Health
MOIT	:	Ministry of Industry and Trade
MoLISA	:	Ministry of Labours, Invalids and Social Affairs
MoNRE	:	Ministry of Natural Resources and Environment
MoSTE	:	Ministry of Science, Technology and Environment
MPI	:	Ministry of Planning and Investment
MPS	:	Ministry of Public Security
NAEC	:	National Agriculture Extension Center
NGO	:	Non-governmental Organization
NORRD	:	Northwest Region Rural Development Project in Vietnam
NR	:	National Road
NRD	:	New Rural Development
NTP	:	National Target Program
O & M	:	Operation and Maintenance
ODA	:	Official Development Assistance
OEI	:	Operation and Effect Indicators
O & E	:	Operation and Effect
PAPI	:	Public Administration Performance Index
PBF	:	Performance-based Financing
PCFs	:	People's Credit Funds
pcu	:	Passenger Car Unit
PIM	:	Participatory Irrigation Management
PM	:	Prime Minister
PMU	:	Project Management Unit
PO	:	Project Owner
PPC	:	Provincial People's Committee
PPMU	:	Provincial Project Management Unit
PST	:	Provincial State Treasury
RBF	:	Result Based Financing
SEA	:	Strategic Environmental Assessment
SEDP	:	Socio-economic Development Plan
SEDS	:	Socio-economic Development Strategy
SPL	:	Sector Project Loan
ST	:	State Treasury
TA	:	Technical Assistance
TBD	:	To be determined
Anti-TIP	:	Anti-Trafficking in Persons
TOR	:	Terms of Reference
TOT	:	Training of Trainer
UNDP	:	United Nations Development Programme
UNESCO	:	United Nation Educational Scientific and Cultural Organization
USD	:	United States Dollar
VAT	:	Value Added Tax
VBARD	:	Vietnam Bank for Agriculture and Rural Development
VBSP	:	Vietnam Bank for Social Policy
VEA	:	Vietnam Environmental Administration
VND	:	Vietnamese Dong
WS	:	Water Supply
WB	:	World Bank
WMB	:	Water Management Board
WUA	:	Water User Association
WUG	:	Water User Group
WUOs	:	Water User Organizations

Measurement Units

Length

mm = millimeter(s)
cm = centimeter(s) (cm = 10 mm)
m = meter(s) (m = 100 cm)
km = kilometer(s) (km = 1,000 m)

Extent

cm² = square centimeter(s) (1.0 cm × 1.0 cm)
m² = square meter(s) (1.0 m × 1.0 m)
km² = square-kilometer(s) (1.0 km × 1.0 km)
ha = hectare(s) (10,000 m²)
Acre = 0.4047 hectare(s) (4,047 m²)

Volume

cm³ = cubic centimeter(s)
(1.0 cm × 1.0 cm × 1.0 cm, or 1.0 ml)
m³ = cubic meter(s)
(1.0 m × 1.0 m × 1.0 m
or 1.0 kl)
L = liter (1,000 cm³)
MCM = million cubic meter(s)

Weight

g = gram(s)
kg = kilogram(s) (1,000 grams)
ton(s) = metric ton(s) (1,000 kg)

Time

sec = second(s)
min = minute(s)
hr = hour(s)

Others

ppm = parts per million
° = degree
°C = degrees Celsius
% = percent
mS = millisiemens

Currency

US\$ = United State dollar(s)
JPY = Japanese yen(s)
VND = Vietnamese Dong(s)

***I: GENERAL INFORMATION AND
NEEDS ASSESSMENT***

CHAPTER I-1 INTRODUCTION

I-1.1 General

This is the final report prepared by the JICA Survey Team in accordance with the contract for the “Data Collection Survey on the Needs for Agriculture Productivity Improvement in Northern Six Provinces”, defined as “the Survey”, agreed upon between the Japan International Cooperation Agency (JICA) and the joint venture of Nippon Koei Co., Ltd. and KRI International Corp. on 29 September 2015.

The JICA Survey Team commenced the work in September 2015 to undertake various activities for the Survey. The JICA Survey Team compiled all information collected and prepared the final report to present the results of the work.

I-1.2 Background

While the Socialist Republic of Vietnam has achieved a remarkable economic growth through the introduction of the market economy and development of the secondary and tertiary industries, it tends to expand the economic difference between urban and rural areas. Three-fourths of the population live in rural areas and most of them rely on unstable agricultural income. In the six provinces of Dien Bien, Lai Chau, Son La, Lao Cai, Yen Bai, and Ha Giang located in the northwestern and northeastern areas of Vietnam, ethnic minority groups occupy 80% of the people living there and the poverty rate of these provinces is high (25-47%). Therefore, these provinces are important as target areas for poverty reduction. To prevent social destabilization due to widening income disparity and to promote sustainable growth, the Government of Vietnam (GOV) regarded the agricultural development as an important policy in these areas. In this connection, JICA implemented “The Northwest Region Rural Development Project in Vietnam (for five years, from August 2010 to July 2015, hereinafter called the “NORRD Project”). It aims to achieve agricultural development in Dien Bien Province. The achievements of this project were compiled as the Agriculture Extension Guideline/Water Management Development Manual. The Dien Bien Province People's Committee approved them in July 2015 as the provincial official technical documents to be used for further application.

JICA implemented the Rural Infrastructure Development and Living Standard Improvement as a yen loan project and implemented the Small-Scale Pro Poor Infrastructure Development Project (SPL) from 1996 to March 2016. In SPL, infrastructure has been improved, including roads, water supply, irrigation facilities, and electricity distribution lines. In the six provinces, the social infrastructure is also being improved through SPL; however, further development is necessary for the development of regional economies.

Under these circumstances, a yen loan project for local infrastructure development along with dissemination of both the guideline/manual was requested by the Ministry of Agriculture and Rural Development (MARD) of GOV to JICA's Vietnam Office for the promotion of agriculture in the northern areas. As a response to this request, JICA decided to implement the Survey to collect basic information for promotion of agriculture in the six provinces.

I-1.3 Objectives and Scope

Objectives: The objectives are to collect comprehensive information concerning local/rural development, including natural environment, social and economic conditions, social infrastructure development, states of agriculture, and budgetary conditions of local governments and to study/examine the GOV's capacity and budget so as to disseminate the outputs of the Northwest Region Rural Development Project in Vietnam. Also, to introduce the performance-based budgeting and financing system that finances as per results.

Scope: The target organizations and provinces of the Survey are organizations related to MARD and the six provinces (Dien Bien, Lai Chau, Son La, Lao Cai, Yen Bai, and Ha Giang). The contract was extended in February 2016 up to the end of June 2016 due to the necessity to include further

examination of the provincial government capacity and project formulation works. The revised contents of the work are shown in Table I-1.3.1 below:

Table I-1.3.1 Contents of Work

Stage of Survey	Period of the Survey	Items of the Survey
1. Preparatory Work in Japan	Late September 2015	(1-1) Explanation and Discussion (JICA HQ) (1-2) Collection/Analysis of Existing Materials (1-3) Preparation of Inception Report (1-4) Preparation of Checklist on Asset Management and O&M
2. Work in Vietnam (Phase 1)	Early October 2015 up to the end of January 2016	(2-1) Explanation and Discussion on Inception Report (2-2) Collection of Existing Materials, Current Situation Survey, and their Analysis (2-3) Survey and Analysis on Dissemination Possibility of the Guideline/Manual in Dien Bien Province (2-4) Survey and Analysis on Local Infrastructure Projects which Contribute to Agricultural Development in Dien Bien Province (2-5) Collection of Information on Technical Applicability of the Guideline/Manual to Other Five Provinces (2-6) Survey and Analysis on Local Infrastructure Projects Contributing to Agriculture Development in the Other Five Provinces (2-7) Preparation of Progress Report and its Explanation to JICA
3. Work in Vietnam (Phase 2)	February 2016-May 2016	(3-1) Additional Survey on Dissemination of the Guideline/Manual (3-2) Additional Survey on Local Development and Infrastructure Projects and Implementing Organizations and Plans (3-3) Compilation of the Conditions for Launching ODA Loan Projects (3-4) Preparation of Draft Final Report and its Explanation to JICA and Vietnamese Government Organizations (3-5) Preparation of Final Report (draft) and Its Explanation to JICA
4. Final Work in Japan	June 2016	(4-1) Preparation of Final Report and Its Submission to JICA

Source : JICA Survey Team

I-1.4 Activities

The JICA Survey Team started the Phase 1 work from October 2015 in Vietnam and visited the provinces. The JICA Survey Team completed the site visits of all six provinces by the beginning of December and continued examination and analysis in December. On 12 January 2016, the results of the Phase 1 work were presented to MARD and the leaders of the six provinces and generally agreed among the participants. A progress report was prepared and submitted in the beginning of February 2016 where the Phase 1 work was completed.

The Phase 2 work was commenced right after the Tet holidays in February 2016 and site visits were conducted in the six provinces. In March, the visits were completed and examination and analysis were started and continued until the beginning of May. The JICA Survey Team visited all six provinces to explain the results of the Phase 2 work with MARD and JICA and the leaders of the provinces agreed in its contents. The final report has been prepared based on all the above survey works and comments from JICA.

CHAPTER I-2 GENERAL INFORMATION OF VIETNAM

I-2.1 Natural Condition

I-2.1.1 Area

Vietnam is located in the east edge of the Indochina Peninsula. It has a long land extended from north (23°23' north latitude) to south (8°27' north latitude) with a total area of 330,967 km². It is surrounded by the South China Sea in the east, China in the north, and Lao People's Democratic Republic (PDR) and Cambodia in the west. The six target provinces for the Survey are located in the north eastern and western area of Vietnam with an area of 53,990 km², and occupy 16% of the total area of Vietnam.

I-2.1.2 Climate

Vietnam has a tropical climate in general, although regional differences are observed due to its long land shape. The rainy seasons are normally from April/May to September/October generated by the tropical monsoons. In the central coastal areas, the rainy season start a bit late in around July and ends in December. The total annual rainfall varies from station to station and from year to year which can range from around 1,000 mm (Vung Tau) to more than 4,000 mm (Hue).

Average annual mean temperature is from around 18°C to 28°C. In the northern areas like Sa Pa in Lao Cai Province where altitude is high, the temperature in winter sometimes goes down to 0°C.

I-2.2 Socioeconomic Condition

I-2.2.1 Administration and Population

There are 63 provinces in the country with a population of 90,728,900 (2014). Total population in the six target provinces is 4,357,300 with only 5% share in the total population of Vietnam. The share of rural population at the national level in 2014 is 67%, lower than that of the six target provinces (83%).

The average population density is 274 people/km² for the whole country; on the other hand, one of the six target provinces is 80, which is much lower than the national average.

I-2.2.2 Economic Condition

Table I-2.2.1 shows the gross domestic product (GDP) in the past recent years.

Table I-2.2.1 GDP in the Past Recent Years

Item	2010	2011	2012	2013	2014 prel
GDP at current price (VND in billions)	2,157,828	2,779,880	3,245,419	3,584,262	3,937,856
GDP per capita (VND in thousands)	24,818	31,640	36,544	39,932	43,402
GDP per capita (USD)	1,273	1,517	1,748	1,907	2,052
Share (%) of GDP by sector	100	100	100	100	100
Agriculture, forestry and fishing	18.38	19.57	19.22	17.96	17.7
Industry and construction	32.13	32.24	33.56	33.19	33.21
Service	36.94	36.73	37.27	38.74	39.04
Products taxes subsidies on production	12.55	11.46	9.95	10.11	10.05
GDP at constant 2010 price (VND in billions)	2,157,828	2,292,483	2,412,778	2,543,596	2,695,796
Growth rate of GDP (% change compared to previous year)	6.42	6.24	5.25	5.42	5.98

Source: Statistical Year Book of Vietnam 2014

The current GDP was at VND 3,938 trillion, and GDP per capita was USD 2,052 in both 2014 preliminary figures. The share of agriculture, forestry, and fishing sector to the total GDP showed declined tendency and was at 17.7% in 2014. GDP (at constant price) growth had increased with 5-6% annual growth rate indicating that Vietnam's economy is steadily growing.

Total regional GDP for the six target provinces at current price was at VND 100,627 billion in 2014 with only 3% of the total GDP of the whole country.

I-2.2.3 Ethnic Groups

The Committee of Ethnic Minority Affairs (CEMA) defines an ethnic group having 1) self-identification; 2) language of their own; and 3) different culture from others such as social custom. Currently, 54 ethnic groups are officially identified in Vietnam. The majority, which is the Kinh Group, dominates having 87% of the whole population whereas the rest of the 53 minority groups make up 13% in 2014. Moreover, about 75% of 53 ethnic minority groups are concentrated in the Northern Mountains and the Central Highlands and mostly lived in rural areas. Table I-2.2.2 illustrates the ethnic groups as per each language categorization.

Table I-2.2.2 Ethnic Groups in Vietnam

Language Family	Language Group	Ethnic Group	Remark		
Sino-Tibetan	Tibeto-Burman	1 HaNhi, Akha	Many live in northwest (especially Muong Te District, Lai Chau Province) Population is smaller than that of Hmong and Dao Highland Swiddeners They also live in northern Myanmar, northern Thailand, northern Laos, and southern China		
		2 La Hu			
		3 Phu La			
		4 Lo Lo			
		5 Coong			
		6 Sila			
	Miao-Yao	7 Hmong, Meo	Migrated from southwest China within the last 300 years They also live in southern China, northern Myanmar, northern Thailand, and northern Laos Highland Swiddeners: Hmong have a strong clan-based society		
		8 Dao, Yao			
		9 Pathen			
	Tai/Thai	10 Tay, Tho	Lowland Wet Rice Cultivators Original inhabitants of Lai Chau, Dien Bien, and Son La They also live in Assam (India), southwestern China, northern Myanmar, northern Thailand, and northern Laos Some say Tai migration to Vietnam started in the days before Christ but generally believed as early as the tenth century.		
		11 Thai, Tai			
		12 Nung			
		13 San Chay			
		14 Giay, Nhang			
		15 Lao			
		16 Lu			
		17 Bo Y			
		Kadai		18 La Chi	Closest to the Tai/Thai group in terms of language
				19 La Ha	
	20 Co Lao				
	Chinese	21 Pu Peo	Related to Chinese It is said to have the lowest poverty rate among the 54 ethnic groups		
		22 Hoa			
		23 Ngai			
		24 San Ziu			
Austro-Asian	Annam-Muong	25 Kinh, Viet	The Muong are the closest to the Kinh and are original inhabitants of HoaBinh and Tan Hoa provinces		
		26 Muong			
		27 Tho			
		28 Chut			
	Mon-Khmer	29 Kho Mu	(Mon-Khmer language group: Widespread from Assam Region in India to Indochina Peninsula) In Vietnam, many are in the south and central highlands: Khamu, Xin Munh, Khang and Mang live in the mountainous area in the northwest Many live in mid-area between the highland and lowland in Laos, which may also apply to Vietnam.		
		30 Bahnar			
		31 Sedang			
		32 Kohor, Co Ho			
		33 Hre			
		34 Mnong			
		35 Stieng, Xtieng			
		36 Bru-Van Kieu			
		37 Co Tu			
		38 Gié-Trieng			
		39 Ma			
		40 Kho Mu			
		41 Chor			
		42 Ta Oi			
		43 Cho Ro			
		44 Xinh Mun			
		45 Mang			
		46 Brau			
		47 O Du			
		48 Ro Mam			

Language Family	Language Group	Ethnic Group	Remark
		49 Khang	
Austro-nesian	Malayo-Polynesian	50 Gia Rai	(Ausutronesian language group : Widespread from Madagascar to Indonesia, Philippines, Taiwan, Melanesia, Micronesia, and Polynesia) Cannot be found in the northwest
		51 Ede, Rhade	
		52 Cham	
		53 Raglai	
		54 Chu Ru	

Source: JICA Master Plan Study on Improvement of Rural Living Conditions in North western Mountainous Region in Viet Nam (2008)

I-2.2.4 Poverty

Vietnam has experienced decrease in poverty rate from 9.8% in 2013 to 8.4% in 2014 but the rate is low in more developed regions such as the Red River Delta and in the southeast. There has been still intensified inequality in poverty level in the northern midlands and mountain areas where the six provinces are located (18.4%, 2.19 times higher than the national average) and in the central highlands, and the north central area and central coastal area as shown in Table I-2.2.3.

Table I-2.2.3 General Poverty Rate by Region

Areas	2013		Prel. 2014	
	Poverty Rate (%)	Poverty Rate in Each Region as Compared to National Average (times)	Poverty Rate (%)	Poverty Rate in Each Region as Compared to National Average (times)
WHOLE COUNTRY	9.8	1	8.4	1
Red River Delta	4.9	0.5	4	0.48
Northern midlands and mountain areas*	21.9	2.23	18.4	2.19
North Central area and Central coastal area	14	1.43	11.8	1.4
Central Highlands	16.2	1.65	13.8	1.64
Southeast	1.1	0.11	1	0.12
Mekong River Delta	9.2	0.94	7.9	0.94

Source: Statistical Yearbook of Vietnam 2014

Note: *:All the six target provinces are in the northern midlands and mountain areas.

Poverty rate is calculated by monthly average income per capital of household.
2013: 570 thousand dong for rural area and 710 thousand dong for urban area;
2014: 605 thousand dong for rural area and 750 thousand dong for urban area.

I-2.2.5 Other Social Indicators

Despite of the fact that the living standards has been improved across every geographic region, in northern Midland and mountainous areas (say six provinces) have seen unequal progress compared to other regions across social-economic indicators: living conditions, education, and health as shown in Table I-2.2.4. This is partly because the investment in public infrastructure such as rural roads has not been sufficient enough to provide these social services in remote areas.

Table I-2.2.4 Social Indicators by Geographic Region

	Red River Delta	Northern Midland and Mountainous Areas	North Central and Central Coastal Area	Central Highlands	South-east	Mekong River Delta
<i>Living Conditions (2010) (%)</i>						
Households using cleaned water	98.6	80.3	91.0	82.8	98.1	81.5
Households using sanitary toilet	89.6	60.8	81.9	62.1	92.0	47.6
<i>Education (%)</i>						
Literacy rate for population aged 10 and older in 2010	97.3	88.9	93.6	90.9	96.4	92.6
Literacy rate for population aged 10 and older in 2012	97.6	89.6	94.7	92.9	97.1	93.6
Net enrolment rate at lower secondary education in 2012	94.9	86.8	89.3	83.9	87.1	78.6

	Red River Delta	Northern Midland and Mountainous Areas	North Central and Central Coastal Area	Central Highlands	South-east	Mekong River Delta
<i>Health</i>						
Pregnant women receiving at least three antenatal care sessions in 2011	94.2	75.4	86.4	81.3	89.1	86.3
Under-1 mortality rate/1000 live births in 2012	12.3	23.5	17.1	24.6	9.2	12.0
Under-5 mortality rate/1000 live births in 2012	18.4	35.7	25.8	40.2	13.7	18.0

Source: Ministry of Planning and Investment, Millennium Development Goals Full Report 2013

I-2.2.6 Gender

Vietnam has observed good progress in promoting people's well-being and gender equality in the past few years. It was ranked at 116th out of 188 countries in the United Nations Development Programme (UNDP) human development index in 2014, which places it in the group of countries of medium human development. UNDP's gender inequality index (GII) positioned Vietnam at 60th out of 155 countries in 2014 as shown in Table I-2.2.5. For example, in Vietnam, 24% of parliamentary seats are held by women, which has been ahead of other southeast Asian countries in promoting women's empowerment.

Table I-2.2.5 Gender Indicators in Vietnam

	Rank	Evaluation
Human Development Index (HDI)	116 th out of 188 in 2014	Medium human development
Gender Inequality Index (GII)	60 th out of 155 in 2014	Upper middle-rank group

Source: United Nations Development Programme, Human Development Report 2015

I-2.2.7 Import and Export

(1) Whole Country

The value of import and export of goods is shown in the table below.

Table I-2.2.6 Import and Export Values of Goods in the Past Recent Years

Unit: USD1000

Year	2008	2009	2010	2011	2012	2013	2014
Import	80,713,829	69,948,810	84,801,199	106,749,854	113,792,411	132,125,483	146,048,658
Export	62,685,130	57,096,274	72,191,879	96,905,674	114,572,740	132,134,909	150,186,493

Remarks: The data means preliminary figures for each year.

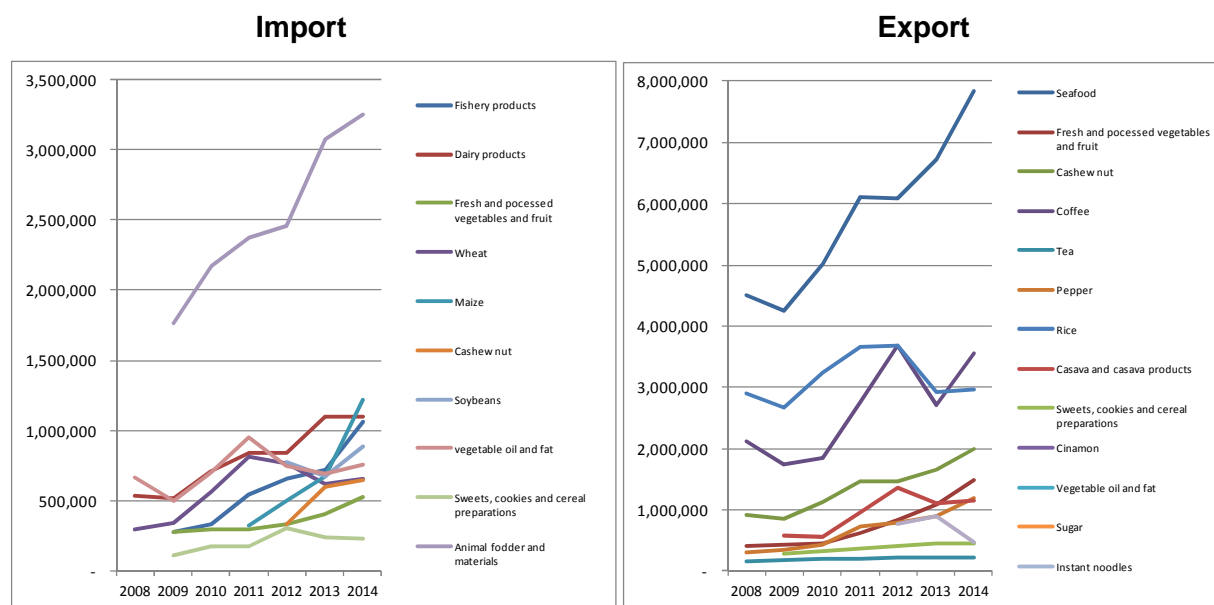
Source: General Statistical Office of Vietnam, Website

Until 2011 the value of import of goods had been larger than that of export. In the recent two to three years, the value of export has increased and both values show similar amount, indicating that domestic industries seem to grow.

The main goods for import are 1) machinery, instrument, and accessory (15% of total value in 2014); and 2) computers, electronic products and parts (13% of total value in 2014). The main export goods are 1) telephone and their parts, which has been growing rapidly (16% of total value in 2014) and 2) textile and sewing products (14% of total value in 2014). It is indicated that factories related to cloth and mobile phone, of which global markets are growing, are active in Vietnam.

(2) Agriculture Related Goods

Import and export of agriculture related goods are shown as total value in the following figure as total value.



Remarks: The data means preliminary figures for each year. Unit is USD 1,000.

Source: General Statistical Office of Vietnam, Website

Figure I-2.2.1 Import and Export of Agriculture Related Main Goods

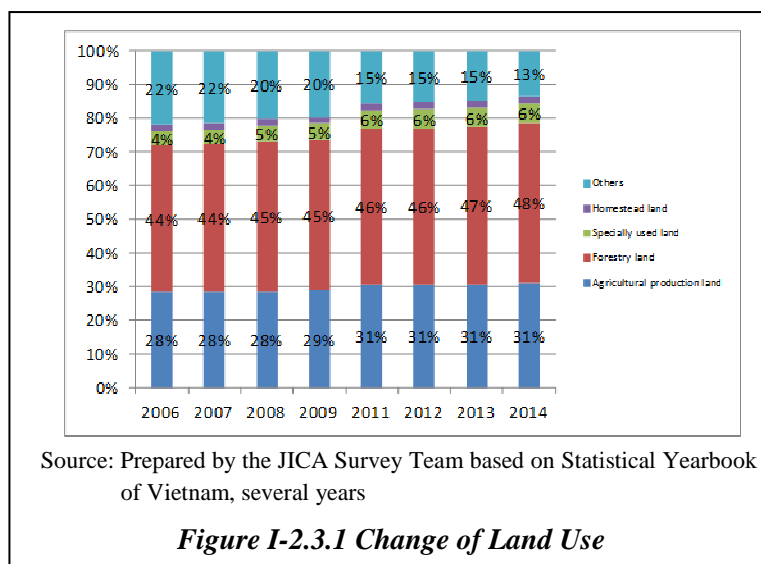
The main import goods are animal fodder and materials, maize (with recent sharp increase), and dairy products, indicating that demand for livestock products have become higher. The export goods are mainly seafood, coffee, and rice.

I-2.3 Trend of Agriculture in Vietnam

I-2.3.1 Land Use

As shown in Figure I-2.3.1, the largest part of the land is forestry land (48% in 2014) followed by agriculture production land (31% in 2014). Both are gradually increasing in the recent years according to the statistics.

Specifically, used land includes security and defence land, land for non-agricultural production and business, and public land with gradual increase as well. Others include unused flat/mountainous land and non tree rocky mountain that have decreased to accommodate the increment of the other land categories.



Source: Prepared by the JICA Survey Team based on Statistical Yearbook of Vietnam, several years

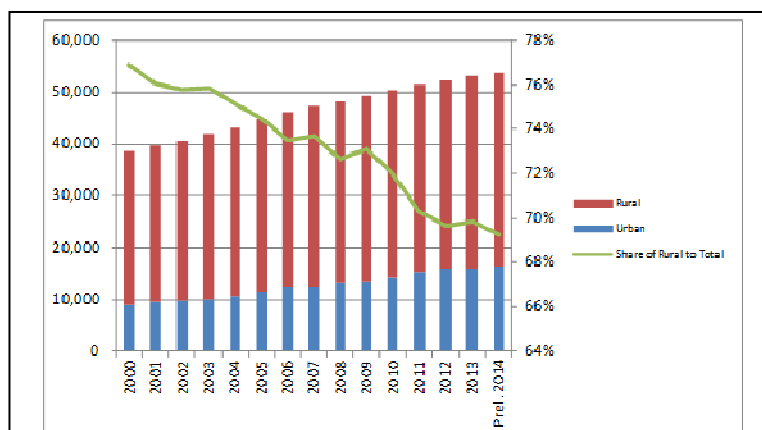
Figure I-2.3.1 Change of Land Use

The share of forestry land and agriculture production land to the total land of the six target provinces are 63% and 16% (both in 2013), respectively. Compared with the national figures, the target area is characterized as the area with more forest and less agricultural production land.

I-2.3.2 Rural Labour Force

The rural labour force is shown in Figure I-2.3.2. Labour force of 15 years of age and above is increasing having 53,748,000 which occupies 59% of the total population (2014). The same labour force in rural area is also increasing in number having 37,222,500 in 2014. However, the share of rural labour force to the total labour force shows tendency of continuous decline (69% in 2014).

The labour force in the six target provinces is 2,702,293 (5% of national labour force in 2013). Rural labour force in the target provinces in the same year is 2,258,434, and share is 84% of the total labour force, which is higher than the national level figure.



Source: prepared by JICA Survey Team based on Statistical Yearbook of Vietnam, several years, unit is 1000 people

Figure I-2.3.2 Rural Labour Force

I-2.3.3 Rural Income

Monthly average income per capita is shown in the table below:

Table I-2.3.1 Monthly Average Income Per Capita at Current Price

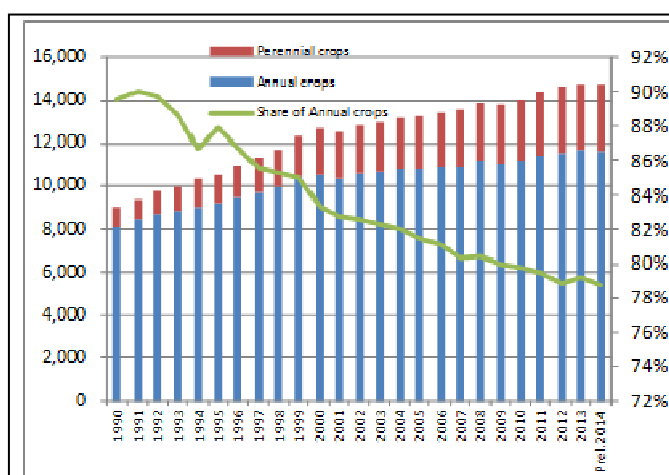
Year		1999	2002	2004	2006	2008	2010	2012	Prel. 2014
Whole country		295	356	484	636	995	1,387	2,000	2,640
By residence	Urban	517	622	815	1,058	1,605	2,130	2,989	3,968
	Rural	225	275	378	506	762	1,070	1,579	2,041
By region	Red River Delta	282	358	498	666	1,065	1,580	2,351	3,278
	Northern Midlands and Mountain Areas	199	237	327	442	657	905	1,258	1,613
	North Central and Central Coastal Area	229	268	361	476	728	1,018	1,505	1,982
	Central Highlands	345	244	390	522	795	1,088	1,643	2,008
	Southeast	571	667	893	1,146	1,773	2,304	3,173	4,124
Mekong River Delta		342	371	471	628	940	1,247	1,797	2,326

Unit: VND 1,000

Source: Statistical Year Book of Vietnam, several years

The national average of the monthly income per capita is VND 2,640,000, of which the one in rural areas is 2,041,000. The figure in the northern midlands and mountain areas, where the six target provinces are located, is VND 1,613,000, which is 61% of the national average and even lower than the rural average.

Assuming that there are five members in the family, annual household income can be estimated as VND 158 million, VND 122 million, and VND 97 million for the whole nation, in rural areas, and in the northern midlands and mountain areas, respectively.



Source: Prepared by the JICA Survey Team based on Statistical Yearbook of Vietnam, several years, unit is 1000 ha

Figure I-2.3.3 Planted Area by Crop Group

I-2.3.4 Agriculture Production

(1) Planted Area of Crop Groups

As shown in Figure I-2.3.3, the total planted area is expanding, and the figure in 2014 is 14,804,000 ha. Out of the total planted area, the planted area of annual crops has the largest share (79% in 2014) although this share to the total planted area has decreased continuously.

The table below shows the data of planted area of both annual and perennial crops with their breakdown crops. In the annual crops, cereals have the largest share in the total area for annual crops (77% in 2014).

In terms of increase area from 1990 to 2014, total planted area increased by 64%. Area of annual crops increased by 44%, on the other hand area of perennial crops expanded greatly with 235%.

Table I-2.3.2 Planted Area of Annual Crops and Perennial Crops

Unit: 1000 ha

Year	Total Planted Area	Annual Crops				Perennial Crops			
		Total	Cereals	Annual Industrial Crops	Others	Total	Perennial Industrial Crops	Fruit Crops	Others
1990	9,040	8,102	6,477	542	1,083	939	657	281	0
2010	14,061	11,214	8,616	798	1,801	2,847	2,011	780	57
2011	14,364	11,421	8,778	788	1,855	2,943	2,080	773	91
2012	14,636	11,538	8,919	730	1,889	3,098	2,223	766	109
2013	14,793	11,714	9,074	731	1,910	3,078	2,111	707	260
Prel. 2014	14,804	11,660	8,992	711	1,957	3,144	2,134	794	216
Increase from 1990 to 2014	64%	44%	39%	31%	-	235%	225%	182%	-

Source: Statistical Year Book of Vietnam, several years

In 2014, cropping intensity at the national level is estimated at 145% dividing the total planted area by the agriculture production area.

Regarding the six target provinces, the areas for annual and perennial crops are analyzed taking an example of land use data as a proxy of planted areas. Table I-2.3.3 shows the composition of the annual and perennial crop lands.

Table I-2.3.3 Annual Crop Land and Perennial Crop Land in 2014

Province	Agricultural Production Land				
	Total	Annual Crop Land	%	Perennial Crop Land	%
National	10,232,000	6,410,000	63%	3,822,000	37%
Total of the Six Provinces	873,955	699,357	80%	174,597	20%

Source: Statistical Year Book of Vietnam 2014 for the national figures, 2014 Provincial Statistical Yearbooks for the total six figures.

Interestingly, the share of annual crop land to total agriculture production land in the six target provinces is 80%, more than the national share of 63%. This indicates that annual crops are still the dominant crops in the target provinces in agriculture land, and perennial crops are less developed despite their topography considered favourable for perennial crops.

(2) Planted Area of Main Annual Crops

The following table shows the planted area of main annual crops.

Table I-2.3.4 Planted Area of Main Annual Crops

Unit: 1000 ha

Year	Paddy	Maize	Sugarcane	Cotton	Peanut	Soybean
1990	6,043	432	n.a.	n.a.	n.a.	n.a.
2000	7,666	730	302	19	245	124
2005	7,329	1,053	266	26	270	204
2006	7,325	1,033	288	21	247	186
2007	7,207	1,096	293	12	255	187
2008	7,422	1,140	271	6	255	192
2009	7,437	1,089	266	10	245	147
2010	7,489	1,126	269	9	231	198
2011	7,655	1,121	282	10	224	181
2012	7,761	1,157	302	7	219	120
2013	7,903	1,170	310	3	216	117
Pel. 2014	7,814	1,178	305	3	209	110
Increase from 2000 to 2014	2%	61%	1%	-83%	-15%	-11%

Remarks: Paddy data is aggregated data.

Source: Statistical Year Book of Vietnam, several years

Paddy has the largest planted area, followed by maize. These two crops are considered as major crops in Vietnam (53% for paddy and 8% for maize out of the total planted areas).

For the past around 15 years, the planted area of paddy has increased only by 2%, on the other hand, maize area increased by 61%. Planted area of cotton, peanut, and soybean has decreased. Especially for cotton, planted area has drastically reduced.

Total planted area of paddy, maize, and soybean in the six target provinces in 2014 is 243,222 ha (3% of total paddy planted area), 336,858 ha (29% of total maize area), 39,220 ha (36% of total soybean area), respectively. It should be noted that the planted area of maize and soybean in the target provinces has significant share to the total planted area of these two crops compared with the land share.

(3) Yield of Main Annual Crops

The following table shows the yield of main annual crops at national level.

Table I-2.3.5 Yield of Main Annual Crops

Unit: ton/ha

Year	Paddy	Maize	Sugarcane	Cotton	Peanut	Soybean
2000	4.24	2.75	49.77	1.01	1.45	1.2
2005	4.89	3.6	56.13	1.3	1.81	1.43
2006	4.89	3.73	58.03	1.37	1.87	1.39
2007	4.99	3.93	59.29	1.33	2	1.47
2008	5.23	4.01	59.64	1.38	2.08	1.39
2009	5.24	4.01	58.77	1.26	2.09	1.46
2010	5.34	4.11	60.06	1.37	2.11	1.51
2011	5.54	4.31	62.15	1.29	2.09	1.47
2012	5.64	4.3	62.99	1.28	2.14	1.45
2013	5.57	4.44	64.85	1.07	2.27	1.44
Pel. 2014	5.76	4.41	65.34	1	2.17	1.43
Increase from 2000 to 2014	36%	60%	31%	-1%	50%	19%

Remarks: Paddy data is aggregated data.

Source: Statistical Year Book of Vietnam, several years

Yield of paddy at national average in 2014 is 5.76 ton/ha, with 36% increase from 2000. The same data for maize is 4.41 ton/ha with 60% increase. Except cotton, the increased yields of all other main crops indicate improvement in productivity.

Yield of paddy, maize, and soybean in the six target provinces in 2014 was 4.27 ton/ha, 3.5 ton/ha, and 1.2 ton/ha, respectively, all lower than the national averages.

(4) Production of Main Annual Crops

The following table shows the production of main annual crops at national level.

Table I-2.3.6 Production of Main Annual Crops

Unit: 1,000 ton

Year	Paddy	Maize	Sugarcane	Cotton	Peanut	Soybean
1990	19,225	671	n.a.	n.a.	n.a.	n.a.
2000	32,530	2,006	15,044	19	355	149
2005	35,833	3,787	14,949	34	489	293
2006	35,850	3,855	16,720	29	463	258
2007	35,943	4,303	17,397	16	510	275
2008	38,730	4,573	16,146	8	530	268
2009	38,950	4,372	15,608	12	511	215
2010	40,006	4,626	16,162	13	487	299
2011	42,399	4,836	17,540	13	469	267
2012	43,738	4,974	19,015	9	469	174
2013	44,039	5,191	20,129	3	492	168
Pe. 2014	44,975	5,192	19,928	3	455	158
Increase from 2000 to 2014	38%	159%	32%	-84%	28%	6%

Remarks: Paddy data is aggregated data.

Source: Statistical Year Book of Vietnam, several years

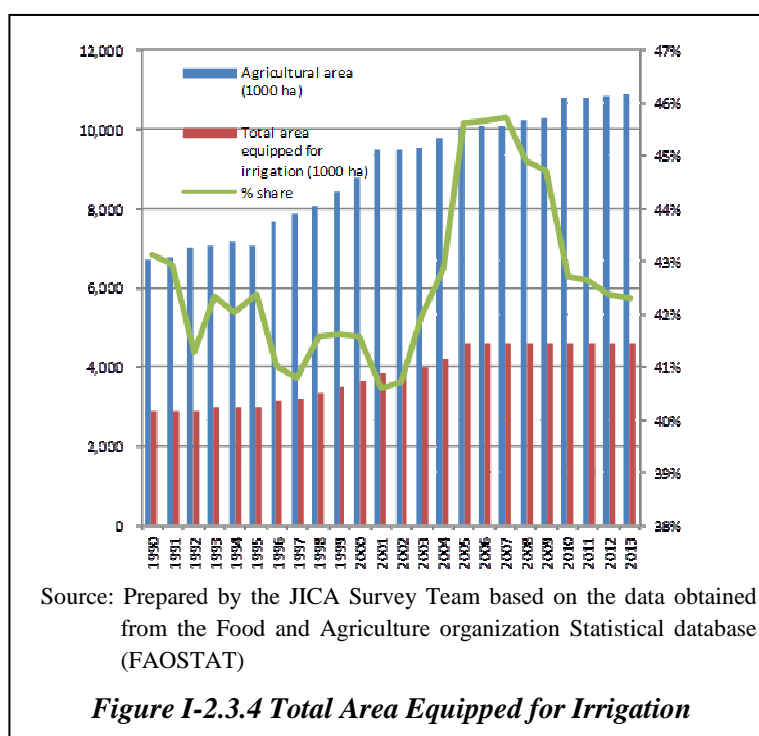
Production value of paddy in 2014 was 44,975,000 tons with 38% increase from production in 2000. Production of maize has greatly increased by 159% due to both increase in planted area and yield and was 5,192,000 tons in 2014.

Total production of paddy, maize, and soybean in the six target provinces in 2014 was 1,039,695 tons (2.3% of total paddy production), 1,179,785 tons (22.5% of total maize production), and 48,974 tons (31.0% of total soybean production), respectively.

I-2.3.5 Irrigation

Figure I-2.3.4 shows past changes of agriculture areas and total area equipped for irrigation. Both areas have been increased although the growth of total area equipped for irrigation is stagnant after 2005. Total area equipped for irrigation has been between 41% and 46% of agriculture area for around 20 years.

Agriculture production area of the six target provinces is 873,955 ha with 8% of total agriculture areas. While irrigation service area in the six target provinces is 121,960 ha, which is 3% of the total area equipped for irrigation. Irrigation in the target provinces is not well developed compared with the national average mostly due to their mountainous topography and fragmented flat areas.



I-2.3.6 Agriculture Machinery

The number of major agriculture machinery in whole Vietnam is shown in the table below.

Table I-2.3.7 Number of Major Agriculture Machineries (2011)

Machinery	Total Numbers	Average per Province
Heavy ploughs, and tractors (more than 35 CV)	17,206	273
Middle-weight ploughs, and tractors (from 12 CV to 35 CV)	221,445	3,515
Small ploughs, and tractors (12 CV and less)	294,618	4,676
Rice mowing machine with engine	266,371	4,228
Agriculture, forestry, fishery product dryers, and ovens	64,726	1,027
Milling machine	249,058	3,953
Motorized Insecticide sprayers	582,116	9,240
Mechanized water pumps for agriculture, forestry, and fishery production	2,187,197	34,717
Sowing machine	27,104	430
Harvesters combine rice mowing machine	14,701	233
Other harvesters	66,658	1,058

Source: Results of the 2011 Rural, Agricultural and Fishery Census, General Statistics Office (GSO)

Water pump, insecticide sprayers, middle and small sized tractors, rice mowing machine, and milling machine are the major machineries in Vietnam.

Comparison between the whole country and the northern midland and mountainous region which includes the six target provinces in terms of mechanized steps of agriculture is show below:

Table I-2.3.8 Percentage of Mechanized Steps in Agriculture in 2014

Step of Cultivation/Production	All of Vietnam	Northern Midland and Mountainous Region
Preparing land	90	40
Sowing, transplanting	30	5
Taking care (cultivating, removing grass, and applying fertilizer and pesticide)	60	35 (especially sugarcane, and tea)
Irrigation control	90	-
Harvesting (mainly paddy rice)	42	20 (paddy rice, sugarcane, and tea)
Drying seed	40	20 (mainly maize)

Source: Decision No. 3642/QĐ-BNN-CB (9 August 2015) on approval of schemes to improve mechanization of agricultural production

Almost all of the steps, mechanization in the northern midland and mountainous region did not progress compared with the national average.

I-2.4 Related Development Policies at National Level

I-2.4.1 Vietnam's Socio-economic Development Strategy (SEDS) for the Period of 2011-2020

(1) General Objective

The general objective is to strive to make the country an modern oriented industry by 2020 with socio-political stability, agreement, democracy, and discipline, people's physical and spiritual life is clearly improved, the independence and territorial unification are firmly maintained, and Vietnam's position in international arena is continually improved creating firm premises for higher development in the next period.

(2) Main Objectives

There are objectives set in the three areas. Main numerical objectives are described in the table below:

Table I-2.4.1 Main Numerical Objectives in SEDS

Economic Development	Socio-cultural Development	Environmental Development
✓ Strive to achieve an average increase in GDP rate of 7-8%/year;	✓ Up to 2020, human development index (HDI) will reach the medium high group of the world;	✓ Real income of people will be 3.5 times higher than that of 2010;
✓ GDP in 2020 will be equal to 2.2 times of that in 2010 in purchasing power parity;	✓ Population growth rate will be stable at 1.1%;	✓ Ensure that 100% of new business and manufacture facilities will apply clean technology or be equipped with
✓ Average GDP per capita in real	✓ Life expectancy will reach 75;	

Economic Development	Socio-cultural Development	Environmental Development
<ul style="list-style-type: none"> ✓ price will reach USD 3,000); ✓ The proportion of industrial and service industries accounts for about 85% of GDP; ✓ Value of high-tech products reaches around 45% of GDP; ✓ Value of manufacture industry makes up 40% of the total industrial manufacture value; ✓ The rate of labor working in agriculture accounts for about 30-35% society's labor force; ✓ Aggregate productivity factor contributes at least 35% to the growth; ✓ Annual energy consumption decreases at 2.5-3% of GDP; ✓ The urbanization rate achieves more than 45 %; and ✓ About 50% of communes meet new rural standards. 	<ul style="list-style-type: none"> ✓ There will be nine doctors and 26 hospital beds per 10,000 people; ✓ Trained labors will reach above 70%; ✓ Vocational training will account for 55% of total labors of the society; and ✓ The rate of poor households will decrease 2-3%/year on average; ✓ Real income of people will be 3.5 times higher than that of 2010. 	<ul style="list-style-type: none"> ✓ devices that help reduce pollution and waste treatment; ✓ Ensure that more than 80% of existing business and manufacture facilities will meet environmental standards; and ✓ Make sure that 95% of regular solid waste, 85% of toxic waste, and 100% of health waste will be solved in line with the standards.

Source: Unofficial translation of SEDS obtained from <http://www.economica.vn/>

As its strategic breakthroughs, it specifies three areas, such as (i) promoting human resources/skills development (particularly skills for modern industry and innovation), (ii) improving market institutions, and (iii) infrastructure development. As for the agriculture sector, it states that development goes towards modern, effective and sustainable directions.

(3) Relation to Socio-economic Development Plan (SEDP)

As more concretized plans to realize SEDS, there was the previous socio-economic development plan (SEDP) 2011-2015 which has just ended. The previous plan elaborated objectives for the first five years of the SEDP including high quality and sustainable economic growth, improved living standards of ethnic minority populations, strengthened environmental protection; and mitigation and prevention of the adverse impacts of climate change.

The new socio-economic development plan 2016-2020 is to soon take place. It is said that the slow progress of the reform stipulated in the previous plan is observed, and therefore it is necessary to accelerate the reforms during 2016-2020 period to achieve the target set in SEDS mentioned above.

I-2.4.2 National Target Program (NTP) on New Rural Development Program (NRD) from 2010 to 2020

(1) Background

The National Target Program (NTP) on the New Rural Development (NRD) was approved by Decision No. 800/QDTTg dated 04 June 2010. This program is to be implemented in all over 9,071 communes for the period from 2010-2020. Currently the first half has just been completed.

(2) Objectives

The objectives of NTP on NRD are the following:

- To develop rural economy and to improve spiritual and material life of rural people;
- To develop rural areas according to plans, linking agriculture to rapid development of industry, services, and urban areas;
- To modernize socioeconomic infrastructure - cultural characteristics preserved and intellectual standard of people improved;
- To ensure eco-environment green, clean, and beautiful; and

- To increase quality of political system operation - good governance.

As its specific targets, 20% of all communes are expected to achieve full new rural criteria set by 2015, and 50% of all communes reached new rural criteria by 2020.

(3) Criteria

NRD is to promote rural development at the commune level to achieve the status of New Rural Commune based on the national set of 19 criteria on NRD (based on Prime Minister (PM) Decision No. 491/QD-TTg dated 16 September 2009). Thorough criteria are shown in Attachment I-2.4.1 and summarized in Table I-2.4.2 below:

Table I-2.4.2 Criteria of NTP on NRD

I. Planning	II. Economic - Social Infrastructure	III. Economics and Activities Production Organization	IV. Culture - Social issues - Environment	V. Political System
1. Planning and implementation of planning	2. Communications Information 3. Irrigation 4. Electrical 5. Schools 6. Cultural facilities and infrastructure 7. Rural markets 8. Post 9. Residential houses	10. Incomes 11. Households Poverty 12. Labor force structure 13. Types of production organizations	14. Education 15. Health cares 16. Cultural lives 17. Environment	18. System of social organization and strong political 19. Security, and social order

Source: Decision No. 491/QD-TTg

This program has been implemented in the six target provinces, and the mid-term evaluation is on-going. The Ministry of Agriculture and Rural Development (MARD) is the implementing agency and the Department of Cooperative and Rural Development is the secretariat.

I-2.4.3 Program 135

(1) Background

Program 135 was established in 1998 to implement government policies targeting the most vulnerable communes, promoting production and access to basic infrastructure, improving education, training local officials, and raising people's awareness for better living standards and quality of life.

This program was approved for a period of seven years. The second phase was formulated in April 2005 and approved in January 2006 for the program to continue until 2010. Furthermore, this program was extended to be implemented in another two periods, which are from 2012-2015 and 2016-2020, by Decision No. 551/QD-TTg of the Prime Minister dated 4 April 2013 as part of NTP on sustainable poverty reduction from 2016-2020.

(2) Objectives and Components

The objectives of the upcoming period 2016-2020 is to enhance major infrastructure to serve for production, business and welfare of the people in extremely difficult communes, border communes, communes in the designated army safety area¹, towns under district and mountain villages thereby expecting to help to impulse socioeconomic development, improve people's living standard, and reduce poverty sustainably and fast. The two components are production development and infrastructure development. Infrastructure development includes rural road system, electricity, health stations, education associated buildings, irrigation systems, and small infrastructures consistent with ethnic minority people.

¹ The areas chosen based on the criteria shown in the Decision No. 897/QD-Ttg dated 27th May 2016, related to the designated areas during French and American wars (the areas are extremely poor with difficulties)

(3) Beneficiary

Beneficiaries are the extremely difficult communes, border communes, safe area communes, town under district and villages in ethnic mountainous areas. The Committee for Ethnic Minority Affairs (CEMA) is the leading agencies to implement the program.

I-2.4.4 Strategy on Agriculture and Rural Development for 2011-2020**(1) Objectives and Target**

The overall objectives are 1) to build a comprehensive agricultural development towards modernization and sustainable, large-scale commodity production, productivity, quality, efficiency and competitiveness, ensuring food security for both short and long terms; 2) to construct new rural areas with modern economic infrastructure; reasonable economic structures and production developing the agriculture industry and services sector and urban planning; stable rural society, rich national cultural characters; enhanced intellect, protection of the ecological environment; strengthening political system in rural areas under the leadership of the party; and 3) to improve the living standard, creating fast changes in difficult areas; provide training to farmers in production.

The strategy states the specific objectives for two five-year periods. The objective of the new period 2016-2020 is agricultural development towards a comprehensive, modern, large-scale commodity production, and sustainability; rural development associated with the process of industrialization and urbanization of the country; and increase income and improvement of basic living conditions of rural residents and environmental protection. The target strategies were set below:

- Sustained agricultural growth rate at an annual average of 3.5-4% is ensured;
- Structure of agricultural production and rural economy is transformed according to market demand, as well as livestock, fisheries, and forestry productions are to be developed;
- Rural labors are to be moved largely out of the agriculture sector for structural change of the industries and is allowed that agricultural labor can become about 30% of the total labor (70% of labor is engaged in other industries);
- At least 50% of the rural communes achieve new rural standard. The income of rural residents is increased by 2.5 times compared with 2010-2011; and
- Forest coverage is increased to 43-45%, protecting biodiversity, ensuring inland and near shore fishing to regenerate and develop, overcoming pollution in agricultural production, recovery and mitigation of natural disasters, epidemics, and adverse impacts of climate change.

(2) Strategic Orientation for the Areas Associated to the Project**Crop Production**

- Development of rice production still becomes a key in contributing to export and ensuring food security;
- Development of commodity crops which have strong competitiveness and efficiency serves the domestic market as well as export; and
- Development of crops which have medium or low competitiveness can expect reasonable import substitution.

Agriculture Extension

- Decentralization from central to local levels and from government to community organizations is promoted in order to gradually transfer management of the funds used for extension from supply-driven extension to demand-oriented extension e.g., timely and practical response to production needs.

- Agricultural extension services are gradually socialized and diversified in service development to meet livelihood needs of residents in rural areas and not only the interests on the technical cultivation technique.

Rural Infrastructure

- Construction of the irrigation system is optimized to save water; water user organizations (WUOs) of farmers, local communities and investors are developed to protect, manage, and operate efficiently the irrigation systems and water;
- Significant funds for operations and maintenance (O&M) and exploitation works are effectively being used to improve water use efficiency;
- Adequate clean water and rural sanitation are being provided;
- Sustainable rural transport association in the national transport network is developed;
- Priority is given to develop the disadvantaged regions so as to facilitate economic social development faster (e.g., roads to highlands, mountains, and coastal areas for industrial and urban development);
- Quality of rural roads is gradually improved through development of mechanisms and policies to ensure regular maintenance;
- Rehabilitation and development of the electricity grid synchronization, ensuring sufficient electricity for agricultural production, and improving the quality of electricity for daily life of rural residents;
- Access to information for people in rural areas is improved, especially in the mountainous, remote areas, and isolated islands; and
- The program of NRD with the criteria is implemented and is consistent with the characteristics of each region giving importance to the more difficult communes in the mountainous, border, capes areas and the islands.

The Northern Mountainous Areas

General Direction

Centers and municipalities associated with industrial parks are developed. Hydropower industry and mining are also developed. The border gates and border economic zones are upgraded. A network of railway traffic, road, river and facilities, services for transportation of materials are agricultural products are established. Tourism and services along the two main axes, namely: north-south corridor (Ha Giang- Ca Mau), west-east corridor (Dien Bien - QuangNinh), routes from Hanoi to the border provinces, and the border belt roads and branch roads are developed. The above development aims to connect the northern mountainous region with the national economy, attracting investment for industrial development, and services in areas of towns along the highway and at the major border crossings, strengthening the service activities, tourism, and trade.

General Agricultural Development

Forestry development is pursued: protection of protective forests and special use of forests to maintain water resources, soil conservation, and forest production intensification combining planting of native trees and produce industrial raw materials.

Agricultural development is diversified: intensification of rice and vegetables, industrial crops, fruit trees, vegetables, flowers, and fodder crops for livestock.

Traditional industries of the region is conserved and developed.

- *Agriculture*
Commodity products which have advantages are intensified: tea, coffee, cotton, corn, soybeans, tobacco, vegetables and flowers.
Livestock is developed: cattle, pigs with farm, and industrial scale.
- *Rural Development*
40 % of communes achieves the new rural standard under the NTP-NRD program to strive in 2020.

I-2.4.5 Participatory Irrigation Management (PIM)

(1) Water Management in Vietnam

In many decades, the government and water users concentrated investment on construction and rehabilitation of irrigation systems. Following the policy on the government and water users working together, farmers in different regions have contributed significantly to the investments in irrigation systems with various levels ranging from 12% of the total investment in the Red River Delta, 30-50% in other region, and 80-100% for small-scale irrigation schemes managed by their own.

According to the investigation data of MARD, currently, about 91% of the irrigation systems managed by the state-owned enterprises serves about 80% of the country's irrigated area. The remaining 9% of irrigation systems managed by farmers irrigates for about 20% of the irrigated area. In the six target provinces, the state-owned provincial organizations manage 5% of the irrigation systems covering 18% of the irrigated or service area. The 95% of the irrigation systems covering 82% of the service area in the six provinces are under the districts' administration and managed by the farmers' WUOs.

In the irrigation systems in Vietnam, almost all small irrigation system/facilities in communes and villages are mainly managed by WUOs/farmers. Farmers take an indispensable part in construction, management, and O&M of irrigation facilities. In that situation, irrigation development relates closely to the implementation of PIM in Vietnam.

(2) PIM in Vietnam

At present, many farmers' organizations for irrigation water management were organized in most provinces to execute participatory irrigation management at various levels, mainly at levels of one hamlet, some hamlets or commune. In order to promote the participation of local people in irrigation development, during the recent decade, the government has issued many policies to provide legal framework for renovation and enhancement of management, promote irrigation works, and promote PIM.

The framework of PIM development strategy provided by MARD in December 2004 was the first legal document on development of PIM that showed the roles and responsibility of authorities at various levels from central to local level and the measures for implementation and roadmap of PIM from 2005 to 2015. Up to now, some basic contents of the strategy that were fulfilled has already been issued by MARD. Some of the policies to promote PIM development includes: i) Circular No. 75 in 2004 on guidance to establish, improve, and develop WUOs, ii) Circular No. 65 in 2009 on guidance to decentralize irrigation works, and iii) Decree No. 67 in 2012 on application of water fee exemption and reduction. Table I-2.4.3 shows the policy on PIM in Vietnam.

Table I-2.4.3 Policies on PIM

Circular/Decree/Order	Date of Issue	Contents
Order No. 32 on Development and Protection of Irrigation Works (32/2001/PL-UBTVQH10)	4 April 2001	Procedure for irrigation development and management
Decree No.143 on Development and Protection of Irrigation Works (143/2003 / ND-CP)	28 November 2003	Revised procedure for irrigation development and management
Circular No.75 on Guidance to Establish, Improve and Develop WUO (75/2004/TT-BNN)	20 December 2004	Guideline on establishment, consolidation, and development of WUOs/WUA/WUG and strategic framework for PIM development in Vietnam
Circular No.65 on Guidance to Decentralize Irrigation Works (65/2009/TT/BNNPTMT)	12 October 2009	Guideline on organization and classification, management of irrigation systems, works, and facilities
Circular No.40 on Regulation on Capability of Organization for Irrigation Management (No.40/2011/TT-BNN)	27 May 2011	Regulation on capability of organizations and individuals to participate in water management of irrigation systems, works, and facilities
Decree No.67 on Application of Water Fee Exemption and Reduction (67/2012/ND-CP)	10 September 2012	Condition for water fee exemption and reduction
Circular No.41 on Development and Protection of Irrigation Works (41/2013/TT-BTC)	11 April 11 2013	Revised procedure for irrigation development and management

Source: MARD

One thing it should be noted is that in 2008, the prime minister issued Decree No.115 dated November 14, declaring abolishment of irrigation service fee for agriculture production of farmers, and provision of irrigation subsidy. Although this decree has a certain meaning on eliminating farmer's burden, but it seems there are some difficulties to promote PIM.

CHAPTER I-3 GENERAL INFORMATION OF THE SIX TARGET PROVINCES

I-3.1 Natural Condition

I-3.1.1 Area

The six target provinces are categorized into the Northern midlands and mountain area. Ha Giang is in the north point of Vietnam. The three provinces, i.e: Ha Giang, Lao Cai, and Lai Chau, share their borders with China towards the north, and Dien Bien and Son La border Lao PDR on the west side. The area of the six provinces is shown in Table I-3.1.1 below.

Table I-3.1.1 Land Area of the Six Provinces (2013)

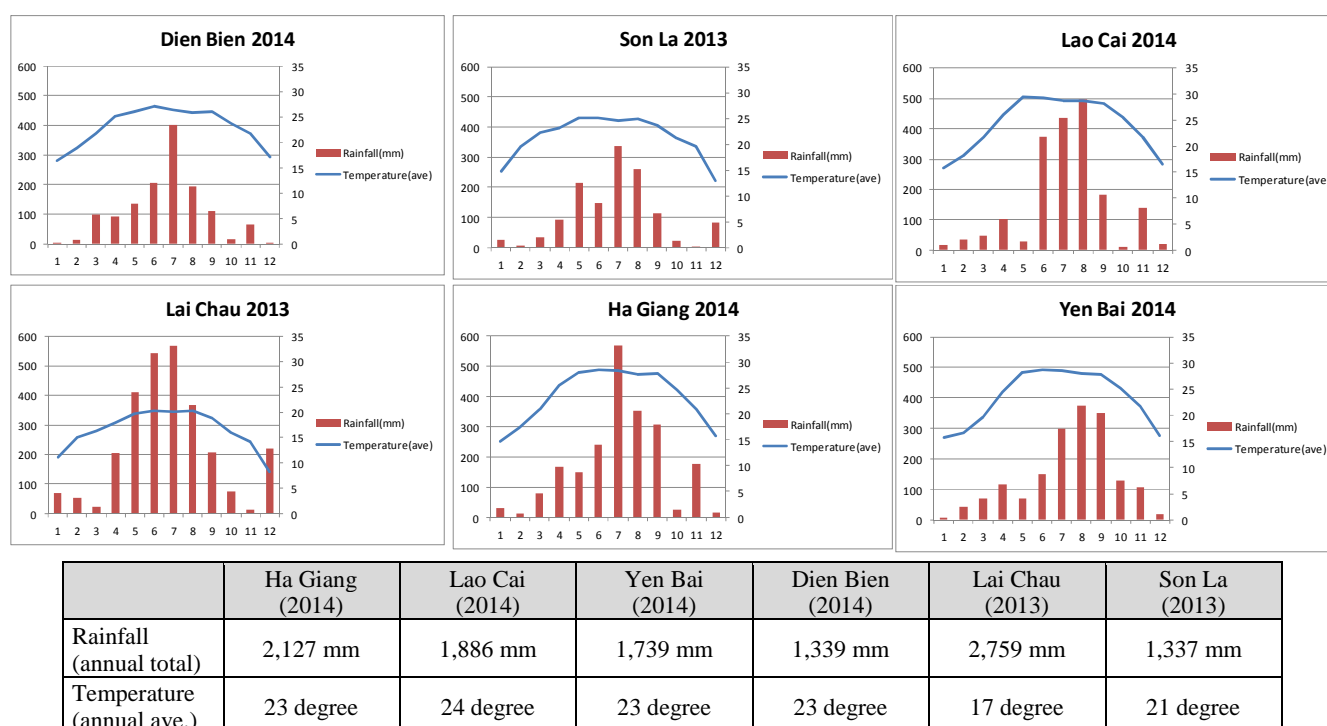
	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Total area	7,915 km ²	6,384 km ²	6,886 km ²	9,563 km ²	9,069 km ²	14,174 km ²
Forest land	71%	53%	69%	67%	81%	45%
Agriculture production area	20%	13%	16%	15%	10%	20%

Source: Provincial Statistical Yearbooks 2013, 2014

The total area of the provinces ranges from 6,384 km² (Lao Cai) as the smallest to 14,174 km² (Son La) as the largest. In terms of land use, Lai Chau has the largest percentage of forest area at 81%; on the other hand, the smallest forest percentage of 45% is observed in Son La.

I-3.1.2 Climate

The average monthly temperature and rainfall in the provinces are depicted in the following figure.



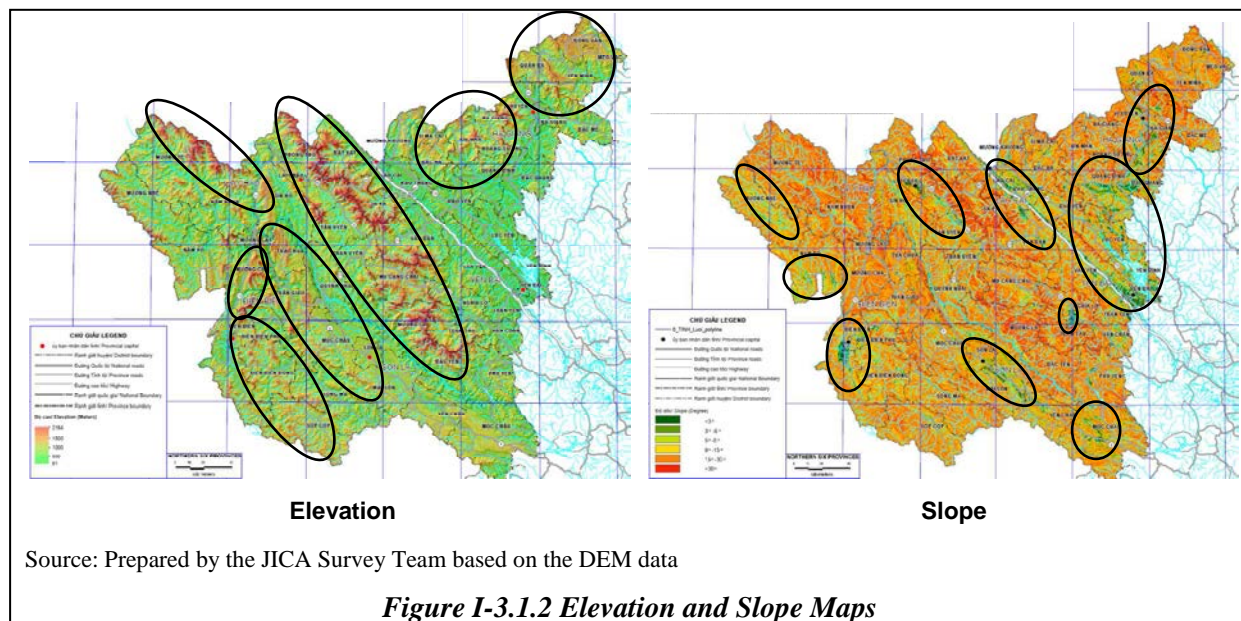
Source: Provincial Statistical Yearbooks 2013, 2014

Figure I-3.1.1 Climate of Six Provinces

Climate patterns are similar, although Lai Chau and Ha Giang have relatively more rainfall than the others. Lai Chau is also slightly cooler than the others.

I-3.1.3 Elevation and Slope

As shown in the location map of this report, the elevation and slope maps are given in Figure I-3.1.2 below.



(1) Elevation

As marked on the elevation map, there are several areas which have high altitudes at around 1,500 m and above. The main mountainous area runs from northwest to southeast almost in the middle of the target area, between Lai Chau and Lao Cai, and Son La and Yen Bai. The northwest of Lai Chau, which borders China, also has higher mountains. Elevation of the northwest and northeast of Ha Giang is also high. The border area between Dien Bien and Son La has also high altitude.

On the other hand, there are places with low elevation, mainly along where the big river flows. One of the large areas is laid on the east side of Yen Bai and south side of Ha Giang.

(2) Slope

Areas by slope category are shown in the table below.

Table I-3.1.2 Areas by Slope Category

Slope degree	Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%
<3	438	5	275	4	783	11	341	4	186	2	567	4
3-5	353	4	283	4	439	6	372	4	224	2	579	4
5-8	570	7	493	8	596	9	769	8	451	5	1,066	8
8-15	1,798	23	1,504	24	1,496	22	2,595	27	1,735	19	3,388	24
15-30	4,009	50	3,153	50	2,988	43	4,860	51	5,206	57	7,451	53
>30	791	10	647	10	591	9	593	6	1,265	14	1,067	8
Total	7,959	100	6,355	100	6,894	100	9,530	100	9,067	100	14,118	100

Remarks: The total areas of the provinces are not exactly the same as the data of the statistical year books.

Source: Prepared by the JICA Survey Team based on the DEM data

Although the share of the area with slope of more than 15% ranges from 52% in Yen Bai to 71% in Lai Chau, in terms of slope category, it can be generally said that all the provinces have similar land characteristics.

Similar to elevation, the above slope map shows some marked areas which are relatively flat areas. The largest area has the same low altitude areas of Yen Bai and Ha Giang. Other areas are scattered across the mountainous areas. These areas are in principle suitable for agricultural activities. It can be

noted that the flat areas in Moc Chau District of Son La Province are relatively at higher elevation, therefore, are famous for their horticulture crops (e.g., vegetables) which suit the condition (another reason is that Moc Chau is also close to Hanoi, which is a big consumer area).

I-3.2 Socioeconomic Condition

I-3.2.1 Administration and Population

The information on administration and population of the six provinces is summarized in the table below.

Table I-3.2.1 Administration and Population of the Six Provinces (2014)

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Districts (including district-level city and town)	11 <u>City</u> ✓ Ha Giang <u>District</u> ✓ Bac Quang ✓ Quang Binh ✓ Vi Xuyen ✓ Bac Me ✓ Hoang Phi ✓ Xin Man ✓ Quan Ba ✓ Yen Minh ✓ Dong Van ✓ Meo Vac	9 <u>City</u> ✓ Lao Cai <u>District</u> ✓ Bat Xat ✓ Muong Khuong ✓ Si Ma Cai ✓ Bac Ha ✓ Bao Thang ✓ Bao Yen ✓ Sa Pa ✓ Van Ban	9 <u>City</u> ✓ Yen Bai <u>Town</u> ✓ Nghia Lo <u>District</u> ✓ Luc Yen ✓ Van Yen ✓ Mu Cang Chai ✓ Tran Yen ✓ Tram Tau ✓ Van Chan ✓ Yen Binh	10 <u>City</u> ✓ Dien Bien Phu <u>Town</u> ✓ Muong Lay <u>District</u> ✓ Muong Nhe ✓ Muong Cha ✓ Tua Chua ✓ Tuan Giao ✓ Dien Bien Dong ✓ Dien Bien Dong ✓ Muong Ang ✓ Nam Po	8 <u>City</u> ✓ Lai Chau <u>District</u> ✓ Tam Duong ✓ Muong Te ✓ Sin Ho ✓ Phong Tho ✓ Than Uyen ✓ Tan Uyen ✓ Nam Nhung	12 <u>City</u> ✓ Son La <u>District</u> ✓ Quynh Nhai ✓ Thuan Chau ✓ Muong La ✓ Bac Yen ✓ Phu Yen ✓ Moc Chau ✓ Yen Chau ✓ Mai Son ✓ Song Ma ✓ Sop Cop ✓ Van Ho
Communes	177	143	157	116	96	188
Population	792,472	665,152	783,534	538,069	432,303	1,169,600
Rural Population Share	85%	77%	80%	85%	83%	86%
Population Density (person/km ²)	100.00	104.00	114.00	56.30	46.68	83.00

Source: Provincial Statistical Yearbooks 2014

The number of districts among the provinces is between 8 and 12. Population varies from the smallest at 432,303 in Lai Chau to the largest at 1,169,600 in Son La (around three times difference). Share of the rural population is similar to more or less 80% across the provinces. As for population density, three provinces, namely: Yen Bai, Lao Cai, and Ha Giang, have more than 100 persons/km², although this is still much less than the national average (274 persons/km²).

I-3.2.2 Economic Condition

(1) Gross Domestic Product (GDP)

The gross domestic product by province at current prices is shown in Table I-3.2.2.

Table I-3.2.2 GDP by Province

	Year	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Gross domestic product at current prices (VND millions)	2010	6,479,302	12,358,827	9,341,768	6,334,035	3,750,150	13,505,110
	2011	8,354,134	16,312,175	13,902,414	7,810,680	4,645,220	18,333,800
	2012	9,921,819	18,263,813	15,000,057	8,743,139	5,138,830	20,957,770
	2013	11,541,500	21,180,127	16,348,483	9,496,394	6,049,290	24,104,030
	2014 Prel.	12,554,953	24,391,308	17,917,244	10,617,283	7,057,920	28,088,330
Share of Agriculture, Forestry and Fishery (%)	2010	40.43	18.99	30.98	25.27	28.47	37.36
	2011	39.35	18.47	26.84	26.41	30.03	38.38
	2012	38.72	18.14	26.42	25.68	28.50	35.64
	2013	37.31	17.04	25.19	24.80	26.12	34.16
	2014 Prel.	36.84	16.13	24.09	24.35	24.02	31.05

	Year	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Gross domestic product at current prices per capita (VND 1,000)	2010	8,780	19,717	12,434	12,639	9,820	12,290
	2011	11,140	25,608	18,325	15,292	11,798	16,391
	2012	12,995	28,249	19,590	16,825	12,745	18,476
	2013	14,817	32,292	21,106	17,970	14,584	20,952
	2014 Prel.	15,843	36,670	22,867	19,732	16,673	24,081

Source: Provincial Statistical Yearbooks 2014

Among the provinces, Son La is the largest in terms of total GDP at VND 28,088 billion (2014, preliminary), followed by Lao Cai and Yen Bai. In terms of GDP per capita, Lao Cai is at the top (VND 36,670,000), followed by Son La and Yen Bai. These three provinces, among the six provinces, are relatively economically developed.

As for the GDP share of agriculture, forestry, and fishery sector, Ha Giang and Son La have figures that exceed 30% (36.84% and 31.05%, respectively), indicating that this sector is significant for their economies. On the other hand, the sector's share in Lao Cai is the smallest at 16.13% relatively indicating that other sectors have more impact on its economy.

The table below provides the growth of GDP per capita by province.

Table I-3.2.3 Growth of GDP per Capita by Province

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2010	8,780	19,717	12,434	12,639	9,820	12,290
2011	9,715	21,516	13,641	12,932	9,927	13,210
2012	10,557	22,602	14,763	13,625	10,288	14,181
2013	11,234	25,037	16,126	14,246	11,361	15,416
2014 Preliminary	11,739	27,380	17,707	14,952	12,090	16,920
Average growth per year	6.7%	7.8%	8.5%	3.7%	4.6%	7.5%

Remarks: Data is GDP per capita at constant 2010 (VND1000)

Source: Provincial Statistical Yearbooks 2014

The average annual growth rate of Yen Bai is the highest among the provinces at 8.5%, followed by Lao Cai (7.8%) and Son La (7.5%). Dien Bien shows the lowest growth among the provinces at 3.7%.

(2) Investment

Investment amount in 2014 is given in the table below:

Table I-3.2.4 Investment by Current Price by Province (2014, Preliminary)

Province	Total	By Investment Source		
		State	Non-state	Foreign Invested Sector
Ha Giang % to total	5,296,292 100%	2,766,645 52%	2,526,547 48%	3,100 0%
Lao Cai % to total	15,390,260 100%	7,783,123 51%	5,555,872 36%	2,051,265 13%
Yen Bai % to total	9,533,765 100%	4,995,979 52%	4,381,643 46%	156,143 2%
Dien Bien % to total	7,449,141 100%	3,752,473 50%	3,696,668 50%	- -
Lai Chau % to total	4,909,735 100%	3,034,866 62%	1,874,476 38%	393 0%
Son La % to total	15,661,626 100%	8,557,813 55%	6,929,700 44%	174,113 1%

Source: Provincial Statistical Yearbooks 2014, unit is VND in millions

Son La and Lao Cai receive the highest investment amount, followed by Yen Bai. Lowest investment amount is observed in Lai Chau.

I-3.2.3 Ethnic Groups

Ethnic compositions are very diverse in the six provinces. Each has more than ten ethnic groups. Only Son La and Yen Bai have an ethnic group with more than 40% of the provincial population, i.e., the Thai (53%) and the Kinh (46%), respectively.

Table I-3.2.5 Ethnic Composition of the Six Provinces in 2014

Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
Group	%*	Group	%*	Group	%*	Group	%*	Group	%*	Group	%*
Mong	32	Kinh	35	Kinh	46	Thai	38	Thai	33	Thai	53
Tay	23	Mong	24	Tay	18	Mong	35	Mong	23	Kinh	18
Dao	15	Tay	15	Dao	11	Kinh	18	Dao	13	Mong	15
Kinh	12	Dao	14	Mong	11	KhoMu	3	HaNhi	4	Muong	8
Other	18	Other	12	Other	14	Other	6	Other	27	Other	7

*Percentage among the provincial population

Source: Ethnic Committee of each province

These ethnic groups are divided into two according to historical lifestyles patterns as shown in Table I-3.2.6.

Table I-3.2.6 Ethnic Group Categorization based on Historical Features

	Lowland and Mid-land Regions	Highland Areas
Ethnic Groups	Annam-Muong language group - Kinh, Muong Tai-Kadai language group - Thai, Tay	Miao-Yao language group - Mong, Dao Burma-Tibetan language group - HanNhi, KhoMu,
Agriculture	Wet rice	Swidden cultivation Wet rice in valleys Terraced fields for dry crops (e.g., Maize) Perennial trees (e.g., anise and cinnamon) in replacement of natural forests
Living Pattern	Sedentary	Migration
House	Communal houses on the ground	Houses built on stilts

Source: Committee of Ethnic Minority Affairs (CEMA)

These two lifestyle patterns may reinforce the long-held stereotype of rich lowlanders and poor highlanders that no longer reflect the reality of ethnic groups. Nonetheless, these are worth understanding to capture the broad characteristics of ethnic groups in the six provinces.

I-3.2.4 Poverty

Among the six provinces, Lai Cai has been the most successful in terms of poverty reduction (-11.8%) in the last five years and recorded the lowest poverty rate at 17.61%. Meanwhile, Lai Chau can be ranked as the poorest among the provinces with the highest poverty rate at 38.82% in 2014.

Table I-3.2.7 Rate of Poor Households

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2010	41.80%	42.90%	26.50%	50.01%	46.78%	37.90%
2011	35.38%	35.29%	25.20%	45.28%	47.20%	34.80%
2012	30.13%	27.69%	24.00%	38.24%	42.80%	32.00%
2013	26.95%	22.21%	23.50%	35.22%	40.98%	29.30%
2014	23.21%	17.61%	22.80%	32.57%	38.82%	26.00%
Reduction Average % per year	-8.9%	-11.8%	-2.8%	-7.0%	-3.4%	-6.3%

Source: Statistical Yearbook of each province

Within the provincial population, ethnic minorities are considerably at risk of poverty. In 2014, apart from Yen Bai, wherein Kinh group (46%) is the majority, more than 90% of the poor households in all the five provinces were from ethnic minorities.

Table I-3.2.8 Rate of Poor Ethnic Minority Households

Name of District	Total Number of Household		Poor Household at the End of 2014			
	Household	Household of Ethnic Minority*	Household	Rate %	Household of Ethnic Minority*	Rate %
	<i>A</i>	<i>B</i>	<i>C</i>	$D=C/A$	<i>E</i>	$F=E/C$
Ha Giang	166,542	141,324	38,655	23.21	38,124	98.63
Lao Cai	151,842	89,264	26,735	17.61	24,339	91.04
Yen Bai	198,869	96,086	40,899	20.56	32,654	79.84
Dien Bien	115,319	89,492	37,565	32.57	36,826	98.03
Lai Chau	86,098	69,013	20,219	23.48	19,962	98.73
Son La	261,613	211,898	62,642	23.94	60,224	96.14

Note: Ethnic minority* is defined here as all ethnic groups except for the Kinh group

Source: DOLISA of each province

I-3.2.5 Other Social Indicators

Yen Bai is the richest province among the five provinces for the last five years with literate human resources (15 years old and above). Yen Bai recorded a literacy rate of 87.6%, which was close to the country's average of 94.7% in 2014. Lao Cai (78.5%) came in second and Son La (75.8%) was in third place.

Table I-3.2.9 Percentage of Literate Population 15 Years Old and Above

	Whole Country	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2010	93.7%	74.6%	75.5%	84.8%	63.4%	63.6%	77%
2011	94.2%	81%	78.4%	86.3%	65%	61.7%	78.3%
2012	94.7%	73.3%	80.4%	86.8%	70.8%	65.8%	74.9%
2013	94.8%	72.4%	80.7%	88.1%	71.4%	64.3%	75.5%
2014 Preliminary	94.7%	73%	78.5%	87.6%	70.2%	66.6%	75.8%

Source: General Statistical Office (GSO) (http://www.gso.gov.vn/Default_en.aspx?tabid=766)

Regarding infant mortality rate, Son La has the lowest record followed by Yen Bai and then Lao Cai for the last five years. It can be noted that economically disadvantaged provinces (Lai Chau, Dien Bien and Ha Giang) experienced poorer social conditions in terms of both literacy rates and infant mortality rates.

Table I-3.2.10 Infant Mortality Rate (Infant Deaths per 1,000 Live Births)

	Whole Country	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2010	15.8	37.1	31.6	26.5	37.3	46.1	25.6
2011	15.5	35	29.8	26.1	35.2	43.5	24.1
2012	15.4	35.8	30.3	29.6	35.8	44.2	24.5
2013	15.3	35.3	30.2	29.4	35.5	44	24
2014 Preliminary	14.9	34.2	29.2	28.3	34.4	42.6	23.2

Source: General Statistical Office (GSO) (http://www.gso.gov.vn/Default_en.aspx?tabid=766)

Likewise, in terms of poverty, ethnic minorities are much more socially vulnerable than the majority Kinh/Hoa group. School attendance rates for Kinh children aged 6-14 in 2010 was 5.2% higher than those for the other ethnic minority groups. Access of the ethnic minorities to public utilities such as national electric power grid and improved water and sanitation was significantly lower than that of their Kinh counterparts.

Table I-3.2.11 Socio-economic Indicators by Ethnicity (%)

	Kinh/Hoa	Ethnic Minority
School attendance rate for children aged 6-14 in 2010	95.0	89.8
Households with access to electricity grid in 2010	90.9	69.6
Households with access to improved water in 2010	69.2	18.4
Households with access to improved sanitation in 2010	98.9	83.2

Source: Ministry of Planning and Investment, Millennium Development Goals Full Report 2013

I-3.2.6 Gender

The United Nations Development Programme's (UNDP's) Vietnam Development Report 2011 claims, from the viewpoint of gender development index (GDI) that the six provinces were ranked at the bottom seven provinces and lagged behind Vietnam's wealthiest provinces in 2008. While Lao Cai was the highest in terms of gender equality and women's empowerment, Lai Chau was the worst. In particular, female adult literacy rate was significantly low in Lai Chau (48.05%). Their rankings largely depend on income, i.e., the more income, the greater the gender equity in their distribution.

Table I-3.2.12 GDI of the Six Provinces (2008)

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
GDI Rank	62/63	57/63	60/63	61/63	63/63	59/63
GDI	0.566	0.643	0.630	0.594	0.531	0.637
Life Expectancy at Birth (M)	63.06	63.55	65.53	62.48	60.38	65.9
Life Expectancy at Birth (F)	69.11	69.56	71.53	68.58	66.57	71.87
Adult Literacy Rate (M)	84.05	86.73	88.4	83.41	75.5	90.45
Adult Literacy Rate (F)	62.71	74.58	78.74	60.47	48.05	72.33
Combined Gross Enrolment Ratio (M)(%)	61.23	61.47	59.74	78.48	65.59	71.27
Combined Gross Enrolment Ratio (F)(%)	54.39	59.35	56.31	55.33	51.42	55.01
GDP per Capita (M) (PPP USD)	681.2	2,020.00	1,158.10	1,071.30	965.4	1,243.20
GDP per Capita (F) (PPP USD)	918.4	1,993.70	1,285.00	1,488.00	836.2	1,540.70
Population Share (M)	49.5	50.2	49.9	50.2	50.7	49.6
Population Share (F)	50.5	49.8	50.1	49.8	49.3	50.4
Life Expectancy Index (M)	0.68	0.68	0.72	0.67	0.63	0.72
Life Expectancy Index (F)	0.69	0.7	0.73	0.68	0.65	0.74
Equally Distributed Life Expectancy Index	0.68	0.69	0.73	0.68	0.64	0.73
Education Index (M)	0.76	0.78	0.79	0.82	0.72	0.84
Education Index (F)	0.6	0.7	0.71	0.59	0.49	0.67
Equally Distributed Education Index	0.67	0.74	0.75	0.68	0.59	0.74
Income Index (M)	0.32	0.5	0.41	0.4	0.38	0.42
Income Index (F)	0.37	0.5	0.43	0.45	0.35	0.46
Equally Distributed Income Index	0.34	0.5	0.42	0.42	0.37	0.44

Source: UNDP, Social Services for Human Development - Vietnam Development Report 2011

Moreover, women from ethnic minorities are more affected by gender gap. For example, 16% of ethnic minority girls (11% of boys) do not attend primary school and 32% of the girls (20% of the boys) do not attend lower-secondary school according to the United Nations Educational Scientific and Cultural Organization: (UNESCO).

I-3.3 Development Plans

I-3.3.1 Agriculture Development Plans

(1) Objectives

The objectives of the agriculture development plans of the six provinces for the next five years from 2016 to 2020 are summarized in the table below.

Table I-3.3.1 Objectives of the Agriculture Development Plans of the Six Provinces

Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
✓ Application of science and technology in agricultural production.	✓ Formation of regional agricultural production with high technology in Sa Pa, Bac Ha.	✓ Construction of specialized production areas, high technology applications to improve productivity, quality and economic efficiency of	✓ Priority basis to invest in plant and animal species that have high economic efficiency; develop long-term industrial crops such as	✓ Exploiting the potential and strengths of the province. ✓ Conversion of agricultural production from the extensive, intensive, and self-sufficiency to produce	✓ Promoting the application of science and technology. ✓ Promoting Public-Private Partnership (PPP) role
✓ Construction of infrastructure to meet the producers.	Center on seed production				
✓ Diversifying					

<ul style="list-style-type: none"> production links, linking production to markets. ✓ Focus on livestock development. ✓ Prioritize the development of crops with high economic value. ✓ Use resources in a reasonable manner. 	<ul style="list-style-type: none"> (rice, potatoes, fruit trees of temperate areas, etc.) ✓ Linking agricultural production, processing, and marketing of products. ✓ Improving the efficiency of land use, stable rice area. 	<ul style="list-style-type: none"> ✓ crops. ✓ Replication of successful models. ✓ Focus on developing a number of crops of high economic value. ✓ Livestock development in the form of concentrated farms. 	<ul style="list-style-type: none"> coffee, rubber, tea; cattle raising; forestry, mining and forest products processing ✓ Focus on developing livestock and poultry; ✓ Development of agricultural production by region, maximizing the potential advantages; promoting the application of advanced science and technology to enhance productivity, quality assurance, and food safety. 	<ul style="list-style-type: none"> goods for sale. ✓ Improving the value of agricultural products. ✓ Environmental protection. ✓ Rapid poverty reduction and sustainability. 	<ul style="list-style-type: none"> of economic cooperation, and linkages associated with processing, production, and consumption ✓ Linking production to markets
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Source: Province DARD

(2) Targets of Value Addition

The targets of value addition are shown in the table below:

Table I-3.3.2 Value Added Agriculture Production in the Agriculture Development Plans of the Six Provinces

	Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020
Growth rate of value added agriculture production (%)	4.50	3.30 ¹⁾	6.00	6.00	5.00	5.00	7.71 ²⁾	5.89 ²⁾	9.60	7.70	7.87	7.61
Value added agriculture production (VND in billions)	1,293	1,718 ¹⁾	4,412	6,154	1,879	2,284	2,101	2,703	1,381	1,796	8,512 ²⁾	11,850 ²⁾

	Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020
Share of agriculture in the economic sector (%)	36.2	28.6	22.4	11.8	29.0	25.0	22.48	19.36	24.0	20.0	37.0	32.5

¹⁾ Calculated based on production value ²⁾ Calculated based on production value added

Source: Province DARD, Province Statistical yearbook

Among the six provinces, the provincial value added agriculture production is highest in Son La followed by Lao Cai in 2016 and 2020. On the other hand, Lai Chau and Ha Giang have the lowest among the provinces. Growth rate of value added agriculture production is set at 4%-9%/year for all the provinces.

The share of agriculture in the economic sectors of the provinces was estimated at 22%~37% in 2015. On the other hand, in 2020, agriculture will occupy 11%~32% of the provincial economic sectors,

which is slightly reduced compared in 2015, indicating the development of secondary industry and tertiary industry like manufacturing and service sectors, as expected in these plans. In the economic sectors of the provinces, it is observed that Son La has the highest ratio in terms of agriculture, while Lao Cai has the lowest. This observation is supposed to be influenced by the characteristics of these two provinces, wherein, Son La is an advanced agricultural province while Lao Cai develops the secondary and tertiary sectors, as characterized by trading with China.

(3) Targets of Agricultural Production

The target figures of agricultural production are summarized in the table below:

Table I-3.3.3 Three Target Products in the Plans

		Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
		2016	2020	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020
Paddy	Product. (1000 t)	212.7	219.6	150.9	155.0	198.0	230	175.0	182.5	130.8	122.0	180.0	188.0
	Area (1000 ha)	36.9	37.17	30.3	30.40	39.6	39.50	49.4 ¹⁾	41.00	30.5	28.04	49.4	43.64
Maize	Product. (1000 t)	190.5	201.9	129.2	145.0	87.0	91.0	78.0	77.83	67.2	78.0	618.0	428.0
	Area (1000 ha)	53.7	54.20	35.7	36.00	28.0	28.00	29.9 ¹⁾	30.00	22.7	22.98	151.8	100.00
Soy beans	Product. (1000 t)	32.2	36.7	5.5	6.3	0.6	0.7	7.23 ¹⁾	-	2.2	2.87	4.24	10.8
	Area (1000 ha)	24.2	24.37	5.0	5.50	0.5	0.5	5.54 ¹⁾	-	2.1	2.52	3.4	7.50
Other target agricultural items		Tea, Ground nuts, Fruits, Medicinal Plants, Forest, Meat, Aquaculture		Tea, Vegetable Medicinal Plants, Flower, Forest Aquaculture		Tea, Cassava, Fruits, Cinnamon Aquaculture		Coffee, Tea, Cotton, Rubber Meat, Forest Aquaculture		Tea, Cinnamon, Rubber, Forest, Meat, Aquaculture		Coffee, Tea Sugarcane, Cotton, Rubber, Meat, Fruits, Milk, Forest Aquaculture	

1): Data is from DB Province Statistical Book 2014

Source: Province DARD, Province Statistical Book

Table I-3.3.4 Other Agriculture Related Products in the Plans

		Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
		2016	2020	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020
Coffee Product (1000 t)		-	-	-	-	-	-	6.70	10.71	-	-	14.83	24
Area (1000 ha)		-	-	-	-	-	-	-	-	-	-	11.72	13
Tea: Product (1000 t)		74.80	91.48	19.78	27	87.00	100	-	-	23.17	33.26	38.37	49
Area (1000 ha)		21.30	23.2	5.42	6.07	11.42	12.3	-	-	4.06	4.5	4.32	6
Sugarcane:													
Product (1000 t)		-	-	-	-	15.60	16.5	-	-	-	-	370.50	382
Area (1000 ha)		-	-	-	-	0.60	0.6	-	-	-	-	5.48	5.48
Rubber: Product (1000 t)		-	-	-	-	-	-	0.16	4.14	-	-	-	-
Area (1000 ha)		-	-	-	-	3.00	3	-	-	13.27	14.28	-	-
Meat (1000 t)		35.10	44	40.31	50.8	40.30	46	19.19	28.3	13.50	21.5	55.00	66
Fruits (1000 t)		20.62	34.44	75.48	95.8	38.00	50	-	-	3.85	4.5	108.24	131.0
Fresh milk (million liter)		-	-	-	-	-	-	-	-	-	-	73.00	128
Aquaculture													
Product (1000t),		2.05	2.43	6.34	8.41	8.00	10.8	2.24	2.99	2.29	4.92	6.74	7.89
Area(1000ha)		2.15	2.25	1.92	2.1	2.30	2.3	2.02	2.08	0.84	1.01	2.58	2.9

Source: Province DARD

Paddy: Production is planned to be increased slightly since the area is not planned for further expansion. This is intended to be achieved mostly by yield increase.

Maize: There is a similar tendency as paddy rice, wherein, agricultural plans show an increased tendency for production with slight increase or almost same area except for Son La. Son La plans to greatly reduce its cultivated area due to its policy to protect the forest land (current sharp expansion is achieved by using forest land).

Soy bean: Tendency is similar to the rest. The cultivated area in Son La is planned to be expanded referring to the increase in consumption.

Generally, across the six provinces, it can be said that the areas of these annual crops including cereals are not planned to be increased drastically most likely due to topographical conditions. Instead, increase in production is planned to be achieved mostly by unit yield increase. On the other hand, areas of industrial crops and fruit trees are planned to be increased. The six provinces have the objectives in their agriculture development plans to put emphasis on quantity and quality of agricultural products, and to invest in agricultural production which has high economic efficiency and high added value.

Each province also has a five-year plan for other products aside from the three target crops, such as perennial crops, livestock, and aquaculture. Other agriculture products emphasized in the plans are summarized below (some are not included in the table above).

- Dien Bien: coffee, rubber, fruits, meat production, and cotton.
- Son La: coffee, tea, sugarcane, fruits, cotton, meat, and milk production.
- Lao Cai: tea, meat production, fruits, medicinal plants, and flower.
- Lai Chau: tea, rubber, coconuts, mango, fruits, and meat production.
- Ha Giang: tea, peanuts, medicinal plants, meat production, and fruits.
- Yen Bai: tea, sugarcane, cassava, meat production, and fruits.

I-3.3.2 Infrastructure Development Plans

(1) Development Plans

The Vietnamese government's main strategy for development comprises the ten-year Social Economic Development Strategy (SEDS) and the five-year Socio-Economic Development Plan (SEDP). In 2010, the Vietnamese government prepared the SEDS for 2011-2020 and the SEDP for 2011-2015. The infrastructure development plan was prepared by the respective provinces based on the SEDP for 2016-2020. The priority projects presented in Chapter 7 are basically nominated according to the infrastructure development plans in the SEDP for 2016-2020. The development targets and plans of the six provinces in the SEDP are summarized as shown in Table I-3.3.5.

Table I-3.3.5 Infrastructure Development Plans of Six Provinces in SEDP

Item	Ha Giang	Lao Cai	Yen Bai
1. Overall development concept, strategies and target	<ul style="list-style-type: none"> • Construct and develop the center of economic areas at the Thanh Thuy border gate, Xin Man – Do Long, San Pun – Dien Bong, Dong Van and Hoang Su Phi districts • Priority on development of tourism infrastructure in plateau area, western districts, and Ha Giang Capital • 	<ul style="list-style-type: none"> • High-speed economic growth • Become the center of the northern mountainous provinces 	<ul style="list-style-type: none"> • Economic development and structural transformation • Focus on comprehensive development and sustainability.

Item	Ha Giang	Lao Cai	Yen Bai
2. Sector Development			
Road	<ul style="list-style-type: none"> • Upgrade the main road: <ul style="list-style-type: none"> - Route from Ha Giang to Noi Bai - Lao Cai Expressway - National Road No. 279 • Upgrade the road connection to the commune centers 	<ul style="list-style-type: none"> • Construct the Noi Bai - Lao Cai Expressway, Phase 2 • Upgrading of NR70, NR4D, NR4E, NR4 and NR279 • Construct the provincial road network: <ul style="list-style-type: none"> - PR151: Tân An - Khe Sang Section - PR151B: Võ Lao - Nậm Rạng - Hòa Mạc - PR152: Upgrade the section: SaPa – Tân Phú - PR153: Connection from NR4 to NR279 - Newly constructed: Mường Khương - Nậm Chảy - PR158: Bản Vược - Sàng Ma Sáo - PR152 connect to NR 279 • Upgrade the district road: Sơn Hà – Cam Cộn – Tân Thượng to the provincial road. • Improve the existing rural road network. 	<ul style="list-style-type: none"> • National Road: <ul style="list-style-type: none"> - Invest in ring roads, bypass roads, bridges crossing the Hong River (Tuan Quant Bridge, bridge crosses the Red River in Co Puce Town) - Upgrading the national roads : NR37, NR32, etc. • Provincial Road: <ul style="list-style-type: none"> - Priority on the route connecting other provinces and Noi Bai – Lao Cai Expressway. - Mậu A - Tân Nguyên, Tân Nguyên - Phan Thanh - An Phú, - Văn Chân - Trạm Tầu - Mù Cang Chải - NR70 – Rescue road in the flood season in Yen Bai City - An Thịnh - Đại Sơn - Mỏ Vàng - An Lương - NR 32C • Rural Road: <ul style="list-style-type: none"> - Upgrade the district road and commune road to Grade VI, and rural road Class A,B
Irrigation	<ul style="list-style-type: none"> • Upgrade the protection dikes for river/stream embankments at highly collapsible locations • Priority on the construction of reservoir and irrigation system for the mountainous area (especially remote areas) 	<ul style="list-style-type: none"> • Improve the existing irrigation systems. • Upgrade and improve the Coc Ly Irrigation System in Bac Ha District. • New construction in Van Ban, Sa Pa, Bao Thang, Muong Khuong, Bao Yen, Bat Xat districts. • Construct the protection dike for border river. 	<ul style="list-style-type: none"> • Improve the old irrigation systems and lining canals • Construct the flood dike, protection dike for the Red River bank. Construct the pumping station along the Red River. • Rehabilitation of the small irrigation systems (Luc Yen irrigation network, Tu Le, Northern Tran Yen, Southern Van Yen, Dong Ho reservoir, etc.)
Water Supply	<ul style="list-style-type: none"> • Priority on the rural water supply for minority people in remote areas • Water supply coverage by 2020: <ul style="list-style-type: none"> - Rural area: more than 86.8% - Urban area: more than 91% 	<ul style="list-style-type: none"> • Priority on water supply systems for the mountainous area: Muong Khuong, Bac Ha districts, etc. • Urban WS: <ul style="list-style-type: none"> - Lao Cai City: upgrading the capacity of Cam Đường Water Treatment Plant - Districts: Newly constructed and upgrade of the existing treatment plants. • Rural WS: <ul style="list-style-type: none"> - Construct the rural system for remote area, boundary and resettlement area. 	<ul style="list-style-type: none"> • Urban Water Supply (WS) <ul style="list-style-type: none"> - Construct the network of secondary and tertiary pipes. - Construct the WS plant in Mu Cang Chai Town. - Expand and upgrade the existing WS plant in Mau A, Yen Binh, Nghia Lo towns. - Expand the tertiary pipe network in Co Phuc WS Plant. - Expand WS plant in Van Yen Industrial Zone and Van Chan - Newly constructed systems for Lien Son Farm, Tran Phu Town, Ba Khe, Khanh Hoa Town and Mu Cang Chai. • Rural WS <ul style="list-style-type: none"> - Construct the rural systems for remote area.
Electrification	<ul style="list-style-type: none"> • Priority on electrification for industrial zone, tourism area and new residential areas 	<ul style="list-style-type: none"> • By 2020, 100% of communes, 95% of hamlets (more than 20 H.H) and 90% of households in rural area are electrified. 100% of households in urban area are electrified. 	<ul style="list-style-type: none"> • Upgrading and improvement of the existing systems and new construction for remote area

Item	Dien Bien	Lai Chau	Son La
1. Overall development concept, strategies and target	<ul style="list-style-type: none"> In 2020, complete the improvement of national road network, provincial road, and airport. Complete the infrastructures of the center's new district, infrastructure of Huoi Puoc border gate, and A Pa Chai border gate. 	<ul style="list-style-type: none"> Economic development and structural transformation Get out of the lagged-behind provincial development status 	<ul style="list-style-type: none"> Focus on economic development in forestry, agriculture, and new rural construction. Focus on economic development in the three main areas: Areas along NR 6, the Da River area, and the boundary mountainous area.
2. Sector Development			
Road	<ul style="list-style-type: none"> Upgrade NR12, 279, 6A and 4H and the provincial road (Grade IV, V) Complete the provincial road: <ul style="list-style-type: none"> Km 45 (NR4H) – Na Hy, Nậm Pồ District. Nà Nhạn – Mường Phăng, Dien Bien District. Nà Hỳ - Mường Bùng, Muong Nhe District. Construct the main route: <ul style="list-style-type: none"> Phi Nhừ - Phình Giàng – Pú Hồng – Mường Nhà Chà Cang – Nà Khoa – Nậm Nhừ - Nậm Chua – Nà Hỳ Nà Sang – Huổi Mí – Nậm Mức – Tủa Chùa – Huổi Lóng Rural road: <ul style="list-style-type: none"> 100% of commune centers are connected by roads. 100% of district roads and the 50% commune roads are paved by asphalted. 	<ul style="list-style-type: none"> Construct the route connection from Noi Bai – Lao Cai Expressway to Lai Chau Capital – Ma Lung Thang border gate Improve NR 32, NR 279, NR 4D and NR 12. Invest to Lai Chau Airport at Tân Uyên Dist. Construct road network and bridges crossing the Da River at the west of Muong Te District Upgrade the provincial roads and district roads to Grade IV and V. Improve the roads connecting the center of communes (improve pavement, drainage systems, etc.) 	<ul style="list-style-type: none"> Promote the construction works at the urban area (Son La City, Moc Chau Town, Hat Lot Town). Upgrading and improving the main national roads: NR 6, NR 37, NR 43, NR 279 and NR 4G connecting to Sop Cop District. Improve the provincial road network Rural road: 100% of the commune centers are connected by roads
Irrigation	<ul style="list-style-type: none"> Improve the old irrigation system and lining canal network. Construction of irrigation systems: <ul style="list-style-type: none"> Nuôi Khâm Hu Irrigation System, Điện Biên District Au Cang Reservoir, Mường Nạ District Huổi Cánh Reservoir, Điện Biên District Nậm Xá Reservoir, Mường Nhé District Na Pa Khoang Reservoir, Điện Biên Đông District 	<ul style="list-style-type: none"> Upgrade, improve the lining canals. <ul style="list-style-type: none"> 100% of lined canals. 90% of winter - summer crops and 100% of autumn - winter crops to be irrigated and drained 	<ul style="list-style-type: none"> Upgrade the lining of the existing systems in the Da River basin and Ma River basin. Construct the small-scale irrigation systems in the border area and remote area.
Water Supply	<ul style="list-style-type: none"> Improve water supply system in Dien Bien Phu City, Dien Bien District and neighboring area of Dien Bien Valley Newly constructed water supply system for Muong Ang and Nam Po districts. Construct the rural water supply systems for remote area, boundary and resettlement areas. 	<ul style="list-style-type: none"> Improve and construct clean water supply systems for the provincial and district towns. Continue to construct water supply facilities for rural areas (priority is on the difficult areas) Clean water used by 100% of rural population 	<ul style="list-style-type: none"> More than 98% coverage of water supply in urban area

Item	Dien Bien	Lai Chau	Son La
Electrification	<ul style="list-style-type: none"> Complete construction of: <ul style="list-style-type: none"> MVL (747,384 km, 35/22kV); Transformer (35 No, 22/0.4 kV) LVL: (924,085km ,0.4kV) 	<ul style="list-style-type: none"> Construct HVL 500 kV: Nậm Hàng (LaiChau Hydropower - Mường La/Son La Hydropower) HVL 110 KV: Lai Châu - Phong Thổ - Sìn Hồ - Nậm Hàng, Bình Lư - Than Uyên - Bản Chát, Xéo Chung Hồ - Lào Cai. Construct and improve MVLS, LVLs network for communes. 	<ul style="list-style-type: none"> Develop the rural electricity grid. Complete the 500 kV (Pi Tong) and 220 kV (Mường Bàng) transformer stations Upgrade and improve the existing systems and new construction for remote area. Electrification rate at 97.5%

Source : Provincial SEDS

(2) Development Projects

Based on the provincial SEDS, the six provinces prepared their infrastructure development projects for 2011-2020 and their necessary investment fund was estimated. The investment requirement of irrigation, road, water supply and electricity in the six provinces varies from VND 15,749 billion in Lai Chau to VND 26,294 billion in Yen Bai as follow:

Table I-3.3.6 Infrastructure Development Projects of the Six Provinces in SEDS, 2011-2020

Sector	Unit	Ha Giang			Lao Cai			Yen Bai		
		Quantity	Project No.	Construction Cost (VND Million)	Quantity	Project No.	Construction Cost (VND Million)	Quantity	Project No.	Construction Cost (VND Million)
Irrigation	ha	17,212	532	5,163,649	17,584	916	846,892	33,500	431	7,179,000
Road	km									
Provincial		365	9	4,380,000	551.00	24	6,821,600	505	24	9,694,695
District		126	97	859,446	921.90	64	2,221,600	772	168	2,868,480
Communal		805	272	2,230,865	4,626.00	1032	2,489,000	1,270	335	1,606,837
Urban		81	11	972,000	332.40	35	4,134,369	143	35	2,863,338
Water supply										
Urban	capacity (m ³ /day)	16,500	15	365,000	88,100	30	805,079	78,000	477	639,328
Rural	person	179,940	983	2,685,815	201,968	663	941,400	56,388	17	220,000
Electricity	person	147,690	223		366,606	-	-	50,796	-	-
	km	2,109	145	1,224,591	1,575	13	1,287,000	2,514	25	1,223,032
Total		-	2,287	17,881,366	-	2,777	19,546,940	-	1,512	26,294,710
Sector	Unit	Dien Bien			Lai Chau			Son La		
		Quantity	Project No.	Construction Cost (VND Million)	Quantity	Project No.	Construction Cost (VND Million)	Quantity	Project No.	Construction Cost (VND Million)
Irrigation	ha	17,460	335	4,023,103	29,300	297	1,500,000	9,560	142	2,868,000
Road	km									
Provincial		296	15	1,876,668	152	2	2,404,500	464	11	3,941,646
District		1,322	102	3,305,789	649	64	1,623,500	735	57	1,925,560
Communal		2,972	630	3,287,161	2,131	950	3,195,900	3,972	1032	2,090,752
Urban		130	23	1,597,970	174	50	869,000	156	8	1,248,000
Water supply										
Urban	capacity (m ³ /day)	23,000	6	343,721	29,000	14	349,340	44,500	11	1,425,000
Rural	person	174,868	490	734,446	145,000	500	5,000,000	335,340	1,456	1,563,064
Electricity	person				474,342			36,713		
	km	1,334	129	1,027,121	4,141	2	807,000	2,060	26	1,250,000
Total		-	1,730	16,195,978	-	1,879	15,749,240	-	2,743	16,312,022

Source : DPIs

I-3.4 Donors' Assistance

I-3.4.1 Assistance by JICA

JICA's major assistance in the six provinces for the last ten years was as follows: a) eight agricultural projects, b) four forestry sector projects, c) one health sector project, and d) eight loan projects covering the Rehabilitation Loan I-II and Sector Project Loan I-VI. The assistance projects include three development studies and ten project-type technical assistance (TA). The Northwest Region Rural Development Project is one of the project-type technical assistance. Two JICA volunteers under the

Japan Overseas Cooperation Volunteer (JOCV) program were dispatched to Tay Back University in Son La City and Son La Rehabilitation Hospital.

Table I-3.4.1 JICA's Assistance for the Northern Six Provinces

Sector / Project Name	Kind of Assistance Implementation	Target Provinces	Activities
Agriculture			
Artisan Craft Development Plan for Rural Industrialization	Study Feb. 2002 – Feb. 2004	Whole Country	Study on artisan craft status and development, pilot project implementation in the four model provinces, and preparation of master plan (MP)
Project of Improvement of Productive Technology in Small and Medium Dairy Farms in Vietnam	Project Type TA Apr. 2006 – Apr. 2011	Sol La (Moc Chau istrict) and three other provinces	Capacity development of extension staff for small-medium scale dairy farming Demonstration of technology
Master Plan Study on Improvement of Rural Living Condition in North-western Mountainous Region	Study Jan. 2007- Sep. 2008	Hanoi, Hoa Binh, Son La, Dien Bien and Lai Chau	Preparation of MP for agricultural development in the regions and feasibility study (FS) for the priority projects
Project on Capacity Development on Artisan Craft Promotion for Socio-economic Development in Rural Area	Project Type TA Nov. 2008 – Oct. 2011	Hoa Binh, Son La, Dien Bien, Lai Chau	TA for promoting artisan craft and local industries through capacity development programs and implementation of pilot projects
Strengthening the Capacities for the Field of Management of Vietnam's Crop Production Sector for Improving the Productivity and Quality of Crop's Products	Project Type TA Jun. 2010 – Dec. 2013	Nationwide and pilot provinces	TA on plant variety protection activities and extension of safe crop's production
Project for the Development of Crop Genotypes for the Midlands and Mountain Areas of North Vietnam	Project Type TA Dec. 2010 – Dec. 2015	North Vietnam (Hanoi University of Agriculture)	TA on genetic survey and identification of useful genes, DNA marker assisted selection, development of promising line, testing ecological adaptability of lines developed
Project for Strengthening of Tay Bac University for Sustainable Rural Development of the Northwest Region <i>(Japan Overseas Cooperation Volunteer: Tay Bac University)</i>	Project Type TA Feb. 2011 – Dec. 2014	Tay Bac University, Son La	Capacity development for improving education, research and outreach activities on agriculture and forestry (Disease and Pest Control)
Northwest Region Rural Development Project	Project Type TA Aug. 2010 – Jul. 2015	Dien Bien	TA for formulating need-based extension system at three pilot districts for rice, maize, and soybean, and irrigation water management, preparation of manual and guideline, and capacity development of extension system.
Forestry			
Capacity Building for Preparing Feasibility Studies and Implementation Plans for Afforestation Projects in the Socialist Republic of Viet Nam	Study Feb. 2007 – Jul. 2007	Nationwide, five provinces including Son La	Study and capacity development on preparing F/S and implementation plan
Project for Sustainable Forest Management in the Northwest Watershed Area	Project Type TA Aug. 2010 – Aug. 2015	Dien Bien	TA on the REDD+ action plan, and participatory forest management and livelihood development
Dien Bien REDD + Pilot Project	Project Type TA Mar. 2012 – Dec. 2013	Dien Bien	TA on formulation of the REDD+ action plan for pilot areas, developing monitoring system, and modifying benefit distribution system
Sustainable Natural resource Management Project	Project Type TA Aug. 2015 – Aug. 2020	Dien Bien, Son La, Lai Chau, Hoa Binh, Lam Dong	TA for promoting forestry sector policies and REDD+action plan, and data basing forestry ecosystem information and resources

Health			
Project for Strengthening Medical Service in Northwest Provinces (<i>Japan Overseas Cooperation Volunteer: Son La Rehabilitation Hospital</i>)	Project Type TA Mar. 2013 – Mar. 2017	Hoan Binh, Son La, Dien Bien, Lao Cai, Lai Chau, Yen Bai	TA for strengthening managerial capacity of MOH on direction office for healthcare activities and referral system (Physical therapy)
Infrastructure Development			
Rehabilitation Loan I-II, Sector Project Loan I-VI (8 loan projects)	Loan Projects 1994 - 2015	Son La, Dien Bien, Lao Cai, Lai Chau, Yen Bai, Ha Giang, and nationwide target poor provinces	Provision of construction loan for road, water supply, irrigation and electricity distribution, strengthening the capacity of implementing agencies and maximizing investment impact

Source: JICA Web Information

I-3.4.2 Other Donors Assistance

(1) Development Banks

Table I-3.4.2 below shows the summary of the current projects by the World Bank and the Asian Development Bank which are related to the new project and include the six target provinces (refer to Attachment I-3.5.1 for more details).

Table I-3.4.2 Summary of Projects in the Target Provinces

	Number of Project and Sector	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
WB	Total of Seven Projects ✓ General agriculture, fishing and forestry: 2 ✓ General transportation, rural and inter-urban roads and highways: 1 ✓ Irrigation and drainage: 1 ✓ General water, sanitation and flood protection: 2 ✓ Water supply: 1	3 projects /7	3 projects /7	4 projects /7	4 projects/ 7	4 projects /7	4 projects /7
ADB	Total of Two Projects ✓ Agriculture, natural resources, and rural development: 1 ✓ Transportation: 1	2 projects /2	1 projects /2	2 projects /2	1 projects /2	2 projects /2	1 projects /2
Total	Nine projects in total	5/9	4/9	6/9	5/9	6/9	5/9

Remarks: The above are loan and on-going projects for ADB, and active projects for WB.

Source: Prepared by the JICA Survey Team based on the websites of both banks

In terms of number of projects which include some components in the target provinces, it can be concluded that the six provinces are almost equally targeted. The project contents include access improvement (road), water supply (urban and rural), irrigation, urban infrastructure, and capacity building.

(2) Other Donor

The Korean International Cooperation Agency (KOICA) implements the “Lao Cai Hanh Phuc (Happiness) Program with Sharing Development Experience of Saemaul Undong in Vietnam” in Lao Cai Province. This program was formulated in line with the National Targeted Program of New Rural Development (NTP on NRD). The period is from December 2014 to February 2018 with a program cost of USD 14 million. There are four components, namely: 1) regional social development which includes village road (481 km), 2) capacity building on education, 3) capacity building on health, and 4) capacity building on local government.

CHAPTER I-4 CURRENT CONDITION OF AGRICULTURE IN THE SIX TARGET PROVINCES

I-4.1 Agriculture Land Use

Among the six provinces, the percentage of land use for agriculture (about 20%) is high in Son La, which has the largest total land area, followed by Ha Giang. On the other hand, the percentage is relatively low in Lai Chau at about 10%.

The percentage of land use for forest is high in Lai Chau at over 80%. In Son La and Lao Cai, it is about 50% (Son La has the lowest percentage of land use for forest at 45%).

The provinces with higher percentage of land use other than for agriculture are Son La and Lao Cai, with each having beyond 30%. On the other hand, Lai Chau and Ha Giang have only about 9% each. It can be inferred that the expansion of urban areas and the attraction of factories are progressing in Son La and Lao Cai considering their high gross domestic product (GDP), compared with the other provinces.

Table I-4.1.1 Land Use (ha) in the Six Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Agricultural Land	155,562	83,585	109,320	143,420	92,998	289,071
Annual crop	126,907	62,656	64,187	130,352	68,411	246,845
Perennial crop	28,655	20,929	45,133	13,068	24,587	42,226
Forest Land	561,766	336,210	474,121	637,817	738,994	641,092
Others	74,161	218,595	105,188	175,053	74,896	487,281
Total	791,489	638,390	688,628	956,290	906,888	1,417,444

Source: Six Provinces' Statistical Books 2014

Table I-4.1.2 Land Use (%) in the Six Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Agricultural Land	19.7	13.1	15.9	15.0	10.3	20.4
Annual crop	16.0	9.8	9.3	13.6	7.5	17.4
Perennial crop	3.6	3.3	6.6	1.4	2.7	3.0
Forest Land	71.0	52.7	68.9	66.7	81.5	45.3
Others	9.4	34.2	15.3	18.3	8.3	34.4
Total	100	100	100	100	100	100

Source: Six Provinces' Statistical Books 2014

I-4.2 Agriculture Working Population

I-4.2.1 Rural and Urban Working Population

The province with the largest labour force is Son La with 730,290. On other hand, the lowest is Lai Chau with less than 250,000. The percentages of the labourers in relation to the province's population are 55% and 57% in Dien Bien and Lai Chau, respectively. The other four provinces have between 62% and 68%.

The percentage of rural labourers in relation to the total province's labour force is as high as 79% and 87%. The rural inhabitants rely on agriculture for their livelihood. Local agricultural development is important in order to improve the living conditions of farmers.

Table I-4.2.1 Population and Rural and Urban Working Population in the Six Provinces in 2014

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Population	792,472	665,152	783,534	538,069	432,303	1,169,600
Total No. of Labour force	542,403	412,623	501,567	293,290	246,665	730,290
Total Labour Force to Population (%)	68	63	64	55	57	62
No. of Rural Labour Force	457,003	327,955	407,981	250,177	203,259	637,530
Rural to Total (%)	84	79	81	85	82	87

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. of Urban Labour Force	85,400	84,668	93,586	43,113	43,406	92,760
Urban to Total (%)	16	21	19	15	18	13

*Labour force: More than 15 years old.

Source: Provinces' Statistical Books, 2014

I-4.2.2 Change of Agriculture Working Population

Assuming that the labour population is 100 in 2010, the number of labourers in each province in 2014 is between 109 and 118. This shows the increase in labour force. Within the labour force, rural labourers increased to between 105 and 116. However, urban labourers increased to between 106 and 136, surpassing the increase of rural labourers.

For the last five years, the growth rates of rural labourers in Dien Bien and Lai Chau are lower than those of the other provinces, and the growth rate of the urban labourers is higher. This suggests that there is migration from the rural areas to the urban areas and other provinces which are more economically developed.

Overall, the growth tendency of the agricultural working population to the total population is supposed to continue in the future, although the speed of increment would be lower than that of urban labour. However, agricultural development in the rural area is still the most important for farmers to obtain more income from farming and improve their livelihood.

Table I-4.2.2 Comparison of Working Population between 2010 and 2014

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Total No. of Labour Force	118	116	112	109 ¹⁾	108	113
No. of Rural Labour Force	115	116	110	107	105	114
No. of Urban Labour Force	136	115	117	128	130	106

¹⁾ Labour population is 100 in 2010.

Source: Calculated based on Province Statistical Books, 2014

I-4.3 Agriculture Production

I-4.3.1 Main Crop Production in the Six Provinces

(1) Agriculture Area by Different Crop Group

Using the data in Table I-4.1.1, the share of annual and perennial areas out of the agriculture production area is shown in Table I-4.3.1.

Table I-4.3.1 Land Use (ha) in the Six Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Agricultural Production Area (% to total)	155,562 (100%)	83,585 (100%)	109,320 (100%)	143,420 (100%)	92,998 (100%)	289,071 (100%)
Annual crop (% to total)	126,907 (82%)	62,656 (75%)	64,187 (59%)	130,352 (91%)	68,411 (74%)	246,845 (85%)
Perennial crop (% to total)	28,655 (18%)	20,929 (25%)	45,133 (41%)	13,068 (9%)	24,587 (26%)	42,226 (15%)

Source: Six Province Statistical Books, 2014

In the six provinces, it can be inferred that annual crops are the more dominant crops than the perennial crops, even though the six target provinces are in the mountainous areas. The perennial crops area in Yen Bai has the largest share to the agriculture production area, meaning that crops are diversified.

(2) Cultivated Area of Main Crops

The following table shows the cultivated areas of main crops. The crops with larger size of cultivated areas are placed in the upper rows of the table.

Table I-4.3.2 Main Crops Cultivated in the Six Provinces (2014)

(Unit:1000 ha)

Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
Maize	54.2	Maize	39.1	All paddy	40.9	All paddy	49.4	All paddy	30.4	Maize	162
All paddy	37.4	All paddy	30.8	Maize	28.4	Maize	29.9	Maize	22.1	All paddy	54.3
Soybean	23.7	Vegetable	10.7	Cassava	16.4	Cassava	7.2	Rubber	12.5	Cassava	30.5
Vegetable	22.8	Cassava	9	Tea	11.4	Soybean	5.5	Cassava	4.4	Coffee	11.2
Tea	20.4	Soybean	4.8	Vegetable and Beans	9.1	Rubber	5.2	Soybeans	2.4	Rubber	6.4
Peanut	8.2	Tea	4.5	Sweet potato	2.8	Vegetable and Beans	4.6	Tea	3	Vegetable	6.1
Cassava	5	Rubber	1.9	Rubber	2.1	Coffee	4	Vegetable	2.8	Sugar cane	5.2
Sweet potato	1.7	Peanut	1.7							Tea	4
Rubber	1.4										

All paddy area includes the areas of dry season paddy, rainy season paddy, and upland paddy.

Source: Province Statistical Book 2014

In the six provinces, there are many different kinds of main production crops such as paddy, maize, soybeans, upland paddy, cassava, sugarcane, sweet potato, peanuts, vegetables, and industrial crops such as tea, coffee, and rubber. These different specific crops are cultivated in different areas with suitable natural environment and social condition. Across the six provinces, maize and paddy are the two main crops in terms of overall cultivated areas.

(3) Area, Yield, and Production of Paddy

In these areas, paddy cultivation can be divided into three categories. One is dry season paddy, another is rainy season paddy, and lastly, upland paddy. The former two are lowland paddy, which require plenty of water, and their difference is by season. The latter one does not require a lot of water similar to upland crops and is normally practiced in the mountainous areas through traditional cultivation (e.g., slash and burn/shifting cultivation). Area, yield, and production of paddy are summarized in Table I-4.3.3 below.

Table I-4.3.3 Area, Yield, Production of Paddy (2014)

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Total Paddy Area (ha)	37,395	30,762	40,920	49,401	30,444	54,137
Dry	9,481	9,880	19,036	8,476	6,223	11,410
Rainy	27,163	20,395	21,884	16,928	19,565	18,177
Upland	751	487	NA	23,997	4,656	24,550
Total Paddy Yield (ton/ha)	5.6	4.8	4.9	3.5	4.2	3.4
Dry	5.6	5.5	5.3	6.1	5.4	6.0
Rainy	5.6	4.6	4.6	5.0	4.5	4.4
Upland	2.2	1.1	-	1.4	1.0	1.3
Total Paddy Production (ton)	207,968	148,348	202,402	170,557	127,090	181,202
Dry	52,949	54,753	101,026	51,285	33,850	68,520
Rainy	153,359	93,079	101,376	85,254	88,440	80,792
Upland	1,660	516	-	34,018	4,800	31,890

Total area and total production of paddy in Son La are not exactly the same as the sum of the three paddy areas.

Source: Provinces' Statistical Books 2014

Overall total paddy: The biggest area is in Son La followed by Dien Bien. Ha Gaing's overall yield is the highest at 5.6 t/ha, and Yen Bai and Lao Cai are in the next tier at 4.9 t/ha and 4.8 t/ha,

respectively. Total paddy production of Ha Giang is the largest (207,968 t), followed by Yen Bai (202,402 t). Characteristics of the dry/rainy season paddy are discussed later.

Upland paddy: Cultivation area in Dien Bien and Son La is the largest at around 24,000 ha each. On the other hand, Lao Cai, Ha Giang, and Yen Bai have upland paddy area of less than 1,000 ha each. Upland paddy is normally cultivated in rainfed and slope land without fertilizer and chemicals, and its average yield in the six provinces is quite low ranging from 1 to 2 t/ha.

(4) Area, and Production of Other Crops Except for the Three Target Crops

Area and production of other crops except for the three target crops are summarized in the table below:

Table I-4.3.4 Crop Production Excluding the Three Main Crops in the Six Provinces in 2014

Province		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Cassava	Area (ha)	5,018	9,054	16,499	7,247	4,420	30,540
	Production (t)	39,451	114,263	317,041	56,962	36,480	371,290
Sugar cane	Area (ha)	632	319	626	29	105	5,213
	Production (t)	15,666	8,197	15,946	632	5,292	350,504
Sweet potato	Area (ha)	1,742	957	2,840	698	0	328
	Production (t)	7,852	5,722	15,371	7,782	2	2,200
Peanut	Area (ha)	8,299	1,764	No data	1,557	No data	1,221
	Production (t)	16,445	2,016	No data	2,010	No data	1,277
Vegetable	Area (ha)	22,875	10,720	No data	NA	2,811	6,156
	Production (t)	116,312	115,228	No data	No data	19,198	82,546
Vegetable and Beans	Area (ha)	No data	No data	9,171	4,674	No data	No data
	Production (t)	No data	No data	97,791	71,329	No data	No data
Tea	Area (ha)	20,468	4,573	11,479	588	3,072	4,003
	Production (t)	65,348	14,217	87,808	78	22,635	33,138
Coffee	Area (ha)	No data	No data	No data	4,059	No data	11,296
	Production (t)	No data	No data	No data	3,718	No data	12,102
Rubber	Area (ha)	1,405	1,997	2,110	5,237	12,593	6,459
	Production (t)	No data	No data	No data	No data	No data	No data
Cotton	Area (ha)	No data	25	No data	346	No data	371
	Production (t)	No data	11	No data	512	No data	348

Source: Provinces' Statistical Books, 2014

Cassava cultivation area and production of the six provinces occupy 13% and 9% of the national area and production, respectively; however, its yield is lower. Among the six provinces, cassava cultivation area is largest in Son La at 30,540 ha, followed by Yen Bai at 16,499 ha, which occupy 43% and 23% of the total cassava area of the six provinces, respectively. Other provinces have 4,000~9,000 ha each. Cassava is also cultivated in the rainfed and slope land without fertilizer. Cassava is used as edible and starch material. Some of the starch is exported to other countries.

Sugarcane cultivation area is largest in Son La (5,213 ha), which occupies 75% of the total sugarcane area of the six provinces. Sugarcane area is only 2.3% of the national area.

Sweet potato cultivation area and production of the six provinces occupy 5% and 3% of the national area and production, respectively; however, its yield is lower. Among the six provinces, sweet potato cultivation area is biggest in Yen Bai (2,840 ha) followed by Ha Giang (1,742 ha), which occupy 43% and 27% of the total sweet potato area of the six provinces, respectively.

Peanut cultivation area is largest in Ha Giang (8,299 ha). Other provinces have about 1,500 ha each.

Vegetable cultivation area is largest in Ha Giang (22,874 ha), followed by Lao Cai (10,720 ha), then Son La (6,156 ha). Vegetable area and production have gradually increased in the provinces especially near Hanoi.

Tea cultivation area in the six provinces occupies 33% of the national tea area. In particular, Ha Giang is the largest tea producing area (20,468 ha), followed by Yen Bai (11,479 ha), which occupy 46% and

30% of the total tea area of the six provinces, respectively. Tea has already been exported. Tea cultivation area has gradually increased both in the whole country and in the six provinces.

Coffee cultivation area in the six provinces occupies less than 3% of the national area. Among the six provinces, coffee cultivation area is largest in Son La (11,296 ha), followed by Dien Bien (4,059 ha). Coffee has already been exported. Coffee cultivation area has gradually increased both in the country and in the six provinces.

Rubber cultivation area in the six provinces occupies only 3.0% of the national rubber area. Among the six provinces, Lai Chau has the largest rubber area (12,593 ha), followed by Son La (6,459 ha) and then, Dien Bien (5,237 ha). Rubber is exported to other countries. Rubber cultivation area has gradually expanded both in the country and in the six provinces.

I-4.3.2 Area, Production, and Yield of the Three Target Crops

(1) Area, Production, and Yield

Area, production, and yield of the three target crops, i.e.: paddy, maize, and soybean, are shown in Table I-4.3.5 below. For paddy, because the Northwest Region Rural Development (NORRD) Project in Vietnam targets irrigated paddy, dry season paddy is considered as a proxy of irrigated paddy. Cropping patterns of the three crops in the target provinces and the data in recent years are shown in Attachment I-4.3.1.

Table I-4.3.5 Production of Paddy, Maize and Soybeans in the Six Province in 2014

		Province	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Paddy	D ¹⁾	Area (ha)	9,481	9,880	19,036	8,476	6,223	11,410
		Production (t)	52,949	54,753	101,026	51,285	33,850	68,520
		Yield (t/ha)	5.58	5.54	5.31	6.05	5.44	6.01
	R ²⁾	Area (ha)	27,163	20,395	21,884	16,928	19,565	18,177
		Production (t)	153,359	93,079	101,376	85,254	88,440	80,792
		Yield (t/ha)	5.65	4.56	4.63	5.04	4.52	4.45
Maize	Area (ha)	54,215	39,132	28,471	29,929	22,150	162,510	
	Production (t)	178,428	117,702	83,612	76,101	62,130	657,660	
	Yield (t/ha)	3.29	3.01	2.94	2.54	2.81	4.06	
Soy beans	Area (ha)	23,758	4,881	334	5,543	2,491	2,086	
	Production (t)	30,482	5,323	409	7,234	2,730	2,646	
	Yield (t/ha)	1.28	1.09	1.19	1.30	1.10	1.26	

Note: ¹⁾ D: Dry season, ²⁾ R: Rainy season, there are some minor differences in yield on between calculation results (production/area) and the above figures (reported in the statistical yearbooks). The above is basically taken from the books.

Source: Six Provinces' Statistical Books, 2014

Paddy: Yen Bai has the largest dry season cropping area (19,036 ha). Yen Bai has relatively flat and large paddy fields, and it is inferred that the irrigation facilities are well maintained and actually used compared with other provinces. On the other hand, Ha Giang has the largest area for rainy season cropping (27,163 ha). The dry season paddy yield in Dien Bien and Son La is around 6.0 t/ha, which is slightly lower than the national average. In the other provinces, it is about 5.5 t/ha. Generally, cultivation area, production, and yield of paddy have gradually increased. This is attributed to irrigation facilities improvement and dissemination of varieties and cultivation techniques.

Maize: Son La's maize area occupies 48% (162,510 ha) of the total maize area of the six provinces. Son La produces 56% of maize by forming a large production area. Maize yield is 4.06 t/ha, and it is close to the national average (4.4 t/ha). In the other provinces, the cultivation area of maize is only between 15% and 33% of the area in Son La, and maize also has a low yield (2.5~3.3 t/ha) in these provinces. Recently, maize cultivation area in Son La has slightly reduced by 5% but production has increased by 22% compared with its production five years ago due to the provincial strategy of forest protection (some encroachment to the forest area has been an issue). In the other provinces, cultivation area and production have increased.

Soybean: The largest cultivation area for soybeans is in Ha Giang, which is 23,758 ha. The other provinces have only 20% of Ha Giang's area. Ha Giang has 61% of the total soybean area and 62% of the soybean production of the six provinces. Soybean yield in the six provinces is between 1.09 to 1.30 t/ha and this is below the national average (1.4 t/ha). Recently, there has been an increase of 14% of the soybean cultivation area in Ha Giang compared in 2010. In other provinces, there was either no change or large decrease. Especially, the areas in Son La and Yen Bai have been reduced by 72% and 63%, respectively. It is said that in both provinces, farmers lost interest in soybeans due to tedious care and lower economic returns unlike the other crops such as maize and industrial crops.

(2) Share of Cultivated Areas of Paddy, Maize, and Soybeans

To find out and compare the significance of the target crops in agriculture among the six provinces, the share of cultivation areas of paddy, maize, and soybean is calculated as shown in Table I-4.3.6 below.

Table I-4.3.6 Ratio of Crop Cultivation Area to Agricultural Land in the Six Provinces

Province	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
% of Paddy (D)* to Total Agriculture Land	6.1	11.8	17.4	5.9	6.7	3.9
% of Paddy (R)** to Total Agriculture Land	17.4	24.4	20.0	11.8	21.0	6.3
% of Maize to Total Agriculture Land	34.9	46.8	26.0	20.9	23.8	56.2
% of Soybeans to Total Agriculture Land	15.3	5.8	0.3	3.9	2.7	0.7

Source: Prepared by the JICA Survey Team based on statistical data, *: Dry season, **: Rainy season

Paddy: In the dry season, the province with the highest percentage of paddy cultivation area in relation to agricultural land is Yen Bai at 17.4%. On the other hand, in the rainy season, Lao Cai has the highest percentage at 24.4%. The lowest ratio in the dry and rainy seasons is Son La at 3.9% and 6.3%, respectively. It is assumed that rainy season paddy cultivation would include dry season paddy area. Basically, it can be understood that the area for paddy is relatively important as one of the major crops except in Son La.

Maize: The province with the highest percentage of maize cultivation area in relation to agricultural land (56.2%) is Son La, where the main production area is for maize. Subsequently, Lao Cai has 46.8%. On the other hand, the lowest percentage is in Dien Bien at 20.9%, although it is still high. In conclusion, the area for maize is significantly large in the target provinces, even more than that for paddy.

However, it is said that this large maize land could be turned into maize fields by clearing the forest land, especially in Son La. Due to the current forest preservation policy, reduction of the area for maize crops and increase in yield are encouraged. Actually, this idea has already been stated in the agriculture development plan of Son La as described in Chapter I-3.

Soybean: The percentage of soybean cultivation area in relation to agricultural land is highest at 15.3% in Ha Giang, which has the main production area of soybeans in the six provinces. On the other hand, the percentage in Son La and Yen Bai is the lowest (less than 1%), and it even has a tendency to decrease.

I-4.4 Cultivation Technique

I-4.4.1 Cultivation Technique

Based on the interviews with the extension workers and observations at the pilot sites in the six provinces, the summary of the present condition of the cultivation of the three target crops is described in Table I-4.4.1 below. The cultivation technique is also discussed.

Table I-4.4.1 Present Condition of Cultivation of the Three Target Crops in the Six Provinces based on Observation

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Paddy during Dry Season	Area 9,481 ha	Area 9,880 ha	Area 19,036 ha	Area 8,476 ha	Area 6,223 ha	Area 11,410 ha
	Yield 5.58 t/ha	Yield 5.54 t/ha	Yield 5.31 t/ha	Yield 6.05 t/ha	Yield 5.44 t/ha	Yield 6.01 t/ha
	Proxy Irrigated* 35%	Proxy Irrigated* 48%	Proxy Irrigated* 87%	Proxy Irrigated* 50%	Proxy Irrigated* 32%	Proxy Irrigated* 63%
	95 % transplanting	95 % transplanting	95 % transplanting	Direct sowing and some transplanting	95 % transplanting	95 % transplanting
	2 cropping / year	2 cropping /year	3 cropping / year with one maize	2cropping /year	2 cropping / year	3 cropping /year with one maize
	F1 var.	F1 var.			F1 var.	
Maize	Area 54,215 ha	Area 39,132 ha	Area 28,471 ha	Area 29,929 ha	Area 22,150 ha	Area 162,510 ha
	Yield 3.29 t/ha	Yield 3.08 t/ha	Yield 2.93 t/ha	Yield 2.54 t/ha	Yield 2.80 t/ha	Yield 4.06 t/ha
	Direct sowing Transplanting with pot seedlings	Direct sowing	Direct sowing Transplanting with pot seedlings	Direct sowing	Direct sowing	Direct sowing Green plant- cut method for animal feeds
					Seed treatment	Seed treatment GMO seeds Covering soil
Soy-beans	Area 23,758 ha	Area 4,881 ha	Area 334 ha	Area 5,543 ha	Area 2,491 ha	Area 2,086 ha
	Yield 1.28 t/ha	Yield 1.09 t/ha	Yield 1.19 t/ha	Yield 1.30 t/ha	Yield 1.10 t/ha	Yield 1.26 t/ha
	Area increased		Area reduced	Area reduced		Area reduced
Others		Winter vegetable	Winter vegetable Mulching, Tunnel			Winter vegetable

*: Proxy irrigated rate is calculated by “dry season paddy area/rainy season paddy area”, assuming that the dry season paddy cultivated area is similar to irrigated area.

Source: JICA Survey Team

(1) Paddy

There is not much difference among the six provinces in the yield (5.3~6.0 t/ha) of dry season paddy cultivation, and the yield is lower than the national average of 6.7 t/ha.

Generally, direct sowing is popular in Dien Bien, whereas transplanting method is widely spread in 95% of the paddy area in the other five provinces. In Dien Bien, F1 hybrid seeds are not so much used by farmers, but in the five provinces, F1 hybrid seeds are widely used. F1 hybrid seeds are produced at the seed centers (especially in the seed center in Lao Cai. Yen Bai Seed Center also conducts seed multiplication).

Ratio of proxy irrigated area to paddy area in the dry season is highest in Yen Bai at 87%, followed by Son La at 63%, assuming dry season paddy needs irrigation facilities. In these two provinces, paddy cultivation is generally practiced twice a year in the irrigated field. Furthermore, three cropping systems per year, twice for paddy and once for maize cultivation, have been gradually introduced to the farmers in these two provinces. On the other hand, share of proxy irrigated area (dry season paddy) to rainy season paddy in Lai Chau and Ha Giang is about 30% lower than the others.

(2) Maize

Among the six provinces, the cultivation area and yield of maize is largest in Son La (162,500 ha and 4.06 t/ha, respectively) and its yield is almost similar to the national average at 4.4 t/ha. On the other

hand, yield of the other five provinces ranges from 2.8~3.2 t/ha, which is lower than the national average.

F1 hybrids are used in all the provinces but cultivation trial of genetically modified organism (GMO) seeds with high yield has started at the pilot farms in Son La.

In terms of new techniques, seed treatment has started in Son La and Lai Chau to make germination faster, and young plant cutting cultivation for animal feed and the soil erosion protection method in the slope area have spread in Son La. Use of raising seedlings in pots for winter cropping has gradually spread in Yen Bai and Ha Giang, which is considered advanced.

(3) Soybeans

Soybean cultivation area has gradually decreased in most of the provinces. The soybean cultivation area has expanded and has taken an overwhelming proportion of the cultivation area and production in Ha Giang only.

Yield is 1.0~1.3 t/ha, which is less than the national average (1.4 t/ha). Some of the reasons for low yield and low quality are rain damage and self-produced seeds (not certified, qualified seeds).

(4) Others

The vegetable cultivation area has gradually increased and new techniques such as developed seed raising (partially), mulching, tunnel cover, and greenhouse have been disseminated in Son La, Lao Cai, and Yen Bai. Vegetable cultivation of high profitable crops will be expanded to farmers in the provinces near Hanoi.

Overall, it can be concluded that the level of cultivation techniques has not yet reached the national average level. Among the six provinces, Son La, Lao Cai, Ha Giang, and Yen Bai are thought to have higher level than Dien Bien and Lai Chau. For the improvement of crop production and yield, it is necessary to disseminate suitable varieties in the local areas, improve the irrigation facilities, improve conventional techniques, introduce useful and new techniques, and use agricultural machineries. Also it is important to train the extension staff through capacity building.

I-4.4.2 Good Agriculture Practice (GAP) Related Activities

GAP is known as "practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products" (FAO COAG 2003 GAP paper). GAP procedures are established by countries and regions such as GlobalGAP and JGAP. Vietnam has its own GAP called VietGAP, too. In the six provinces, their activities related to GAP in the past three years are detailed in Attachment I-4.4.1 and summarized as below:

Table I-4.4.2 GAP Related Activities in the Six Provinces

Province	Ha Giang	Lao Cai	Yen Bai
Activities Made	<ul style="list-style-type: none"> + Vegetable: VietGAP certificates have been granted to two cooperatives (one from Ha Giang City and the other from Hoang Su Phi District) and four production groups (all from Ha Giang City) for 17 ha. + Fruit: There are six production units getting VietGAP certificates for orange products in Bac Quang District for 134.9 ha. + Tea: VietGAP certificates have been granted to 14 	<ul style="list-style-type: none"> + Tea: In Lung Vai, Ban Lau, Thanh Binh and Ban Sen communes in Muong Khuong District and Phu Nhuan Commune in Bao Thang District, VietGAP certificates have been granted for 1,035 ha. + Vegetable: In Sa Pa Commune in Sa Pa District and Y Ty in Bat Xat District, VietGAP certificates have been granted with 40 ha and procedures for 75 ha are being prepared. Besides, in 	<ul style="list-style-type: none"> + Fruit: There are two production groups getting VietGAP certificates in Van Chan and Luc Yen districts for orange production. + Tea: VietGAP certificates have been granted to 70 production groups in Yen Bai City, Van Chan, Tran Yen, and Yen Binh districts. + Livestock husbandry: VietGAP certificate has been granted to Hoa Binh Minh Company for pig husbandry.

Province	Ha Giang	Lao Cai	Yen Bai
	production units (1 company, 1 cooperative, 4 CPCs, and 8 production groups in Bac Quang, Vi Xuyen, Quang Binh, and Hoang Su Phi districts) for 1,581.24 ha. Besides, there are 1.673 ha in Vi Xuyen, Quang Binh, and Hoang Su Phi districts getting organic agriculture certificates.	Lao Cao City, Bac Ha, Sa Pa, Bat Xat, Bao Thang districts, safety production certificates have been granted for 585 ha.	
Province	Dien Bien	Lai Chau	Son La
Activities Made	+ VietGAP certificates have not been granted in Dien Bien yet. However, in Dien Bien Phu City, Dien Bien District, and Muong Lay Town, some pilot areas on vegetable production and livestock husbandry are certified as safe production.	+ Tea: VietGAP certificate has been granted to Than Uyen Tea Production Company. Tam Duong Tea Company is carrying out procedures for issuance of VietGAP certificate. + Some pilot areas on safety vegetable production and livestock husbandry have been developed in Lai Chau City, Than Uyen and Phong Tho districts.	+ Vegetable: Two production groups have obtained VietGAP certificates (one from Chieng Hac Commune and the other from Dong Sang Commune, Moc Chau district) for 12 ha. + Fruit: There are three production units getting VietGAP certificates (orange production farm in Muong Thai Commune, Phu Yen District; company in Phieng Luong Commune, Moc Chau District for strawberry production; and cooperatives in Dong Sang Commune, Moc Chau District for avocado production) for 9.2 ha. + Tea: Two tea production companies obtained VietGAP certificates (Moc Chau Tea Production Company and private enterprise in Tan Lap Commune, Moc Chau District) for 47.55 ha. + Livestock husbandry: VietGAP certificates have been issued to three enterprises (Moc Chau Dairy Cattle Breeding Join-Stock Company; Minh Thuy Enterprise in Co Noi Commune, Mai Son District and Hong Long Company in Phu Yen District)

Source: Prepared by the JICA Survey Team based on the hearing with the provincial DARD

I-4.5 Agriculture Marketing and Import/Export

I-4.5.1 Agriculture Marketing in the Six Provinces

(1) General Distribution of the Three Target Crops (Rice, Maize, and Soybeans)

Even though the total paddy production is considered not only the dry season paddy production, the production has not yet met the consumer demand. There is rice shortage in the six provinces as estimated below.

Table I-4.5.1 Estimation of Rice Self Sufficiency in the Six Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La	Total
Total Paddy Production, 2014 (ton)	207,968	148,348	202,402	170,557	127,090	181,202	1,037,567
Convert to Rice* (ton)	114,382	81,591	111,321	93,807	69,900	99,661	570,662
Population, 2014	792,472	665,152	783,534	538,069	432,303	1,169,600	4,381,130
Estimated Annual Consumption** (ton)	158,494	133,030	156,707	107,614	86,461	233,920	876,226
Surplus (ton)	-44,112	-51,439	-45,386	-13,807	-16,561	-134,259	-305,564

*: Milling rate is assumed 0.55.

** : Per capita rice consumption is assumed at 200 kg/year.

Source: Prepared by the JICA Survey Team based on the information from the Provincial Statistical yearbook, 2014 and the above assumptions.

Based on the result of the above estimation, no province has surplus production to meet the demand of rice. Total deficit of rice is estimated at 305,564 t in 2014, of which Son La has the largest deficit at 134,000 t because of its large population and relatively not much paddy production.

Therefore, although rice is exported in Vietnam, there is no sufficient rice production in the six provinces, and rice is purchased from the other provinces. Most of the rice produced in the six provinces is distributed within the provinces. The branded rice of Dien Bien and Lao Cai are distributed in Hanoi at a high price.

Large amount of maize is imported from abroad primarily for livestock feeds in Vietnam. Son La has a large-scale area and high production of maize; however, it is mostly for domestic usage than for export. Most of the maize products are shipped to major feeds manufacturing company, such as Animal Feed Xuan Mai CP (a subsidiary of CP Vietnam Livestock Corporation). On the other hand, maize is exported to China in Lao Cai and Yen Bai. Although high prices of exported maize are appreciated by farmers, it is said that they have no other choice but to accept the low price in the domestic market when export is not possible. In this sense, it is inferred that stable export environment is preferable for farmers.

Soybeans are also imported in large quantities in Vietnam. While Ha Giang is the largest producer of soybeans among the six provinces, it is not for exports but for domestic consumption of other provinces.

Table I-4.5.2 General Situation for Marketing/Distribution of Rice, Maize, and Soybean in Vietnam

Paddy/Rice	Paddy output is about 44 million tons annually consisting of: 1 million ton for breeding; 20 million tons as food for human consumption; 3 million tons for food processing; 4 million tons for livestock feeds; 1 million ton as reserve; around 15 million tons of paddy equivalent to 7.5 million tons of rice for export. (Source: Department of Agro-forestry, Aquaculture and Salt (MARD))
Maize	In 2015, domestic corn production was about 5 million tons to meet the 72% of corn demand. Vietnam annually incurs about 2 million tons of maize shortage. Domestic corn production is mainly used as raw materials to produce animal feeds of 3.5-4 million tons. Temporary import and re-export of about 1 million ton, the rest is use for breeding and feeds (Source: AGROINFO, 2014)
Soybean	Soybean production nationwide is at 168,400 t in 2013; the forecast for 2015 is 192,000 t. In 2013, Vietnam imported about 1.26 million tons while US imported 556,000 t. Soybeans are mainly used as an ingredient of feeds for animal and aquaculture, raw materials for the oil refinery plants, and homemade food such as tofu, sauce, etc... (Source: Agency contact trade Promotion, Ministry of Industry and Trade)

Source: Prepared by the JICA Survey Team based on the above sources.

(2) Marketing of the Three Target Crops at the Farmers' Level

There are two ways to market paddy in the target provinces at the farmers' level, i.e., to consume rice at home and to sell it through middlemen.

With regard to maize and soybean as cash crops, there are four different ways of selling maize and soybean products in the local area as revealed through the sample survey in Tuan Giao District of Dien Bien Province.

- Transporting the harvest in a motorbike to sell it to the store; high selling price (40% of farmers)
- Seeds, fertilizers, and pesticides are borrowed from agricultural material shops, and returned during harvest time; low selling price (10-20% of farmers)
- Self-consumption (30% of farmers)
- Middleman comes to purchase; low selling price (10-20% of farmers)

I-4.5.2 Export and Import in the Six Provinces

The six provinces are bordering China and Laos, thus trading with China is particularly taking place. In 2014, the provinces with high export value were Lao Cai (USD 295,778,000) and Son La. This has pushed up the export value by exporting heavy industrial products. Lao Cai (USD 33,835,000) and Yen Bai have the largest agricultural product exports. Export value of agricultural products of Son La and Lai Chau is about USD 100,000 each, which occupies less than 2.0% of the total export value.

Major import items are machinery, industrial raw materials, fuel, and food. Import of agricultural products was not reported in the statistics of each province.

Agriculture is the main industry in the six provinces and the development of agriculture has been promoted there. Whereas, it is understood that there is an attempt to encourage industrialization in Son La, Lao Cai, and Yen Bai. In general, total export value has a slight increasing trend in every province, but the percentage of agricultural product exports is declining.

Main agricultural export products are tea, coffee, cassava, vegetables, maize, rice, rubber, and timber. Imports related to agriculture are wheat, fertilizer, timber, rubber plants, cattle feeds, and chemicals.

Table I-4.5.3 Agriculture Products for Export in 2012~2014

Unit: USD 1,000

		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2014	Total Export	29,934.4	295,778.0	53,452.0	23,200.0	4,860.0	103,436.0
	Agr. Products	6,496.8	33,835.0	10,464.0	4,925.0	98.9	102.0
	%	21.7	11.4	19.6	21.2	2.0	0.1
2013	Total Export	28,354.2	407,781.0	53,704.0	18,641.0	4,641.2	15,737.0
	Agr. Products	5,886.6	38,512.0	1,317.0	3,956.0	802.6	97.0
	%	20.8	9.4	2.45	21.2	17.3	0.6
2012	Total Export	30,188.5	205,556.0	46,858.0	13,885.0	5,927.0	5,481.0
	Agr. Products	12,719.5	32,836.0	10,253.0	3,317.0	3,564.8	114.0
	%	42.1	16.0	21.9	23.9	60.1	2.1

Source: Province Statistical Books, 2014

Table I-4.5.4 Agriculture-Related Products/Goods for Export and Import in 2014

Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Export					
✓ Assorted tea: 2,357 t	✓ Vegetable: USD 30,181,000	✓ Tea: 829 t	✓ Vegetable and fruits: 420 t	✓ Tea: 889 t	✓ Green tea: 1,935 t
✓ Dried sliced cassava: 49,454 t	✓ Coffee: 180 t	✓ Starch: 20,403 t	✓ Sugar: 305 t	✓ Cardamon: 102 t	✓ Maize: 60 t
	✓ Tea: 572 t	✓ Votive: 8,258 t			
	✓ Rice: 943 t	✓ Lumber: 14,726 m ³			
	✓ Pepper: 105 t	✓ Wooden chopsticks: 17 million pairs			
	✓ Rubber: 1,685 t				

Import					
✓ Fertilizer 813 t	✓ Chemicals*: USD 9,974,000	✓ Chemicals*: USD 245,300 ✓ Fertilizer 88,270 t	✓ Wheat flour: 26 t	✓ Wheat: 19 t ✓ Animal powder and processing: USD 13,000	✓ Lumber kinds:130 t ✓ Rubber plants: 564,955 plants**

Source: Province Statistical Books, 2014, *: not necessarily only 'agriculture' chemicals, **: record in 2011

I-4.6 Rural Income and Access to Finance

I-4.6.1 Income of Rural Household

(1) Rural Income Estimated from Statistic Book

In 2014, the average monthly rural income per rural household in the six provinces was high in Yen Bai (VND 6,022,600) and Lao Cai, and it was low in Dien Bien (VND 4,057,600) and Lai Chau. Of the rural income, agricultural income amounted to VND 2,000,000 in the five provinces, except in Dien Bien (VND 1,741,300). Other income such as salary and wage of outside works, except agriculture and non-agriculture, is highest in Yen Bai (VND 2,661,900), followed by Lao Cai (VND 1,658,700), and then Ha Giang, and it was lowest in Dien Bien (VND 656,400) and Lai Chau.

For comparison of monthly average income per capita in urban and rural areas, assuming that the income in 2012 was 100, the income in 2014 was compared among the provinces. Generally, income in the urban area is higher than in the rural area; the highest income in the urban area was in Lao Cai (193), then Ha Giang (192), and then followed by Son La (161).

The province with the highest income growth in the rural area is Yen Bai (132), which has the lowest income growth in the urban area, and it is followed by Lao Cai (127), and Ha Giang (127), while the lowest income in the rural area is in Son La (105). The reason for the income growth in the rural area in most of the provinces is the growth in non-agricultural income and other income, which is more than that of agricultural income.

Table I-4.6.1 Agricultural Income and Non-agricultural Income of Rural Household in 2014

	Unit	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. of persons/rural household (hh)	person	5.1	5.5	4.9	5.4	5.7	4.7
No. of rural hh	household	131,179	92,819	126,935	84,222	61,080	216,764
Average income/month per one rural hh	VND '000	4,524.8	5,512.3	6,022.6	4,057.6	4,109.0	4,242.6
Average agricultural income/month per one rural hh	VND '000	2,373.7	2,018.0	2,043.7	1,741.3	2,358.6	2,603.3
Average non-agricultural Income/month per one rural hh	VND '000	476.5	1,835.6	1,317.0	1,659.9	982.0	803.6
Average other income/month per one rural hh	VND '000	1,674.6	1,658.7	2,661.9	656.4	768.4	835.7

Source: Calculated based on: 1) the results of Rural, Agricultural and Fishery Census of 2011 (Statistical Publishing House 2012), 2) Province Statistical Books, 2014

Table I-4.6.2 Comparison of Monthly Average Income per Capita in Urban and Rural Areas

	Unit (in 2012)	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Average income per capita in the province	100	147	147	125	111	124	120
Average income per capita in urban area	100	192	193	108	120	136	161
Average income per capita in rural area	100	127	127	132	123	120	105
Average agriculture income per capita	100	120	115	127	108	123	103
Average non-agriculture income per capita	100	224	227	143	103	127	159

Note: The data is obtained by the data in year 2014 / 2012.

Source: Province Statistical Book 2014

(2) Farm Household Income from the Sample Interview Survey in Dien Bien Province

There are differences in agricultural income in the districts within the same province. An example of agricultural income of sampled farm households in Dien Bien Province is shown in Table I-4.6.3. The reason why Tuan Giao District has lower agricultural income than Dien Bien is due to the low income in crop cultivation. This is most likely attributed to low yield and low sales revenue. The low yield is due to the low amount of fertilizer and inappropriate cultivation management. The low sales income can also be due to the low prices caused by low quality in harvest. On the other hand, it is said that livestock is a stable income source.

Table I-4.6.3 Agriculture Income of Sampled Farm Household in Dien Bien Province

District	Dien Bien	Muong Cha	Tuan Giao
No. of Sampled Farmers	17	15	18
Paddy	4,440	1,680	805
Other Crops	2,352	2,432	1,366
Livestock	12,175	11,045	11,110
Others	1,764	6,020	4,046
Total (Annual)	20,731	21,177	17,327

Note: Unit of data is VND '000.

Source: JICA Survey Team based on the sample survey implemented in Dien Bien Province

I-4.6.2 Crop Budget

To understand the profitability of the target crops, crop budgets in two provinces are shown in the tables below as examples. The income from paddy shows the same trend in both provinces. On the other hand, net income from maize and soybeans is different between the two provinces. Farmers in Yen Bai Province ship their products to the market at high prices and they are able to spend more on agricultural inputs such as seeds, fertilizer, and pesticide to improve yield and quality. Investment in agricultural materials, cultivation technique, and good marketing are important in order to obtain more net income from crop cultivation.

With regard to market price, maize costs VND 5,000 and soybean costs VND 10,000 in Tuan Giao District in Dien Bien Province. In contrast, the prices are higher in Luc Yen District in Yen Bai Province at VND 7,000 for maize and VND 19,000 for soybeans. The factor for the difference in the prices between the two locations is thought to be the difference in product quality and traffic accessibility.

In Dien Bien, the largest labour force input for farm work is required for paddy, followed by maize, and soybeans. Workload in paddy cultivation is high during field preparation, weeding, and harvest time.

Table I-4.6.4 Crop Balance in Luc Yen District of Yen Bai Province in 2013

Items	Unit	Paddy (/ha)	Maize (/ha)	Soybeans(/ha)
Cost of supplies:	VND1,000	15,215	8,719	13,072
Inputs	VND1,000	9,639	5,319	8,431
Labour	VND1,000	685	366	458
Others	VND1,000	4,890	3,034	4,183
Yield	t/ha	5.63	3.46	1.72
Price	VND 1,000/kg	6	7	19
Total income	VND1,000	33,780	24,220	32,680
Net income	VND1,000	18,565	15,501	19,608

Source: Luc Yen District Agricultural and Rural Development Division

Table I-4.6.5 Production Cost in Tuan Giao District of Dien Bien Province in 2015

Items	Paddy (/ha)	Maize (/ha)	Soybeans(/ha)
Total Cost of Materials (VND '000)	15,007	4,313	5,780
Seeds	1,566	1,710	1,086
Fertilizers	4,456	2,370	1,375
Chemical	661	233	3,319
Others	8,324	0	0
Total Labour Input (hours x days)	137.3	128.7	114.8
Plowing	40.3	39.5	42.4
Sowing/planting	16.0	25.7	15.2
Weeding	34.2	32.2	33.8
Harvesting	34.6	31.3	23.4
Water management	12.2	0	0
Yield (t/ha)	6.0	2.7	1.3
Price (VND '000/kg)	6	5	10
Total Income (VND '000)	36,000	13,500	13,000
Net Income (VND '000)	20,993	9,187	7,220

Source: JICA Survey Team based on the sample survey implemented in Dien Bien Province

I-4.6.3 Farmer's Credit

(1) General Situation in the Northern Mountainous Areas

As observed in most of the rural areas in the world, there are two loan sources in the northern mountainous areas, i.e., formal and informal sectors. Major banks in the formal sector are Vietnam Bank for Social Policy (VBSP), Vietnam Bank for Agriculture and Rural Development (VBARD), and People's Credit Funds (PCFs). The informal sector includes shops (especially agriculture inputs shop), money lenders, friends, and relatives. VBARD is the biggest state-owned commercial bank, which provides credit for agricultural and rural areas with more than 50% of its total outstanding loan. VBSP provides extension preferential loans to low-income agricultural households as a major form of government intervention. PCF targets consumers of farms, small and medium enterprises, rather than poor farm households.

The result of the study¹, whose samples were in Lao Cai, Phu Tho, Lai Chau, and Dien Bien, shows the sources of credits in the northern mountainous areas in Table I-4.6.6. Around 70% of the sample household have no access to credit. Out of the 33% sample households who have access to credit, majority accessed through formal banks.

¹ Luan, D.X and Anh, N.T.L. (2015). Credit Access in the Northern Mountainous Region of Vietnam: Do Ethnic Minorities Matter? *International Journal of Economics and Finance*; Vol.7, No.6; p166-178. Most of the description in this part is from this study.

Table I-4.6.6 Credit Sources

	No access	With access	Only VBSP	Only VBARD	Only PCF	Only Union	Only Informal	VBSP and Informal	VBSP and VBARD	VBARD and PCF	Total
Sample	898	440	244	67	5	16	92	12	3	1	1,338
%	67.12	32.88	18.24	5.01	0.37	1.20	6.88	0.90	0.22	0.07	100

Source: Luan, D.X and Anh, N.T.L. (2015)

(2) Dien Bien Sample Survey

According to the sample survey implemented in Dien Bien Province, 50% of the farmers in the three districts in Dien Bien Province have loans. The lenders were Vietnam Bank and Agribank. The debt amount is between VND 26,800,000 and VND 33,500,000. The interest rate is as low as 6.5%. The large sum is needed for building and renovating new houses, purchasing motorbike, and other reasons. The number of farmers who obtain loans for farming seems small.

When their cash to purchase agricultural materials is insufficient, farmers borrow seeds, fertilizer, and pesticides from agricultural materials shops in the commune and return the loans in the form of agricultural products after harvesting.

Table I-4.6.7 Farmer's Loan in Dien Bien Province in 2015

District		Dien Bien	Muong Cha	Tuan Giao
No. of Farmers		28	31	29
No. of Farmers who have Loans		13	14	17
Loan	Lenders	Vietnam Bank for Social Policies; Agribank	Vietnam Bank for Social Policies; Agribank	Vietnam Bank for Social Policies; Agribank
	Loan Amount (VND 1,000)	33,558	26,857	30,235
	Condition	Low interest rates (6.5 %)	Low interest rates (6.5 %)	Low interest rates (6.5 %)
Unpaid	No. of Farmers	13	14	17

Source: JICA Survey Team based on the sample survey implemented in Dien Bien Province

I-4.7 Agriculture Mechanization

I-4.7.1 Agricultural Machinery in the Six Provinces

Generally, agricultural machinery in the six provinces is not commonly used. Agricultural machineries used by paddy farmers in the six provinces are tractor, diesel engine, sowing machine, transplanting machine, motorized insecticide sprayer, rice mowing machine with engine, and threshing machine, although these are not common. Use of agricultural machinery is high in Son La and Ha Giang.

Small tractors are plenty in Ha Giang, Lai Chau, and Son La. Sowing and transplanting machines are almost not distributed to farmers in the provinces. Some farmers use motorized insecticide sprayers, whereas most farmers use handy-type sprayers. In Ha Giang, rice mowing machines with engine are used, although they are rarely used in the other provinces.

Table I-4.7.1 Number of Agricultural Machineries in the Six Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Heavy ploughs, tractor (35 CV or more)	14	75	-	-	-	53
Middle-weight ploughs, tractors (12-35 CV)	473	89	180	23	15	442
Small ploughs, tractors (12 CV and less)	3,580	375	615	365	2,755	1,933
Diezen/ petrol, diesel engines	937	1,903	170	119	40	2,680
Sowing machine	-	-	-	21	7	-
Transplanting machine	-	-	-	-	25	-
Motorized insecticide sprayers	564	544	1,642	4,242	127	6,131
Insecticide sprayers	-	-	-		287	
Harvesters combined with rice mowing	91	-	76	2	1	67
Rice mowing machine with engine	5,957	937	879	-	562	815
Threshing machine	-	-	-	787	-	-

Source: Province DARD 2014

I-4.7.2 Issues in Agricultural Machinery Distribution in the Six Provinces

The six provinces are located in the northern mountainous areas in Vietnam, and there are cases that crop cultivation is conducted at the slopes and terraced fields. Cultivation fields are scattered small areas with various shapes. In the case of Dien Bien, area of paddy cultivation per agricultural household is between 0.1 and 0.3 ha. For maize crops, it is between 0.1 and 1.6 ha. For soybeans crops, it is between 0.05 and 0.3 ha. These cultivation field conditions cause difficulty in introducing new machineries, which results in low yield and low income.

Introduction of agriculture machinery is topographically not easy and has low cost-effectiveness except in some flat land. Moreover, purchase cost of even a simple small tractor is high for many farmers. Due to these, the number of agriculture machinery used in the six provinces is far below the national average.

Currently, most of the paddy farmers use water buffalo to plough; and seeding, planting and harvesting are done manually by farmers. Threshing after harvesting paddy is done by using the threshing machine carried to the field, which is shared among the farmers. Most farmers need small tractors for land preparation to reduce their time since land preparation requires many hours among the other field works. If small tractors can be used in small and terraced fields, it is not necessary to take care of water buffalo.

Although still a small number, there are some farmers who can afford to purchase and use machinery. They can normally enjoy high yield and stable production.

Because purchasing of agricultural machineries is difficult for most of the farmers in the provinces, it is recommended to start sharing the use of agricultural machineries in the communes or hamlets. Another way to accelerate dissemination of agricultural machineries is through land consolidation. For example, it is necessary to expand the size of one field area by combining some fields, making the fields in square shape in order to use agricultural machineries easily and effectively in the field.

CHAPTER I-5 GOVERNMENT ORGANIZATIONS OF THE SIX TARGET PROVINCES

I-5.1 Related Government Organizations

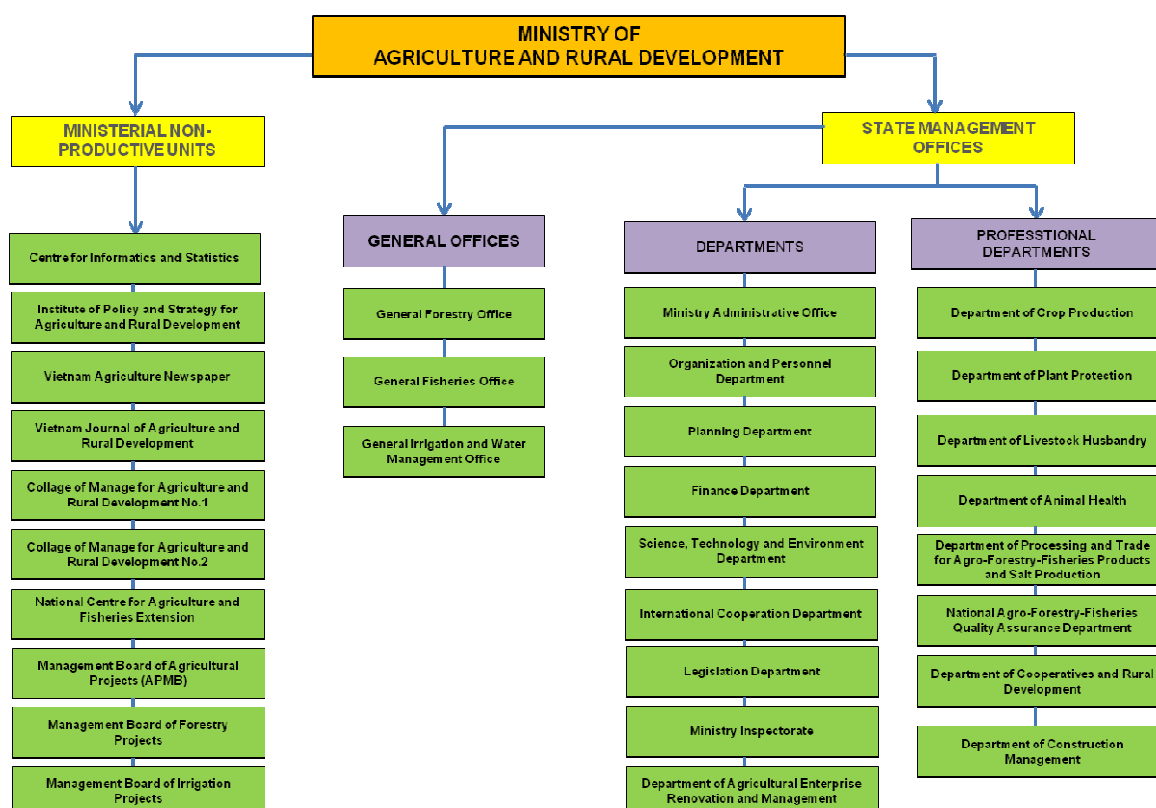
I-5.1.1 Central Level

The Agricultural Project Management Board (APMB) of the Ministry of Agriculture and Rural Development (MARD) is assigned to cooperate with JICA to formulate a new infrastructure development project in the northern provinces of Vietnam. It is considered that they will play significant roles in implementing this new project. The profiles of MARD and the APMB are briefly discussed below.

(1) Ministry of Agriculture and Rural Development

The Ministry of Agriculture and Rural Development (MARD) is a governmental agency performing state level management functions in the fields of agriculture, forestry, salt production, fishery, irrigation/water services, and rural development, including delivery of public services in accordance with legal documents. Its detailed tasks and authorities are stipulated in Decree No.1/2008/ND-CP dated 3 January 2008 (please see Attachment I-5.1.1).

Figure I-5.1.1 shows the organizational structure of MARD. Under MARD, there are 20 state management units and several non-productive units including the APMB and the “National Centre for Agriculture and Fisheries Extension” which support state management functions. They have 1,943 officers for state management units and 566 for non-productive units, excluding the extension center and three management boards.



Source: Prepared by the JICA Survey Team based on the MARD website, Decree No. 199/2013/ND-CP regulating functions, tasks, powers and organizational structure of the MARD, and other information provided by MARD.

Note: There are many other non-productive units in addition to those listed in this figure.

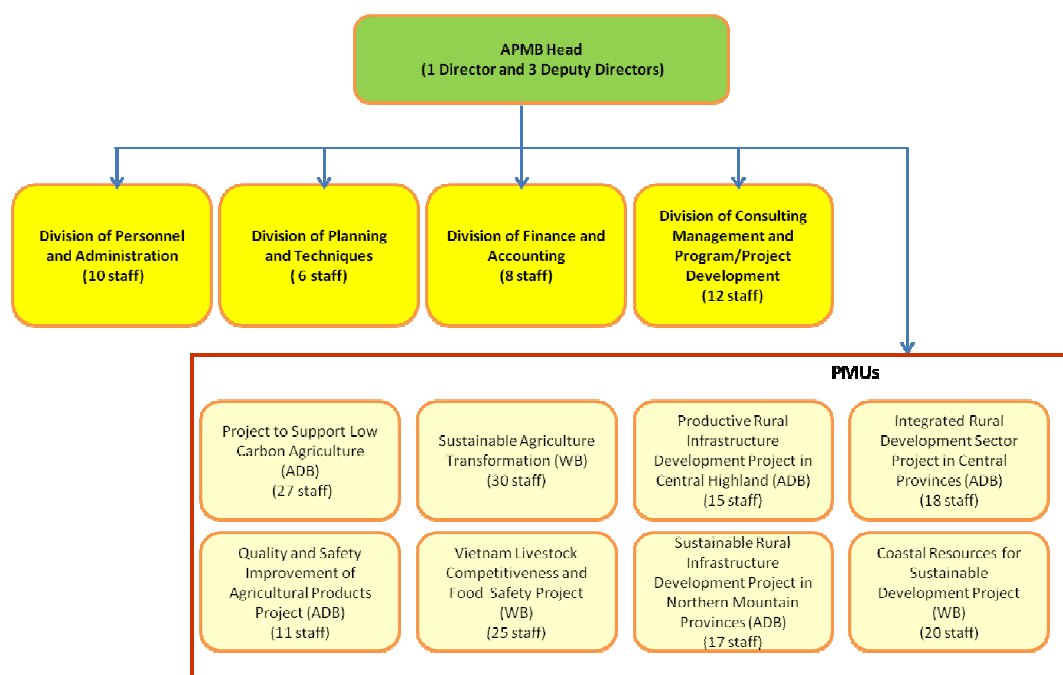
Figure I-5.1.1 Organizational Structure of MARD

(2) APMB

Decision of MARD dated 22 October 2008 (No. 3241/QD-BNN-TCCB) defines the functions and tasks of the APMB. The APMB is assigned by the minister to govern official development assistance (ODA) programs/projects (development investment and technical assistance,) in the fields of agriculture, fisheries, and rural development by implementing the tasks as follows:

- Perform duties/powers/responsibilities of project owners such as undertaking procurement-related activities.
- Manage preparation of documents and agreements on programs/projects.
- Direct overall planning and detailed annual implementation planning of programs/projects.
- Supervise implementation of obligations by contractors and consultants.
- Prepare plans of counterpart funds and submit them to MPI; and guide and supervise financial management.
- Implement administrative tasks (e.g., establishment of the project management units (PMUs), staff recruitment, and public relations).
- Coordinate with donor agencies and relevant authorities of MARD.
- Coordinate with the Provincial People's Committee (PPC) in management and implementation of programs/projects.
- Guide and examine performances of the PMUs; and supervise and support the PMUs in monitoring and evaluating programs/projects.
- Report to MARD, donor agencies, and other relevant agencies on progresses and results of programs/projects.

Figure I-5.1.2 shows the organizational structure of the APMB together with staff number. The APMB is headed by a director (or equivalent to so called "director general") who directs, manages, and administrates all activities of the APMB. Three deputy directors assist the director to implement assigned tasks. The APMB has four divisions: i) personnel and administration, ii) planning and techniques, iii) finance and accounting, and iv) consulting management and program/project development. Under the APMB, a PMU is established to perform assigned tasks and responsibilities for an ODA program/project. Eight PMUs are currently under the APMB.



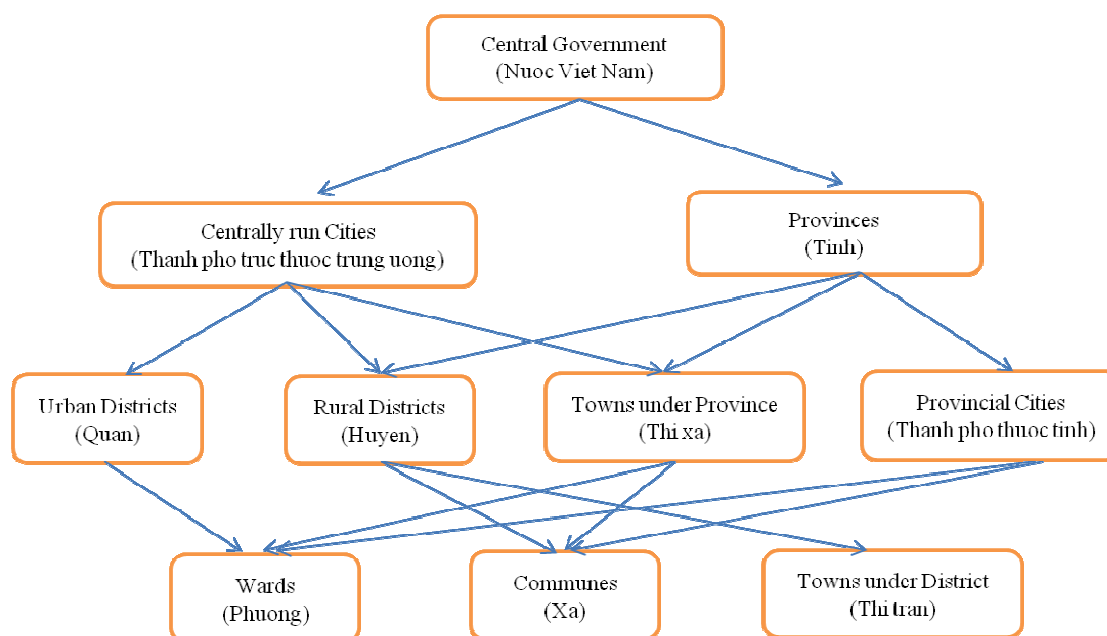
Source: Prepared by the JICA Survey Team based on information provided by the APMB.

Figure I-5.1.2 Organizational Structure of APMB with Staff Number

I-5.1.2 Local Level

(1) Administrative Structures at Local Level

Administrative structures at local level are regulated in the Constitution and Law on the Organization of People's Council and People's Committee dated 26 November 2003¹. Figure I-5.1.3 shows the Vietnamese four-tier administrative structures. Districts/cities/towns (*Thi xa*) are set under provinces, and towns (*Thi tran*)/communes/wards are set under districts/cities/towns (*Thi xa*).



Source: Article 110, Chapter IX, Constitution of the Social Republic of Vietnam.

Figure I-5.1.3 Administrative Units of Vietnam

(2) Provincial People's Committee

The Provincial People's Committee (PPC) is established at the provincial level as the executive agency of the provincial people's council and the state administrative agency at the local level. The members of the PPC are selected by the provincial people's council. It executes and carries out state management at the local level in accordance with the constitution, law, and documents of state agencies at higher levels and resolutions of the provincial people's council.

The duties and responsibilities of the PPC are regulated in the Law on the Organization of People's Council and People's Committee. The PPC is composed of nine to 11 members including one chairperson and three to four vice chairpersons². The PPC members take part in collective discussions and decide by majority on such following issues:

- The province's socio-economic development plans, budget estimate, annual budget accounts, and reserve funds that will be submitted for the decision of the provincial people's council.
- Plans for investing in major construction projects in the province that will be submitted for the decision of the provincial people's council.

¹ A new law was enacted in June 2015 (Law No. 77/2015/QH13 dated 19/6/2015 on local organization). Since this law became effective in January 2016, the previous law was reviewed for this survey.

² Decree No. 107/2004/ND-CP dated April 1, 2004 prescribes the number of vice-chairpersons and membership structure of people's committees of all levels. Under this decree, the PPC of Hanoi and Ho Chi Minh cities shall have 13 members with five vice-chairpersons. The PPC of provinces having a population of two million or more or a land area of 10,000 km² or more, and of centrally-run cities being class-I urban centers shall have 11 members (four vice-chairpersons). The PPC of other cases shall have nine members (four vice-chairpersons). In case additional vice chairperson is needed, request must be sent and approved by the government.

- Plans for mobilizing human and financial resources to deal with the province's urgent issues that will be submitted for the decision of the provincial people's council.
- Schemes for establishing, incorporating, and dissolving specialized agencies and state-owned enterprises; organization options of personnel under the PPC's management; and the demarcation and modification of the boundaries of local administrative divisions.

The chairperson is responsible for leading and managing general operations of the PPC (including development of policy and socio-economic plan, development planning, and management of programs/projects) with assistances from vice chairpersons. Demarcations of their responsible sectors are summarized in Table I-5.1.1.

Table I-5.1.1 Responsible Sectors of Chairperson and Vice Chairpersons

Province	Chairperson/ Vice-Chairperson	Responsible Sectors and Departments
Ha Giang	Chairperson	Economic issues, planning, investment plan, budget, Department of Planning and Investment (DPI), and Department of Finance (DOF)
	Vice 1	Economic sector, banking, industry and trade, <u>capital construction</u> , <u>transportation</u> , <u>electricity</u> , Department of Transport (DOT), and Department of Construction (DOC)
	Vice 2	Education and training, culture, health, and social affairs
	Vice 3	<u>Rural development and agriculture</u> , science and technology, environment and natural resources, new rural development, Department of Agriculture and Rural Development (DARD), and Department of Natural Resources and Environment (DONRE)
Lao Cai	Chairperson	Planning, financing and budget, investment projects, ODA projects, and <u>agriculture and forestry</u>
	Vice 1	<u>Transportation</u> , <u>capital construction</u> , industries, urban ODA projects, and new rural development
	Vice 2	Education and training, culture, tourism, health, labor, and ethnic
	Vice 3	Trade, mineral/land/water resources, and environment
	Vice 4	Foreign affairs, science and technology, and information and communication
Yen Bai	Chairperson	Industry, mineral management, DPI, DOF, DOC, and DONRE
	Vice 1	<u>Capital construction projects</u> , and industry and trade
	Vice 2	Education and training, employment, culture, health, and social welfare
	Vice 3	Science and technology, <u>agriculture</u> , forestry, <u>rural development</u> , environment, and DARD
	Vice 4	Foreign economic relations, industry, information technology, <u>electricity distribution</u> , and <u>DOT</u>
Dien Bien	Chairperson	Planning, investment, environment, <u>transportation</u> , and foreign affairs
	Vice 1	Finance and industry and trade
	Vice 2	<u>Agriculture and rural development</u> , and ethnics affairs
	Vice 3	Education and training, health, social affairs, tourism and sport culture, and communication information
	Vice 4	<u>Construction</u> and resettlement works for hydropower projects
Lai Chau	Chairperson	DOF, DPI, and foreign affairs
	Vice 1	<u>Agriculture</u> , forestry, rural development, resettlement, DARD, and DONRE
	Vice 2	Education and training, and health
	Vice 3	n. a.
	Vice 4	n. a.
Son La	Chairperson	DPI and new rural development
	Vice 1	<u>Agriculture</u> , forestry, new rural development, and DARD
	Vice 2	Ethnic and resettlement works for hydropower projects
	Vice 3	<u>Construction</u> , <u>transportation</u> , industry and trade, environment, DOC, and DOT
	Vice 4	Culture, sports, education, health, Department of Labor, Invalids, and Social Affairs (DOLISA)
	Vice 5	Budget and DOF

Source: Dien Bien - Notification 37/TB-UBND dated 6 August 2015 on adjustment on rights and duties of PPC members; Son La - Notification 26/TB-UBND dated 26 February 2015 on rights and duties of the PPC members; Lao Cai - Decision 2038/QD-UBND dated 23 July 2014 on rights and duties of PPC members; Lai Chau – website (<http://vpubnd.laichau.gov.vn>); Ha Giang - Decision 2272/QD-UBND dated 14 December 2011 on rights and duties of the PPC members; Yen Bai - Decision 2287/QD-UBND dated 26 November 2014 on rights and duties of PPC members.

Note: Since two vice- chairpersons in Lai Chau were newly assigned, information regarding their responsible sectors has not yet been updated.

Actual administrative operations are done by specialized departments or units receiving guidance and supervision from the PPC and related state ministries. The PPC also have powers and authorities to direct lower level administrative units such as districts/cities/towns (*Thi xa*). Structures under the PPC for the six target provinces are shown in Attachment I-5.1.2.

Some of such specialized departments which will be involved with the preparation and implementation of JICA's new infrastructure development project are overviewed in the following sections.

(3) Department of Agriculture and Rural Development

Functions and duties of the Department of Agriculture and Rural Development (DARD) are stipulated in the above Joint Circular 61/2008/TTLT-BNN-BNV dated 15 May 2008 of MARD and the Ministry of Interior.

According to them, DARD is the specialized authority on the guidelines and management of organization and personnel and duty of the PPC. At the same time, DARD is under the guidelines, checking, and major instructions of MARD. DARD helps the PPC to implement the local state management functions on: i) agriculture, ii) forestry, iii) salt, iv) aquaculture, v) irrigation, vi) rural development, vii) flood and typhoon prevention, viii) safe agricultural, forest, aquatic, and salt products during the production process to the market, and ix) public services on agriculture and rural development sector. It also implements some duties authorized by the PPC and pursuant to the law. Please see Attachment I-5.1.3 for further detailed functions and duties of DARD.

In order to undertake these functions, there are several divisions (e.g. finance and planning, planting, and inspection), sub-departments (e.g. irrigation, forestry, rural development, plant protection, and veterinary), centers (e.g. extension, design and planning, and plant seed), PMUs, and other units under DARD. The DARD organization charts for the six target provinces and their staff numbers are shown in Attachment I-5.1.4 and Table I-5.1.2, respectively.

Table I-5.1.2 Staff Number of DARD

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
DARD	607	728	777	690	535	1,016

Source: DARD of respective provinces.

(4) Department of Transport

Functions and duties of the Department of Transport (DOT) are stipulated in Decree 13/2008/ND-CP and Joint Circular 12/2008/TTLT-BGTVT-BNV³. The DOT is a provincial agency under the PPC's direction and the Ministry of Transport's direction and supervision. DOT performs functions such as advising and supporting the PPC in implementing state management of roads, railways, inland waterways, and traffic safety throughout the provincial area. Regarding transport infrastructure development, the DOT shall submit to the PPC the drafts of decisions, directives, strategies, long-term/five-year/annual plans, and investment projects on transport, as well as execute powers and duties of those who decide investment and project owners. Table I-5.1.3 shows staff number of the DOT for the six target provinces.

Table I-5.1.3 Staff Number of DOT

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
DOT	109	173	150	121	136	135

Source: DOT of respective provinces.

³ Decree 13/2008/ND-CP dated 4 Feb 2008 of government stipulating function of specialized units under provincial PPC and central city, and Joint Circular 12/2008/TTLT-BGTVT-BNV dated 05/12/2008 of the Ministry of Transport and the Ministry of Interior stipulate function, duty, powers, and organization structure of units specializing on transportation under provincial and district PPC.

(5) Department of Construction

The functions and duties of the Department of Construction (DOC) are stipulated in Decree 13/2008/ND-CP and Joint Circular 20/2008/TTLT-BXD-BNV⁴. DOC is a professional unit under the PPC and under directions and control of the Ministry of Construction (MOC). The DOC assists the PPC in implementing state administration in the fields of construction; architecture and construction planning; urban infrastructure, industrial areas, export processing areas, economic zones, hi-tech areas; urban development; houses and offices; real estate trading; building materials; public services relating to DOC's state administration; and implementing other duties and rights as allocated and/or authorized by the PPC and the law. For instances, the DOC submits the drafts to PPC to issue decisions/instructions/other documents and long-term/five-year/annual plans/programs; and guides and checks legal documents, specifications, standards, and approved plans/programs/projects. In order to execute these duties, each of the DOC of the six target provinces has the number of staff shown in Table I-5.1.4.

Table I-5.1.4 Staff Number of DOC

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
DOC	98	265	168	78	60	102

Source: DOC of respective provinces.

(6) Department of Finance

The Department of Finance (DOF) is the specialized authority under the PPC and under the guidelines, checking, and major instructions of the Ministry of Finance (MOF). The DOF helps the PPC to implement the local state management functions on finance, state budget, State properties, national financial funds, financial investment, enterprise finance, accounting, independent audit, tariff, and financial service activities at the local pursuant to law.

The duties of DOF particularly regarding budget issues are⁵:

- Submit to the PPC to issue decisions/instructions/other documents on finances, long-term/five-year/annual plans/ programs of finances, plan of income decentralization and payment tasks of each local budget level, allocation norm, estimate of local budget adjustment, plans of budget balance, and necessary methods to fulfill assigned tasks of budget collection and payment.
- Instruct provincial administrative units and lower level of financial agencies to setup estimation of annual state budgets, check budget estimations, set estimation of budget collection and payment, set budget allocation plan, and report them to PPC.
- Check and supervise the management and budget usage of the organizations/units using state budget.
- Manage ODA and non-governmental investment and development budgets (together with the 3 DPI and other concerned organizations) including tasks such as: i) advise the PPC a strategy to mobilize and use domestic and foreign investment capital; ii) submit to the PPC the allocation of development budgets, list of investment projects, and adjustment plan; iii) check progress of management and usages of investment budgets; and iv) summarize the progress of budget mobilization and usage, local budget balancing, and report it to the PPC.

⁴ Joint circular 20/2008/TTLT-BXD-BNV dated 16 Dec 2008 of the Ministry of Construction and the Ministry of Interior stipulates function, duty, powers, organization structure of specialized units under provincial PPC, district PPC, and commune PPC on state management in the construction area.

⁵ Joint circular 90/2009/TTLT-BTC-BNV dated 6 May 2009 of the MOF and the Ministry of Interior stipulates function, duty, power, and organization structure of units specializing in financial area under provincial PPC and district PPC.

(7) Department of Planning and Investment

The Department of Planning and Investment (DPI) is an agency under the administration of the PPC on organization, personnel, and activities; at the same time, under the administration, guidance, inspection, and examination of the Ministry of Planning and Investment (MPI).

The DPI's functions include state management of all activities related to planning and investment such as⁶:

- Submit to the PPC to issue general and strategic planning for five-year and annual socio-economic development, allocate investment fund, and balance investment fund and finance.
- Instruct other departments/agencies/District People's Committees (DPC) to build their plans.
- Lead the collaboration with the DOF and other departments/agencies to formulate plans and allocate development investment budgets, and examine/supervise the use of investment funds on development programs/projects.
- Manage ODA and non-governmental investment and development budgets including tasks such as: i) instructing other departments/agencies to make detailed programs/projects; ii) compile and submit them to PPC, and report to the MPI; and iii) assess the implementation and prepare periodical reports.

I-5.1.3 Law on Construction

Organizations, both at central and local levels which will possibly be involved with the implementation of JICA's new infrastructure development project, are reviewed in the preceding parts. The implementation structure, including involvement of these organizations, will be examined by the JICA Survey Team at the next stage. In connection with this, descriptions such as project owners (investors), project execution structure, and rights and obligations of concerned parties in the Law on Construction are summarized in Table I-5.1.5.

Table I-5.1.5 Descriptions on Project Execution in "Law on Construction"

Issues	Descriptions	Article
Project Owner (= Investor)	<ul style="list-style-type: none"> - The person who has the right to determine investment (investment determiner), and choose agencies and organizations which are eligible to be investors (POs). - Investment determiner has the right to determine investment assigned to the project management unit (PMU) of specialized construction investment. - Investors (POs) could be responsible for project management of regional construction investment in the case of absence of a PMU. 	Article 7.
Formulation of construction investment projects	<ul style="list-style-type: none"> - For important national projects or group A projects consisting of multiple project components, each component can be operated independently. - Investors (POs) must prepare an F/S report on construction investment except cases which only need formulated technical-economic report. 	Article 50. Article 52.
Specialized/ areal construction investment PMUs	<ul style="list-style-type: none"> - The chairpersons of the PPC/DPC can decide to establish specialized/areal construction investment for the PMUs to manage a number of projects in the same special area. - These PMUs are assigned to be investors to execute project management tasks (project management and handing over of works to O&M agencies/units) and project management consultancy functions. 	Article 63.
Rights/obligations of investors (= POs)	<ul style="list-style-type: none"> - (elaborate and manage implementation of construction investment projects) Investors have the rights/obligations to i) elaborate/manage projects, ii) request related agencies/organizations to provide information, iii) select/sign contract with consultants, iv) decide to establish PMUs, and v) check/monitor project implementation with investment determiner and authorized state agencies. - (construction design) Investors have the rights/obligations to i) self-perform construction design, or ii) select/sign contract with contractor of construction design. - (construction work) Investors have the rights/obligations to i) carry out construction work themselves, or ii) select/sign with contractors for construction work, iii) coordinate with concerned organizations/ individuals for construction 	Article 68. Article 85. Article 112.

⁶ Joint Circular 05/2009/TTLT-BKH-BNV dated 05/8/2009 of MPI and Ministry of Interior stipulates function, duty, power, organization structure of units specializing in investment, and planning area under the provincial PPC and district PPC.

Issues	Descriptions	Article
	work, iv) organize supervision and quality management, and v) organize pre-acceptance test.	
Rights/obligations of the PMUs	- The PMU has the rights/obligations to i) execute project management under authorization of investors, ii) employ consultancy organizations, and iii) report to the investors.	Article 69.
Maintenance of construction works	- Maintenance procedure must be made and approved by the investors prior to construction works into unitization.	Article 126.

Source: Law of Construction (No. 50/2014/QH13) dated 18 June 2014.

I-5.2 Government System to Allocate Local Development Budget

The state budget of Vietnam comprises the central budget and local budgets which are composed of budgets of the local administrations at various levels (e.g. province, district, city, commune, and town). The State Budget Law which was revised in December 2002 and effectuated in 2004⁷ stipulates drafting, implementing, checking, inspecting, auditing, and preparing final accounts of the state budgets as well as powers and duties of state agencies of various levels with respect to the state budget. The law also covers functions of decentralized budgets.

This section will firstly review mechanisms of decentralized revenues for the local budgets, then see the procedures of preparation and execution of the local budgets, and finally describe the financial situations of the six target provinces.

I-5.2.1 Tax Revenues

The revenues available for local budgets include those from taxes. The three types of taxes collected at the local level are shown in Table I-5.2.1. The revenues from (1) local taxes and (2) shared revenues from national taxes are retained at local budgets and usage of these revenues is not conditioned by the central government.

Table I-5.2.1 Taxes Collected at Local Level

Taxes	Remarks
(1) Local Taxes: Revenue with 100% entitlement to local budgets	Land and housing taxes, natural resources tax excluding petroleum activities, license tax, tax on transfer of land use rights, tax on use of agricultural land, fee on land use, land rent, registration fees, and revenues from lotteries
(2) National Taxes: Shared revenue in percentage	Corporate income tax, income tax on high-income earners, VAT excluding from import goods, special consumption tax on domestic goods and services, and gasoline and oil fees
(3) National Taxes: Revenue with 100% entitlement to the central budget	VAT on import goods, import and export taxes, special consumption tax on import goods, and taxes and other revenues from the petroleum industry

Source: State Budget Law 2002, MOF website.

I-5.2.2 Budget Transfers⁸

There are two types of transfers from the central budget to local budgets namely balancing transfers and target transfers.

⁷ New State Budget Law was enacted in June 2015; however, it will be effectuated for fiscal year of 2017.

⁸ Contents of this section are extracted from the "Note on Budget Transfer System from Central Government to Provincial Governments in Vietnam" (JICA Vietnam Office, April 2015).

(1) Balancing Transfers

Balancing transfers are general and unconditional. The list of provinces receiving balancing transfers as well as the annual transferred amount to each province is basically fixed within the stability period of three-to-five years. During the period of 2011-2015, 50 out of all 63 provinces received balancing transfers.

Transferred amounts are decided based on norms for allocation of the state budget for recurrent expenditures and development investment expenditures, which consider factors such as population, geographic location, poverty levels, the number of administrative units, specific circumstances, and funding needs of the respective provinces. The local governments could use the balancing transfers for any purposes assigned to them.

(2) Target Transfers

Unlike balancing transfers, the recipient provinces have to use the funds of target transfers for specific purposes such as supporting new policies, implementing national programs/projects in the local areas, implementing significant socio-economic programs/projects, and dealing with emergency difficulties.

National programs/projects include the National Target Programs (NTP) under control of concerned line ministries (see Table I-5.2.2) and other special target programs.

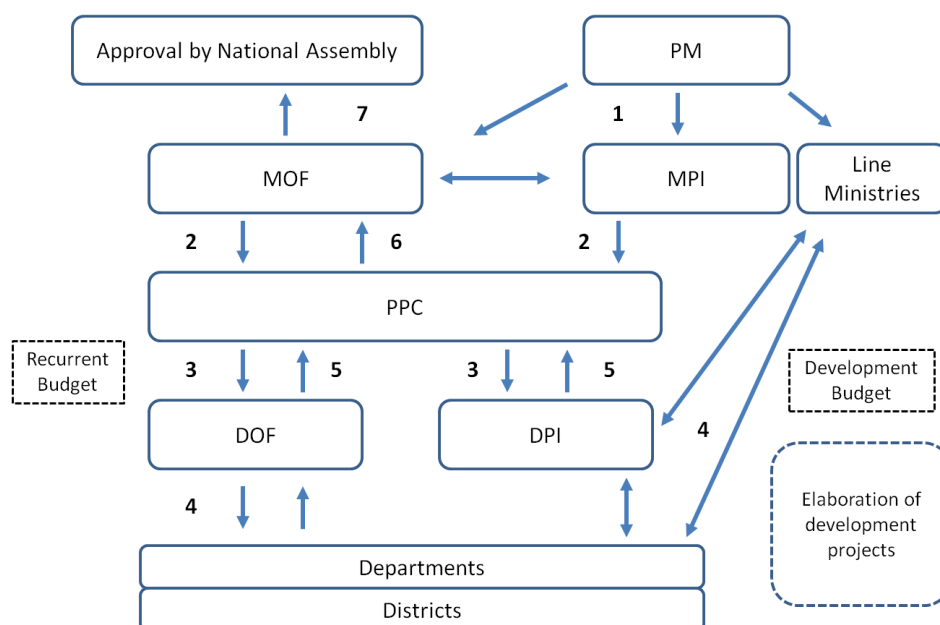
The amount of target transfers is subject to the capacity of the central budget. If there are revenue excesses at the central budget, additional target transfers could be realized in the course of the fiscal year. After the MOF and the MPI have discussed, the MPI would propose programs/projects and the standing committee would approve them. Thus, the executed target transfers are usually much higher than the approved estimated budgets at the beginning of the year.

Table I-5.2.2 National Target Programs (2011-2015)

No.	National Target Programs	Managing Ministry
1	Employment and Vocational Training	MoLISA
2	Sustainable Poverty Reduction	MoLISA
3	Rural Water Supply and Environment Sanitation	MARD
4	Health	MoH
5	Population and Family Planning	MoH
6	Food Hygiene and Safety	MoH
7	Culture	MoCST
8	Education and Training	MoET
9	Drug Prevention and Combat	MPS
10	Crime Prevention and Combat	MPS
11	Vietnam - National Energy Efficiency Program	MOIT
12	Response to Climate Change	MoNRE
13	New Rural Development	MARD
14	HIV/AIDS Prevention and Control	MoH
15	Introduction of Information to Mountainous, Deep-lying, Remote, Border and Island Regions	MIC
16	Overcoming Pollution and Environmental Improvement	MONRE

Source: Resolution No. 13/2011/QH13, PM's Decision No.2406/QĐ-TTg.

I-5.2.3 Budget Preparation



Source: Prepared by the JICA Survey Team based on State Budget Law 2002 and hearing from former officer of MOF.

Figure I-5.2.1 Preparation of Estimations of Budget Expenditures

Figure I-5.2.1 shows the procedure for preparing estimations on local budget expenditures. These are prepared based on the State Budget Law 2002, detailing and guiding the implementation of the State Budget Law (Decree No. 60/2003), Circular No. 3/2005 (circular guideline of the regulation on financial publicity applicable to state budgets of all levels and the regime of reporting on financial publicity) with the following steps.

Step 1: The PM decides general outlines of socio-economic plans and state budget for the following year and informs it to central ministries. This decision is usually done in May.

Step 2: Based on the PM's decision, the MOF will issue the guiding circular on budget estimation and the MPI will issue the guiding circular on elaboration of development projects to PPC in June. The MPI's guide includes appropriate aggregated amounts for the projects and their priorities (e.g. target projects, ODA projects, and on-going projects are prioritized).

Step 3: The DOF is responsible for the preparation of estimation of recurrent budgets. The DPI is responsible for elaboration of development projects which also include target programs/projects.

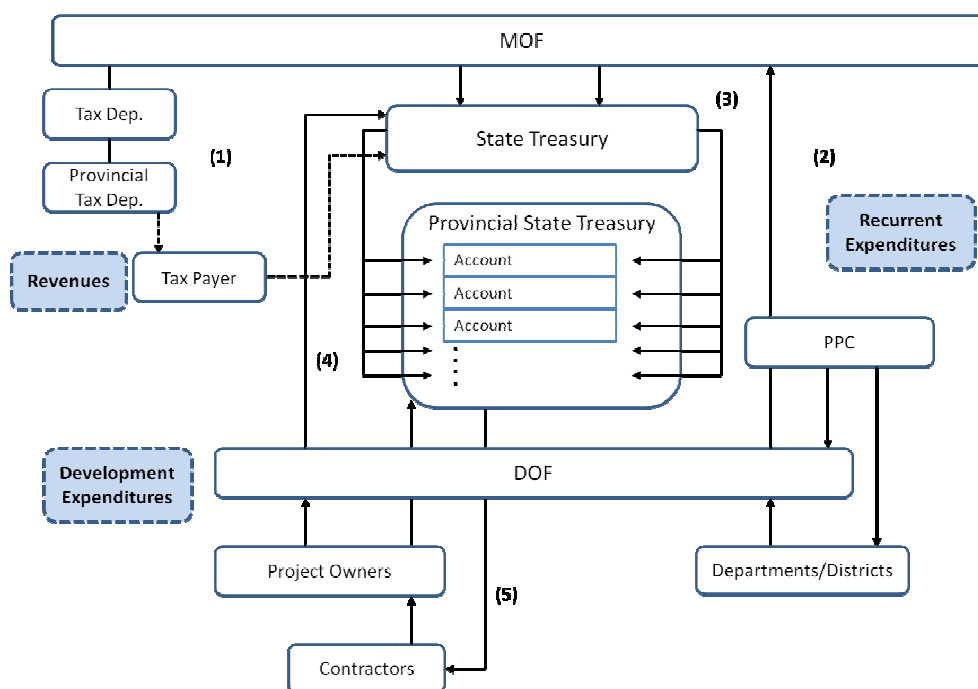
Step 4 and 5: <Recurrent> Based on the circular, the DOF will request respective departments/districts to prepare estimations for recurrent budgets. Respective departments/districts will submit estimations on recurrent budgets to the DOF. The DOF will review, adjust, finalize, and submit them to the PPC. <Development> Based on the circular (guide), the DPI will request respective departments/districts (Planning and Investment Division) to prepare initial plans for development projects. After checking initial plans, the DPI will request them to prepare detailed budget plans. They will submit the detailed plans of the development projects to the DPI. In the process of elaborating development project, there have to be communication and negotiation with the MPI (for target program in general) and line ministries (for national target programs)⁹. These processes are conducted at around July, August, and September. Then, the DPI submits the detailed plans of development projects to the PPC for approval around September.

⁹ Despite this communication/negotiation, it is not the respective line ministries but the MPI who would arrange target transfers to provinces, covering expenditures for target development projects. Once the state budget is approved by the National Assembly, the PPC would decide to allocate local budgets, including those for target development projects to their units using it (departments, districts, and PPMUs). In addition, the departments/units that are not involved with budget preparation could be the POs and be allocated with development budgets.

Step 6: The PPC will review budget estimations submitted by the DOF and the detailed plans submitted by the DPI; compile these as a local budget estimation and submit it to the MOF.

Step 7: The MOF will combine budget proposals from all ministries and provinces as a state budget proposal and submit it to the National Assembly. The national assembly will discuss it and approve it before November 15. Based on this approved state budget, the PPC will decide the allocation of the provincial budgets before December 10 (according to Article 45 of State Budget Law).

I-5.2.4 Budget Execution



Source: Prepared by the JICA Survey Team based on State Budget Law 2002, hearing from former officer of the MOF and DOF/DPI of respective target provinces.

Figure I-5.2.2 Local Budgets Execution

Local budgets are also executed based on the above-mentioned State Budget Law 2002, Decree and Circular. Figure I-5.2.2 shows the procedure for budget execution. Their execution is done by “revenue” and “expenditure” sides.

The execution of revenues is shown in (1) in the above figure. Tax revenues are collected at the local level. The provincial tax department under the MOF tax department informs tax payers of their tax amounts and requests them to pay directly to the accounts of the state treasury.

Local budget expenditures are executed with steps of (2), (3), (4), and (5) in Figure I-5.2.2. Based on the approved state budget, the PPC will decide the allocations of budgets to budget using units (departments, districts, and project owners). The PPC’s decision is reported to the MOF. (See (2))

Accounts by budget using units are set up in the state treasury. Based on the PPC’s decision on allocations, regular recurrent expenditures including salary payments are remitted on monthly basis to these respective state treasury accounts.. (See (3))

The execution of development expenditures including those for target programs is done with the ceiling of budgets allocated to respective project owners (POs). The POs request payments for the state treasury, and the state treasury will remit requested amounts to the respective accounts of the POs. The expenditures for target programs are covered by “Target Transfers” from the central revenue. (See (4))

Regarding the payments for contractors under development expenditure, after receiving invoices from contractors, the POs will review and submit them to the state treasury, then, the state treasury directly transfers money to the bank accounts of the contractors. (See (5))

Actual execution situations of the development budgets are explained in Attachment I-5.2.1.

I-5.2.5 Financial Situations of the Six Target Provinces

Table I-5.2.3 shows local budget revenues and expenditures with major items (plan and actual) for the six target provinces. Some significant issues related to their financial situations are analyzed in the following sections.

Table I-5.2.3 Local Budget Revenues and Expenditures (VND in millions)

Ha Giang		2011		2012		2013	
		Plan	Actual	Plan	Actual	Plan	Actual
I	Local Budget Revenues	4,896,759	11,064,927	5,566,814	15,140,138	7,352,608	NA
1	Revenues with 100% entitlement	532,500	585,720	636,195	746,705	868,997	NA
2	Shared revenues in percentage	0	0	0	0	0	NA
3	Balancing transfers	3,402,019	5,976,399	3,538,100	6,728,255	3,538,100	NA
4	Target transfers	862,240	3,490,963	1,251,719	6,195,902	1,663,346	NA
5	Revenues from grants	0	7,608	0	4,418	0	NA
6	Investment mobilizations under Article 8. Clause 3 - State Budget Law	100,000	50,000	50,000	120,000	50,000	NA
7	Budget remainder revenues	0	21,456	0	29,428	0	NA
8	Brought forward revenues	0	665,899	0	944,059	0	NA
II	Local Budget Expenditures	4,896,759	11,035,153	6,091,632	15,116,977	7,352,608	NA
1	Development investment expenditures	399,135	1,906,633	1,305,000	2,983,455	1,338,655	NA
2	Recurrent expenditures	3,475,304	4,027,954	4,554,452	5,713,311	5,754,817	NA
3	Payment for principals and its interest of mobilizations under Article 8. Clause 3 - State Budget Law	0	152,319	0	51,465	0	NA
4	Brought forward expenditures	0	944,059	0	418,117	0	NA
5	Target programs expenditure and others	862,240	0	0	0	0	NA
6	Transfer to financial reserve fund	1,200	1,200	1,200	1,200	1,200	NA

Note: In case of zero (0) in Shared revenues in percentage, figures are already combined under Revenues with 100% entitlement.

Item of Additional allocation for low-level budgets (3,660,946 (mil.VND) for 2011 Actual and 5,547,281 (mil.VND) for 2012 Actual) is included in Actual Local Budget Expenditures.

Lao Cai		2011		2012		2013	
		Plan	Actual	Plan	Actual	Plan	Actual
I	Local Budget Revenues	NA	6,826,254	5,300,000	9,464,133	6,850,000	NA
1	Revenues with 100% entitlement	NA	832,225	1,562,886	923,803	1,893,471	NA
2	Shared revenues in percentage	NA	662,438	0	912,882	0	NA
3	Balancing transfers	NA	2,097,625	2,160,554	2,160,554	2,160,554	NA
4	Target transfers	NA	1,916,276	1,174,560	3,450,356	2,230,975	NA
5	Revenues from grants	NA	0	0	0	0	NA
6	Investment mobilizations under Article 8. Clause 3 - State Budget Law	NA	30,000	0	130,000	150,000	NA
7	Budget remainder revenues	NA	63,945	0	65,719	0	NA
8	Brought forward revenues	NA	848,013	92,000	1,493,104	130,000	NA
II	Local Budget Expenditures	NA	6,751,330	5,300,000	9,354,640	6,850,000	NA
1	Development investment expenditures	NA	1,707,211	479,000	939,265	579,880	NA
2	Recurrent expenditures	NA	3,150,476	3,616,579	4,240,917	4,563,139	NA
3	Payment for principals and its interest of mobilizations under Article 8. Clause 3 - State Budget Law	NA	62,776	21,000	84,734	60,120	NA
4	Brought forward expenditures	NA	1,493,104	0	1,538,601	0	NA
5	Target programs expenditure and others	NA	0	797,321	2,227,221	1,210,761	NA
6	Transfer to financial reserve fund	NA	1,100	1,100	1,100	1,100	NA

Note: In case of zero (0) in Shared revenues in percentage, figures are already combined under Revenues with 100% entitlement.

Yen Bai		2011		2012		2013	
		Plan	Actual	Plan	Actual	Plan	Actual
I	Local Budget Revenues	3,537,300	5,270,291	4,331,028	7,062,234	5,278,850	NA
1	Revenues with 100% entitlement	847,899	852,515	890,305	1,072,793	1,047,395	NA
2	Shared revenues in percentage	0	0	186,600	0	0	NA
3	Balancing transfers	2,170,201	2,170,201	2,561,607	2,235,307	2,235,307	NA
4	Target transfers	519,200	1,415,315	671,800	2,446,127	1,103,909	NA
5	Revenues from grants	0	0	0	0	0	NA
6	Investment mobilizations under Article 8. Clause 3 - State Budget Law	0	40,000	0	100,000	0	NA
7	Budget remainder revenues	0	79,156	0	77,354	0	NA
8	Brought forward revenues	0	624,458	0	923,129	0	NA
II	Local Budget Expenditures	3,537,300	5,171,484	4,331,028	6,895,788	5,278,850	NA
1	Development investment expenditures	858,650	976,570	918,948	1,140,350	814,368	NA
2	Recurrent expenditures	2,571,120	2,813,913	3,249,993	4,006,752	3,994,687	NA
3	Payment for principals and its interest of mobilizations under Article 8.Clause 3 - State Budget Law	0	135,000	0	0	0	NA
4	Brought forward expenditures	0	923,129	0	964,150	0	NA
5	Target programs expenditure and others	0	226,152	0	425,754	351,059	NA
6	Transfer to financial reserve fund	1,200	1,200	1,200	1,200	1,200	NA

Note: In case of zero (0) in Shared revenues in percentage, figures are already combined under Revenues with 100% entitlement.

Dien Bien		2011		2012		2013	
		Plan	Actual	Plan	Actual	Plan	Actual
I	Local Budget Revenues	3,578,057	5,985,242	4,666,229	8,375,719	5,737,484	NA
1	Revenues with 100% entitlement	88,577	137,075	129,967	146,040	155,831	NA
2	Shared revenues in percentage	258,423	237,731	296,213	303,331	348,169	NA
3	Balancing transfers	2,511,967	2,511,967	2,612,446	2,969,539	2,612,446	NA
4	Target transfers	615,590	2,055,616	1,473,783	2,997,743	1,549,007	NA
5	Revenues from grants	0	1,921	0	25,807	0	NA
6	Investment mobilizations under Article 8. Clause 3 - State Budget Law	0	30,000	0	100,000	0	NA
7	Budget remainder revenues	0	45,804	0	31,952	0	NA
8	Brought forward revenues	0	875,726	0	1,518,575	0	NA
II	Local Budget Expenditures	3,578,057	5,953,290	4,666,229	8,325,119	5,737,484	NA
1	Development investment expenditures	791,460	1,208,605	1,005,175	2,152,819	1,082,063	NA
2	Recurrent expenditures	2,670,327	3,076,898	3,537,864	4,609,525	4,507,926	NA
3	Payment for principals and its interest of mobilizations under Article 8.Clause 3 - State Budget Law	30,000	30,000	32,000	32,000	42,285	NA
4	Brought forward expenditures	0	1,518,575	0	1,247,824	0	NA
5	Target programs expenditure and others	0	0	0	0	0	NA
6	Transfer to financial reserve fund	1,000	1,000	1,000	1,000	1,000	NA

Lai Chau		2011		2012		2013	
		Plan	Actual	Plan	Actual	Plan	Actual
I	Local Budget Revenues	3,442,313	5,701,996	4,508,888	7,908,154	5,484,666	NA
1	Revenues with 100% entitlement	244,000	485,305	343,300	448,491	423,500	NA
2	Shared revenues in percentage	0	0	0	0	0	NA
3	Balancing transfers	2,288,823	2,288,823	2,692,195	2,692,195	3,117,914	NA
4	Target transfers	809,490	1,835,943	1,315,393	2,973,749	1,651,252	NA
5	Revenues from grants	0	0	0	6,730	0	NA
6	Investment mobilizations under Article 8. Clause 3 - State Budget Law	100,000	50,000	150,000	180,000	200,000	NA
7	Budget remainder revenues	0	172,621	0	187,164	0	NA
8	Brought forward revenues	0	869,304	0	1,266,815	0	NA
II	Local Budget Expenditures	3,442,313	5,512,580	4,508,888	7,713,884	5,484,666	NA
1	Development investment expenditures	304,000	453,370	303,300	646,328	293,300	NA
2	Recurrent expenditures	2,162,693	2,280,296	2,890,668	3,593,159	3,498,042	NA
3	Payment for principals and its interest of mobilizations under Article 8.Clause 3 - State Budget Law	100,000	0	150,000	46,000	200,000	NA
4	Brought forward expenditures	0	1,266,815	0	1,139,933	0	NA
5	Target programs expenditure and others	799,490	1,415,046	996,140	2,120,379	1,219,424	NA
6	Transfer to financial reserve fund	1,000	1,000	1,000	1,000	1,000	NA

Note: In case of zero (0) in Shared revenues in percentage, figures are already combined under Revenues with 100% entitlement.

Son La		2011		2012		2013	
		Plan	Actual	Plan	Actual	Plan	Actual
I	Local Budget Revenues	NA	7,865,379	6,465,393	10,252,196	7,886,248	NA
1	Revenues with 100% entitlement	NA	648,120	361,775	879,182	451,596	NA
2	Shared revenues in percentage	NA	932,655	1,288,225	1,158,439	1,348,404	NA
3	Balancing transfers	NA	3,161,843	3,256,698	3,700,642	4,396,911	NA
4	Target transfers	NA	1,962,969	1,558,695	2,932,238	1,578,337	NA
5	Revenues from grants	NA	1,146	0	3,945	0	NA
6	Investment mobilizations under Article 8. Clause 3 - State Budget Law	NA	40,000	0	99,000	0	NA
7	Budget remainder revenues	NA	34,709	0	55,503	0	NA
8	Brought forward revenues	NA	854,261	0	1,288,627	96,000	NA
II	Local Budget Expenditures	NA	7,804,255	6,465,393	10,185,550	7,886,248	NA
1	Development investment expenditures	NA	463,012	381,400	656,837	381,400	NA
2	Recurrent expenditures	NA	4,436,141	5,061,642	5,914,446	6,163,976	NA
3	Payment for principals and its interest of mobilizations under Article 8.Clause 3 - State Budget Law	NA	24,000	0	32,000	0	NA
4	Brought forward expenditures	NA	1,274,499	0	1,653,283	0	NA
5	Target programs expenditure and others	NA	1,379,068	841,151	1,663,328	1,149,672	NA
6	Transfer to financial reserve fund	NA	1,200	1,200	1,200	1,200	NA

Source: Prepared by the JICA Survey Team based on MOF HP.

(1) Local Tax Revenues

As previously mentioned, revenues from local taxes (revenue with 100% entitlement) and shared revenues in percentage from national taxes are retained at local budgets as the decentralized revenues. Since there is a possibility to increase these decentralized revenues by policies and efforts of provinces and the purposes of use of these revenues are decided by the provinces, share of these decentralized revenues against total revenue could be regarded as indicators of the financial capacity of the provinces. According to these indicators, Son La is ranked first, then Lao Cai and followed by Yen Bai. The shares of Dien Bien, Lai Chau, and Ha Giang are relatively low. Table I-5.2.4 shows the total local revenues and own revenues of the six provinces.

Table I-5.2.4 Total Local Revenues and Own Revenues of Provinces

		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2010	Total Local Revenues (mil. VND)	5,652,762	6,425,845	4,143,570	4,292,072	4,372,464	5,850,741
	1. Local revenue with 100% entitlement (mil. VND)	473,131	146,244	720,455	125,444	277,800	481,940
	2. Shared revenue in percentage (mil. VND)	0	910,362	0	191,297	0	647,985
	Decentralized Revenues (1. + 2.)	473,131	1,056,606	720,455	316,741	277,800	1,129,925
2011	Total Local Revenues (mil. VND)	11,064,927	6,826,254	5,270,291	5,985,242	5,701,996	7,865,379
	1. Local revenue with 100% entitlement (mil. VND)	585,720	832,225	852,515	137,074	485,305	648,120
	2. Shared revenue in percentage (mil. VND)	0	662,438	0	237,731	0	932,655
	Decentralized Revenues (1. + 2.)	585,720	1,494,663	852,515	374,805	485,305	1,580,775
2012	Total Local Revenues (mil. VND)	15,140,138	9,464,133	7,062,234	8,375,719	7,908,154	10,252,225
	1. Local revenue with 100% entitlement (mil. VND)	746,705	923,803	1,072,793	146,040	448,491	879,182
	2. Shared revenue in percentage (mil. VND)	0	912,882	0	303,331	0	1,158,441
	Decentralized Revenues (1. + 2.)	746,705	1,836,685	1,072,793	449,371	448,491	2,037,622
Annual Total Local Revenues (2010-12 average) (mil.VND)		10,619,276	7,572,077	5,492,032	6,217,678	5,994,205	7,989,449
Annual local revenues per person (thousand VND)		13,400	11,384	7,009	11,556	14,161	6,831
Annual Decentralized Revenues (1. + 2.) (2010-12 average) (mil.VND)		601,852	1,462,651	881,921	380,306	403,865	1,582,774
Average Share of Decentralized Revenues (1. + 2.)/Total Local Revenues (%)		5.67	19.32	16.06	6.12	6.74	19.81

Source: Prepared by JICA Survey Team based on MOF HP.

Note: Although figures for 2. Shared revenue in percentage for Lai Chau, Ha Giang, and Yen Bai are zero (0), it was explained by persons in each of the DOF that figures were already included under local revenue with 100% entitlement.

(2) Development Expenditures

Development expenditures include those for general development investment and for target programs. As previously mentioned, expenditures for target programs are covered by the target transfers from the central budget.

Since Dien Bien, Lao Cai, and Ha Giang include "expenditure for the target programs" in "expenditure on development investment", the JICA Survey Team cannot compare the six target provinces on these two expenditures separately. Thus, figures related to "aggregate actual expenditure for development investment" combined with these two expenditures, namely, the aggregate expenditures per person and their shares to total actual local expenditures are calculated for understanding the priority and capacity of provinces for development activities. For aggregate expenditures per person, Lai Chau is ranked first, and then followed by Lao Cai and Ha Giang while Lai Chau also ranked first, then followed by Lao Cai and Yen Bai for the total actual local expenditures. It seems that Lai Chau and

Lao Cai have relatively higher priority and capacity for implementing development activities. Table I-5.2.5 shows the details of the development expenditures.

Table I-5.2.5 Development Expenditures

		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2010	Total Actual Local Expenditures (mil. VND)	5,630,922	4,920,149	4,041,147	4,246,268	4,198,167	5,814,514
	1.Total Actual Local Expenditure on Development Investment (mil. VND)	1,543,667	1,232,804	788,260	987,906	280,993	344,175
	2. Expenditure for Target Programs (mil. VND)	364,819	0	372,796	0	1,146,609	1,095,817
	Aggregate Actual Expenditure for Development Investment (1.+2.)(mil.VND)	1,908,486	1,232,804	1,161,056	987,906	1,427,602	1,439,992
	Total Actual Local Expenditure on Recurrent (mil. VND)	2,981,611	2,633,316	2,226,361	2,215,102	1,791,011	3,246,060
2011	Total Actual Local Expenditures (mil. VND)	11,035,153	6,751,330	5,171,484	5,953,290	5,512,580	7,804,255
	1.Total Actual Local Expenditure on Development Investment (mil. VND)	1,906,633	1,707,211	976,570	1,208,605	453,370	463,012
	2. Expenditure for Target Programs (mil. VND)	0	0	226,152	0	1,415,046	1,379,068
	Aggregate Actual Expenditure for Development Investment (1.+2.)(mil.VND)	1,906,633	1,707,211	1,202,723	1,208,605	1,868,416	1,842,080
	Total Actual Local Expenditure on Recurrent (mil. VND)	4,027,954	3,150,476	2,813,913	3,076,898	2,280,296	4,436,141
2012	Total Actual Local Expenditures (mil. VND)	15,116,977	9,354,640	6,895,788	8,325,119	7,713,884	10,185,550
	1.Total Actual Local Expenditure on Development Investment (mil. VND)	2,983,455	939,265	1,140,350	2,152,819	646,328	656,837
	2. Expenditure for Target Programs (mil. VND)	0	2,227,221	425,754	0	2,120,379	1,663,328
	Aggregate Actual Expenditure for Development Investment (1.+2.)(mil.VND)	2,983,455	3,166,486	1,566,104	2,152,819	2,766,707	2,320,165
	Total Actual Local Expenditure on Recurrent (mil. VND)	5,713,311	4,240,917	4,006,752	4,609,525	3,593,159	5,914,446
Annual Total Local Expenditures (2010-12 average)(mil.VND)	10,594,351	7,008,706	5,369,473	6,174,892	5,808,211	7,934,773	
Annual Aggregate Expenditures for Development Investment (2010-12 average)(mil.VND)	2,266,191	2,035,500	1,309,961	1,449,776	2,020,908	1,867,412	
Annual Total Local Expenditures on Recurrent (2010-12 average)(mil.VND)	4,240,959	3,341,570	3,015,675	3,300,508	2,554,822	4,532,216	
Aggregate Actual Expenditures for Development Investment per year and per person (2010 ~ 2012 average)(thousand VND)	2,860	3,060	1,672	2,694	4,774	1,597	
Share of Aggregate Actual Expenditures for Development against Total Actual Local Expenditures (%) (2010 ~ 2012 average)	21.39	29.04	24.40	23.48	34.79	23.53	

Source: Prepared by the JICA Survey Team based on MOF HP.

Note: Since Dien Bien, Lao Cai, and Ha Giang include "expenditure for target programs" in "expenditure on development investment" in some years in their final statements, these two expenditures are combined into "aggregate actual expenditure for development investment".

(3) Recurrent Expenditures

Recurrent expenditures are used for salaries of staff (e.g., state management), education, and training. Accounts by budget using units (provincial departments, districts, and other project owners) are set up in the state treasury. Based on the PPC's decision on allocations, regular recurrent expenditures are remitted to these respective accounts by the state treasury on a monthly basis.

Table I-5.2.6 shows the total recurrent expenditures per person and their shares to total actual local expenditures. In descending order of local recurrent expenditures per person, Dien Bien is ranked first, and followed by Lai Chau, Ha Giang, Lao Cai, Son La, and Yen Bai. Since large parts of the recurrent expenditures are spent for salaries of officers, the amounts could be the criteria for judging whether necessary personnel are ensured or not. However, whether ensured personnel efficiently undertake local administrative services should be evaluated together with outputs and outcomes of these administrative services.

Table I-5.2.6 Recurrent Expenditures

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Total Local Expenditures on Recurrent per year and per person (2010 ~ 2012 average)(thousand VND)	5,352	5,024	3,849	6,134	6,035	3,875
Share of Total Local Expenditures on Recurrent against Total Actual Local Expenditures (%) (2010 ~ 2012 average)	40.03	47.68	56.16	53.45	43.99	57.12

Source: Prepared by the JICA Survey Team based on MOF HP.

Table I-5.2.7 shows recurrent expenditures of major provincial departments. The shares of recurrent expenditures of the DOC, DOT, and DARD against those of total major departments¹⁰ are 1.1%~4.4%, 1.9%~5.5% (20.7% for Yen Bai as an exceptional case), and 2.7%~8.2 %, respectively, which more or less reflects the number of staff mentioned in the above Section I-5.1.2. In addition, features of respective provinces are found from these figures. For example, those allocated to the Department of Education and Training (DOET) are high except for Son La, while those allocated to Department of Health (DOH) are very high in Dien Bien (49.7%) and Lai Chau (54.8%) which are with relatively

¹⁰ Since majority of local recurrent expenditures are spent for below district level, shares against total local recurrent expenditures cannot be used here.

high poverty ratios. Son La allocates higher portion of its recurrent expenditures to the department in charge of tourism.

Table I-5.2.7 Recurrent Expenditures of Major Provincial Departments

2012 (VND in millions)	Ha Giang		Lao Cai		Yen Bai		Dien Bien		Lai Chau		Son La	
Department of Planning and Investment	6,706	6.7%	6,361	5.0%	6,109	2.9%	7,439	0.7%	6,572	0.6%	7,700	7.8%
Department of Finance	9,964	10.0%	9,103	7.2%	13,359	6.3%	12,668	1.2%	8,063	0.8%	9,660	9.8%
Department of Justice	3,989	4.0%	4,612	3.6%	4,181	2.0%	8,390	0.8%	4,426	0.4%	5,295	5.3%
Department of Construction	4,201	4.2%	5,527	4.4%	6,915	3.3%	11,703	1.1%	7,321	0.7%	4,365	4.4%
Department of Transport	3,929	3.9%	3,937	3.1%	43,643	20.7%	19,698	1.9%	56,047	5.5%	5,269	5.3%
Department of Agriculture and Rural Development	6,822	6.8%	5,356	4.2%	5,738	2.7%	87,631	8.2%	65,804	6.5%	5,220	5.3%
Department of Natural Resource and Environment	4,183	4.2%	34,307	27.0%	39,448	18.7%	19,777	1.9%	26,510	2.6%	3,929	4.0%
Department of Industry and Trade	6,818	6.8%	5,221	4.1%	6,905	3.3%	17,565	1.7%	12,847	1.3%	5,729	5.8%
Department of Health	4,661	4.7%	3,587	2.8%	12,432	5.9%	528,688	49.7%	557,231	54.8%	4,790	4.8%
Department of Education and Training	31,328	31.4%	22,489	17.7%	46,718	22.1%	286,646	27.0%	217,581	21.4%	8,169	8.3%
Department of Information and Communication	8,988	9.0%	8,841	7.0%	4,167	2.0%	6,102	0.6%	6,215	0.6%	3,238	3.3%
Department of Culture, Sports, and Tourism	5,382	5.4%	9,152	7.2%	8,882	4.2%	44,250	4.2%	38,028	3.7%	32,911	33.2%
Department of Science and Technology	2,849	2.9%	8,444	6.7%	12,439	5.9%	13,061	1.2%	10,911	1.1%	2,708	2.7%
Total for the above departments	99,820	100%	126,937	100%	210,936	100%	1,063,619	100%	1,017,555	100%	98,983	100%
Total Local Recurrent Expenditures	5,713,311		4,240,917		4,006,752		4,609,525		3,593,159		5,914,446	

Source: Prepared by the JICA Survey Team based on MOF HP.

(4) Brought Forward Revenues/Expenditures

If budgets for certain expenditure items such as those for development investment, target programs, and recurrent expenditures have been allocated but not yet spent by the end of the fiscal year, unspent amounts for those expenditure items could be accounted as brought forward revenues for the following year's budget. The current State Budget Law (2002) does not stipulate ceilings of those brought forward expenditures/revenues¹¹.

According to hearing with concerned persons in the DOF of the target provinces, the reasons of occurrence of brought forward expenditures are as follows:

- Decision of additional allocation of budgets from the central budget as well as their allocation are delayed or made nearly at the end of the year,
- Program/project activities including construction are not completed by the end of the year due to delay in implementation, and
- Payment for contractors are delayed and not made by the end of the year due to insufficient payment request documents¹².

Since there seems to be a tendency that the budget allocation for new programs/projects is more emphasized than completion of currently executing allocated budgets by the end of the year¹³, amounts of brought forward expenditures become large as seen in Table I-5.2.8.

Table I-5.2.8 Shares of Brought Forward Expenditures

Brought Forward Expenditures/ Local Expenditure (%)	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2011	8.56%	22.12%	17.85%	25.51%	22.98%	16.33%
2012	2.77%	16.45%	13.98%	14.99%	14.78%	16.23%

Source: Prepared by the JICA Survey Team based on MOF HP.

¹¹ According to a former officer of the MOF, recurrent budgets which are allocated but not spend in principle could not be carried to the following year's budget under the new State Budget Law.

¹² If advance payments for contractors are made, these amounts are included in the brought forward expenditures.

¹³ According to a former officer of the MOF, this tendency could be applied not only for target provinces but also for other provinces.

(5) Execution Situations

Table I-5.2.9 shows the budget execution rates (actual/plan) of local revenues and expenditure. Both actual local revenues and expenditures exceeded over the plan by around 60% to 170%. In addition, actual local revenues exceed actual local expenditure in all six province which proves that they at least secure revenues which could be used for necessary expenditures.

Since actual decentralized revenues are exceeding over the plan by 0% to 30%, a large gap between the total actual local revenues and its plan is mainly caused by target transfers which increase is very high from the plan.

Regarding execution rates (actual/plan) of local expenditures, those for development investment (from 170% to 250%) are much higher than those for recurrent (from 117% to 130%). Although expenditures for general investment and those for target programs are not divided in the final statement in some target provinces, it could be thought that increased actual total local expenditures are mainly caused by increased actual expenditures for target programs.

Budget execution rates (actual/plan) could be used for evaluating target provinces' capacities for executing budgets on the assumption that budgets are appropriately planned to certain extent. However, since it is a common practice in Vietnam that relatively large amount of revenues under target transfers and of expenditures for target programs are added in the course of the fiscal year, the execution rates calculated based on the initially planned budgets could not be used for evaluating budget execution capacities of the province.

Table I-5.2.9 Budget Execution: Comparison of Plan and Actual

Actual/Plan (2012) (%)	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Total Local Revenues (mil. VND): Actual/Plan (%)	272	179	163	179	175	159
Decentralized Revenues (1. Local revenue with 100% entitlement + 2. Shared revenue in percentage) (mil. VND): Actual/Plan (%)	117	118	100	105	131	123
Total Local Expenditures (mil. VND): Actual/Plan (%)	248	177	159	178	171	158
Aggregate Expenditures for Development Investment (mil. VND): Actual/Plan (%)	229	248	170	214	213	190
Total Local Expenditures on Recurrent (mil. VND): Actual/Plan (%)	125	117	123	130	124	117

Source: Prepared by the JICA Survey Team based on MOF HP.

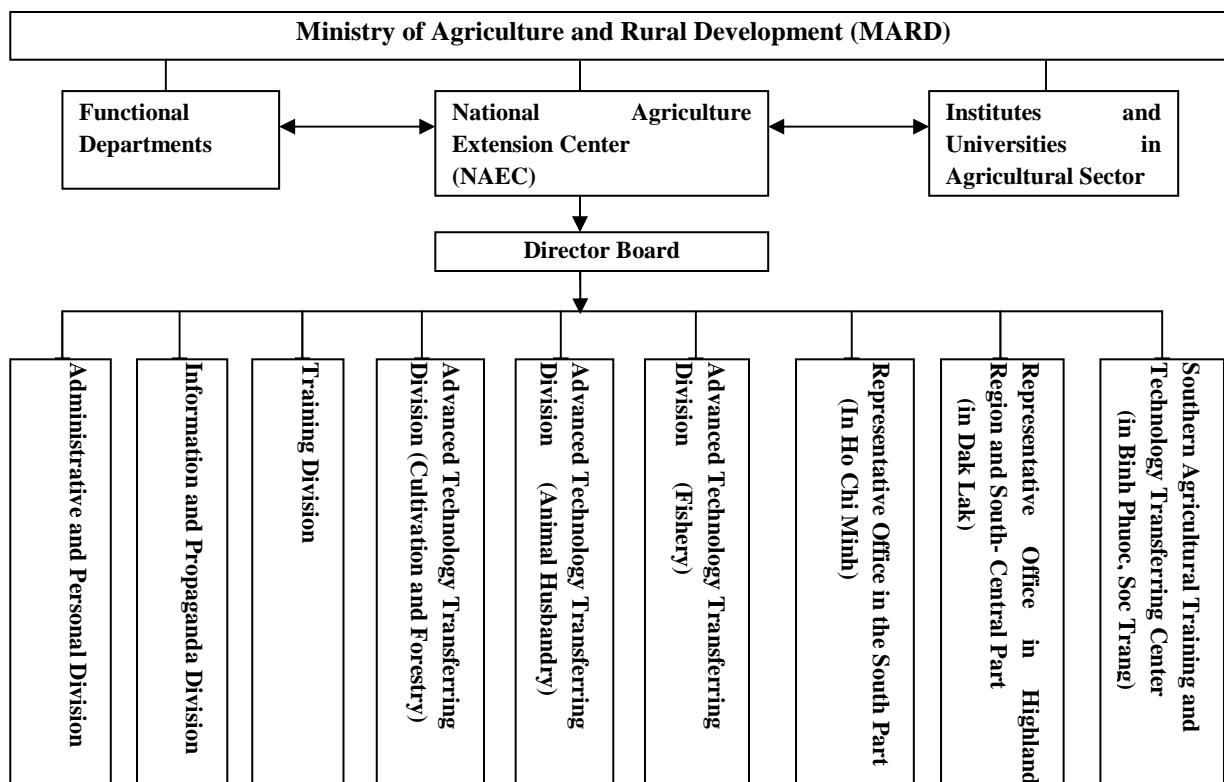
I-5.3 Government Institution of Extension Activities

I-5.3.1 Extension System in Vietnam

(1) National Agriculture Extension Center (NAEC)

1) Establishment of NAEC

The Vietnam Extension System was established in 1993. The Department of Agriculture and Forestry Extension (DAFE) under MARD and the Department of Aquaculture under the Ministry of Aquaculture functioned as state governing organizations as well as technology transfer bodies. After merging the Ministry of Fishery with MARD in 2008, the National Agriculture Extension Center (NAEC) was established. NAEC is an agency for providing non-profit service under MARD. NAEC has its functions to implement extension activities on agriculture, forestry, salt production, irrigation, fishery, rural industries, and other rural agricultural services throughout the country. The target groups for agriculture extension are Vietnam and foreign organizations, and individuals operating agricultural and fishery extension activities in fields of agriculture. Figure I-5.3.1 shows the organizational structure of NAEC.



Source: NAEC Brochure

Figure I-5.3.1 Structure of the National Agriculture Extension Center (NAEC)

2) Responsibilities of NAEC

In the Decree 02/2010ND-CP of the government, NAEC shall perform the state management of agricultural extension activities according to the following contents:

- To formulate and promulgate or propose to competent authorities the agricultural extension strategies, legal documents and policies;
- To formulate and approve central agricultural extension programs, plans and projects and direct the implementation thereof;
- To professionally guide localities in agricultural extension activities;
- To cooperate with domestic and foreign organizations and individuals in attracting capital and resources for agricultural extension activities;
- To examine, inspect and settle complaints and denunciations in the central agricultural extension activities;
- To manage the central agricultural extension fund; and
- To monitor, inspect, assess and periodically report to the Prime Minister on the implementation of agricultural extension programs and projects nationwide.

3) Responsibilities of Provincial People's Committees

In the Decree 02/2010ND-CP of the government, Provincial People's Committees shall perform the state management of agricultural extension activities in their respective localities according to the following contents:

- To formulate and promulgate agricultural extension guidelines and policies suitable to local conditions;
- To formulate, approve, and direct the implementation of agricultural extension programs and projects in their respective locations;

- To ensure capital sources for agricultural extension and the implementation of agricultural extension policies in their respective localities according to this decree;
- To mobilize domestic and foreign organizations and individuals to contribute resources to local agricultural extension activities;
- To manage local agricultural extension funds; and
- To monitor, inspect, assess and biannually report to the MARD on agricultural extension activities in their respective localities.

4) Main Activities of NAEC

- Participate in development of strategies, long-term/short-term plans, policies, legal papers and agricultural extension projects at the national level.
- Information transfer includes transferring and guiding new policies, advanced technology/techniques, experiences, good productive models and providing market information, prices of agricultural materials and products to farmers through website, mass media, organizing extension events, and publishing extension materials.
- Training in compiling technical professional documents/materials, organizing training-of-trainers (TOT) training courses and job training courses, and organizing international/national study tours and visits.
- Establishing and replicating demonstration models at the household level and transferring advanced technology to farmers.
- Extension consultancy.
- Cooperating implementation of national target programs (NTP).

5) Human Resources for Agriculture Extension

The total number of public extension workers at the province, district, and commune level in Vietnam accounts for 17,890 persons, making an average of 533¹⁴ farm households per one public extension worker.

NAEC has 80 employees. All 63 provinces/cities have their own Agriculture Extension Center (AEC) with a total of 2,750 staff (15% of total), an average of 44 persons per center. At the district level, they have an Agriculture Extension Station (AES) which are directly under the control of the provincial AEC or the District People's Committee. The total number of extension workers at the district level accounts for 4,600 persons (26% of total), an average of eight persons per station. At the commune level, there are 10,540 extension workers (59% of total), or one person per commune. Figure I-5.3.2 shows the extension structure in Vietnam.

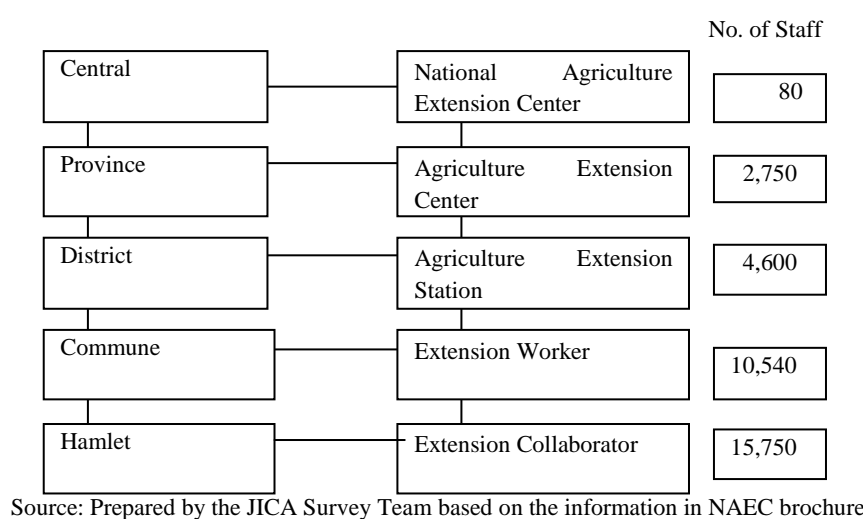


Figure I-5.3.2 Extension Structure in Vietnam

¹⁴ The total no. of farm households based on General Statistical Office 2011.

(2) Extension Activities of NAEC implemented in the Six Provinces

1) Extension Plan and Budget of NAEC

In order to tackle agricultural challenges and improve agriculture in Vietnam, NAEC implements related agricultural projects in the provinces all around the country. NAEC receives proposals from each district and decisions are made by all divisions. The extension efforts are done in paddy rice, fruits, forestry, beekeeping, and many other areas.

Until a few years ago, the budget was increased from 10% to 12%, but the budget has leveled off in the recent years. The annual budget is VND 240 billion (USD 10 million), which is VND 25,200 (USD 1)/agricultural household. Until four years ago, the budget was equally divided among provinces. Now, the budget is allocated differently from province to province depending on the area of focus.

2) Extension Activities of NAEC in the Six Provinces

Of the six provinces where NAEC's extension activities budget was allocated, Son La and Lao Cai received the most (VND 4.07 billion and VND 3.24 billion respectively), and Lai Chau received the least (VND 0.31 billion). The allocated budget size differs from province to province. Extension activities include establishment of pilot farms, farmers training, extension workers training, and agricultural forum and fair.

Table I-5.3.1 Extension Activities of NAEC Implemented in the Six Provinces

		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
2014	Budget (VND 1,000)	3,027,625	3,241,859	2,875,749	2,948,980	311,740	4,071,897
	No. of Activities	6	6	8	5	3	8
2015	Budget (VND 1,000)	3,581,601	5,215,362	3,619,906	1,260,000	1,023,700	2,362,149
	No. of Activities	6	9	9	2	2	8

Source: Data of the NAEC in 2015

Table I-5.3.2 shows the extension budgets for the six provinces for paddy rice, maize, and soybeans. The pilot farms involved in F1 seed production of paddy rice in Lao Cai stands out. High yielding F1 paddy rice has been widely spread in Lao Cai and the surrounding provinces. Using NAEC's extension budget, forums were held in Son La and Ha Giang, which are the main maize and soybean production areas.

Table I-5.3.2 Extension Activities of NAEC on Three Main Crops Implemented in the Six Provinces

	Year	Province	Activity	Subject	No.	Budget (VND 1000)
Paddy rice	2014	Lao Cai	Pilot farm	F1 seed production	5	1,533,259
	2015	Lao Cai	Pilot farm	F1 seed production	5	2,296,844
	2015	Lao Cai	Pilot farm	Parental seed production	5	516,718
	2015	Lao Cai	Organizing forum	Quality rice production	5	160,000
	2015	Yen Bai	Pilot farm	F1 seed production	11	577,763
Maize	2014	Lai Chau	Organizing forum	Sustainable maize production	6	128,250
	2015	Son La	Organizing forum	Farmer contest, Fair trade	8	765,400
Soybeans	2014	Ha Giang	Organizing forum	Solution developed commodity soybeans	1	127,500

Source: NAEC

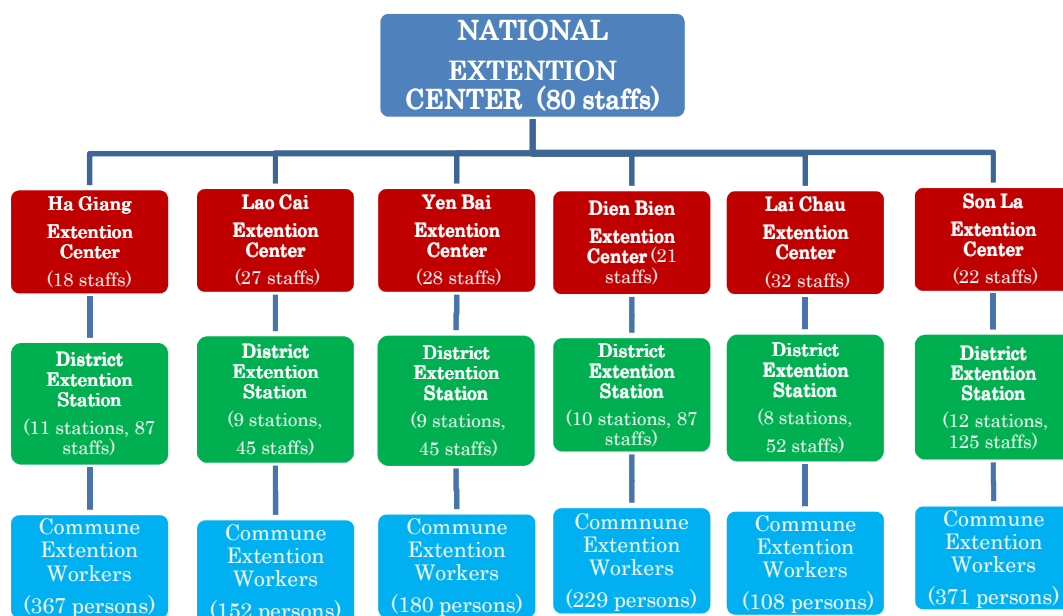
I-5.3.2 Extension Structure and Activities in the Six Provinces

(1) Extension Staff/Extension Workers

Each AEC in the six provinces has 18 to 32 staffs, which is fewer than the average number of AEC staffs each province has across the country. The District Agriculture Extension Station (AES) has five

to ten staffs, which is somewhat less than the average size of AES staffs around the country. There are about one to two extension workers per commune at the same time.

The number of farm household for each commune extension worker is largest in Yen Bai and Lao Cai. On the other hand, the number is lowest in Dien Bien and Ha Giang, half of the Yen Bai and Lao Cai. The agriculture land area per extension worker is largest in Lai Chau and Son La, and smallest in Lao Cai and Ha Giang. Figure I-5.3.3 shows the number of extension staffs of the AEC, AES, and commune in the provinces. Table I-5.3.3 shows the human resources for extension activities in the six provinces.



Source: prepared by the JICA Survey Team based on the information from Provincial AECs

Figure I-5.3.3 Number of Extension Staffs of the AEC, AES and Commune in the Provinces

Table I-5.3.3 Human Resources for Extension Activities in the Six Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. of provincial AEC staffs	18	27	28	21	32	22
No. of district AESs	11	9	9	10	8	12
No. of district AES staffs	87	45	45	87	52	125
No. of commune, town*	190	152	167	130	103	197
No. of commune extension workers	367	152	180	229	108	371
No. of staffs/AES	7.9	5.0	5.0	8.7	6.5	10.4
No. extension worker/commune	1.9	1.0	1.1	1.8	1.0	1.9
No. of farmer household in the province	119,581	88,074	122,098	78,667	57,425	185,786
No. of farmers in the province (labor in rural)	434,049	327,955	407,981	250,177	203,259	637,530
Total agricultural land (ha)	155,562	83,585	109,320	143,420	92,998	289,071
Annual crop (ha)	126,907	62,656	64,187	130,352	68,411	246,845
No. of farmers household/commune extension worker	325	579	678	343	531	500
No. of farmers/commune extension worker	1,183	2,158	2,267	1,092	1,882	1,718
Agricultural land(ha)/commune extension worker	423	549	607	626	861	779
Annual crop (ha)/commune extension worker	345	412	356	569	633	665

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
District sample	Bac Quang	Bat Xat	Luc Yen	Muong Cha	Than Uyen	Mai Son
No. of staff in extension station	12	6	6	11	7	12
No. of commune	23	23	24	12	7	22
No. of commune extension worker	45	23	24	12	12	38

Source: No. of extension staff from provincial AEC.

No. of labor force aged 15 and by residence from Provincial Statistical Book 2014.

No. of agricultural household in 2011 from General Statistical Office.

(2) Extension Budget

The extension activity budget of each province is shown in Table I-5.3.4.

Son La and Lao Cai's AECs control all of the extension budgets of the province including district activities. Therefore, the budget is large, and the AEC has much authority compared with other provinces. On the other hand, the other four provinces do not have large budgets, but each district also has an extension budget.

Table I-5.3.4 Extension Budget (Actual Expenditure) of the Six Provinces in the Year 2014

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
District sample	Bac Quang	Bat Xat	Luc Yen	Muong Cha	Than Uyen	Mai Son
Provincial extension budget (VND in millions)	5,809.0	27,893.0	4,160.0	2,793.1	2,707.7	28,418.0
Annual current budget (VND in millions)	1,350.0	24,022.0	2,927.0	1,641.0	1,492.0	20,165.0
Extension activities (VND in millions)	4,459.0	3,871.0	1,233.0	1,152.1	1,215.7	8,253.0
District extension budget (VND in millions)	1,312.0	3,398.0	2,039.0	1,138.9	2,166.4	2,937.6
Annual current budget (VND in millions)	1,042.0	3,233.0	1,638.0	603.3	819.6	2,481.3
Extension activities (VND in millions)	270.0	165.0	401.0	535.6	450.0	456.3

*Provincial extension budget of Son La and Lao Cai includes the extension budget of all districts.

*Provincial extension budget and district extension budget of the other four provinces are independent.

Source: Provincial extension budget from the Provincial Agriculture Extension Center

District extension budget from the District Agriculture Extension Station except Mai Son from Provincial AEC.

To compare, total extension activity budget of provincial AEC and districts per province (excluding recurrent cost) is estimated and summarized in the table below:

Table I-5.3.5 Estimated Extension Activities Budget (Actual Expenditure) of the Six Provinces in 2014

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. of districts in province	11	9	9	10	8	12
Estimated extension activities budget for all districts (VND in millions)	2,970.0	—	3,609.0	5,356.0	3,600.0	—
Estimated extension activities budget for the province and all districts (VND in millions)	7,429.0	3,871.0	4,842.0	6,508.1	4,815.7	8,253.0
Budget extension activities/all extension related workers (AECs, AESs, and communes) (VND 1000)	15,739	17,281	19,139	19,312	25,082	15,932
Budget extension activities/farmers in province (VND 1000)	17.1	11.8	11.9	26.0	23.7	12.9

In comparing all the budget of extension activities among six provinces,

*Estimated budget of Son La and Lao Cai is based on the provincial budget.

*Estimated budget of other four provinces is calculated based on the provincial budget and the budget of the sample district.

Son La and Ha Giang have the large amount of the estimated activity expenditure, almost double of that of Lao Cai. On the other hand, the expenditure per all staff related to extension works is observed

biggest in Lau Chau followed by Dien Bien. The expenditure per farmer is highest in Dien Bien, followed by Lai Chau. Son La, where cultivation techniques are considered higher, has a smaller budget per extension staff as well as farmers, indicating higher cost effectiveness of agriculture policy.

(3) Extension Activities

The AEC in Son La and in Lao Cai have strong authority to decide on the plans and budgets of extension programs. These provinces proactively lead extension activities such as pilot farm implementation, farmer trainings, and planning of extension workers training. The district Agriculture Extension Stations (AES) follow the plans of the AEC.

In the other four provinces, the AESs also have extension budget and implement both AEC and AES activities. While overall extension budget is declining, Yen Bai's AEC receives support from private sector and NGO to support the pilot farms.

Commune extension workers monitor Hamlet farms and report their activities every month at the district meetings. Extension workers receive support from the AES for issues they cannot handle by themselves. Commune extension activities take place according to the district or provincial plans. Commune extension staff does not have individual budgets so it is difficult to implement extension activities by their own initiative.

In Son La and Lao Cai, employment of extension workers is decided by the provinces. Extension workers are employed permanently with social insurance. On the other hand, extension workers are employed by districts in the other four provinces. In Dien Bien, contracts are for one year with no social insurance. Lai Chau, Ha Giang, and Yen Bai staffs are employed permanently with social insurance. In Dien Bien, extension workers' salaries range from VND 1,800,000 to VND 2,690,000 per month, depending on the level of education received. This salary is somewhat lower than that of the other five provinces. It is said that extension workers in Dien Bien sometimes quit their jobs due to the short-term (one year) contract, lack of social insurance, and low salary.

I-5.4 Government Budget and Expenditure System of Infrastructure Development

I-5.4.1 Infrastructure Development Expenditures

Table I-5.4.1 shows infrastructure development expenditures by related sector (irrigation, road and bridge, water supply, and electricity distribution) for the six target provinces. Shares of expenditures for all these four sectors against total development investment expenditure are around 30% to 75%. It is found that road and bridge sector accounts for largest portion and irrigation sector follows although there is an exceptional case of Son La in 2011. Development expenditures for sectors of water supply and electricity distribution are relatively small.

Table I-5.4.1 Infrastructure Development Expenditures by Sector

Ha Giang		Actual Development Investment Expenditure (VND Million)							
		Year 2011				Year 2012			
		A. Province	B. All Below Districts/Cities	Total (A + B)	%	A. Province	B. All Below Districts/Cities	Total (A + B)	%
1	Irrigation	282,420	83,600	366,020	19.20%	399,715	198,721	598,436	20.06%
2	Road and Bridge (Provincial, District, Communal and Ward)	430,983	132,016	562,999	29.53%	607,360	220,973	828,333	27.76%
3	Water Supply (Urban and Rural)	102,551	32,522	135,073	7.08%	300,202	86,455	386,657	12.96%
4	Electricity Distribution (Medium/Low Voltage Lines and Transformers)	24,487	19,865	44,352	2.33%	27,624	34,197	61,821	2.07%
	Total of the Above 4 Sectors			1,108,444	58.14%			1,875,247	62.85%
	Total Actual Development Investment Expenditure (VND Million)			1,906,633	100.00%			2,983,455	100.00%

Source: PPC Ha Giang.

Lao Cai		Actual Development Investment Expenditure (VND Million)							
		Year 2011				Year 2012			
		A. Province	B. All Below Districts/Cities	Total (A + B)	%	A. Province	B. All Below Districts/Cities	Total (A + B)	%
1	Irrigation	64,792	135,698	200,490	11.74%	102,147	166,662	268,809	8.49%
2	Road and Bridge (Provincial, District, Communal and Ward)	554,265	398,778	953,043	55.82%	1,157,345	531,343	1,688,688	53.33%
3	Water Supply (Urban and Rural)	6,895	56,318	63,213	3.70%	8,829	64,370	73,199	2.31%
4	Electricity Distribution (Medium/Low Voltage Lines and Transformers)	5,100	68,489	73,589	4.31%	7,056	75,200	82,256	2.60%
Total of the Above 4 Sectors				1,290,335	75.58%			2,112,952	66.73%
Total Actual Development Investment Expenditure (VND Million)				1,707,211	100.00%			3,166,486	100.00%

Source: PPC Lao Cai.

Yen Bai		Actual Development Investment Expenditure (VND Million)							
		Year 2011				Year 2012			
		A. Province	B. All Below Districts/Cities	Total (A + B)	%	A. Province	B. All Below Districts/Cities	Total (A + B)	%
1	Irrigation	127,443	38,782	166,225	13.82%	136,025	90,547	226,572	14.47%
2	Road and Bridge (Provincial, District, Communal and Ward)	145,843	100,414	246,257	20.47%	223,316	303,695	527,011	33.65%
3	Water Supply (Urban and Rural)	25,364	4,539	29,903	2.49%	49,165	1,352	50,517	3.23%
4	Electricity Distribution (Medium/Low Voltage Lines and Transformers)	9,110	1,842	10,952	0.91%	4,377	1,980	6,358	0.41%
Total of the Above 4 Sectors				453,337	37.69%			810,458	51.75%
Total Actual Development Investment Expenditure (VND Million)				1,202,723	100.00%			1,566,104	100.00%

Source: PPC Yen Bai.

Dien Bien		Actual Development Investment Expenditure (VND Million)							
		Year 2011				Year 2012			
		A. Province	B. All Below Districts/Cities	Total (A + B)	%	A. Province	B. All Below Districts/Cities	Total (A + B)	%
1	Irrigation	72,932	86,956	159,888	13.23%	142,594	132,217	274,811	12.77%
2	Road and Bridge (Provincial, District, Communal and Ward)	346,004	155,349	501,353	41.48%	894,531	158,170	1,052,701	48.90%
3	Water Supply (Urban and Rural)	30,188	42,247	72,435	5.99%	36,175	101,317	137,492	6.39%
4	Electricity Distribution (Medium/Low Voltage Lines and Transformers)	5,648	1,763	7,411	0.61%	3,430	4,856	8,286	0.38%
Total of the Above 4 Sectors				741,087	61.32%			1,473,290	68.44%
Total Actual Development Investment Expenditure (VND Million)				1,208,605	100.00%			2,152,819	100.00%

Source: PPC Dien Bien.

Lai Chau		Actual Development Investment Expenditure (VND Million)							
		Year 2011				Year 2012			
		A. Province	B. All Below Districts/Cities	Total (A + B)	%	A. Province	B. All Below Districts/Cities	Total (A + B)	%
1	Irrigation	148,892	139,124	288,016	15.41%	207,455	133,861	341,316	12.34%
2	Road and Bridge (Provincial, District, Communal and Ward)	187,067	114,665	301,732	16.15%	476,459	240,259	716,718	25.91%
3	Water Supply (Urban and Rural)	37,999	39,505	77,504	4.15%	20,020	26,165	46,185	1.67%
4	Electricity Distribution (Medium/Low Voltage Lines and Transformers)	8,584	6,743	15,327	0.82%	10,529	15,630	26,159	0.95%
Total of the Above 4 Sectors				682,579	36.53%			1,130,378	40.86%
Total Actual Development Investment Expenditure (VND Million)				1,868,416	100.00%			2,766,707	100.00%

Source: PPC Lai Chau.

Son La		Actual Development Investment Expenditure (VND Million)							
		Year 2011				Year 2012			
		A. Province	B. All Below Districts/Cities	Total (A + B)	%	A. Province	B. All Below Districts/Cities	Total (A + B)	%
1	Irrigation	206,182	81,875	288,057	15.64%	134,995	127,617	262,612	11.32%
2	Road and Bridge (Provincial, District, Communal and Ward)	110,961	86,509	197,471	10.72%	322,979	154,182	477,161	20.57%
3	Water Supply (Urban and Rural)	31,456	29,100	60,557	3.29%	11,922	82,495	94,417	4.07%
4	Electricity Distribution (Medium/Low Voltage Lines and Transformers)	18,412	4,845	23,257	1.26%	23,460	8,666	32,126	1.38%
Total of the Above 4 Sectors				569,341	30.91%			866,316	37.34%
Total Actual Development Investment Expenditure (VND Million)				1,842,080	100.00%			2,320,165	100.00%

Source: PPC Son La.

Note:

- "Actual Development Investment Expenditure" includes expenditures both for general development investment and target programs.
- "Expenditures for Province" means those spent by all provincial level agencies such as departments, PMUs, unions, and committees
- "Expenditures for all below Districts/Cities" means those spent by all agencies below district/city level such as divisions, PMUs, communes, wards, and other units.

I-5.4.2 Achievement of Mid-Term Development Plan

Table I-5.4.2 shows the achievement of the Social Economic Development Strategy, 2011-2020 in the six provinces. The following data was prepared on the basis of the preliminary data collected from the respective DPIs and further verification shall be made in the future study. Based on the preliminary data, achievement of infrastructure development projects for irrigation, road, water supply, and electricity planned in Social Economic Development Strategies in 2011-2020 was assessed.

Lai Chau and Son La achieved 76% and 63% of the respective projects by using 51% and 61% of the respective construction funds planned. Achievement of Yen Bai, Ha Giang and Dien Bien are limited at 35%, 43%, and 44% of the respective projects by using 32%, 39%, and 42% of the respective funds. Lao Cai achieved 46% of the projects by using 61% of the funds.

Table I-5.4.2 Achievement of the Social Economic Development Strategy, 2011-2020 in the Six Provinces (Preliminary Assessment)

(Unit: % to the target)

Sector	Ha Giang			Lao Cai			Yen Bai		
	Quantity	Project No.	Cost Disbursed	Quantity	Project No.	Cost Disbursed	Quantity	Project No.	Cost Disbursed
Irrigation	49	74	49	71	67	176	52	52	43
Road									
Provincial	23	33	23	54	50	50	51	58	36
District	42	36	43	50	55	53	18	24	19
Communal	48	55	49	55	39	71	14	18	15
Urban	37	100	37	86	46	73	28	51	8
Water supply									
Urban	55	33	59	55	57	40	69	30	33
Rural	56	25	26	18	26	38	50	53	34
Electricity	65	97	21	11	92	25	40	52	42
Total	-	43	39	-	46	61	-	35	32
Sector	Dien Bien			Lai Chau			Son La		
	Quantity	Project No.	Cost Disbursed	Quantity	Project No.	Cost Disbursed	Quantity	Project No.	Cost Disbursed
Irrigation	61	55	49	85	143	70	60	63	60
Road									
Provincial	56	60	47	100	100	52	38	45	49
District	52	61	48	65	9	65	64	84	64
Communal	47	54	41	51	72	51	49	66	73
Urban	50	57	26	39	34	39	77	75	78
Water supply									
Urban	83	67	74	63	50	49	55	55	55
Rural	19	21	19	50	55	44	60	60	60
Electricity	16	33	21	76	100	33	75	73	68
Total	-	44	42	-	76	51	-	63	61

Source: Preliminary data from DPIs

I-5.4.3 Operation and Maintenance System

(1) Budget Preparation

For the O&M of the road, “Provincial O&M fund” was created according to the Decree No.18/2012/ND-CP of the Vietnam government, dated 13 March 2012. The O&M activities shall be implemented according to the Decision No.2196/QD/BGTVT of the MOT, dated 29 July 2013.

At the provincial level, the responsible organizations are the DOT for provincial roads and the DPCs for district roads. The communal roads shall be basically maintained by Commune People’s Committees (CPCs) with the assistance of the respective DPCs.

The procedure for budget planning, approval and execution for O&M of roads are shown in Figure I-5.4.1 and made as follows:

1. The DPC and DOT shall prepare the O&M budget plan and request it to the provincial O&M fund.
2. The provincial O&M fund shall assess O&M fund requirement based on verified unit cost and request it to the DOF.
3. The DOF shall verify and prepare the O&M budget that is submitted to the PPC.
4. The PPC shall approve the O&M budget and allocate it to the DPC and DOT.
5. The DOT and DPC shall sign contract with the outside contractors to carry out the O&M activities.
6. The DOF/DOT/DPC shall disburse according to inspection results and contract.

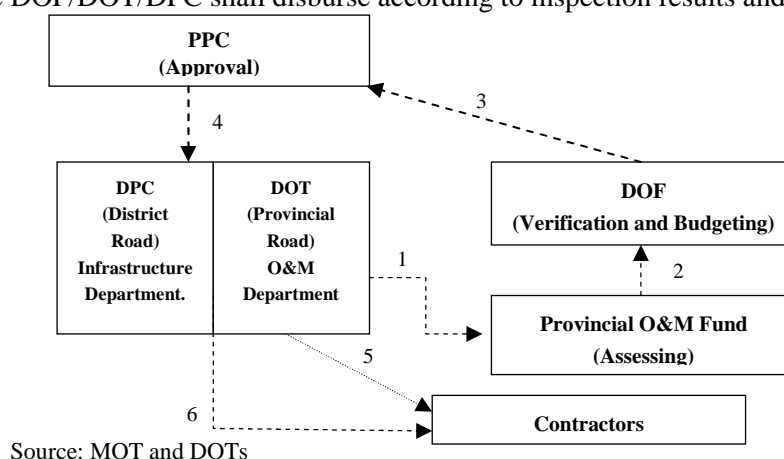
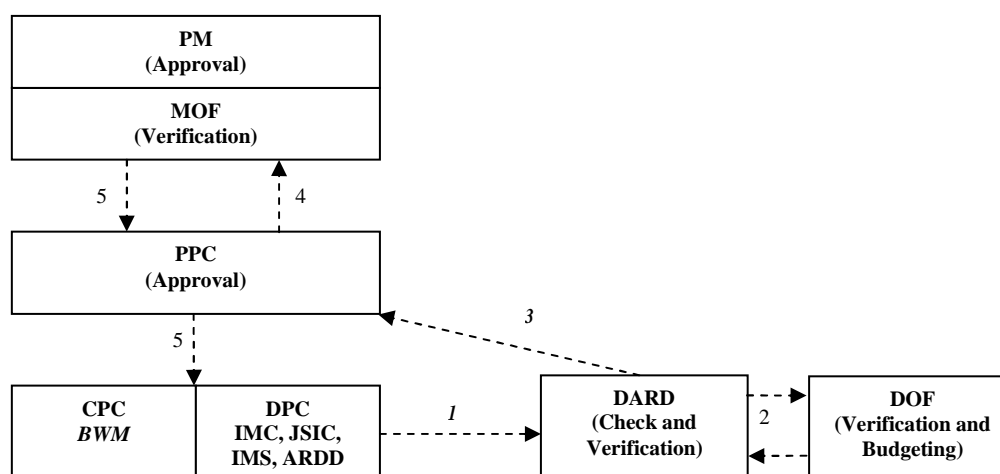


Figure I-5.4.1 O&M Budget Preparation and Approval for Road

In the case of irrigation, the O&M budget at the provinces are sourced from the irrigation subsidy based on Decree 67/2012/ND-CP of the Vietnamese government. The procedures are shown in Figure I-5.4.2 and summarized as follows:

1. The irrigation O&M organizations such as Irrigation Management Company (IMC), Joint Stock Irrigation Company (JSIC), Irrigation Stations, Agriculture and Rural Development Division under DPC and Board of Water Management (BWM) under CPC shall prepare their O&M plan based on irrigated area, irrigation type, and submit it to DARD.
2. The DARD shall verify and prepare the O&M plan and the DOF shall verify the O&M budget.
3. Based on 2, DARD shall submit the O&M plan and budget to the PPC.
4. The PPC shall approve and submit the O&M budget plan to the MOF.
5. The MOF shall verify the O&M plan and submit it to the PM for approval. The approved budget shall be transferred by PPC/DOF to the O&M organizations and DPCs.



Source: MARD and DARDs

Figure I-5.4.2 O&M Budget Preparation and Approval for Irrigation

The standard values of irrigation subsidy applied to the mountainous provinces are as follows:

- Pumps : VND 1,811,000 /ha/season (summer/spring)
- Gravity : VND 1,267,000/ ha/season
- Gravity and pumps : VND 1,539,000/ ha/season

The above standard of irrigation subsidy is modified by PPCs and DARD based on the provincial condition for practical O&M activities.

The urban water supply systems are managed by the provincial water companies or DPC and the rural water supply systems are managed by CPCs in general. The O&M fund source is basically the water fee collected from users. Some districts allocate their own budget for assisting and supplementing the O&M cost. The O&M of electricity system is made by the Electricity of Vietnam (EVN).

(2) Operation and Maintenance Expenditure and Assessment

The operation and maintenance of infrastructure in the six provinces are assessed for road, irrigation, water supply, and electricity.

According to Circular No. 11/2012/TT BXD of the guiding the calculation and management of construction maintenance costs, the recommended road O&M cost is estimated as follows:

Table I-5.4.3 Recommended O&M Works by Type of Surface

Item	Type of Surface			
	Asphalt Concrete	Cement Concrete	BPM	Gravel/Earth
Maintenance Period	5 years	10 years	3 years	
Organization (Staffing for routine/periodic inspection)	Management and technical staff	Management staff only		
Required budget per year	VND 80 – 100 million/km/year	VND 15 – 20 million/km/year		
Maintenance Activities	Routine	cleaning of ditches and culverts, grass cutting		
	Periodic	Patching potholes	Not required	Reshaping

Source: SPL-VI data

Based on the data collected from the DOTs, the road O&M cost are estimated at VND 25 million/km/year for national roads and VND 40-53 million/km/year for provincial roads and frequency is monthly. The O&M cost for district roads is limited at VND 4-6 million/km/year by two to three times annually. With comparison of minimum requirement of the BPM pavement applied for the most of district road at VND 15–20 million/year, the present O&M expenditure at around VND 5

million/km/year is limited at less than 30% of the requirement. Table I-5.4.4 shows the O&M status of roads in the six provinces in 2014.

Table I-5.4.4 O&M Status of Roads in the Six Provinces (2014)

Type of Road	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La	National Average
1. O&M Cost (VND in million/km/year)							
National	25	25	25	25	25	25	25
Provincial	41	40	53	38	41	40	40
District	5	6	5	4	5	5	5
2. Frequency (times/year)							
National	12	12	12	12	12	12	12
Provincial	12	12	12	12	12	12	12
District	3	3	2	2	2	3	4

Source: DOTs

The O&M of the irrigation systems is made by the provincial organizations such as the IMC and the district and communes with water users organizations. The provincial systems are maintained by 0.3 to five persons on average per system. Or in other words, the O&M coverage area is 12 ha to 64 ha per person. The annual O&M cost varies per province, i.e. VND 32 million/system in Yen Bai to VND 495 million/system in Dien Bien. The annual rehabilitation expenditure of the provincial system ranges from VND 12 million to VND 228 million. The total of O&M and rehabilitation cost per hectare ranges from VND 1.3 to VND 4.9 million.

The district and communal irrigation systems are maintained by 0.7 person to 3.1 persons on average per system, or 4.5 to 9.6 ha is managed by one person. The annual O&M cost varies from VND 8 million/system in Yen Bai to VND 36 million/system in Lao Cai. The annual rehabilitation expenditure of district and communal systems is from none in Dien Bien to VND 28 million/system in Lao Cai. The total of O&M and rehabilitation cost per hectare ranges from VND 1.6 to 3.4 million. Table I-5.4.5 shows the O&M status of irrigation in the six provinces in 2014.

Table I-5.4.5 O&M Status of Irrigation in the Six Provinces (2014)

Item	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Provincial						
Number of staff assigned (person/system)	None	None	0.3	4.0	1.4	5.1
Area per staff assigned (ha/person)	None	None	49.4	56.9	63.8	12
O&M cost (VND in millions/system/year)	None	None	32	495	77	283
Rehabilitation cost (VND in millions/system/year)	None	None	12	228	44	19
O&M + Rehabilitation cost (VND in millions/ha/year)	None	None	3.0	3.2	1.3	4.9
District						
Number of staff assigned (person/system)	0.7	3.1	0.8	1.4	2.8	1.3
Area per staff assigned (ha/person)	8.7	6.0	5.8	9.6	7.0	4.5
O&M cost (VND in millions/system/year)	8	36	8	22	25	8
Rehabilitation cost (VND in millions/system/year)	3	28	1	-	10	6
O&M + Rehabilitation cost (VND in millions/ha/year)	1.7	3.4	2.2	1.6	1.8	2.3

Source: Year 2014, DARD, IMC

The rural water supply systems are maintained by the commune or district by the limited maintenance staff (one or two persons/system) and the minimum O&M cost. Most of the rural water supply systems provide clean water without chlorination.

The 593 urban water supply systems with necessary treatment functions in the six provinces are maintained by provincial water supply companies, water supply center under the DARD, or the O&M organizations under the DPCs. The urban water supply systems are maintained by two to 16 staff per system. Most of the urban systems generate net income from the water fee collected that are utilized for rehabilitation expenditure and extension of distribution lines. The provincial water supply companies are the most capable O&M organization in the respective provinces with the skilled

technical and O&M staff. Table I-5.4.6 shows the O&M status of urban water supply in the six provinces in 2014.

Table I-5.4.6 O&M Status of Urban Water Supply in the Six Provinces (2014)

Item	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. of urban system	4	16	5	10	9	34
No. of staff assigned	24	123	52	160	80	76
Annual revenue (VND in millions/year)	23,000	96,652	31,200	35,808	18,553	93,228
O&M cost (VND in millions/year)	2,400	92,297	8,458	11,556	16,163	25,318
Per System						
Number of staff assigned	6	8	10	16	9	2
Annual revenue (VND in millions)	5,750	6,041	6,240	3,581	2,061	2,742
O&M cost (VND in millions)	600	5,769	1,692	1,156	1,796	745

Source : Provincial Water Supply Companies and the DARDs

I-5.5 Evaluation of Governmental Capacity of the Target Provinces

I-5.5.1 General

In the new project, it is assumed that local development is realized through establishment of a new model to improve budget preparation execution by government administrations, infrastructure development, and extension of agriculture technology. To do so, it is necessary to assess government capacity of target provinces to see whether the provinces have enough capability to implement the project or not.

There are several trials and fields for evaluation of governmental administrative capacity. The following table shows some examples on evaluation of governmental capacity.

Table I-5.5.1 Several Examples on Evaluation of Governmental Capacity

Trials/fields	Background/Contents/Viewpoints for Indicators
Public Finance Management (PFM)	Detailed indicators are set focusing specifically in finance.
Governance	Broad indicators are set including public voice, participation in selecting government, absence of violence, and control of corruption.
Provincial Governance and Public Administration Performance Index (PAPI) Financed by UNDP in Vietnam	This is implemented since 2011 in Vietnam. The indicators used are considered customized based on the governance indicators. The method is face to face interviews.
Example of Methodology of Rating Local Governments by a Rating Company (Standards and Poor's)	Since the purpose of this rating is to see the entity's creditworthiness, largely its willingness and ability to service its financial obligations, most of the indicators are related to finance. At the same time, economic conditions (e.g. GRDP/pop.) are also considered.
Cases in Japan	In most cases, individual tasks and projects are evaluated with a performance oriented concept. Therefore, indicators include not only budget, expenditure, and number of staff; but also output and outcome. Program- and policy-level evaluation is rarely implemented, and cases to evaluate local government body itself as a whole are not common.
Cases in US	The evaluation system (measurement system) was introduced because public voice was strong that quality of service delivery by local governments should be high. Therefore, most of indicators are the ones to measure outputs and outcome (performance).
Cases in UK	Very comprehensive indicators were used, not only results and performance, but also organization and system including finance. Due to the huge administrative costs, this measurement system was abolished.

Source: Prepared by the JICA Survey Team

As seen, there are various viewpoints depending upon purposes. In developed countries, it seems that effective service delivery to the public is the main issue with an assumption that proper financial management had already been established.

I-5.5.2 Evaluation Framework

(1) Approaches

The approaches taken are as follows:

- In evaluating provincial government administrative capacity, as of now, achievements by each province were considered, not the potential capacity of the provinces;
- To assess absolute capacities on whether the provinces can really implement the project or not is difficult; therefore, capacities were relatively evaluated among the provinces; and
- Referring to the several examples of measurement and evaluation of government capacity, the indicators were set considering finance (actual expenditure, not budget), human resources (number and technical level), performance (implementation of public policy, outcome, and performance of similar past projects), and public opinions.

(2) Indicators

Three large categories and nine small categories were set with 18 indicators as summarized below.

Table I-5.5.2 Indicators for Evaluation of Governmental Capacity

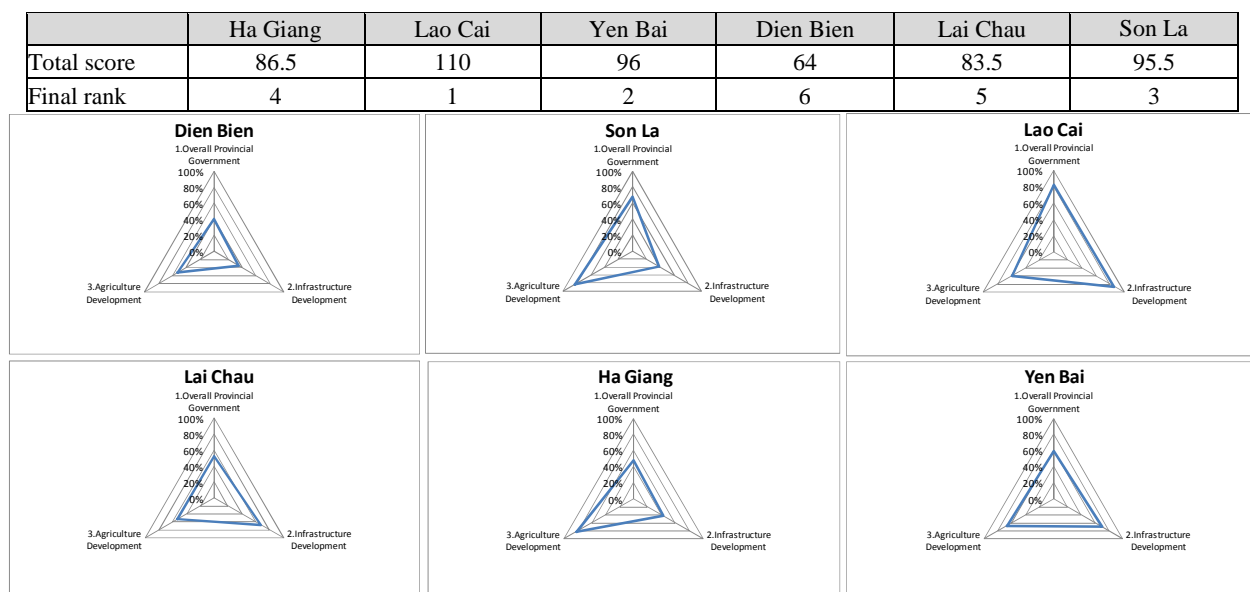
Category		Indicator	Weight	Points	
1. Overall Provincial Government	1.1 Government financial capacity	1.1.1 Scale of provincial government finance	1	6	
		1.1.2 Financial capacity of province		6	
		Weight	2.5	15	
	1.2 Development plan	1.2.1 Achievement of the development plan	1	6	
	1.3 Public opinions	1.3.1 Citizen's evaluation on provincial government capacity	1	6	
	1.4 Outcome achievement	1.4.1 Economic Development		6	
			Weight	1.5	9
		1.4.2 Poverty Reduction		6	
	Weight	1.5	9		
Sub-total				51	
2. Infrastructure Development	2.1 Development activities	2.1.1 Capacity for development activities	1	6	
	2.2 O&M	2.2.1 O&M institutional arrangement		6	
			Weight	1.5	9
		2.2.2 O&M expenditure		6	
			Weight	1.5	9
	2.3 Performance on project management for similar rural infrastructure projects	2.3.1 SPL 6		1	6
		2.3.2 ADB Sustainable Rural Infra Pjt (data as of the end of 2014)		1	6
	Sub-total				42
3. Agriculture Development	3.1 Extension	3.1.1 Extension expenditure (actual)	1	6	
		3.1.2 Number of rural work force/extension workers	1	6	
		3.1.3 Availability of crop manual		6	
			Weight	2.5	15
		3.1.4 Expert judgment on extension activities/capacity		6	
		Weight	2.5	15	
	3.2 Agriculture growth	3.2.1 Increase of yield		1	6
		3.2.2 Increase of cultivated area		1	6
Sub-total				54	
Total Score				147	

Source: JICA Survey Team

Each indicator has six score points. The scores of some indicators were weighted considering their importance as shown above. All the score points were added by province; and provinces were ranked by total scores. Details of the indicators are shown in Attachment I-5.5.1

I-5.5.3 Results

The results of the evaluation are shown in the following figure.



Remarks: Percentage in the radar charts shows the share of the subtotal score for each large category to full score point of a particular large category.

Source: JICA Survey Team

Figure I-5.5.1 Results of the Evaluation of Governmental Capacity

Based on the evaluation result, the highest evaluated province is Lao Cai, followed by Yen Bai, Son La, Ha Giang, Lai Chau, and Dien Bien.

As seen, differences are observed among the six provinces. In terms of the overall provincial government, Lao Cai and Son La are highly evaluated mainly due to their own high revenue sources and good performance of outcome. For the infrastructure development, Lao Cai and Yen Bai are highly evaluated. Son La and Ha Giang show good performance in the agriculture development category.

These results will be used to understand the different characteristics of the provinces, and be used as pre-assumption for formulation of the new project in terms of provincial government capacity to deal with extension activities as well as infrastructure development.

CHAPTER I-6 STUDY ON EXTENSION POSSIBILITY OF THE NORRD GUIDELINE/MANUAL

I-6.1 Study and Analysis on Extension Possibility in Dien Bien Province

I-6.1.1 NORRD Project

JICA's "Northwest Region Rural Development Project in Vietnam" (NORRD) was implemented in Dien Bien Province for five years, from August 2010 to July 2015. Three districts namely Dien Bien, Muong Cha, and Tuan Giao were selected as pilot districts. The activities implemented are summarized in the table below.

Table I-6.1.1 Three Pilot Districts and their Activities

District	Commune	Site	Contents of Activities				
			Paddy	Irrigation · Water Management	Maize	Soybeans	Organic Fertilizer
Dien Bien	Thanh Huong	Team 10	●	●	—	—	●
	Noong Het	Team 18	●	●	—	—	—
		Team 19	—	—	●	—	▲
Tuan Giao	Quai Cang	Sang	●	●	—	—	—
		Cuong	—	—	●	●	▲
	Muong Mun	Muong 1	●	●	●	▲	●
Muong Cha	Muong Tung	Pom Cai	●	●	—	—	—
	Ma Thi Ho	Ha Chim 2	●	●	—	—	●

Note: ▲ 2014 started

Source: Final Report of the JICA Technical Cooperation Project

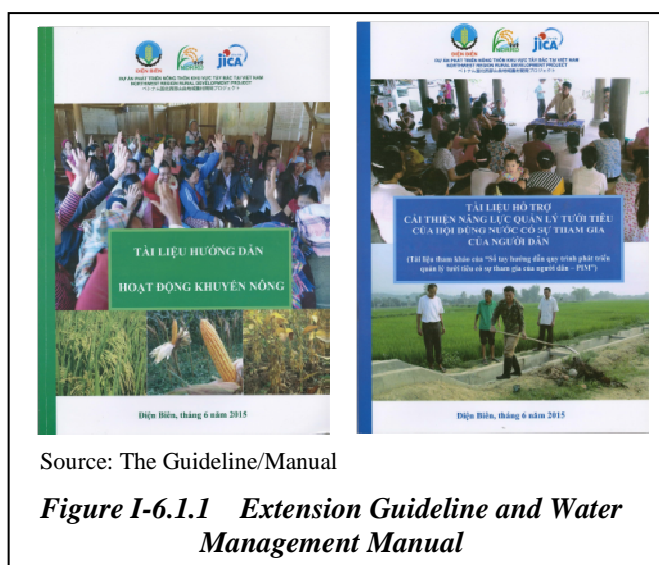
The project purpose of the NORRD Project is “The rural development in the pilot districts is promoted through strengthening the system, as district government being the core thrust force, to improve the production, post harvesting and marketing of market-oriented agricultural products”. To achieve this purpose, the following three outputs were set:

1) The method and approach for cultivation, post harvesting and marketing of agricultural products as paddy, maize, soybean are improved in the pilot districts.

2) Water resource distribution and irrigation infrastructure management are improved in the pilot districts.

3) The capacity for rural development of local government such as provincial, district and commune people’s committees and some agencies under those committees as well as mass organizations and agricultural enterprises is improved through strengthening the production, post harvesting and marketing of market-oriented agricultural products.

As a result of the NORRD Project activities, the guideline/manual were prepared in relation to the output 1) and 2), namely incorporating improved cultivation techniques of paddy, maize, and soybean; and measures of improved water resource distribution and irrigation facility management referring to the concept of PIM (Figure I-6.1.1). The guideline/manual was officially approved by Dien Bien PPC as a provincial official technical guideline/manual to be used for further application.



Source: The Guideline/Manual

Figure I-6.1.1 Extension Guideline and Water Management Manual

I-6.1.2. Agriculture Extension

(1) General

The guideline was formulated in cooperation with NORRD and Dien Bien Department of Agriculture and Rural Development (DARD), the pilot districts, and the pilot communes. The guideline consists of the outputs obtained through the activities of verification farms and trainings on several issues such as yield increase, optimization of fertilization, pest control, and production cost reduction of target crops, namely: paddy, maize, and soybeans. The guideline contains explanations and many charts on cultivation and extension techniques. It is expected to be widely utilized by those who work in the agricultural field to contribute to better agricultural extension.

The contents of the guideline are summarized in the table below.

Table I-6.1.2 Summary Contents of the NORRD Guideline

Agriculture Extension Guideline
PART I: GENERAL GUIDELINES FOR AGRICULTURAL EXTENSION ACTIVITIES
1. Objectives
2. Principles of extension method
3. Main points in extension activities via project activities
4. Extension activities for farmers' capacity building
5. Capacity building for agriculture staff
6. Periodic assessment methods of agricultural extension plans
PART II: DETAILED GUIDELINES FOR AGRICULTURAL EXTENSION ACTIVITIES
1. Basic knowledge about agricultural extension activities
2. Actual examples for agricultural extension activities
3. Individual capacity improvement
4. Cooperation among relevant authorities (typical examples about agricultural extension activities)
5. Workshop method (Typical examples about agricultural extension activities)
PART III: DETAILED GUIDELINES FOR PADDY RICE CULTIVATION TECHNIQUES
1. Objectives
2. Paddy rice varieties and crop seasons
3. Soil improvement
4. Land preparation
5. Variety preparation
6. Seeding
7. Weed prevention
8. Seedling pricking-out and transplanting (replanting) techniques
9. Physiological characteristics of paddy rice and fertilizer management
10. Water management
11. Pest prevention
12. Safe application of plant protection products
13. Harvesting, drying, cleaning and preserving
14. Post-harvesting treatment
15. Rice consumption promotion
16. Rice production recording (cultivation process management)
17. Agribusiness
PART IV: DETAILED GUIDELINES FOR MAIZE CULTIVATION TECHNIQUES
1. General features
2. Role of major nutrients
3. Morphological characteristics
4. Growth period of maize
5. Maize cultivation techniques
6. Pest prevention
7. Harvesting and preservation
PART V: DETAILED GUIDELINES FOR SOYBEAN CULTIVATION TECHNIQUES
1. General features
2. External conditions
3. Morphological characteristics
4. Growth period
5. Cultivation techniques
6. Some major pests and prevention measures
7. Harvesting and preservation

Source: The Guideline/Manual

The JICA Survey Team conducted the sample interview survey of local farmers and agricultural extension workers in six communes where pilot projects were implemented (Thanh Huang, Noong Het,

Muong Tung, Ma Thi Ho, Quai Cang, Muong Mun) as well as six non-pilot communes in the pilot districts (Thanh Luong, Than Xuong, Na Sang, Huoi Leng, Quai To, Quai Nua), and three communes in the non-pilot districts (Muong Luang, Muong Nhe, Muong Bang) where pilot projects were not implemented.

Interview findings and related data collected by the District Agricultural Extension Station as well as the Province Agricultural Extension Center are shown in Attachment I-6.1.1 in order to analyze the extension results and the possibility of dissemination of the guideline/manual formulated by NORRD in Dien Bien Province.

The interview targets intended around 15 local farmers under the pilot communes as well as around ten local farmers in non-pilot communes of the pilot districts and non-pilot districts (actual numbers interviewed are shown in Attachment I-6.1.1). Also agricultural extension workers assigned to each commune were interviewed.

The summary findings are described below.

(2) Results of Sample Interview Survey

1) Pilot Farmers

All pilot hamlet farmers positively evaluated NORRD's recommended techniques as "very helpful" or "helpful," and most of the farmers stated that they would continue to implement the techniques taught. On the other hand, due to economic and other reasons, there were some farmers in Tuan Giao who declined to answer the questions.

Table I-6.1.3 Evaluation and Continuity of the Recommended Techniques

District		Dien Bien		Muong Cha		Tuan Giao	
Commune		Thanh Huong	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
No. of farmers		14	14	16	15	15	14
Evaluation (No. of farmers)	Very useful	6	9	10	9	12	11
	Useful	8	5	6	3	3	3
	Not useful	0	0	0	0	0	0
Continuity (No. of farmers)	Continuous	14	14	16	12	5	10
	Not continuous	0	0	0	0	0	0

Source: JICA Survey Team, Sample Interview Survey

The table below summarizes the effect of the NORRD Project by cultivation item for the target crops.

Table I-6.1.4 Summary of NORRD Project Effect

	Paddy	Maize	Soybeans
Sample	69	19	7
Variety	Main varieties were Bac Thom So 7, Te Rau, BC 15, IR64, and local variety, showing no changes before and after the NORRD Project implementation.	F1 hybrids of LVN10, LVN85, NK99, NK54, DK8 and some local varieties. Varieties were not changed before and after NORRD Project.	DT84 as the same before and after the NORRD Project implementation.
Seed selection by salt water	Seed selection by salt water before sowing has an effect in removing immature and empty seeds and increasing the germination rate. Most farms (80 to 100%) now use seed selection by salt water.	-	-
Seed volume	Seed volume was reduced from 20 to 49%, which has contributed to the reduction of production costs.	Decreased (32% of seeds were decreased in Noong Het.)	Decreased by 34%
Sowing	No. of farmers who changed from	75~80% of farmers who used	100% of farmers who used

	Paddy	Maize	Soybeans
	broadcasting to stripe seeding in all pilot communes increased. Transplanting is conducted among some farmers in Muong Cha.	broadcasting method in Quai Cang and Muong Mun adopted stripe seeding	broadcasting method changed to strip seeding.
Weeding frequency	Slightly decreased from 1.6~2.0times to 1.3~1.9 times.	1.7 ~1.8 times the same before and after NORRD	1.7 ~1.8 times the same before and after NORRD.
Fertilization frequency	Slightly increased 0.9~2.9 times to 2.4~3.0 times	Increased from 0.6~2.0 times to 2.2~2.4 times.	All farmers who had not used fertilizer have changed to apply it
Chemical spray frequency	Slightly increased from 2.0~4.0 times to 2.8~4.4 times.	Slightly increased. Farmers, who applied less chemical before, increased because of understanding the chemical effect. Farmers who applied much chemical before decreased their frequency.	Increased from 1.3 times to 2.1 times.
Effect of chemical	Rate of farmers, who recognized the good effect of spray, was improved from 38~67 % to 60~100%	The percent of farmers who recognized the good effect of spray generally increased.(60% of farmers in Noong Het recognized the good effect)	No. of farmers who recognized the effect of chemical spray increased.
Yield	Increased from 3.27~5.28t/ha to 3.93~6.22t/ha.	Increased from 2.65~4.40 t/ha to 3.50~6.66 t/ha.	Increased from 0.97 t/ha to 1.52 t/ha
No. of farmers who sold products	Slightly increased and their selling income also increased at 30~45 %.	Increased from 40% to 60% and the selling income also improved in Noong Het.	All farmers sold products and their selling income increased by 56 %.

Source: JICA Survey Team, Sample Interview Survey

Based on the result of the interview survey, it is revealed that yield increased through acceleration of understanding on basic farming practices. The recommended techniques that the farmers adopted include field preparation, seed treatment, direct stripe seeding, fertilization, and pest control. These techniques have led to the reduction of production costs, reduction of agricultural labour, improvement of crop quality, and increase of yield and production.

Table I-6.1.5 Adopted Techniques and Its Effectiveness

	Paddy	Maize	Soybeans
Adopted techniques	Land preparation and puddling, seed treatment, direct stripe seeding, fertilization, pest control	Land preparation, direct stripe seeding, fertilization, pest control	Direct stripe seeding plant distance, fertilization, pest control
Effectiveness of adopted techniques	Insects decrease, good growth of rice plants, reduction of production cost (seeds, fertilizers, chemicals), reduction of farming load, improvement of rice quality, production increase	Reduction of production cost (seeds, fertilizers), increase of yield and production	Production increase, reduction of production cost (seeds, fertilizers)

Source: JICA Survey Team, Sample Interview Survey

The table below shows the participation of farmers in the extension activities for the NORRD Project.

Table I-6.1.6 Participating in the Extension Activities Before and After the NORRD Project

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Huong		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun	
No. of Farmers		14		14		16		15		15		14	
NORRD		B	A	B	A	B	A	B	A	B	A	B	A
Visiting pilot farm	% of farmers	0	79	14	100	19	69	13	36	1	80	7	79
Participating in training	Frequency	0	4.4	0.4	4.5	1.0	4.8	0.3	3.5	0.6	3.8	0.5	4.0
Use of training material for farming	% of farmers	86		64		81		60		33		86	
Technical transfer to other farmers	% of farmers	64		93		69		53		53		21	

Source: JICA Survey Team, Sample Interview Survey, B: Before implementation of the NORRD Project A: After implementation of the NORRD Project

Pilot hamlet farmers were involved in the NORRD extension activities. About 69%~100% of farmers visited the pilot farm. However, in Ma Thi Ho only 36% of farmers visited the pilot farm due to only one paddy cropping yearly in this area and different characteristics of the ethnic group of Mong (they have their own language and culture and prefer upland crops). Participating in training was increased from 0~1 to 3.8~4.8 times. Farmers commented that it was difficult to understand the training contents at first, but they could understand it gradually. From 60% to 80% of farmers used the training materials for farming, except Quai Cang farmers (33 % of farmers, low). Approximately 53% to a high 93% of farmers transferred the acquired techniques to other farmers such as stripe seeding, fertilization, plant distance, and pest control. In Muong Nun there was a low rate of 21 %.

In sum, the NORRD Project is generally successful in changing the target farmers' farming level and attitude for extension.

2) Non-Pilot Farmers

The sample interview survey was also conducted in six communes (Thanh Luon, Thanh Xuong, Na Sang, Huoi Leng, Quai To, Quai Nua) of the three pilot districts and in the three communes (Muong Luang, Muong Nhe, Muong Bang) of the three non-pilot districts.

The following table describes the summary of current farming exercise for the target crops in the non-pilot areas.

Table I-6.1.7 Summary of Current Farming Exercise in Non Pilot Areas

	Paddy	Maize	Soybeans
Sample	40	32	2
Variety	Bac Thom 7, IR 64 and local variety, mostly the same as the pilot farmers	F1 hybrid LVN10, NK54, NK339, MX6 as same as those of the pilot farmers	DT84 was the same as that of the NORRD Project
Seed selection by salt water	Conducted by 80% of farmers in the communes of Dien Bien and Tua Chua Districts and in the other communes, it was 33~67%, lower than the pilots.	-	-
Seed volume	-	About 20~38kg same as that of the pilot farmers, except 100kg/ha in Muong Nhe commune.	Direct stripe seeding was practiced with the same volume of seeds as the NORRD Project.
Sowing	All farmers in Muong Cha used broadcasting seeding and the others used stripe seeding or transplanting.	Direct stripe seeding was conducted in Dien Bien Don, Muong Nhe and Tua Chua, and in the other	

	Paddy	Maize	Soybeans
	Especially, in Dien Bien Don and Muong Nhe 80 % of farmers used transplanting.	communes direct broadcasting was used.	
Fertilization frequency	Generally less than that of pilot farmers. Approximately 50% of farmers in Dien Bien Don did not apply fertilizer	From 50% to 100% of farmers in the non-pilot districts did not apply fertilizer	There is one farmer, out of two, who did not apply fertilizer and chemicals
Chemical spray frequency	Almost the same as the pilot farmers except Muong Cha and Tuan Giao (less spray)	Most of the farmers in the non-pilot districts did not apply any chemicals	
Yield	Generally low at 2.83-4.7 t/ha except 6.10 t/ha in Dien Bien. Paddy cultivating in the communes of Dien Bien have flat and irrigated field which are close to the pilot commune of the NORRD Project	About 5.5 t/ha in Dien Bien and these farmers applied weeding, fertilization, and chemical spray more than the others. Farmers who did not apply fertilizer and chemical obtained low yield. Exceptionally, the yield in Dien Bien Don was high	Both farmers sold the products. One farmer had low yield 0.4 t/ha, but he had much production due to the wide area of farm.
No. of farmers who sold products	About 30% of farmers in Dien Bien sold products. Other farmers used products for self-consumption	Farmers who had high yield and high production sold the products to the market	

Source: JICA Survey Team, Sample Interview Survey

Paddy: Current situation of paddy cultivation techniques of non-pilot farmers is the same as that of the pilot farmers before the NORRD Project.

Maize: Current situation of maize cultivation techniques of non-pilot farmers is the same as that of the pilot farmers before the NORRD Project, except for the interviewed farmers in Dien Bien and Dien Bien Don.

Soybeans: Current situation of soybeans cultivation techniques of non-pilot farmers is the same as that of the pilot farmers before the NORRD Project, except for an interviewed Tua Chua farmer.

In sum, it can be said that the current farming practices stay at the level of pilot areas of the NORRD Project before it started except in some places like Dien Bien and Dien Bien Don, indicating there are rooms to improve by use of the guideline/manual.

It is noted that all non-pilot farmers did not recognize the NORRD Project. However, farmers are interested in the recommended techniques of the NORRD Project when the team explained and they are expecting the extension activities.

3) Extension Workers in Both Pilot and Non-pilot Areas.

Extension workers at the commune level, and staff of the Agriculture Extension Station (AES) at the district level were also interviewed. Commune-level extension workers in the pilot communes in general think that the project is sustainable and farmers adopting the recommended techniques will continue to use them because the recommended techniques are basic, easy, and at low cost.

Problems and issues in extension expansion were raised by the commune extension workers and are summarized below.

Table I-6.1.8 Problems and Issues in Extension Expansion

Pilot Commune Extension Workers	Non-pilot Commune Extension Workers in Pilot Districts	Non-pilot Commune Extension Workers in Non-pilot Districts
<ul style="list-style-type: none"> - Extension workers do not receive the extension activity budget which causes restriction in extension activities. So the activity area becomes small and the training to farmers becomes meetings. (All Communes) - Access to the farmer's field during the rainy season is difficult due to bad road condition. (Muong Cha, Tuan Giao) - It is difficult for poor farmers to adopt the costly techniques. (Muong Cha, Tuan Giao) - It needs special attention for the ethnic group farmers to adopt the techniques due to different language and culture. (Muong Cha, Tuan Giao) - It needs more care to train the low educated farmers. (Muong Cha) - A technical issue is a method of seed sprouting using seeder. (Dien Bien) - Water pollution caused by excess chemical spray needs to be solved. (Dien Bien) - Some extension workers and hamlet leaders in the pilot commune have the capacity to support the non-pilot hamlets and communes for extension expansion. 	<ul style="list-style-type: none"> - Farmers are interested in practical techniques such as new varieties and pest control. - There are no extension activity budgets for extension worker in commune such as the ones for implementing pilot farm and for motorbike fuel. - It is difficult to visit the farmer's fields due to scattered small fields and long access to the fields. - Extension workers are less to cover wide extension area. (Quai To) - It needs special consideration to communicate with the ethnic group farmers due to their different language and culture. (Na Sang) - Better ways need to be considered to train the farmers with different level of knowledge and technique. (Thang Luong, Na Sang, Quai To) - Farmers who lack farming funds are having difficulty in adopting new techniques. (Quai To) - Computer, projector, camera are necessary for extension activities. (Thanh Luong, Thanh Xuong, Quai Nua) - Technical training on crop cultivation is needed for the extension workers. (Na Sang, Quai Nua, Huoi Leng) 	<ul style="list-style-type: none"> - There is lack of extension budget for pilot farm implementation. (All Communes) - It is difficult to visit the farmer's fields during the rainy season due to bad road condition. (Muong Luang) - Fuel cost of motorbike is own expense. (Muong Liang, Muong Bang) - No. of hamlets and no. of farm household are too many for the extension activities. (Muong Bang) - There is lack of training materials for the farmers which contain the pictures and photos with less sentence. (Muong Luang, Muong Bang) - Computer, printer, projector are necessary to prepare the training materials for extension activities. (Muong Nhe) - Some ethnic group farmers need considerations in order to understand the extension worker's guidance more (their different language and education level should be well considered). (Muong Luang, Muong Bang) - Farmers cannot understand the reason of low yield, but they are willing to learn the actual cultivation techniques through the training. (All Communes)

Source: The Guideline/Manual

Budget concerns were raised by all categories. At the commune level, in fact, there is generally no extension budget. Therefore, district-level and provincial-level budget preparation is important for continuation and dissemination of activities. Other concerns are access and coverage, with special consideration to ethnic groups and poor farmers.

Extension workers of non-pilot communes in the pilot districts did not directly attend any programs of the NORRD Project, but know the project. All extension workers of non-pilot communes in the non-pilot districts did not know the NORRD Project, even though some extension workers received the guideline/manual just one week before the survey team arrived there. The AESs' staff in all non-pilot districts know the project.

The comments on the guideline/manual by extension workers are summarized below.

Table I-6.1.9 Comment on Guideline

Pilot Districts					
Dien Bien		Muong Cha		Tuan Giao	
Thanh Hung (by commune extension workers)	Noong Het (by commune extension workers)	Muong Tung (by commune extension workers)	Ma Thi Ho (by commune extension workers)	Quai Cang (by commune extension workers)	Muong Mun (by commune extension workers)
<ul style="list-style-type: none"> • Unnecessary of modification • Use for extension activity 	<ul style="list-style-type: none"> • Use for extension activity 	(No comment)	<ul style="list-style-type: none"> • Easy to understand • Unnecessary of modification 	<ul style="list-style-type: none"> • Good for extension activity • Unnecessary of improvement • Use for training 	<ul style="list-style-type: none"> • Always keeping for extension activity • Useful for farmer's question • Unnecessary of

Pilot Districts		
Dien Bien	Muong Cha	Tuan Giao
		modification
(By AES staff)	(By AES staff)	(By AES staff)
<ul style="list-style-type: none"> Senior extension workers understand easily and satisfied with the manuals. Manuals are very useful to extension activities. New and junior extension workers do not understand the Manual It is difficult for farmers to understand, so more pictures and figures are needed in the manual. 	<ul style="list-style-type: none"> Workshop on the manuals was implemented for the non-pilot commune. Manuals are easily understandable and good for extension activities. Manuals are not necessary to be modified. 	<ul style="list-style-type: none"> Technical problem on paddy, maize, and soybeans are not existing in manuals. It is easily understandable and satisfied. Manuals are not necessary to be modified. Extension workers already implemented workshop for Commune farmers and some farmers attended the training held by AES. Manuals for other crops is expected to be formulated.
Non Pilot Districts (by AES staff)		
Dien Bien Don	Muong Nhe	Tua Chua
<ul style="list-style-type: none"> The guideline is useful for crop cultivation in the district. Term of cultivation is necessary to be modified (advanced example). When farmers adopt these techniques, it is needed to be more practically and more detailed. 	<ul style="list-style-type: none"> The guideline is easily understandable because of many pictures, especially pest control. It is possible to disseminate the manual's techniques to the farmers. It is some difficult for the new extension workers to understand. 	<ul style="list-style-type: none"> The guideline are easily understandable. It is very useful for extension activities and good for adaptation to the farmers.

Source: JICA Survey Team

The guideline was evaluated very well by all extension workers. Some extension workers are already using the guideline for extension activities.

(3) Extension System in the Province

1) Extension staffs

The number of AEC staff of Dien Bien Province is 21, total staff of AESs in ten districts is 87 and total number of extension workers is 229 for 130 communes.

Generally, two extension workers are assigned in one commune and a hamlet leader assists the extension workers as an extension collaborator for each hamlet in Tua Chua.

2) Extension budget

Extension budget of AEC has decreased gradually as shown below:

Table I-6.1.10 Extension Budget (Actual) of AEC in Dien Bien Province for the Year 2013-2014

(Unit: VND in millions)

	2013	2014
Extension Budget	2,893.7	2,793.1
Current budget	1,750.0	1,641.0
Extension activities	1,143.7	1,152.1

Source: AEC

The amount of AES extension budget is different among the districts. In the table below, extension budget of Tuan Giao, Dien Bien Don, and Tua Chua generally decreased similar to other districts.

Table I-6.1.11 Extension Budget of Agriculture Extension Station (AES)

(Unit: VND in millions)

	District	Tuan Giao	Dien Bien Don	Tua Chua
2015	Extension budget	1,212	10,327	8,581
	Current budget	361	1,054	722
	Extension activities	851	9,273	7,859
2014	Extension budget	1,367	10,733	29,639
	Current budget	876	1,593	683
	Extension activities	491	9,140	28,956
2013	Extension budget	1,557	13,995	12,909
	Current budget	790	900	776
	Extension activities	767	13,905	12,133

Source: District Planning and Finance Division, Agriculture Extension Station

The amount of extension activities expenditure of all AESs and AEC in the province is estimated as VND 6,508 million per year (2014).

3) Extension Possibility in Dien Bien Province

1) Extension possibility of the guideline in the pilot communes

- Extension workers in pilot communes acquired the extension and cultivation techniques from the NORRD Project.
- Hamlet leaders and farmers in non-pilot hamlets of pilot communes know the NORRD Project activities and recommended techniques.
- Extension of the guideline is possible for the non-pilot hamlets in the pilot communes. However, the extension budget support is preferable for them from districts and provinces.

2) Extension possibility of the guideline in the non-pilot communes/districts

- Natural and land condition in non-pilot districts and communes are similar to that of the pilot sites.
- Conventional farming is similar to that of the pilot sites before the NORRD Project implementation.
- Most of the extension workers (at the district level) recognized the NORRD Project. They are willing to use the results for extension activities and farmers are very interested in new techniques. Commune-level extension workers need further information.
- The recommended techniques are basically appropriate for farmers. However, the support from the province and the pilot districts is necessary considered with the current extension worker's capacity and the expansion budget in the non-pilot areas.
- Finally, the extension of the guideline is possible in Dien Bien Province with budget support and the extension worker's improved capacity.

I-6.1.3 Water Management

(1) Activities of the NORRD Project

The water management component of the NORRD Project is summarized below.

Table I-6.1.12 Summary of Water Management Component, NORRD Project

Output	Water resource distribution and irrigation infrastructure management are improved in the Pilot Districts
Activities	<ul style="list-style-type: none"> • To conduct workshops for water use and identify needs and major challenges, thus deepening the understanding of farmers and irrigation management staffs. • To draft and implement the improvement plan with the farmers and irrigation management staff for efficient and effective water usage based on the problems identified above. • To conduct training to farmers and facility managers for water use, and identify where the training is utilized. • To monitor and verify the above activities in the pilot communes and to formulate guidelines/manuals for drawing the improvement plan according to the farmer's needs, and then to distribute them to the local government. • To identify the problems related with the management of the small-scale infrastructure associated with rural development and solve them with farmers.

Source: Joint Terminal Evaluation Report, NORRD

1) Establishment of Water Users' Group (WUG)

The NORRD Project had supported establishment of water users' group (WUG) in the six pilot sites, i.e. Thanh Hung, Noong Het, Ma Thi Ho, Muong Tuong, Quai Cang and Muong Mun, since August 2012. The target WUGs made the improvement plan of water management covering the following subjects:

- Prepare discussion on water management mechanisms
- Develop regulations of the WUG
- Organize periodical meeting with the board and members of WUGs
- Prepare and implement a plan to rehabilitate the irrigation system
- Prepare and implement operation and maintenance (O&M)
- Change the water consumption habits of farmers
- Publicize and inform on labour contribution or revenue and expenditure related to O&M activities and rehabilitation works.

2) Rehabilitation and construction of small-scale infrastructure

The target WUGs conducted design and construction of irrigation facilities jointly with the JICA NORRD experts. The construction of irrigation facilities were implemented in 2013 and 2014. The summary of rehabilitation and construction works is as follows.

Table I-6.1.13 Summary of Rehabilitation and Construction Works in Pilot Site

District	Commune	Works	Irrigated Area /Construction Cost
Dien Bien	Thanh Hung (Team 9, 10)	Rehabilitation of irrigation canal : 397m (width:70~40 cm) Rehabilitation of diversion weir	74.4 ha VND 4,446 million (JPY 22.2 million)
	Noong Het (Team 18)	Rehabilitation of drainage canal ; 336m (width: 110~140cm)	200 ha (drainage area) VND 1,919.0 million (JPY 9.6 million)
Muong Cha	Ma Thi Ho (Ho Chim 1 and 2)	Construction of pipeline Rehabilitation of diversion gate	15 ha (pipeline) VND 1,332 million (JPY 6.7 million)
	Muong Tung (Pom Cai)	Rehabilitation of diversion weir Rehabilitation of irrigation canal : 56m (width: 50cm)	21 ha VND 1,060 million (JPY 5.3 million)
Tuan Gia	Quai Can (Sang)	Rehabilitation of diversion weir (settling basin, sand sluiceway) Dredging	17.2 ha VND120,392 thousand (JPY 0.6 million)
	Muong Mun (Muong 1)	Rehabilitation of diversion weir Rehabilitation of irrigation canal : 303m (width: 40cm) Rehabilitation of diversion works	21 ha VND 3,459 million (JPY 17.3 million)

Source: Final Report, NORRD

3) Preparation of manual on participatory water management and its extension

Based on the activities made, the manual on water management was prepared by the NORRD Project Team. The DARD held the workshop to present the manual. The manual was distributed to all districts in Dien Bien Province.

(2) Summary of Manual on Participatory Water Management

The manual consists of two parts. The first part is the “Guide of Concept” and the second part is the “Guide of Water Management Improvement” as shown below.

Table I-6.1.14 Summary of Table of Contents of Water Management Manual

Part I: Guide of concept for water management	Part II: Guide of water management improvement
Summary	
Basic concept and applicable conditions to administrative officer in order to make plan for water management improvement by farmers’ participation.	For efficient and effective participatory water management, specific steps and contents of activities made by administrative officer and key farmers
Table of contents	
1. Purpose 2. Background and policy 3. Basic concept 4. Area need farmers’ participatory water management 5. Strengthening of farmers’ participatory water management group and steps of water management plan formulation 6. Case of farmers’ participatory water management activity	1. Purpose 2. Strengthening of farmers’ participatory water management group and steps of water management plan formulation 3. Specific steps of water management plan formulation <ul style="list-style-type: none"> • Summary of steps • Baseline survey for strengthening of farmers’ participatory water management group • Need for awareness of farmers on farmers’ participatory water management and formulation of establishment team • Institution of WUG • General and board meeting • Operation and Maintenance Plan • Monitoring plan • Facility improvement plan 4. Case of farmers’ participatory water management activity

Source: Water Management Development Manual, NORRD

(3) Questionnaire survey result of the NORRD Pilot/Non-pilot areas in Dien Bien Province

The JICA Survey Team conducted questionnaire survey in the pilot and non-pilot communes. The respondents included representatives of irrigation management staff, board members of WUGs and farmers. In each pilot and non-pilot sites, the interview survey was made covering the following respondents:

Table I-6.1.15 Respondents of WUGs Survey

Items	Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua	Total
1. Pilot Sites							
Communes	Thanh Huong, Noong Het	Muong Tung Ma Thi Ho	Quai Cang Muong Mun	-	-	-	6 communes
Village Staff	2	2	2	-	-	-	6
WUG Chairman	2	2	2	-	-	-	6
Farmers	16	11	13	-	-	-	40
Sub-total	20	15	17	-	-	-	52
2 Non-Pilot Sites							
Communes	Thanh Luong, Thanh Xuong	Na Sang Huoi Leng	Quai To Quai Nua	Thanh Luan	Huong Nhe	Muong Bang	9 communes
Village Staff	2	2	2	1	1	1	9
WUG Chairman	0	0	0	0	0	0	0
Farmers	2	2	2	1	1	1	9
Sub-total	4	4	4	2	2	2	18
Total	24	19	21	2	2	2	70

Source: JICA Survey Team

1) Survey Result at Pilot Sites

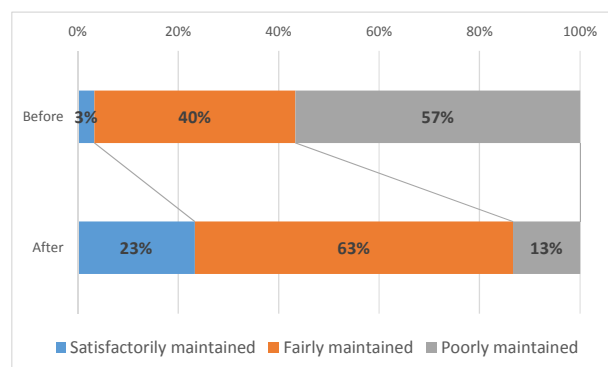
Based on the interview survey and WUG’s information, the present status of the pilot sites are as follows:

Table I-6.1.16 Status of WUGs at Pilot Sites

DPC	Dien Bien DPC		Muong Cha DPC		Tuan Giao DPC	
CPC	Thanh Hung	Nong Het	Muong Tung	Ma Thi Ho	Muong Mun	Quai Cang
WUG	Team 9&10	Team 18	Pom Cai	Ho Chim 1&2	Muong 1	Sang
1. Household (No.)	136	83	64	79	87	82
2. Service Area (ha)	39.5	14.4	10.1	62.0	23.3	17.5
3. Cropping Pattern	Paddy-paddy In dry season, maize and vegetable	Paddy-paddy	Paddy-paddy	Paddy crop in summer season only. (Some farmers try to cultivate dry cropping)	Paddy-paddy	Paddy-paddy
5. Water Sources	Stream and Additional: Hong Khenh reservoir (managed by Dien IMC)	Pa Khoang reservoir (managed by IMC)	Stream	Stream	Stream	Stream
5. Irrigation Facilities	Diversion weir (2), Main canal (2,819 m), Diversion gate (11) Secondary canal (2)	Main canal (1,000 m), Drainage canal (1,120 m), On-farm canal (1,000 m), Diversion gate (7)	Diversion weir (3: upper, middle and lower), Main Canal (3:upper 700m,middle 100m and lower 500 m),	Phi Linh diversion weir, Phi Linh main canal (3,720 m), Diversion gate (16), Secondary canal (7)	Phai-kha diversion weir, Muong 1 main canal (228 m), Diversion gate (2) Secondary canal (2)	Phai Hua It diversion weir, Muong Hua Ta main canal (1,000 m), Diversion gate (3), Secondary canal (3)
6. WUG Organization	Chairman (1), Vice Chairman (1), Accountant (2), Irrigation staff (4), Librarian (1) Farmers' group leader (4), Secretary (2) Total: 15	Chairman (1), Vice Chairman (1), Accountant (1), Irrigation staff (4), Farmers' group leader (6), Secretary (2) Total: 15	Chairman (1), Accountant (1), Irrigation staff (4), Farmers' group leader (5), Total: 11	Chairman (1), Vice Chairman (1), Accountant (1), Irrigation staff (3), Farmers' group leader (7), Secretary (2) Total: 15	Chairman (1), Vice Chairman (1), Accountant (1), Irrigation staff (4), Farmers' group leader (5), Secretary (2) Total: 14	Chairman (1), Vice Chairman (1), Accountant (1), Irrigation staff (3), Farmers' group leader (6), Secretary (2) Total: 14
7. Water fee	Sum-Aut (Wet): 3.0 kg of paddy per 1,000m ² Win-Spr (dry): 4kg /1,000m ²	Both seasons VND 8,000 per 1,000 m ² /seasons	Sum-Aut (Wet) 2.0kg/1,000m ² Win-Spr (Dry): 2.5kg/1,000m ²	Both seasons: VND 10,000 per 1,000 m ² /season	Sum-Aut(Wet) 2.0kg/1,000m ² Win-Spr (Dry): 2.5kg/1,000m ²	Both season VND 10,000 per 1,000m ² /season

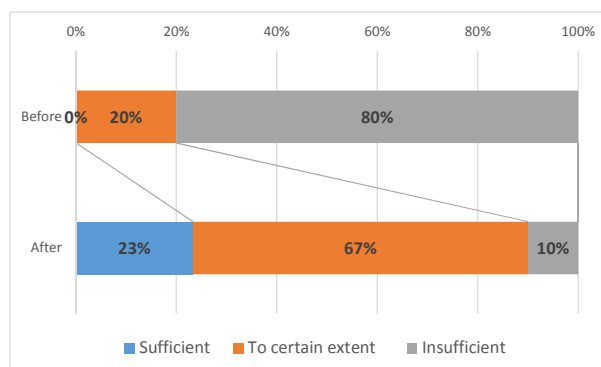
Source: JICA Survey Team

The summary of some key findings from the interview survey is as shown below.



Source: JICA Survey Team

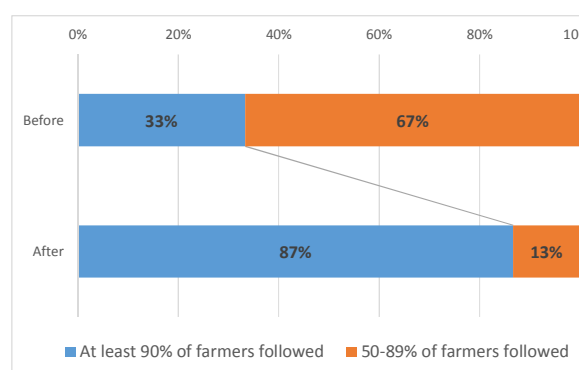
Figure I-6.1.2 Condition of Irrigation Facilities



Source: JICA Survey Team

Figure I-6.1.3 Sufficient Water during Dry Season

- After the NORRD Project, irrigation facilities have been maintained well. Eighty six percent of farmers considered that the irrigation facilities were improved and fairly maintained by WUGs.
- After the NORRD Project, water shortages in the dry season have improved significantly.
- At least 90% of farmers followed the water distribution plan. The facilities were improved and irrigation scheduling and distribution became more effective.



Source: JICA Study Team

Figure I-6.1.4 Farmers' Practices According to the Water Distribution Plan

- The majority of farmers practice and repair according to the maintenance plan.
- Before the NORRD Project, communes/hamlets collected water fee for O&M depending on the administrative staff. However, after the establishment of the WUGs, water fees were fixed and the collection rate reached 100%. The collection of water fees is made by the WUGs after harvest.
- The meeting of WUGs was continued regularly, usually once every two months except one time before the wet and dry seasons. The rate of participation to the meeting was very high ranging from 75 to 100%.
- The WUGs' board has a notebook to record discussions and decisions made in the meeting.
- Regarding JICA's pilot activities on water management, all respondents judged that the activities of irrigation management were useful. They said that JICA's water management manual was applicable to their work.
- The improvement of the irrigation facilities in the six pilot communes was completed in time. The irrigation facilities were handed over to the communes. The local monitoring experts and the short-term Japanese experts supervised construction works.
- The management boards of WUGs operated the systems effectively. The regular meetings were held with participation of farmers. The farmers participated in the maintenance works regularly. The collection rate of water fee became high.

2) Survey Result of Non-Pilot Sites

The JICA Survey Team conducted the questionnaire survey for nine non-pilot communes in the six districts in Dien Bien Province. The summary of non-pilot commune and questionnaire survey results are shown below.

Table I-6.1.17 Status of WUGs in Non-Pilot Sites

DPC	Dien Bien DPC		Dien Bien Dong DPC	Muong Cha DPC		Muong Nhe DPC	Tuan Giao DPC		Tua Chua DPC
	Thanh Luong	Thanh Xuong	Thanh Luan	Na Sang	Huoi Leng	Muong Nhe	Quai To	Quai Nua	Muong Bang
WUG	IR team	IR team	Hamlet	None	None	None	None	None	None
1. Household (No.)	73	54	10	39	44	135	96	None	119
2. Service Area (ha)	29.2	16.2	4.5	14.4	18.3	60.0	10.2	15.5	26.0
3. Cropping Pattern	Paddy-paddy and maize in dry season	Paddy-paddy and maize in dry season	Paddy-paddy and maize in dry season	Paddy-paddy and maize in dry season	Paddy crop in summer season only.	Paddy-paddy and maize in dry season	Paddy-paddy	Paddy-paddy	Paddy-paddy
4. Water Sources	Stream	Stream	Stream	Stream	Stream	Stream	Stream	Stream	Stream
5. Irrigation facilities	Diversion weir (1) Main canal (3,200 m),	Diversion weir (1) Main canal (2,200 m),	Diversion weir (1) Main canal (600 m),	Diversion weir (1) Main canal (1,200 m),	Diversion weir (1) Water storage tanks (7)	Diversion weir (1) Main canal (2,500 m),	Diversion weir (1) Main canal (1,200 m),	Diversion weir (1) Main canal (1,200 m),	Diversion weir (4) Main canal (783 m)
6. WUG organization	Chairman (1), Farmers' group leader (9), Total: 10	Chairman (1), Farmers' group leader (3) Total: 4	Chairman (1), Farmers' group leader (2), Total: 3	-	-	-	-	-	-
7. Water fee	VND 7,000/1000 m ² /season	2 kg (in kind paddy)/ 1000 m ² /season	No	No	No	No	No	No	No

Source: JICA Study Team

Summary of some key findings from the interview survey are summarized as follows.

- Irrigation management in non-pilot communes are underdeveloped. The existing WUGs in the non-pilot communes have their own hamlet rules including irrigation, not like the irrigation regulation set-up by farmers in the NORRD Project. Of the nine WUGs in the non-pilot sites, three WUGs elect the members of the board and the management staffs.
- Farming with irrigation water supply is decided by the respective hamlet chief and operation and maintenance is made under the instruction of the hamlet (village) chief.
- There are no specific meetings on O&M of irrigation facilities due to a lot of subjects in the village meetings and no WUGs present to discuss about O&M.
- Irrigation water fee in the systems organizing WUGs is decided on the basis of requirement for cost of manpower and repair of facilities.
- In the non-pilot districts, WUGs' activities are limited and regular O&M works are not executed. The WUGs in the non-pilot sites in the pilot districts seem active than the non-pilot districts and their concerns are about shortages of irrigation water.

(4) Extension possibility in Dien Bien Province

Most of WUGs in non-pilot sites at the provincial and district systems in Dien Bien require improvement of their activities by applying Participatory Irrigation Management (PIM). Before the initiation of investment works for irrigation systems, strengthening the existing WUGs, including reorganization of WUGs, will be indispensable to increase the sustainability of the facilities. In the interviewed non-pilot communes, any water fee was not collected regularly. Even minor repairs of the facilities could not be made by their own fund and the system function decreased year by year.

For the non-pilot systems, the irrigation division and the provincial agricultural extension center under DARD will be a key player for PIM extension activities. The lessons learnt through NORRD activities are available from the staff involved in the NORRD Project in DARD, the pilot districts, and communes. DARD shall prepare the activity plan and schedule with necessary budget for the PIM extension activities. Moreover, it is recommended that the identification of target small irrigation systems with WUOs in the non-pilot districts and arrangement of their rehabilitation investment plan should also be prepared by DARD.

The PIM extension in the non-pilot systems shall be implemented by using the district, commune, and hamlet staffs involved in NORRD activities. Based on the interview surveys at the pilot PIM sites, most of the staff involved expressed their acceptable opinions and transfer their knowledge and experience to the non-pilot areas. This situation is useful and valuable for the expansion of PIM in the non-pilot areas under the pilot districts.

I-6.1.4 Social Consideration to Ethnic Groups and Gender

The JICA Survey Team interviewed different farmers from ethnic and gender perspectives within limited available time. Ethnic and gender backgrounds of the interviewed pilot and non-pilot farmers are shown below.

Table I-6.1.18 Ethnic and Gender Backgrounds of the Interviewed Pilot Farmers

District		Dien Bien			Muong Cha		Tuan Giao		
Commune		Thanh Hung	Noong Het		Muong Tung	Ma Thi Ho	Quai Cang		Muong Mun
Hamlet		10	18	19	Pom Cay	Ho Chim 2	Cuong	Sang	Muong 1
Crop	Paddy	1	10	/	16	14	/	5	11
	Maize/Soybean	13	/	4	/	/	10	/	3
Ethnic Group		Thai	Thai	Thai	Thai	Mong	Thai	Thai	Thai
Gender	M	4	4	2	3	11	1	3	6
	F	10	6	2	13	3	9	2	8

Source: JICA Survey Team

Table I-6.1.19 Ethnic and Gender Backgrounds of the Interviewed Non-Pilot Farmers

District		Dien Bien		Dien Bien Dong	Muong Cha		
Commune		Thanh Luong	Thanh Xuong	Muong Luan	Na Sang	Huoi Leng	
Hamlet		11	C9A	Muong Luan 1	Hin 1	Huoi Toong	
Crop	Paddy	10	10	11	11	8	
	Maize/Soybean	/	/	/	/	/	
Ethnic		Thai	Kinh	Lao	Khang	Mong	
Gender	M	2	4	7	9	1	
	F	8	6	4	2	7	
District		Muong Nhe	Tuan Giao		Tua Chua		
Commune		Muong Nhe	Quai To	Quai Nua	Muong Bang		
Hamlet		Muong Nhe	Ta	Long Hong	Na Ang	Sung Un	
Crop	Paddy	6	11	10	6	2	2
	Maize/Soybean	/	/	/	/	/	/
Ethnic		Thai	Thai	Thai	Thai	Mong	Mong
Gender	M	4	4	6	5	2	2
	F	2	7	4	1	0	0

Source: JICA Survey Team

(1) Ethnic Groups

1) Review of NORRD Guideline/Manual

The NORRD guideline and manual draw attention on social consideration to ethnic groups as follows.

Table I-6.1.20 Description of Social Consideration to Ethnic Groups in Guideline/Manual

<p><u>Agriculture Extension Guideline</u> Chapter II Agriculture Extension Manual 1. Basics of Extension Activities 1.3 Manner for Extension Workers <u>1.3.3 Language</u> Languages are different from area to area, from ethnic group to ethnic group. It is necessary for extension workers to study local dialects and ethnic languages. If there is any question, extension workers should ask without hesitation..... 1.3.4 Social Customs There is a variety of social customs among different areas and ethnic groups. Extension workers should understand them.</p>
<p><u>Water Management Development Manual</u> Chapter II Manual for Water Management Improvement through Participatory Irrigation Management 3. Capacity Development in Participatory Irrigation Management and Procedure for Implementation of Water Management Improvement Plan 3.3.1 Necessity of Farmers' Awareness-raising towards Participatory Irrigation Management Arrangement such as making addition explanation through several ethnic languages by in-charge persons should be made to get all concerned farmers understand the necessity of participatory irrigation management in ethnic minority areas.....</p>

Source: NORRD Guideline/Manual

Agriculture extension workers are required to build a trusting relationship with the farmers in-charge by placing themselves in their positions to understand what they need. In this regard, it is necessary for them to understand local languages and social customs which vary according to area and ethnic group.

In the manual, one way to overcome the communication barrier among different ethnic groups in water management is to dispatch local responsible persons to serve as translators.

2) Survey Findings and Extension Possibility in Dien Bien Province

According to the agriculture extension workers, the following four approaches that the NORRD Project took were effective to extend NORRD activities to pilot communes with ethnic groups:

- 1) The trainings were held by hamlet or village so that the participating farmers were almost uniform in ethnicity.
- 2) The elders, chiefs, or heads of hamlet or village helped extension workers to explain agricultural skills and techniques to farmers in different local languages and acted as mediators during the training.
- 3) The training materials for farmers were visualized as much as possible to be understood by all, irrespective of ethnic backgrounds.
- 4) The adopted teaching method in extension and experiential learning in demonstration farms was effective for farmers to adopt new skills and techniques.

Furthermore, the extension activities could also be smoothened by targeted ethnic groups, mostly the Kinh and Thai groups. Three out of six extension workers responsible for pilot communes shared their experiences where Kinh and Thai groups adopt new techniques more easily than Mong and KhoMu groups. The former have things in common due to the fact that they are paddy farmers, having higher literacy rate, richer living standards and more sociable characteristics to others as lowland residents. Ethnic Division and Women's Union of Muong Cha District observe that, in comparison, the latter groups are usually swidden farmers living in highlands with poor productivity and insufficient basic infrastructure and therefore, thought to be neither well-educated nor open-minded to others. In fact, NORRD found out that it had been difficult for only the Mong group in Ma Thi Ho to start stripe seeding since they had a long-standing tradition to make seeding on farms earlier in the summer-autumn work and have been conservative towards the new custom.

To sum up, NORRD is highly likely to be extended further in Dien Bien Province as far as the following conditions are fulfilled:

- 1) The trainings should be held in a similar ethnic unit like a hamlet or village as possible.
- 2) The elders, chiefs or heads, of hamlet or village should be involved in extension activities as mediators among different ethnic groups during the training.
- 3) The training materials for farmers should have many visual images to be easily accessible by different ethnic groups.
- 4) The teaching method in extension should be practical and can easily be understood by all farmers like experiential learning in demonstration farms.
- 5) Characteristics and social customs variations across ethnic races should be studied to come up with appropriate approaches in extension activities (refer to Table 3.2.3, Chapter 3).

In the guideline, it should highlight that not only the study of local language and social customs but also the involvement of local leaders are necessary for effective extension activities in Dien Bien Province like what is stipulated in the manual. Given approximately 19 ethnic groups, the communication and cultural barriers will not be overcome without their support for extension activities as mediators. Above all, the guideline and manual should be practical and understandable to all concerned farmers.

(2) Gender

1) Review of NORRD Guideline/Manual

Social consideration to gender is only pointed out in the guideline as follows.

Table I-6.1.21 Description of Social Consideration to Gender in Guideline

<p><u>Agriculture Extension Guideline</u> Chapter II Agriculture Extension Manual 2. Actual Extension Activities 2.3 Basics of Field Activities 2.3.2 Understanding of Actual Situation –Let’s get to know working environment. i) Actual Situation surrounding Individual Farmers: crucial information. Human beings: family composition (name, relationship, age), farmers (sex, age), husband (thinking about farming, problem consciousness, motivation, role in local society), wife (thinking about agricultural life, participation condition into farm management), sons and daughters (farming condition, marital status), participation condition into society (social and organizational position, formal and informal relationships)</p>

Source: NORRD Guideline

The guideline instructs agriculture extension workers to study the backgrounds of concerned farmers including their family composition and participation condition into society as crucial information to grasp actual situation surrounding individual farmers.

2) Survey Findings and Extension Possibility in Dien Bien Province

The survey revealed that the vast majority of women were engaged in farming seasonally but, in addition to this economic activity, women were overloaded by house-keeping work every day in both pilot and non-pilot sites. Women worked for two to three hours per day more than men irrespective of ethnicity. According to the Women’s Unions (Muong Cha, Dien Bien Dong, and Tua Chua), 60% to 70 % of domestic chores including farming activities are generally done by women. This is largely due to the deep-rooted tradition of patriarchal society and strong boy-preference.

Tables below describe the ranking of typical farming works (seeding, land preparation, planting, weeding, cultivation, storage, and preservation) done by men, women, and both for pilot farmers according to the survey. In farming activities, men took on heavy physically-demanding work (e.g., land preparation and seeding) whereas women do the rather delicate, physically light work (e.g., seeding, weeding and planting). They were also engaged in activities together (e.g., cultivation,

preservation and storage). In summary, all surveyed areas showed more or less the same pattern in work-sharing between men and women and had no pattern that adheres to a specific area and ethnic group.

Table I-6.1.22 Men's Work in Farming for Pilot Farmers

District		Dien Bien		Muong Cha		Tuan Giao	
Commune		Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Ethnic Group		Thai	Thai	Thai	Mong	Thai	Thai
Ranking	No.1	Land Preparation 64%	Land Preparation 79%	Land Preparation 81%	Land Preparation 57%	Land Preparation 67%	Land Preparation 79%
	No.2	Seeding 14%	Seeding 21%	Seeding 6%	Seeding 50%	Seeding 27%	Seeding 21%
	No.3		Cultivation 14%		Preservation 21%	Cultivation 7%	Cultivation 14%

Source: JICA Survey Team

Table I-6.1.23 Women's Work in Farming for Pilot Farmers

District		Dien Bien		Muong Cha		Tuan Giao	
Commune		Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Ethnic Group		Thai	Thai	Thai	Mong	Thai	Thai
Ranking	No.1	Seeding 57%	Seeding, Weeding, Planting 64%	Seeding 94%	Planting 64%	Weeding 67%	Seeding, Planting 64%
	No.2	Weeding 29%	Storage 36%	Planting 62%	Seeding 35%	Seeding, Planting 60%	Storage 36%
	No.3	Land Preparation 14%	Preservation 29%	Weeding 56%	Weeding 28%		Preservation 29%

Source: JICA Survey Team

Table I-6.1.24 Work Shared between Men and Women in Farming for Pilot Farmers

District		Dien Bien		Muong Cha		Tuan Giao	
Commune		Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Ethnic Group		Thai	Thai	Thai	Mong	Thai	Thai
Ranking	No.1	Planting, Storage, Preservation 93%	Cultivation 64%	Cultivation 81%	Storage 79%	Cultivation 86%	Cultivation 64%
	No.2		Preservation 57%	Preservation 56%	Cultivation 71%	Storage 80%	Storage, Preservation 57%
	No.3		Seeding 7%	Weeding 44%	Weeding 64%	Preservation 66%	Seeding 7%

Source: JICA Survey Team

NORRD had not seen any changes in the share of workload itself between men and women according to all pilot farmers. However, about 42% of female farmers claimed that new skills and techniques (e.g., seeding in lane and proper timing of fertilizer) gained from the project had helped them save time and money. These saved resources have then been redistributed to extra economic activities, typically completing undone household work. As a result, women had become more confident about what they did and been likely to have more voice in their family. Indeed, NORRD itself encouraged women to be actively involved into the training. In all pilot communes, women kept accounting for 50% to 70% of participants during the training.

In water management, gender balance within pilot water users' groups is shown below. According to the survey, all groups except for Muong Tung were male-dominated. They assumed that water regulation should be done at night time by men while women are too busy with house-keeping work

during night time. On the other hand, in Muong Tung, women were in-charge of grass clearance and waste collection.

Table I-6.1.25 Gender Balance within Water Users' Group Members

District		Dien Bien	Muong Cha	Muong Cha	Tuan Giao	
Commune		Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Ethnic Group		Thai	Thai	Mong	Thai	Thai
WUG	M	9	2	8	8	6
	F	1	4	0	0	1

Source: JICA Survey Team

Key issues in gender are that men and women have equally benefitted in extension activities and water management in order to cover other areas in Dien Bien Province. The extension of NORRD in Dien Bien Province can be made through its continuous efforts to get women actively involved in training. Women's representation should also be taken into account in water management.

As Section I-6.1.4 (2) describes, agriculture extension workers are led to understand backgrounds of concerned farmers including their family composition and participation condition into society as crucial information to grasp actual situation surrounding individual farmers in the guideline. However, there is no further guidance on how to make the information about individual farmers useful for gender consideration in extension activities. To fill this gap, the following points of view should be mentioned in the guideline/manual.

Table I-6.1.26 Recommended Social Considerations in Guideline/Manual

1. Have extension activities/water management been planned to assess beneficiaries and their present situation from gender perspective (e.g., the respective roles and needs of men and women)?
2. Is there any provision to encourage both men and women to participate in the planning and decision-making process of extension activities/water management? In doing so, has consideration for their active participation (e.g., information disclosure, time setting, venue, etc.) been made?
3. Do extension activities/water management take into consideration positive and negative impacts that could be expected that would indirectly affect men and women?
If any negative impacts may arise, countermeasures for eliminating (minimizing) the negative impacts should be made.
(e.g., Women's representation in water management should be secured but it should be avoided that women are overloaded by water management work in addition to domestic chores. Work-sharing between men and women should be conducted from comprehensive perspectives)

Source: JICA Survey Team

I-6.2 Study and Analysis on Technical Applicability to Other Five Provinces

I-6.2.1 Agriculture Extension

Details are examined to study technical applicability, as shown in Attachment I-6.2.1. The summary is shown below.

(1) Natural Condition and Cultivation Technique

As shown in Chapter I-3, I-4, and Attachment I-6.2.1, the natural conditions, including climate and land use, are more or less similar among the six provinces including Dien Bien and may not influence cultivation of the target three crops significantly.

With regard to cultivation technique, among the six provinces, Son La, Lao Cai, Ha Giang, and Yen Bai are thought to be rather higher than Dien Bien and Lai Chau as discussed in Section I-4.4.

(2) Extension Manuals

Comparison of the collected manuals with the NORRD guideline is shown in the table below.

Technical contents of the NORRD guideline, which are both extension and cultivation techniques on paddy, maize, and soybeans, are mostly mentioned in the manuals of the five provinces. Each manual introduces suitable techniques for the local areas. About the detailed technical contents, some of these are not available in the NORRD guideline, but available in other provinces' manuals and vice versa. Technical items mentioned in the manuals include the methods of extension activities and farmer's training and the basic and important cultivation techniques such as variety, sowing, fertilization, water management, pest control and post-harvest. These techniques are basic but important techniques.

The five provinces' manuals have been formulated in different forms such as books, leaflets, Powerpoint slides, and documents according to crops and technical subjects. The quantity of technical contents in the manuals is different depending on each province. Ha Giang has one compact manual in book type, which is easy to carry for extension activities.

Table I-6.2.1 Comparison of Extension Manuals in the Five Provinces

Ha Giang	Lao Cai	Yen Bai	Lai Chau	Son La
Manual is a compact book type, can be easily carried in the fields, but has less number of photos. Other crop manuals are also available.	Manuals are for each crop and most of them are documents with fewer photos. There are also Powerpoint slides for manuals. Other crop manuals are also available.	Manuals consist of documents, pamphlet, and power point slides which were summarized for each crop. Manuals having photos of practical techniques are useful for extension activity. Other crop manuals are also available.	Manuals does not have enough technical contents, so NAEC's manuals are been using for extension. Other crop manuals also available.	Manuals consist of documents, pamphlets, and power point slides which were summarized for each crop. Manuals having photos of practical techniques are useful for extension activity. Other crop manuals are also available.

Source: JICA Survey Team

Common basic techniques of the NORRD guideline, such as extension method, pest control, water management, and post-harvest are easily used for extension activities in the five provinces. Especially, many coloured photos of the NORRD manual are easily understandable for extension workers and farmers.

The NORRD manual will be much effectively adopted in Lai Chau, and is also useful for improvement of cultivation techniques and the existing manuals in other provinces.

There are some comments that say that the NORRD manual described a lot of paddy cultivation but less soybeans, and is heavy to carry.

(3) Extension System in the Province

1) Extension staff

As Table I-5.3.3 show, AEC has 18 to 32 staffs; whereas, AES has five to ten staffs. One extension worker is assigned to one commune in Lao Cai, Lai Chau, and Yen Bai. Other provinces have two extension workers per commune. In Ha Giang, one of two extension workers is a temporary employee and one extension collaborator is assigned to each hamlet.

All AEC staff already recognized the NORRD Project. However, most AES staff and commune extension workers did not know the NORRD Project.

2) Extension budget

The AEC of Son La and Lao Cai have large amount of extension budget (VND 28,418 million, VND 27,893 million) because province extension budget includes the extension budget of all district AESs.

On the other hand, the province extension budget and district extension budget of the other three provinces are independent individually. Examples of district-level extension budget are shown below.

Table I-6.2.2 Extension Budget (Actual) in the Five Provinces in the Year 2014

District	Ha Giang	Lao Cai ¹⁾	Yen Bai	Lai Chau	Son La ¹⁾
Province AEC extension budget (VND in millions)	5,809.0	27,893.0	4,160.0	2,707.7	28,418.0
Annual current budget (VND in millions)	1,350.0	24,022.0	2,927.0	1,492.0	20,165.0
Extension activity budget (VND in millions)	4,459.0	3,871.0	1,233.0	1,215.7	8,253.0
District sample	Bac Quang	Bat Xat	Luc Yen	Than Uyen	Mai Son
District E. budget (VND in millions)	1,312.0	3,398.0	2,039.0	2,166.4	2,937.6
Annual current budget (VND in millions)	1,042.0	3,233.0	1,638.0	819.6	2,481.3
Extension activity budget (VND in millions)	270.0	165.0	401.0	450.0	456.3

1) Province extension budget of Son La and Lao Cai includes the extension budget of Mai Son and Bat Xat Districts.

Source: Province extension budget from Province Agriculture Extension Center (AEC)

District extension budget from District Agriculture Extension Station (AES), except Mai Son from Province AEC.

The amount of extension activity budgets of all AESs and AEC in the provinces is estimated and shown in the table below:

Table I-6.2.3 Estimated Annual Extension Activity Budgets (Actual) of the Five Provinces in 2014

	Ha Giang	Lao Cai	Yen Bai	Lai Chau	Son La
Extension activities (VND in millions):Province total	7,429.0	3,871.0	4,842.0	4,815.7	8,253.0

Source: Calculated by the Team based on the assumption below:

*Estimated budget of Son La and Lao Cai is based on the province budget.

*Estimated budget of other three provinces is calculated based on the province budget and the budget of the sample district.

3) Extension Possibility in Five Provinces

- The five provinces are located in the mountainous area of northern Vietnam, which is under appropriate climate conditions, suitable for cultivation of major crops such paddy, maize, and soybeans. Natural environment conditions of the five provinces are similar to those in Dien Bien Province.
- Yield of paddy for dry season in the five provinces is 5.3-6.0 t/ha, which is considered not low, but production is not enough for consumer demand. Share of proxy irrigated area to total paddy area is the highest in Yen Bai and is low in the other provinces. Maize production in Son La accounts for 60% of total maize area in the five provinces and its yield is almost the same as the national average. Maize yield of other provinces is low. Production of soybeans in Ha Giang accounts for 73% of the total area in the five provinces but the yield of soybeans in all five provinces is low. Through the improvement of cultivation techniques and irrigation management, it is possible to increase the yield and production of maize and soybeans (and even paddy).
- Each province published technical manuals of extension and cultivation which have been already used in the extension activities. It is possible to use the NORDD guideline as a supplement to their techniques and for improvement of the existent manuals. Overall, extension workers are much interested in the guideline.
- To promote the extension expansion, the plan and budget proposed by each province is necessary to be modified according to the actual extension situation and budget of the provinces. It is also important for the provincial government to secure the expansion budget.
- From the analysis of the survey results, the extension of the NORDD guideline in the five provinces is a large possibility.

I-6.2.2 Water Management

The success or failure of PIM totally depends on the community. Awareness of farmers about the PIM is important. The success of the organizational development for PIM does not depend on a person to organize. Assessment of needs of local people is important. For organizing PIM, members of the management organization need to be elected and WUO's regulation should be prepared through participation of WUOs' members. The regulation covers three key points on i) responsibility of management organization, irrigators such as IMC or WUO, and farmer members, ii) provisions and commitments on water fee (rates, time for collection, expenditure for O&M), and iii) provisions for reward, penalty, and solution of disputes in water shortages.

PIM extension in the other five provinces is also an essential activity for sustainable irrigation development including investment and system management at present and in the future. The results of the survey show that most of the survey sites face shortage of water in the dry season that might get worse due to irregular weather condition.

The current O&M of the irrigation systems are evaluated on the basis of discussion with DARDs, proposed districts, and communes for extension, data, and information collected. The results are summarized as follows:

Table I-6.2.4 Capacity of Extension Organizations for PIM Promotion in the Six Provinces

Province	Capacity of Staff	Guidline/ Manual	Provision of O&M Training	Average O&M Subsidy (VND1000/ha/season)	Evaluation
	1/		2/	3/	
Ha Giang	Fair	Available	Fair	1,210	Fair
Lao Cai	Very good	Available	Very good	1,940	Very good
Yen Bai	Very good	Available	Fair	1,982	Good
Dien Bien	Fair	Available	Fair	1,947	Fair
Lai Chau	Fair	Available	Good	1,137	Good/Fair (50/50)
Son La	Good	Available	Good	1,425	Good

Note: 1/ Based on the status of the filing system, quality of the files and discussions with DARDs, IMCs and O&M organizations, 2/ Based on the collected documents and reports, 3/ Data from DARDs.

Source: JICA Survey Team

Based on the survey results in the six provinces, the active WUOs are limited at 24% of the provincial systems and 18% (Refer to Table I-7.1.11) of the district systems including Dien Bien. The majority of the existing WUOs in the six provinces are inactive. Considering similar irrigation systems in the six provinces, technical applicability of the NORRD manual is also very high in the other five provinces. In order to promote sustainable irrigation management and increase efficiency of irrigation investment, promotion of PIM is highly demanded.

I-6.3 Comparison on Extension Possibility among the Six Target Provinces

I-6.3.1 Agriculture Extension

(1) Cultivation Techniques

As a result of the following matrix of evaluation on cultivation techniques, the cultivation technical level is high in Son La, Lao Cai, Ha Giang, and Yen Bai.

Table I-6.3.1 Matrix Evaluation of Cultivation Technique of the Six Provinces

District		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Paddy	Area 10,000ha more			●			●
	Yield 6.0t/ha more				●		●
	Proxy Irrigated paddy 50% more			●	●		●
	Transplanting	●	●	●		●	●
	IPM	●	●	●	●		●
	3 cropping (2 paddy+maize)			●			●

District		Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
	F1 variety	●	●	●		●	●
	Brand rice		●		●		
Maize	Area 100,000ha more						●
	Yield 3.0t/ha more		●				●
	Area expansion 20% for 5 Y		●	●			
	Yield improved 10% for 5 Y	●				●	●
	F1 seeds	●	●	●	●	●	●
	Seed treatment					●	●
	Green-cut plant						●
	Pot seedlings	●		●			
	Covering soil						●
Soy beans	Area 10,000 ha more	●					
	Yield 1.2 t/ha more	●			●		●
	Area expansion	●					
	Yield improved 10% for 5 Y	●	●			●	
Others	Vegetable cultivation	●	●	●			●
	Vegetable mulching, tunnel			●			
	Agr export USD10mill more		●	●			
Total point of items		11	10	12	6	6	16
Rank evaluation of cultivation techniques		A	A	A	B	B	A+

Source: JICA Survey Team

(2) Extension Manual

1) Comparison of the Six Provinces' Manuals

The table below compares the six provinces' manuals with regard to extension activities as well as technical items of paddy, maize, and soybeans. These technical items include the methods of extension activities and farmer training, and basic and important cultivation techniques such as variety, sowing, fertilization, water management, pest control, and post-harvest. Overall, all the manuals cover most of the technical topics and are suitable for each location.

The description of the detailed technical items in manuals is compared. As a result, manuals from Son La and Ha Giang were highly evaluated, followed by Yen Bai, Lao Cai, Dien Bien, and Lai Chau being the last in order. There is a tendency that the manuals of provinces that have high agricultural techniques and active extension were evaluated high, whereas provinces with lower agricultural techniques and less extension activities tended to receive lower evaluation.

Table I-6.3.2 Matrix Evaluation of Manuals of the Six Provinces

Subject	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
1. EXTENSION ACTIVITIES						
1.1 Method of extension activities						
- Training on capacity building for extension staff	●	●	●	●	●	●
- Establish pilot farms	●	●	●	●	●	●
- Visit tours	●	●	-	●	●	-
- Organizing meetings	-	-	-	●	-	●
- Information and, communication	●	●	●	-	●	●
- Methods of participatory extension planning	●	●	●	-	-	●
- Workshops, contests and fairs	●	●	●	●	-	-
- Technical guidelines	●	●	●	-	●	●
- Consulting	-	-	-	-	-	●
1.2. Method of farmers' training						
- Methods of workshop	●	●	●	●	●	●
- Farmer teaching for farmer	-	-	-	●	-	-
- Facilitation skills (observe, listen, ask, presentations, etc.)	●	●	-	-	●	●

Subject	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
- Learner-centered training approach	•	•	•	-	•	•
- Training on field	•	•	•	-	•	•
2. PADDY						
2.1 Variety						
- Seasonal varieties shall be selected	•	•	•	•	•	•
- Seed treatment technique, soaking, sprouting	•	•	•	•	•	•
- Requirement of seed for 1 ha	•	-	•	-	•	-
2.2 Sowing/planting						
- Direct sowing and use seeding machine.	-	-	•	•	-	-
- Planting density pitch plating or coated tray.	•	•	•	•	•	•
- Transplanting method.	•	•	•	•	•	•
2.3 Fertilizer application						
- Base fertilization before plowing	•	•	•	•	•	•
- Topdressing at different plant growth stage	•	•	•	•	•	•
- Kind of fertilizer and application amount	•	-	•	-	•	•
2.4 Water management						
- Management from sowing to tillering stage	•	•	•	•	•	•
- Management after tillering stage	•	•	•	•	•	•
- Management at heading to mature stage	•	•	•	•	•	•
2.5 Pests control						
- IPM and pest control measures not using chemicals	•	•	•	•	-	•
- Identify specific pest (rat, snail yellow grub, pests, diseases, etc.) and how to prevent.	•	•	•	•	•	•
- Safe utilization of chemicals	-	•	-	•	-	-
2.6 Post-harvest						
- How to know the time of harvest	•	•	•	-	•	•
- Harvesting, drying, cleaning, and storage	•	•	•	•	•	•
- Handling residues after harvest	-	-	-	•	-	•
3. MAIZE						
3.1 Variety						
- Varieties are suitable	•	•	•	•	•	•
3.2 Sowing						
- Seed requirement	•	•	•	-	-	•
- Seed treatment before sowing	-	-	-	-	-	•
- Spacing density and sowing seeds	•	•	•	•	•	•
- Technical sowing in rows or in niches	•	-	-	•	-	•
- Corn sowing method in soil bags, and planting	•	-	•	-	•	-
3.3 Fertilizer application						
- Amount and kind of fertilizer per area (1 ha or 360 m ²)	•	•	•	•	•	•
- Fertilizer base: before sowing	•	•	•	•	-	•
- Topdressing at different plant growth stages	•	•	•	•	•	•
- How to apply	•	•	•	•	•	•
- Water management	-	-	•	-	-	-
3.4 Pests control						
- Identify pests and control measures	•	•	•	•	•	•
- Mouse control measures	-	-	-	•	-	•
3.5 Post-harvest						
- How to know harvesting time	•	•	•	•	•	•
- Preservation techniques	•	•	•	•	•	•
- Using corn plants to cover the soil to prevent from erosion	-	-	-	-	-	•
- Using corn plants to feed livestock in winter	-	-	•	-	-	-
4. SOYBEAN						

Subject	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
4.1 Variety						
- Features of some soybean varieties	●	-	●	●	●	●
- Selection of varieties by season and local condition	●	●	-	●	-	●
4.2 Sowing						
- Season sowing density and methods	●	●	●	●	●	●
4.3 Fertilizer application						
- Amount of fertilizer for area	●	●	●	-	-	-
- Fertilizer base: before sowing	●	●	●	-	●	-
- Top dressing at different plant growth stage	●	●	●	●	●	●
- How to apply fertilizer.	●	-	-	●	-	●
4.4 Pests control						
- Identify pests and control measures	●	●	●	●	●	●
- Mouse control measures	-	-	-	●	-	●
4.5 Post-harvest						
- How to know harvest time and preservation methods	●	●	●	●	●	●
- Harvesting, drying, store	●	●	●	-	-	-
5. OTHERS						
- Many documents and subjects	●	●	●	-	●	●
- Many pictures and photos	-	-	●	●	-	●
- Published manual	●	-	-	●	-	-
Total points of items	50	44	48	43	39	50
Rank evaluation of the manual in point of extension method and cultivation technical	A	B	B	B	C	A

*A: High ~ C: Low

Source: JICA Survey Team

2) Adoptability of NORRD Guideline in the Five Provinces.

The application of the guideline is most likely necessary in Lai Chau, which does not have enough technical manuals yet, has natural conditions similar to Dien Bien and its suitable agricultural technical levels can apply the concepts of NORRD. On the other hand, the other provinces have already produced technical manuals specific to their local areas and use these manuals for extension. For such provinces, the guideline could be used to complement existing manuals and to improve existing techniques.

The techniques in the guideline that could be applied to any region are the extension method, basic techniques of cultivation management, pest control, water management, and others.

Table I-6.3.3 Adoptability of NORRD Guideline to the Five Provinces

	Ha Giang	Lao Cai	Yen Bai	Lai Chau	Son La
Natural condition similar to DB	●	●	●	●	●
Technical level similar to DB				●	
Lack of technical contents in manuals				●	
Rank of adoptability of NORRD Manuals to 5 Provinces	B	B	B	A	B

*A: High ~ C: Low

Source: JICA Survey Team

3) Issues to be Improved in the Manuals

Each province's technical manuals cover the extension techniques and cultivation techniques suitable for each region. In addition, the manuals need to look at the agricultural environment and technical issues that change every day. Issues that farmers commented on cultivation techniques are F1 hybrid variety, practical diagnosis and control of diseases and insects, water management during water shortage, fertilization suitable for plant growth, and the prevention of maize and soybeans quality loss

during the rainy season. There is a demand for manuals that include not only general topics but also practical instructions appropriate for local farmer's fields. Manuals must be understood easily and be put into practice by extension workers and farmers.

The table below describes points to be improved in the manuals. It is necessary to use pictures and charts that anyone can understand and to put together a crop cultivation technical manual.

Table I-6.3.4 Issues to be Improved in the Manuals

Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
•Insert pictures and figures in the manuals for easy understanding	•Insert pictures and figures in the manuals for easy understanding. •Prepare not only e-file manual but also book manual.	•Compile some technical documents into one crop manual. •Prepare not only e-file manual but also book manual.	•Explain soybeans cultivation in detail. •Insert actual field pictures in the manual. •Make simple manual for farmers. •Separate manual for each crop for easy handling.	Formulate manual suitable to the local area by using NORRD manual.	•Compile some technical documents into one crop manual. •Prepare not only e-file manual but also book manual.

Source: JICA Survey Team

(3) Extension Organization

1) Extension Staff / Extension Workers

Provinces are ranked by the number of farmers per commune extension worker in the six provinces to determine which provinces have low ranking and thus enable workers to do extension activities more easily. Dien Bien and Ha Giang are the provinces with the least burden to the extension workers, whereas Lao Cai and Yen Bai extension workers oversee more compare to the others.

Table I-6.3.5 Human Resources for Extension Activities in the Six Provinces

Province	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. E. staff province (AEC).	18	27	28	21	32	22
No. E. staff district (AES).	87	45	45	87	52	125
No. E. staff commune.	367	152	180	229	108	371
No. of farmer in province (labour in rural)	434,049	327,955	407,981	250,177	203,259	637,530
No. of farmer/one extension commune worker	1,183	2,158	2,267	1,092	1,882	1,718
Rank	A	C	C	A	B	B

Source: No. of extension staff from Province Extension Agriculture Extension Center

No. of rural labour force aged 15 and by residence from Province Statistical Books 2014 as a proxy data of farmers

2) Extension Budget (Estimated)

Lai Chau has the highest extension budget per extension worker (across AEC, AES, and commune). Lai Chau and Dien Bien have the largest budget per farmer (rural work force).

Table I-6.3.6 Estimated Extension Activity Budget of the Six Provinces

Province	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Estimated Extension activities (VND in millions): province as a whole	7,429	3,871	4,842	6,508	4,816	8,253
Total number of extension workers at provincial., district., and commune.*	472	224	253	337	192	518
Expenditure E. activities/total E. worker (VND1,000)	15,739	17,281	19,139	19,312	25,082	15,932
Score (1~6)	1	3	4	5	6	2

Province	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
No. of farmers in the province (labour in rural)**	434,049	327,955	407,981	250,177	203,259	637,530
Expenditure E. activities/rural work force in province (VND 1,000)	17.1	11.8	11.9	26.0	23.7	12.9
Score (1~6)	4	1	2	6	5	3
Total Score	5.0	4.0	6.0	11.0	11.0	5.0
Final score (1~6)	2	1	4	5	5	2
Rank	C	C	B	A	A	C

Source: JICA Survey Team, *number of extension workers from extension related institutions of each province, **: rural work force from Province Statistical Books, 2014

3) Extension Worker's Capacity

The activities of extension workers in the communes visited in Dien Bien Province as well as in the candidate pilot communes in the five provinces were compared. All communes have experiences in pilot farm implementation. However, only Son La has an obligatory goal for extension workers to establish three pilot farms and to provide training to 300 farmers every year. There are only eight trainings per year in Dien Bien's communes, but the other five provinces provide trainings more than ten times a year. The other five provinces are also active in terms of farming field monitoring.

The activeness and capability of extension workers are comparatively high in Son La, Lao Cai, and Yen Bai and low in Dien Bien.

Table I-6.3.7 Extension Worker's Activities in Candidate Pilot Communes

Province	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
District as example	Quang Binh	Bao Thang	Luc Yen	Tuan Giao	Tam Duong	Mai Son
Commune	Xuan Giang	Phu Nhuan	Vinh Lac	Quai To	Ban Bo	Muong Bang
No. of Hamlet	9	33	11	27	16	26
No. of Farm household	1,126	2,460	1,121	1,223	1,159	1,678
No. of Extension W.	2	1	1	2	1	2
Pilot farm	2015 Paddy	2013 Paddy	2015 Paddy	2015 Maize	2014 Maize	2014 Crop 9 pilot farms
Farmers training: times	3~4 / crop	15-20 /year	2 / month	8 / year	3-4 /crop	14 / year
Visit to the farmers	3 days/week	Daily	Daily	3day /month	3 days/week	Daily
Contract of extension worker	Permanent and Part-time	Permanent	Permanent	One year	Permanent	Permanent
Rank	B+*	A	A	C	B	A

Note: A: Positive extension activity ~ C: Less extension activity, *: Overall judgement of the extension activities in Ha Giang is A as shown in Attachment I-5.5.1 (this tables' judgement is for the pilot communes, though in general this represents overall extension activities).

Source: JICA Survey Team

(4) Comparison on Extension Possibility among the Six Target Provinces

1) Comparison on Extension Possibility

The previous results are summarized in the table below:

Table I-6.3.8 Summary on Extension Possibility among the Six Target Provinces

	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
Cultivation Technique	A	A	A	B	B	A+
Extension Manual	A	B	B	B	C	A
Extension Workers	A	C	C	A	B	B
Extension Budget	C	C	B	A	A	C
Capacity of Extension Workers	B+	A	A	C	B	A

Source: JICA Survey Team, from previous tables

It is important to understand the above characteristics of each province and customize the extension activities. The general directions of each province are shown below.

- Dien Bien: Since the NORRD guideline has been prepared and is available, it is recommended to continue the extension activities. Comparatively, the data shows that extension workers and the budget per unit is more than the others, and therefore, it is expected to allocate the budget properly to continue their activities. However, capacity is relatively lower because continuous capacity development is also important.
- Son La: Most of the areas are good. Under proper guidance, it is expected to start the activities with the NORRD guideline as a supplemental input.
- Lao Cai: Capacity of the extension workers is higher than the others. Although the extension workers and budget are both relatively lower, the expected activities such as merger of the manuals and guideline and acceleration of the extension activities can be done by capable staff.
- Lai Chau: Lai Chau is the appropriate province to apply the NORRD guideline. Under proper guidance, improvement of the extension activities is expected.
- Ha Giang: The direction is similar to Son La.
- Yen Bai: The direction is similar to Lao Cai.

2) Issues of Extension Expansion

As extension programs are being expanded, the following seven points are recommended:

1. In order to widely disseminate the NORRD guideline, it is necessary to secure the necessary extension budget.
2. Extension expansion plans¹ proposed by each province need to be further revised to ensure the budgets and plans which are feasible considering the extension workers' capacity and financial capability of each province.
3. It is essential to provide training for the extension workers to improve their capacity on extension knowledge and cultivation techniques in order to implement extension activities in the fields.
4. In order to further accelerate the extension, AEC, AES, and commune need to build a strong organization and coordination for management and implementation of the pilot activities. In order to do so, a strong AEC leadership is critical. And also, regular technical meeting is advised.
5. In order to expand extension inside Dien Bien Province, it is necessary for experienced NORRD extension staffs and workers to support inexperienced districts and communes.
6. The other five provinces say that support from experienced extension staffs from Dien Bien is not necessary. However, there are not enough human resources that can be put into the pilot activities such as conducting Training of Trainer (TOT), running demonstration farms, verifying the NORRD recommended cultivation techniques, merging them with their own manuals, and implementing extension to neighbouring farmers. Thus, support from other organizations could be one option. For instance, in Son La Province, the collaboration with Tay Bac University, which has already been in partnership with the province, seems a good idea. As for the other provinces, support from the National Agriculture Extension Center (NAEC) that has experiences and accumulated techniques in the northern areas seems another option.
7. It is also recommended to send Japanese experts in order to give guidance and monitor the expansion of pilot extension activities.

¹ During the Phase 1 work, the expansion plans were requested to be prepared and their first drafts were shared. These plans were reviewed and modified with the survey team's assistance and was finalized during the Phase 2 work.

I-6.3.2 Water Management

The extension potential of PIM in the six provinces was evaluated through the capacity on PIM extension, status of WUOs and needs of PIM extension as follows:

Table I-6.3.9 Applicability of NORRD PIM in the Six Provinces

Province	Capacity of Staff	WUOs* Status			PIM Extension Needs	Extension Potential of NORRD PIM
		WUOs organized	Active WUOs	(%)		
Ha Giang	Fair	2,891	334	12	Very High	Very big Extension strengthening needed
Lao Cai	Very good	1,057	311	29	High	Big Further PIM extension needed
Yen Bai	Very good	2,848	559	20	High	Big Further PIM extension needed
Dien Bien	Fair	912	263	29	High	Big Extension strengthening needed
Lai Chau	Fair	1,017	161	16	Very High	Very big Extension strengthening needed
Son La	Good	2,296	455	20	High	Big Further PIM extension needed

*: Number of WUOs is total of provincial and district systems.

Source: JICA Survey Team

The capacity of PIM extension and the status of WUOs vary in the six provinces. The capacity development of DARD is indispensable especially in Ha Giang, Dien Bien, and Lau Chau. The extension needs of PIM are high in all provinces, but its necessity in the provinces with a lower rate of active WUOs is higher. The overall extension potential of the NORRD PIM is evaluated as big in the six provinces.

Before initiation of PIM extension activities, the activity plan and schedule in each province shall be prepared together with the agricultural extension activities. The necessary budget for the activities shall be arranged by the respective Provincial People's Committees (PPCs) and the implementation shall be initiated at least from June 2016.

For the implementation of extension strengthening in the target pilot WUOs, the current status of WUOs needs to be evaluated for the preparation of the assistance. The following evaluation criteria are proposed for this evaluation.

Table I-6.3.10 Criteria for WUOs Status and Monitoring of WUOs' Performance

Criteria to evaluate PIM activities	Check/ Monitor
1. WUA has an operation regulation	Checked by WUA meeting
2. WUA has irrigation, maintenance, financial, and training plans	Checked by WUA meeting
3. Ratio between actual irrigation area (ha) and designed irrigation area (ha)	If the ratio ≤ 1 : irrigation activities are not satisfactory (The ratio = 1: irrigation area is equal to designed irrigation area)
4. Percentage rate on on-farm water fee collection (TLP): Actual collected TLP comparing to planned TLP : Percentage of TLP (%) = $\frac{\text{Actual collected TLP (VNĐ)}}{\text{planned TLP (VNĐ)}} * 100$	If this ratio $\leq 100\%$, the water fee collection is not satisfactory (If 100% meaning that the collection meet the requirements of WUA)
5. Cost for Operation and Maintenance (O&M): Ratio between Actual O&M cost and total annual income of a WUA $O\&M (\%) = \frac{\text{Actual O\&M cost (VNĐ)}}{\text{Annual income of a WUA}} * 100$	The minimum ratio is 30 % (to remain normal operation of structures)
6. The ability to ensure finance (TC) : Ratio between Total annual income and Total annual cost of a WUA: $TC (\%) = \frac{\text{Total annual income (VNĐ)}}{\text{Total annual cost (VNĐ)}} * 100$	This ratio represents the possibility of financial security for annual activities of a WUA
7. Efficiency in using irrigation structures (CT) (%): Number of damaged structures and total number of structures: $CT (\%) = \frac{\text{Number of damaged structures}}{\text{total number of structures}} * 100$	The less ratio is the better performance of structures

Source: JICA Survey Team

I-6.3.3 Social Consideration to Ethnic Groups and Gender in the Six Target Provinces

The ethnic board of each province claims that there are more than ten ethnic races in each target province. Moreover, the survey suggests that gender situations can be similar there. Given these conditions, the same lessons learnt from the Dien Bien experience are applicable in extension activities to all six provinces. Especially, when the NORRD guideline/manual is merged to the current existing manuals in each province, all points proposed in consideration of ethnic groups and gender shall be incorporated.

CHAPTER I-7 STUDY ON LOCAL INFRASTRUCTURE DEVELOPMENT SUBPROJECT FOR THE PROJECT

I-7.1 Condition of Infrastructure

I-7.1.1 Road

There are 921 registered roads with a total length of around 15,100 km in the six provinces. The road density per 1,000 population in the six provinces is 3.47 km/1,000 population, which is higher than the national average of 2.07 km/1,000 population. Meanwhile, the economically used land (= used and forestry area) in the six provinces is 0.35 km/km² which is lower than the national average of 0.65 km/km². Considering the small population in the six provinces, the road density per population may be higher than the national average, but the road density per the economically used land in the six provinces is significantly lower than the national average. The road density per km² varies from 0.2 km/km² in Lai Chau as the lowest to 0.43 km/km² in Lao Cai as the highest.

Table I-7.1.1 Existing Roads in the Six Provinces (2014)

Type of Road	Ha Giang		Lao Cai		Yen Bai		Dien Bien	
	No.	Length (km)	No.	Length (km)	No.	Length (km)	No.	Length (km)
1. Existing Road								
National	5	472	5	462	4	347	6	752
Provincial	6	365	13	506	14	490	22	607
District	127	1,867	78	770	153	1,360	108	1,220
Urban	4	21	119	172	-	122	9	206
Total	142	2,724	215	1,910	171	2,319	145	2,785
2. Road Density (km/person or km²)								
Per 1,000 person	3.45		2.87		2.96		5.18	
Per km ² of used and forestry area	0.37		0.43		0.38		0.35	
Type of Road	Lai Chau		Son La		Six Provinces		Whole Nation	
	No.	Length (km)	No.	Length (km)	No.	Length (km)	No.	Length (km)
1. Existing Road								
National	5	317	6	652	31	3,002	109	15,360
Provincial	4	217	18	912	77	3,097	n.a	36,225
District	62	981	131	1,997	659	8,195	n.a	129,259
Urban	15	149	7	143	154	813	n.a	6,650
Total	86	1,664	162	3,704	921	15,106	109	187,494
2. Road Density (km/person or km²)								
Per 1,000 person	4.01		3.18		3.47		2.07	
Per km ² of used and forestry area	0.20		0.39		0.35		0.65	

Note : n.a: not available

Item	HG	L. Cai	YB	DB	L. Chau	SL	6 Pro	WN
Used area and forestry land in 2014 (km ²)	7,381	4,446	6,041	7,977	8,413	9,517	43,775	286,838
Population in 2014 (1,000 person)	788.8	665.2	783.5	538.1	415.3	1166.4	4,357	90728.9

Source: DOTs, Provincial Statistics

Table I-7.1.2 Traffic Volume of Roads in the Six Provinces (2014)

Province	National Road (pcu/day)		Provincial Road (pcu/day)		District Road (pcu/day)	
	Lowest	Highest	Lowest	Highest	Lowest	Highest
Ha Giang	620	1,343	190	510	30	310
Lao Cai	456	2,942	187	440	102	322
Yen Bai	500	4,283	110	3,000	10	1,000
Dien Bien	250	1,114	170	450	40	330
Lai Chau	331	1,174	187	361	20	270
Son La	342	2,281	207	800	35	350

Source: DOTs

The traffic volumes of the national and provincial roads are between 250 pcu/day and 4,283 pcu/day and between 110 pcu/day and 3,000 pcu/day, respectively. The traffic volume of district roads is between 10 pcu/day and 1,000 pcu/day. The traffic volume of some district roads is limited and less than 150 pcu/day.

Fourteen percent of the national roads, 19% of the provincial roads and 51% of the district roads in the six provinces have bad condition and require improvement. As the management level of the road goes down to the district level, the condition of the road becomes worse.

Table I-7.1.3 Road Condition in the Six Provinces (2014)

Province	National Road (km)			Provincial Road (km)			District Road (km)		
	Total Length	Normal Condition	Bad Condition	Total Length	Normal Condition	Bad Condition	Total Length	Normal Condition	Bad Condition
Ha Giang (%)	472 (100)	300 (64)	172 (36)	365 (100)	328 (90)	37 (10)	1,888 (100)	1,284 (68)	604 (32)
Lao Cai (%)	462 (100)	449 (97)	13 (3)	506 (100)	430 (85)	76 (15)	770 (100)	660 (86)	110 (14)
Yen Bai (%)	347 (100)	299 (86)	48 (14)	490 (100)	385 (79)	105 (21)	1,360 (100)	476 (35)	884 (65)
Dien Bien (%)	752 (100)	659 (88)	93 (12)	607 (100)	516 (85)	91 (15)	1,220 (100)	586 (48)	634 (52)
Lai Chau (%)	317 (100)	282 (89)	35 (11)	217 (100)	160 (74)	57 (26)	981 (100)	400 (41)	581 (59)
Son La (%)	652 (100)	597 (92)	55 (8)	912 (100)	684 (75)	228 (25)	1,997 (100)	599 (30)	1,398 (70)
Total	3,002 (100)	2,586 (86)	416 (14)	3,097 (100)	2,503 (81)	594 (19)	8,216 (100)	4,005 (49)	4,211 (51)

Note: According to the definition of DOT, "normal" condition means cars can pass through without road improvement, and "bad" condition means cars face difficulty to pass through the road smoothly and improvement is needed.

Source: DOTs

In summary, the needs for development of road in the six target provinces are high in new construction as well as improvement. As discussed in Chapter I-3.3.2, the direction stated in the infrastructure development plans of the provinces is new investment as well as improvement/upgrading of the existing road network. Currently the O&M expenditures in the six provinces are not sufficient compared to the recommended O&M costs as shown in Chapter I-5.4.4, indicating a limited O&M budget. Given this fact, improvement of the existing roads to maximize the current network can be considered a more cost-effective way to achieve the development plans because new road development will increase necessary O&M costs.

Especially, needs on improvement of district road network are high. As shown, almost half of the existing one is judged in bad conditions. In rural areas, functions of district roads are important to connect communes to communes, production areas to market areas road, and vice versa. Development/improvement of district roads saves time contributing to reduction of the agriculture inputs and improvement of net benefit of the agriculture product. Further, district road networks contribute to improvement social conditions. For instance, time to go to schools and health centers becomes less, expecting improvement of various social indicators which are currently low in the six target provinces.

I-7.1.2 Irrigation

In the six provinces, there are 593 existing provincial irrigation systems covering around 23,550 ha and 11,859 district-managed systems covering around 98,400 ha. The average irrigation area is 40 ha in the provincial systems and 8 ha in the district systems. The provincial systems in Dien Bien are larger at 229 ha/system on the average followed by Lai Chau with 92 ha/system, and then Son La with 61 ha/system.

In Ha Giang and Lao Cai, there are no provincial systems and all systems are transferred under the district and commune administration.

The cropping intensity (cultivated area per irrigation service area per year) in the six provinces is 168% in the provincial systems and 140% in the district systems, which are lower than the national average of 174% (= consolidated figures of both provincial and district systems). The irrigation development of the potential irrigable area in the six provinces is 62% ranging from 51% in Lai Chau to 73% in Lao Cai. Comparing with the whole nation at 69% development of the potential area, irrigation development in the six provinces, except Lao Cai, is behind.

Table I-7.1.4 Existing Irrigation Systems in the Six Provinces (2014)

Item	Ha Giang		Lao Cai		Yen Bai		Dien Bien	
	Province	District	Province	District	Province	District	Province	District
No of System (No.)	-	3,685	-	1,113	461	2,804	36	799
Service Area (ha)	-	23,003	-	20,667	6,720	12,657	8,245	10,698
Average Service Area (ha/system)	-	6	-	19	15	5	229	13
Cropping Intensity of Irrigation Service Area (%)	-	144	-	135	184	156	164	124
Potential Irrigable Area (ha)	37,336		24,072		26,643		27,247	
Irrigated Area (ha)	22,666		17,672		17,052		16,076	
% to the Potential*	61		73		64		59	
Item	Lai Chau		Son La		Six Provinces		Whole Nation	
	Province	District	Province	District	Province	District	Province	District
No of System (No.)	88	805	8	2,653	593	11,859	14,830	31,550
Service Area (ha)	8,101	15,742	491	15,636	23,557	98,403	4,125,391	1,375,130
Average Service Area (ha/system)	92	20	61	6	40	8	278	44
Cropping Intensity of Irrigation Service Area (%)	157	119	174	158	168	140	174	
Potential Irrigable Area (ha)	29,162		24,548		169,008		5,610,892	
Irrigated Area (ha)	15,014		15,465		103,945		3,860,294	
% to the Potential*	51		63		62		69	

Source: MARD, DARD, IMC, *: Irrigated area/potential irrigable area

The cropping intensity per season varies by system and province. In the dry season (winter-spring), the cropping intensity is limited to 75% in the provincial systems and 50% in the district systems in the six provinces.

Table I-7.1.5 Cropping Intensity of Irrigation Systems in the Six Provinces (2014)

Province	Provincial System				District System			
	Total Service Area (ha)	Cropping Intensity*			Total Service Area (ha)	Cropping Intensity*		
		Winter-Spring (ha)	Summer-Autumn (ha)	Annual (%)		Winter-Spring (ha)	Summer-Autumn (ha)	Annual (%)
Ha Giang	-	-	-	-	23,003	10,360	22,666	144
Lao Cai	-	-	-	-	20,667	10,315	17,672	135
Yen Bai	6,720	5,876	6,522	184	12,657	9,213	10,530	156
Dien Bien	8,245	6,578	6,982	164	10,698	4,218	9,093	124
Lai Chau	8,101	4,785	7,949	157	15,742	5,132	13,643	119
Son La	491	367	485	174	15,636	9,788	14,980	158
Total	23,557	17,606	21,938	168	98,403	49,026	88,584	140

Source: DARD, IMC, *: (irrigated area in Winter-Spring + Summer Autumn seasons) / total service area

In conclusion, the extent of the irrigation development against the potential irrigation area in the six provinces is generally low compared with the national average (except Lao Cai). Even in the existing irrigation systems, cropping intensities are lower than the national average (168% for provincial systems and 140% for district system all lower than the national average 174% for all system). Similar to the discussion for road, needs of irrigation development can be high in rehabilitation to maximize the functions of the existing systems.

I-7.1.3 Water Supply

About 93 urban water supply systems and 5,419 rural water supply systems were established in the six provinces covering a population of around 881,000 in the urban area and around 2.0 million in the

rural area. The average design capacities are 2,664 m³/day/urban system and 56 m³/day/rural system. In the rural area, the water supply systems source their water from springs, streams, and wells. Some rural water supply systems that are classified as sanitary water supply still require people to boil water for drinking. The beneficiary population ratios are 95% in the urban area, which is the same as the national average, and 60% in the rural area, which is lower than the national average of 75%.

Table I-7.1.6 Existing Water Supply Systems in the Six Provinces (2014)

Item	Ha Giang		Lao Cai		Yen Bai		Dien Bien	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
No of System (No.)	15	813	16	986	9	411	10	946
Service Population (No.)	94,310	389,522	195,100	180,181	204,209	101,899	126,200	301,482
% of Service Population to the Total Population	58	62	95	39	96	18	91	75
Total Design Capacity (m ³ /day)	23,825	64,404	93,000	27,462	30,550	27,144	37,600	54,577
Service Population per System (No/system)	6,287	479	12,194	183	22,690	248	12,620	319
Design Capacity per System (m ³ /day/system)	1,588	79	5,813	28	3,394	66	3,760	58
Item	Lai Chau		Son La		Six Provinces		Whole Nation	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
No of System (No.)	9	807	34	1,456	93	5,419		
Service Population (No.)	61,020	198,035	200,655	842,526	881,494	2,013,645	24,298,350	48,752,457
% of Service Population to the Total Population	87	56	99	87	95	60	95	75
Total Design Capacity (m ³ /day)	18,300	22,396	44,500	106,960	247,775	302,943	5,800,208	
Service Population per System (No/system)	6,780	245	5,902	579	9,478	372		
Design Capacity per System (m ³ /day/system)	2,033	28	1,309	73	2,664	56		

Note: Urban population includes the surrounding rural population with water supply.

Source : Water supply companies and DARDs

The design capacity utilization of the urban water supply systems is around 72%. On the other hand, utilization of rural water supply systems is limited at 59%. The design capacity of the system needs to consider the future and realistic demand of the target area.

Table I-7.1.7 Utilization of Water Supply Systems in the Six Provinces (2014)

Province	Urban System			Rural System		
	Total Design Capacity (m ³ /day)	Capacity Utilized		Total Design Capacity (m ³ /day)	Capacity Utilized	
		(m ³ /day)	%		(m ³ /day)	%
Ha Giang	23,825	17,896	75	64,404	33,490	52
Lao Cai	93,000	55,900	60	27,462	15,213	55
Yen Bai	30,550	23,901	78	27,144	15,724	58
Dien Bien	37,600	33,400	89	54,577	42,025	77
Lai Chau	18,300	14,685	80	22,396	12,652	56
Son La	44,500	33,840	76	106,960	60,630	57
Total	247,775	179,622	72	302,943	179,734	59

Source : Water supply companies and DARDs

Since the beneficiary population ratio of urban water supply in the target provinces is the same as the national average, it could be said that the development extent of urban water supply in the areas seems not low. However, under current tendency of increasing urban population, improvement and expansion of urban systems is necessary.

On the other hand, percent of rural water supply beneficiaries per population is lower at 60% than that in national (75%), indicating the development needs of rural water supply are high. In addition, current

utilized capacity to design capacity of the existing rural system is 59%, lower than 72% of the existing urban system. Hence, new development and improvement of rural water supply are both important.

Needless to say, water supply system contributes to gender consideration (reduction of time to fetch water) as well as improvement of health (e.g. reduction of water born diseases and infant mortality rate).

I-7.1.4 Electricity Distribution

The electrification rate in the six provinces is 84%, ranging from 68% in Ha Giang to 98% in Yen Bai, which is lower than the national average electrification rate of 98%. By districts, the six provinces have still lower electrification rate. Of the 55 districts, 23 districts (42% of all districts) are lower than the provincial average electrification rate. Mainly due to the mountainous area and scattered population of the six provinces, electrification development becomes slow.

Table I-7.1.8 Present Electrification in the Six Provinces (2014)

Item	Ha Giang	Lao Cai	Yen Bai	Dien Bien
No. of Total Household (H.H)	169,997	115,002	155,941	118,205
No. of Electrified H.H	115,540	102,631	153,561	98,275
Provincial Electrification (%)				
Average	68	89	98	83
Range by District (Lowest - Highest)	54 - 94	70 - 100	86 - 100	71 - 100
No. of District Less than Provincial Average Electrification (% to total no. of districts)	2 (18%)	5 (56%)	3 (43%)	5 (56%)
Total No. of District	11	9	7	9
Item	Lai Chau	Son La	Six Provinces	Whole Nation
No. of Total Household	88,849	266,914	559,145	24,760,000
No. of Electrified H.H	77,434	230,585	470,007	24,373,000
Provincial Electrification (%)				
Average	87	86	84	98
Range by District (Lowest - Highest)	64 - 100	73 - 99	54 - 100	54 - 100
No. of District Less than Provincial Average Electrification (% to total no. of districts)	3 (38%)	5 (45%)	23 (42%)	-
Total No. of District	8	11	55	-

Source: Year 2014, DOIT

As seen, electrification is behind in the target provinces. Therefore, development of electricity distribution in these mountainous areas is necessary in terms of equitable development in line with the national policies. In addition, it is said that electrification is beneficial for women e.g. saving time for women in doing the household chore and thus necessity is high, too.

I-7.1.5 Management of Irrigation Facilities (PIM)

As mentioned, the state-owned provincial organizations manage 5% of the irrigation systems in the six provinces, whereas 95% of the irrigation systems are under the district administration and managed by farmers' water users organizations (WUOs). The provincial systems are under the Irrigation Management Companies (IMC) and Joint-stock Irrigation Companies (JSIC). In the six provinces, there are no provincial-managed systems in Ha Giang and Lao Cai. Even in the provincial-managed system, there are cases where WUOs are established. The types of WUOs and their O&M budget in Vietnam are shown in Table I-7.1.9.

Table I-7.1.9 PIM Organization (WUOs) in the Six Provinces Organized under the Circular 65/2009/TT-BNNPTNT (dated 12/10/2009)

Forms of WUO	Characters	Management	Water Distribution	O&M Fund
1. Agriculture Management Cooperative (AMC)	Irrigation service is one of services of AMC at the commune/village level	Board of AMC	Irrigation Groups of AMC	Government subsidy and fee from members
2. Water Management Board (WMB)/Water Users Association (WUA)/Water Users Group (WUG)	Specialized in irrigation services at the commune/village level	Head of CPC/village	Irrigation Group of CPC/village	Government subsidy and fee from members

Source: MARD

In the target six provinces, WUOs are organized by the following:

- Ha Giang: Agriculture Management Cooperative (AMC)
Water Management Board (WMB) at the commune level
Water Users Group (WUG) at the village level.
- Lao Cai, Yen Bai, Dien Bien, Lai Chau and Son La:
Water Management Board (WMB) at the commune level
Water Users Group (WUG) at the village level.

The activities in Table I-7.1.10 are mandated to WUOs in general.

Table I-7.1.10 Activities of WUOs under Circular 65/2009/TT-BNNPTNT (dated 12/10/2009)

<u>WMB's activities mentioned in the Regulation of DARD at the provincial level</u>	<u>WUG's activities in the field</u>
1. Develop the plan for water distribution to the farm together with WUGs, and plan for the maintenance during each crop season.	1. Implement the plan for water distribution to the farm during each crop season.
2. Check the operation in distributing water to the farm to ensure adequate supply of water for the crop.	2. Operation of intake and distribution of water to the farm to ensure adequate supply of water for the crop.
3. Together with WUGs, check the condition of canal and facilities in the beginning of the irrigation season.	3. Executing check and protection of irrigation facilities (grass removal and canal clean-up),
4. Review and check the maintenance, small repair of irrigation facilities.	4. Executing maintenance and small repair of irrigation facilities.
5. Contract with DPC or list of irrigated areas and irrigation facilities, which are all approved by CPC, DPC.	5. Data recording of irrigated area and duration of each irrigation, and types of crop.
6. Review and report to the DPC the irrigated area, duration of each irrigation and crop.	6. Collect and spend water fee at the village level. These activities are supervised by CPC and water users.
7. Receive financial subsidy from DPC and distribute to WUGs.	

Source: MARD

Based on the data collected and interview with DARDs, in the provincial systems under the Irrigation Management Companies (IMC) and Joint-stock Irrigation Companies (JSIC), 1,279 WUOs were organized and 305 WUOs (24% of the total) were classified as active in the six provinces. In Dien Bien, 45% of WUOs organized in the provincial systems are reported as active. Likewise, 19% to 24% of the WUOs are active in the other three provinces.

In the 11,859 district systems, 9,742 WUOs were organized and 1,778 WUOs (18% of the total) were reported as active. The active WUOs in the district systems range from 12% in Ha Giang to 29% in Lao Cai.

Table I-7.1.11 Status of WUOs of Irrigation Systems in the Six Provinces (2014)

Item	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La	Total
1. Provincial Systems							
No. of Systems	0	0	461	36	88	8	593
Service Area (ha)	0	0	6,720	8,245	8,101	491	23,557
No. of WUOs Organized	0	0	801	145	292	41	1,279
No. of Active WUOs (Active :%)	-	-	174 (22)	65 (45)	56 (19)	10 (24)	305 (24)
2. District Systems							
No. of Systems	3,685	1,113	2,804	799	805	2,653	11,859
Service Area (ha)	23,003	20,667	12,657	10,698	15,742	15,636	98,403
No. of WUOs Organized	2,891	1,057	2,047	767	725	2,255	9,742
No. of Active WUOs (Active :%)	334 (12)	311 (29)	385 (19)	198 (26)	105 (14)	445 (20)	1,778 (18)

Source: MARD, DARDs

To activate WUOs in both the provincial and district systems, promotion activities of PIM are necessary in the six provinces.

I-7.2 Selection Criteria for Local Infrastructure Development Subprojects

As seen, there are still needs to develop infrastructure in the target provinces. In the new project, it is anticipated that rural areas are to be developed through infrastructure improvement as well as raising agriculture productivity. To formulate the project, it was necessary to select subprojects to be implemented. Selection was supposed to be done by the provinces, and therefore it was necessary to examine selection criteria for the project.

The selection criteria of the target subprojects were assessed on the basis of i) the applied criteria for the Japan International Cooperation Agency (JICA)-financed Sector Project Loan – VI (SPL-VI) and ii) implementation results of SPL-VI (2011-2015).

The selection criteria applied for SPL IV were set for all four technical sectors. The major criteria were service area, technical specification, and construction cost depending upon the characteristics of the infrastructures (details are shown in Table I-7.2.2).

In SPL-VI, delayed construction and extended construction period would cause an increase in construction cost. The scheduled construction completion could be made under the following conditions:

1. The feasibility study (FS) and detailed design (DD) were prepared on the basis of necessary surveys and the construction cost was reasonably estimated,
2. Budget preparation for land compensation was made timely and compensation process was completed before initiation of construction work, and
3. The selected contractors have sufficient construction machines and experiences of similar works and were financially capable.

Based on the above requirements, the common condition for subprojects shall be set with the following:

1. Any subprojects classified as JICA Category A (the main condition is involuntary resettlement households of more than 40) are not eligible. The number of households to be relocated under Category B (below 40 households' relocation) shall be minimum, less than ten households.
2. The construction period of any subprojects shall be for two years under the condition of three times the approval of a subproject in a six year period.
3. A project with excessive land acquisition cost will not be selected (land compensation cost should not exceed 20% of construction cost)

In the workshop meeting on 12 January 2016 with the Ministry of Agriculture and Rural Development (MARD) and the provincial people's committee (PPC) representatives from the six provinces, draft selection criteria was explained and discussed.

The comments made by the representative of PPCs on the selection criteria were justified as shown in Table I-7.2.1:

Table I-7.2.1 Comments and Justification on Selection Criteria of Subprojects

Sector	Criteria	Comments from Provinces	Consultant's Justification
Irrigation	Irrigation area	<ul style="list-style-type: none"> • If applied more than 50 ha, most of the irrigation systems could not be selected. • The scale shall be more than 30 ha. 	<ul style="list-style-type: none"> • Based on the selected irrigation system by the provinces, many systems more than 50 ha were proposed.
Water Supply	Capacity of rural water supply	<ul style="list-style-type: none"> • More than 250 m³/day is too big for rural water supply in communes. • The unit construction cost (VND 4 million/m³) is too low. 	<ul style="list-style-type: none"> • The priority of the rural systems shall be more than 250 m³/day considering sustainability. • The unit construction cost would be revised by assessing the example of the actual construction cost.
Road	Annual average daily traffic	<ul style="list-style-type: none"> • More than 150 pcu/day shall be 100 pcu/day due to a limited traffic volume at some district roads 	<ul style="list-style-type: none"> • According to the traffic volume data of the existing district roads, 150 pcu/day is applicable. The roads with limited traffic

Sector	Criteria	Comments from Provinces	Consultant's Justification
Common	Land compensation cost	<ul style="list-style-type: none"> Due to increase of land price, the condition of land compensation cost (below 20% to the construction cost) shall be changed to 30%. 	<ul style="list-style-type: none"> Based on the assessment of SPL-VI, with land compensation cost below 10% -20% of the construction cost were completed in 2 years. There were no subprojects with the compensation cost above 30% of, construction cost in the target provinces in SPL-VI.

Source: JICA Survey Team

The construction cost per unit of the facilities and the construction period required in SPL-VI were assessed as shown in Figure I-7.2.1. In the case of road construction, its unit construction cost per km less than VND three to four billion could be completed within two to three years. The road subprojects with larger unit cost requires a longer construction period.

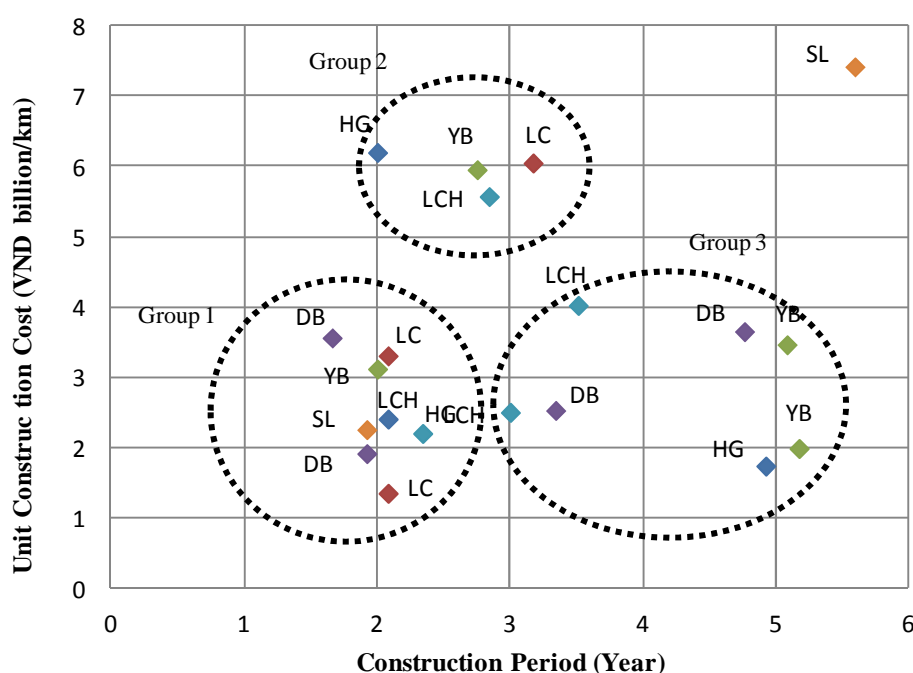


Figure I-7.2.1. Comparison of Unit Construction Cost and Construction Period in SPL-VI, Road Sector

Source: SPL-VI

Note :		
HG: Ha Giang	Group 1:	The average of construction cost per km was less than VND 3 billion and the construction period was less than 2 year.
LC: Lao Cai		
YB: Yen Bai	Group 2:	The high unit construction cost was due to rock excavation work and more than 30 m of bridge construction.
DB: Dien Bien		
LCH: Lai Chau	Group 3:	The Construction period was more than 3 years mainly due to delayed land compensation.
SL: Son La		

The subprojects in SPL-VI with larger land compensation cost i.e. proportion of land compensation cost to the total construction cost, requires longer construction period specifically in the road subprojects. The land compensation cost for irrigation, water supply, and electricity subprojects in SPL-VI were limited and their construction delay was due to land compensation process that did not happen. The construction of subprojects in SPL-VI with less than 10% of land compensation cost to the construction cost could be completed in two to three years as shown in Figure I-7.2.2

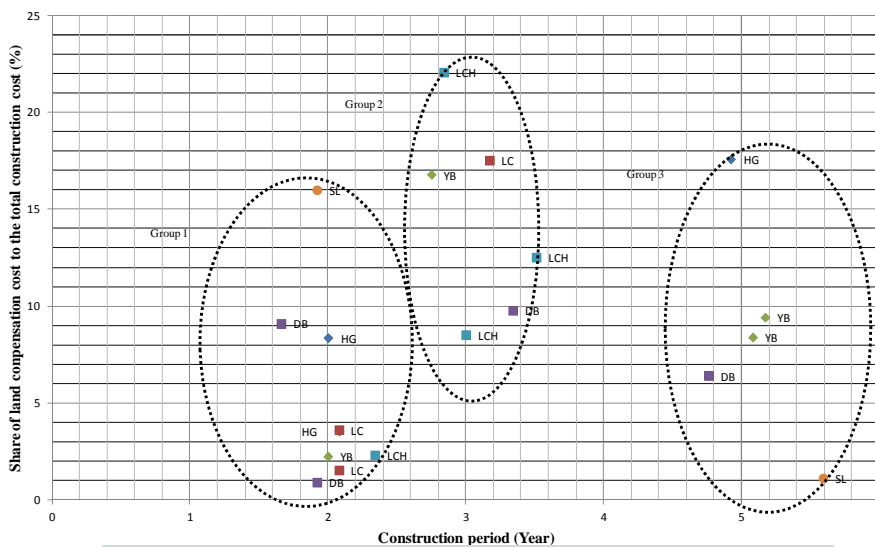


Figure I-7.2.2 Comparison of Share of Land Compensation Cost to the Total Construction Cost and Construction Period in SPL-VI

Source: SPL-VI

Note :	
Group 1:	The average share of land compensation cost to the total construction cost was less than 10% and the construction period was less than 2 year.
Group 2:	The Construction period was more than 3 years mainly due to high land compensation cost.
Group 3:	The Construction period was more than 3 years mainly due poor management

Most of the rural water supply subprojects were newly proposed (new construction), and their water sources are located far from the commune centres. The distribution networks are longer due to scattered house clusters. Therefore, the required construction cost of the rural water supply per m³ was actually higher. Considering the necessity of clean and safe water supply to the commune centres and surrounding villages, the unit cost ceiling was set at VND 40 million/m³.

Based on the above assessment, the selection criteria of subprojects by sector are recommended as shown in Table I-7.2.2 and used for the further survey work.

Table I-7.2.2 Selection Criteria of Subprojects for the Project

Selection Criteria of Technical/Environmental Aspects for Four Sectors applied in SPL-VI			Actual Result of SPL-VI Implementation in 6 Provinces			Proposed Criteria (Indicating direct construction cost not including cost for administration, land compensation, and taxes)	Remarks	
Sector	Condition	Criteria						
Irrigation	a) Irrigation area	More than 50 ha in total	(Unit: ha)			1. More than 50 ha in total 2. One continuous service area	The scale of irrigation area in SPL-VI is applicable. To prevent scattered irrigation projects, criteria of one continuous service area is added.	
			Maximum	Minimum	Average			
				660	68	266		
	b) Construction cost	Not over than VND 25 billion per subproject	(Unit: billion VND)			1. Not more than VND 30 billion per subproject	Considering price escalation and on-farm development requirement, which is necessary for proper function the cost ceiling is increased.	
Maximum			Minimum	Average				
			24.552	14.702	20.000			
c) Priority subproject	Rehabilitation and improvement	- Improvement: 2 subprojects - New construction: 2 subprojects				1. Limited at rehabilitation and improvement (not new construction) 2. Existing beneficiaries' O&M organizations in the service area	For sustainable O&M, existing O&M organization is added.	
d) Non eligible subproject	1. Including new construction of dam with a height of more than 15m 2. Including new construction of reservoir with large-scale waterlogged area of more than 100ha, or storage capacity of more than 10,000,000m ³ . 3. Including new construction of tunnel	All subprojects followed the criteria.				1. Including new construction of dam with a height of more than 15m 2. Including new construction of reservoir with large-scale waterlogged area of more than 100ha, or storage capacity of more than 10,000,000m ³ . 3. Including new construction of tunnel	Based on the SPL-VI status, the same criteria is applied.	
Water Supply	a) Target area	Cities/towns of the district	All subprojects are located in town.			District towns and commune centers	Based on the local needs, commune centers are added.	
	b) Water source	Accurately identified in F/S reports or summary sheets	River(2 subprojects), Reservoir(1), Stream (2)			Available and suitable quality /quantity of water resource needed to be confirmed at the planning stage.	Based on the SPL-VI, confirmation of water quantity and quality at the planning stage is important and added.	
	c) Number of beneficiary	More than 4,000 persons	(Unit: persons)			1. Town water supply system : More than 4,000 persons 2. Commune system : More than 1,000 persons (new criteria)	Town system : The same criteria in SPL-VI is applied. Commune system : Based on the existing commune systems.	
			Maximum	Minimum	Average			
				19,900	550	9,577		
	d) Design capacity	More than 1,000 m ³ /day	(Unit: m ³ /day)			1. Town system : More than 1,000 m ³ /day 2. Commune system : More than 250 m ³ /day (new criteria)	Town system : The same criteria in SPL-VI applied.. Commune system : Based on the existing commune system.	
			Maximum	Minimum	Average			
				3,000	75	1,795		
e) Construction cost per subproject	Not more than VND 30 billion	(Unit: VND billion)			1. Town system : Not more than VND 40 billion 2. Commune system : Not more than VND 10 billion (new criteria)	Town system : Increased considering price escalation and cost for distribution to houses Commune system : Based on the priority list proposed.		
		Maximum	Minimum	Average				
			32.404	1.365	23.695			
f) Construction unit cost	Less than VND 15,000,000/m ³ design capacity	(Unit: VND/m ³)			1. Town system : Less than VND 30,000,000/m ³ design capacity. 2. Commune system : Less than VND 40,000,000/m ³ design capacity (new criteria)	Town system : Increased considering price escalation and cost for distribution to houses Commune system : Based on existing commune systems and the priority list proposed.		
		Maximum	Minimum	Average				
			31,140,000	10,801,000	18,362,000			
g) Number of subproject in the same district	One subproject in one district	One subproject in one district			1. Town system : One subproject in one district 2. Commune system : One subproject in one commune	Town and commune system : The same criteria applied		
h) O&M	-	-			1. PO or O&M organization have O&M staff, O&M plan and budget.	For sustainable O&M, existence of O&M organization is important and therefore added.		

Selection Criteria of Technical/Environmental Aspects for Four Sectors applied in SPL-VI			Actual Result of SPL-VI Implementation in 6 Provinces			Proposed Criteria (Indicating direct construction cost not including cost for administration, land compensation, and taxes)		Remarks
Sector	Condition	Criteria						
Road	a) Construction cost per subproject	Not over VND 40 billion	(Unit: VND billion)			Not over VND 40 billion		Based on the SPL-VI experience (large cost tended to take longer period) and construction period for two years, the same criteria in SPL-VI is applied.
			Maximum	Minimum	Average			
			82.420	21.438	46.067			
	b) Maximum length of one road in the subproject	30 km	(Unit: km)			Less than 15 km		Considering construction period for 2 years and SPL-VI experience, the 15 km is applied.
			Maximum	Minimum	Average			
			31.7	3.6	15.8			
	c) Annual average daily traffic	More than 150 pcu/day	(Unit: pcu/day)			More than 150 pcu/day		Based on the SPL-VI actual result, the same criteria is applied.
			Maximum	Minimum	Average			
			500	150	235			
	d) Unit construction cost	1. Not over VND 2.5 billion/km for road	(Unit: VND billion/km)			1. Not over VND 3.0 billion/km for road		Based on the SPL-VI actual result and price escalation, the unit cost is increased. At the same time, 2-year construction period is also considered (large cost tended to take longer period).
Maximum			Minimum	Average				
			7.419	1.355	3.457			
2. Not over 20 million/m ² for bridge		(Unit: VND million/m ²)			2. Not over 30 million/m ² for bridge			
	Maximum	Minimum	Average					
		47.21	44.16	45.68				
e) Priority subproject					Type of Project	1. Improvement or Rehabilitation (Not new construction) 2. No town road	Considering construction period for 2 years and SPL-VI status, the new criteria is added. For sustainable O&M, the new criteria is added.	
					Bridges in the road	Number of bridge in the road is limited at three (3) locations or less, and each length is 15m of single span or less.		
					O&M	PO or O&M organization have O&M staff, O&M plan and budget		
Electricity Distribution	a) Project owner	Department of Industry or District People's Committee (DPC)	- DOI: 2 subprojects - EPC: 1 subproject	DOI, DARD, DPC		DARD is added based on the current project design. Depending on final decision of the implementing organization at provincial level, POs will be selected.		
	b) Subproject component	1. New construction, expansion or rehabilitation of MV lines	All 3 subprojects fulfilled these criteria.	1. New construction, expansion or rehabilitation of MV lines		Based on the SPL-VI actual result, the same criteria is applied.		
		2. New installation or rehabilitation of distribution transformers		2. New installation or rehabilitation of distribution transformers				
		3. New construction or rehabilitation of LV lines		3. New construction or rehabilitation of LV lines				
	c) Construction cost	Not more than VND 25 billion per subproject	(Unit: VND billion)			Not more than VND 25 billion per subproject (same as SPL-VI)	Based on the SPL-VI actual result, the same criteria is applied.	
			Maximum	Minimum	Average			
		18.388	18.016	18.261				
d) Power source	Grid of Electricity of Vietnam (EVN)	Grid of Electricity of Vietnam (EVN)		Grid of Electricity of Vietnam (EVN) (same as SPL-VI)				
e) Non eligible project	Project including more than 220kv or more than 15km elevated transmission line	All 3 subprojects are less than 220kv and 15km.		1. Subproject including more than 220 kv or more than 15km elevated transmission line 2. Subproject is not scattered at different locations (within one continuous lines)		Based on the SPL-VI status, the same criteria (1) is applied. Based on the issues in SPL-VI, subprojects located at several locations are excluded (2).		
Common for 4 sectors	a) Construction period	-	1.5 to 5.5 years		Construction period is within two (2) years.		Based on the Project design and schedule, the new criteria is added..	
	b) Resettlement and land compensation cost	-	-		Resettlement and land compensation cost is not exceed 20% of construction cost.		Based on the issues in SPL-VI, the new criteria is added.	
	c) Environment (Not Eligible Condition)	Subprojects classified as JICA category A are not eligible	All 32 subprojects are not classified as JICA category A.		Subprojects classified as JICA Category A are not eligible (in case of involuntary resettlement, its population below 100)		Based on the SPL-VI status, The same criteria applied (involuntary resettlement is emphasized).	

Source: SPL-VI, JICA Survey Team

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Data Collection Survey on the Needs for Agricultural
Productivity Improvement in Northern Six Provinces

I-7.3 Potential Infrastructure Subprojects during Phase 1 Survey

The JICA Survey Team explained the subproject selection criteria on the inception report and requested PPCs to prepare the list of priority subprojects covering the four sectors during the field survey made in 7 October to 7 November in Dien Bien and Son La and 16 to 30 November 2015 for the other four provinces. Some provinces prepared the lists of priority subprojects by their technical departments such as DARD, DOT, DOC and DOIT, and some are prepared under the coordination with DPI.

The six provinces submitted 20 to 65 subprojects; respectively with total investment of VND 1.020 to 2,182 billion as shown in Table I-7.3.1 and I-7.3.2. By sector, 31 road subprojects in the six provinces share VND 4,351 billion (46%) of the total construction cost, followed by 101 irrigation subprojects (VND 2,334 billion, 24%) and 44 urban water supply subprojects (VND 1,760 billion, 18%).

Table I-7.3.1 Summary of Priority Subprojects (as of Dec. 2015)

Province	Road		Irrigation		Electricity	
	No	Total Construction Cost (VND billion)	No	Total Construction Cost (VND billion)	No	Total Construction Cost (VND billion)
Ha Giang	4	1,427	5	417	-	-
Lao Cai	5	1,129	39	484	-	-
Yen Bai	7	661	30	720	3	173
Dien Bien	5	342	10	529	3	86
Lai Chau	5	385	13	105	-	-
Son La	5	407	4	79	6	359
Total	31	4,351	101	2,334	12	618
Province	Urban WS		Rural WS		Total	
	No	Total Construction Cost (VND billion)	No	Total Construction Cost (VND billion)	No	Total Construction Cost (VND billion)
Ha Giang	7	324	4	14	20	2,182
Lao Cai	10	376	6	39	60	2,028
Yen Bai	10	116	15	87	65	1,757
Dien Bien	4	126	30	194	52	1,277
Lai Chau	10	421	25	109	53	1,020
Son La	3	397	12	41	30	1,283
Total	44	1,760	92	484	280	9,547

Source: JICA Survey Team

Table I-7.3.2 Comparison of Unit Construction Cost of Priority Subprojects (Proposed as of Dec. 2015)

Province	Road			Irrigation		
	Unit Construction Cost (VND billion/km)			Unit Construction Cost (VND million/ha)		
	Lowest	Highest	Average	Lowest	Highest	Average
Ha Giang	4.31	20.75	9.86	173	314	215
Lao Cai	2.42	8.03	5.34	37	344	147
Yen Bai	1.89	12.77	3.97	33	465	179
Dien Bien	3.12	4.32	3.75	1	1,264	336
Lai Chau	2.20	13.55	5.57	14	167	78
Son La	4.13	7.85	5.06	187	750	365
Total	1.89	20.75	5.69	1	1,264	107
Province	Urban WS			Rural WS		
	Unit Construction Cost (VND million/m ³)			Unit Construction Cost (VND billion/System)		
	Lowest	Highest	Average	Lowest	Highest	Average
Ha Giang	10	35	15	2	5	3
Lao Cai	2	17	8	3	9	7
Yen Bai	4	9	7	5	12	7
Dien Bien	7	24	16	5	8	6
Lai Chau	4	43	11	3	5	4
Son La	8	33	18	3	4	4
Total	2	43	9	2	12	5

Source: JICA Survey Team

Some of the subprojects were not in accordance with the selection criteria for the respective sectors on the scale of facilities such as length of roads, capacity of the facility, total cost and unit costs. Some road subprojects with longer scope of length may not be completed in two years for their construction works. The unit construction costs of the priority subprojects varied and some subprojects did not accord with the selection criteria. Considering their plans at the level of concept paper, the JICA Survey Team continued to investigate and assess the scope works of the priority subprojects in the field investigation made in February to March 2016.

II: CONCLUSIONS

CHAPTER II-1 CONCLUSIONS

The main conclusions of the report are briefly summarized in this chapter.

- The development of the six target provinces located in the northern bordering areas has lagged behind the national average of Vietnam in terms of agriculture, infrastructure, and social aspects.
- The development policies of the government of Vietnam aim at modern industrialization in general (SEDS), and agriculture development in a modernized and sustainable way (Strategy on Agriculture and Rural Development), development of rural areas through NTP on NRD, and poverty reduction through Program 135 and NTP on Sustainable Poverty Reduction, indicating acceleration of economic growth as well as mitigation of disparity.
- Among the six provinces, there are different characteristics. The natural conditions are similar, and the socioeconomic conditions in Lao Cai, Son La, and Yen Bai are better than the others in general. There are many ethnic minorities in the target provinces. The Kinh, the majority group in Vietnam, is not the majority except Yen Bai. With regard to agriculture, there is a tendency that the level of cultivation techniques is higher in the provinces where economic development is higher.
- In the provincial government system, PPC is the executing agency of state management at local level. Especially, budgetary approval is one of the important roles which PPC carries out. There are several vice chairpersons, and each has his/her own areas in-charge. All different province-level technical departments are under PPC.
- Local budget revenues in the six target provinces depend mostly on budget transfers from the central government. Decentralized revenues such as tax revenues with 100% entitlement and shared revenues, considered as provincial own revenue sources, vary from around 6% to 20% implying different budget capacity.
- The government capacity of the six provinces was evaluated from overall provincial government, infrastructure development, and agriculture development. Based on the overall evaluation, the highest evaluated province is Lao Cai, followed by Yen Bai, Son La, Ha Giang, La Chau, and Dien Bien with different characteristics per province for three large categories.
- The Survey Team studied and analyzed the impacts of the NORRD Project in Dien Bien Province. As a result, yield and production, cultivation technique, and irrigation water management in the pilot sites are improved. Technical adaptability of the guideline/manual compiling recommendation made by the NORRD Project was also surveyed to the other five provinces from the viewpoints of natural condition, cultivation techniques, extension system and budget, and activeness of WUOs. The results say that the guideline/manual is technically applicable, and needs to disseminate the guideline/manual are confirmed although there are some differences among the six provinces.
- In addition, importance of creating awareness on safety agriculture product (e.g. with GAP) and improvement of the social condition (e.g. through maternal and child health, anti-trafficking in person (anti-TIP)) in the target provinces were also discussed and confirmed.

The new project intends to introduce the performance-based system which provides infrastructure finance to the provinces based on evaluation results of activities to be done by the provinces. The results of the Survey shown in this report are used to formulate the new project.

Attachments

- Attachment I-2.4.1 Criteria for NTP on NRD
- Attachment I-3.4.1 List of current WB and ADB projects in the six target provinces
- Attachment I-4.3.1 Cropping patterns and recent production data of three target crops in the six target provinces
- Attachment I-4.4.1 GAP related activities in past three years in the six provinces
- Attachment I-5.1.1 Tasks and authorities of MARD
- Attachment I-5.1.2 Structures under PPC for target six provinces
- Attachment I-5.1.3 Functions and duties of DARD
- Attachment I-5.1.4 DARD organization charts for six provinces
- Attachment I-5.2.1 Actual execution situation of development budgets
- Attachment I-5.5.1 Evaluation of government capacity
- Attachment I-6.1.1 Result of survey in Dien Bien province on agriculture extension of NORRD project
- Attachment I-6.2.1 Result of examination on extension possibility on NORRD project in other five provinces

***Attachment I-2.4.1
Criteria for NTP on NRD***

ATTACHMENT I-2.4.1 CRITERIA FOR NTP ON NRD

A. NEW RURAL COMMUNE

I. PLANNING

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
1	Planning and implementation of planning	Planning and essential infrastructure for development of agricultural production goods, industrial, small industries and services Land development planning economic level - society - according to the new environment development Planning new residential and renovation of existing residential areas towards civilization , security there are good cultural identity	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach

Source: Decision No. 491/QĐ-TTg

II. ECONOMIC - SOCIAL INFRASTRUCTURE

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
2	Communications Information	2.1. Ratio of length by km of road to the central of commune is asphalt or concrete according to technical standards of the Ministry of Transport	100%	100%	100%	100%	100%	100%	100%	100%
		2.2. Percentage of village roads are concrete according to technical standards of the Ministry of Transport	70%	50%	100%	70%	70%	70%	100%	50%
		2.3. Percentage of hamlet roads are clean and not muddy in the rainy season .	100%	100 % (50 % concrete)	100 % concrete	100 % (70 % concrete)	100 % (70 % concrete)	100 % (50% concrete)	100 % concrete	100 % (30 % concrete)
		2.4. Percentage of field road is concrete and available to vehicle travel	65%	50%	100%	70%	70%	70%	100%	50%
3	Irrigation	3.1. Basic Irrigation System meet the requirements of production and daily life	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		3.2. Percentage of canal embankment managed by communes are concrete	65%	50%	85%	85%	70%	45%	85%	45%

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
4	Electrical	4.1. Power system meet technical standard of electrical regulations	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		4.2. Percentage of households using electricity regular and safe from all sources	98%	95%	99%	98%	98%	98%	99%	98%
5	Schools	Percentage of schools at all levels : pre- childhood, kindergarten , elementary , junior high school has facilities to meet national standards	80%	70%	100%	80%	80%	70%	100%	70%
6	Cultural Facilities and infrastructure	6.2. Cultural house and sports facilities at commune level meet national standards	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		6.3. Percentage of villages with cultural houses and sport facilities meet national standards	100%	100%	100%	100%	100%	100%	100%	100%
7	Rural markets	Rural markets meet national standards set by the Ministry of constructions	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
8	Post	8.1. There is postal service for telecommunications	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		8.2. The Internet Access Point at village level	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
9	Residential houses	9.1. Temporary houses dilapidated	No	No	No	No	No	No	No	No
		9.2. Percentage of households' houses meet national standards set by Ministry of Construction	80%	75%	90%	80%	80%	75%	90%	70%

Source: Decision No. 491/QD-TTg

III. ECONOMICS ACTIVITIES AND PRODUCTION ORGANIZATION

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
10	Incomes	Per capita Income per year of the whole commune is higher than the provincial average	1,4 times	1,2 times	1,5 times	1,4 times	1,4 times	1,3 times	1,5 times	1,3 times
11	Households Poverty	Percentage of poor households	< 6%	10%	3%	5%	5%	7%	3%	7%
12	Labor force structure	Percentage of labor within working ages in agriculture, forestry and fisheries of the total labor force	< 30%	45%	25%	35%	35%	40%	20%	35%
13	Types of production organizations	There are cooperatives or cooperative groups operate effectively	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Decision No. 491/QD-TTg

IV. CULTURE – SOCIAL ISSUES - ENVIRONMENT

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
14	Education	14.1. Universal secondary education	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		14.2 . Percentage of students graduating from junior high school continue to senior high school (popular, supplementary , vocational training)	85%	70%	90%	85%	85%	70%	90%	80%
		14.3 . Percentage of rural labor force gets formal training	> 35%	> 20%	> 40%	> 35%	> 35%	> 20%	> 40%	> 20%
15	Health cares	15.1. Proportion of rural people has health insurance	30%	20%	40%	30%	30%	20%	40%	20%
		15.2. Health cares at communes meet national standards	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
16	Cultural lives	Communes with more than 70 % of villages achieving standard of culture village under the provisions of the ministry of culture, sports and tourism	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
17	Environment	17.1. Percentage of households used hygienic water according the national standards	85%	70%	90%	85%	85%	85%	90%	75%
		17.2 . Production facilities meet environmental standards	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		17.3 . None activities causing environmental degradation and development activities in the green environment , clean and beautiful	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		17.4 . Cemetery was built according to overall planning	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		17.5 . Waste, waste water are collected and processed in accordance	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach

Source: Decision No. 491/QĐ-TTg

V. POLITICAL SYSTEM

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
18	System of social organization and strong political	18.1. Commune staff meet official standards	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		18.2. There are adequate organizations of the political system as prescribed.	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach

No.	Name of criteria	Content of the criteria	Overall	Specific for region						
				Northern Mountainous	Red River Delta	North Central Coast	South Central Coast	Central Highland	South East	Mekong River Delta
		18.3 . Party cells, government system meet the standard of "in a clean and strong "	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
		18.4 . The mass organizations of commune have reached more advanced titles	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach
19	Security social order	Security, social order is kept	Reach	Reach	Reach	Reach	Reach	Reach	Reach	Reach

Source: Decision No. 491/QD-TTg

B. NEW RURAL DISTRICTS

With at least 75 % of communes in the district achieving new rural development standard.

C. NEW RURAL PROVINCE

With at least 80% of rural districts in the province achieving new rural development standard.

Attachment I-3.4.1
List of current WB and ADB projects in
the six target provinces

Attachment I-3.4.1 List of Current WB and ADB Projects in 6 Target Provinces

No.	Project Name	General description						Province					
		Approved date	Status	Closing date	Sector	Components	Loan amount	Dien Bien	Son La	Lai Chau	Lao Cai	Ha Giang	Yen Bai
World Bank													
1	Additional Financing to Second Northern Mountains Poverty Reduction Project	27-Feb-15	Active	N/A	General agriculture, fishing and forestry	The amended development objective is to enhance the living standards of the Project Beneficiaries by improving: (i) their access to productive infrastructure; (ii) the productive and institutional capacity of local governments and communities; (iii) commune integrated investment planning and (iv) market linkages and business innovations.	Total Project Cost: US\$ 110 million Commitment Amount: US\$ 100 million	x	x	x	x		x
2	Second Northern Mountains Poverty Reduction Project	6-Apr-10	Active	30-Jun-18	General agriculture, fishing and forestry	The amended development objective is to enhance the living standards of the Project Beneficiaries by improving: (i) their access to productive infrastructure; (ii) the productive and institutional capacity of local governments and communities; (iii) commune integrated investment planning and (iv) market linkages and business innovations.	Total Project Cost: US\$ 165 million Commitment Amount: US\$ 150 million	x	x	x	x		x
3	Vietnam Road Asset Management Project	12-Dec-13	Active	31-Dec-20	General transportation Rural and Inter-Urban Roads and Highways	1) Road Asset Management System (RAMS) development 2) Road Asset Preservation 3) Road Asset Improvement 4) Institutional Strengthening	Total Project Cost: US\$ 301.7 million Commitment Amount: US\$ 250 million		x			x	
4	Vietnam Irrigated Agriculture Improvement Project	15-Jan-14	Active	31-Dec-20	Irrigation & Drainage	1) improved irrigation water management 2) irrigation and drainage scheme level improvements 3) support services for climate-smart agricultural practices 4) project management, and monitoring and evaluation	Total Project Cost: US\$ 210 million Commitment Amount: US\$ 180 million					x	
5	Medium Cities Development Project	15-Dec-11	Active	30-Dec-17	General water, sanitation and flood protection	1) Urban basic infrastructure upgrading and service improvement 2) Urban water supply and environmental sanitation 3) Construction of urban roads & bridge 4) Project management support and technical assistance	Total Project Cost: US\$ 285 million Commitment Amount: US\$ 210 million				x		
6	Results-based Scaling Up Rural Sanitation and Water Supply Program	12-Nov-15	Active	31-Jul-21	Water supply	(a) Rural water supply (b) Rural sanitation and hygiene (c) Capacity building and implementation support	Total Project Cost: US\$ 300 million Commitment Amount: US\$ 200 million	x	x	x	x	x	x
7	Result-Based Northern Mountains Urban Program Project	5-Jun-14	Active	30-Jun-21	General water, sanitation and flood protection	(a) institutional strengthening at city level (b) delivery of infrastructure services in participating cities (c) sustainable infrastructure investments (d) national policy, support and oversight	Total Project Cost: US\$ 270 million Commitment Amount: US\$ 250 million	x					x

No.	Project Name	General description					Province						
		Approved date	Status	Closing date	Sector	Components	Loan amount	Dien Bien	Son La	Lai Chau	Lao Cai	Ha Giang	Yen Bai
Asian Development Bank													
1	Sustainable Rural Infrastructure Development Project in Northern Mountain Provinces	22-Oct-10	on-going	-	Agriculture, natural resources, and rural development	The project will rehabilitate and upgrade deteriorated but critical rural infrastructure in 15 mountainous provinces of northern Viet Nam. These provinces have a combined population of 12.2 million people and are among the poorest in the country. Overall poverty rates average about 27%, but are considerably higher in more isolated areas, where poverty levels may be 50%-60%. One of the main reasons for these high levels of poverty is limited access to productive assets and infrastructure (such as irrigation water systems), and physical isolation. The project will focus on improving small- to medium-scale irrigation and/or drainage systems, rural roads, and district and commune markets.	US\$ 110 million	x	x	x	x	x	x
2	Transport Connections in Northern Mountainous Provinces	30-Sep-11	on-going	-	Transportation	Under the project, about 304 kilometers (km) of provincial roads in six northern mountainous provinces of Viet Nam will be rehabilitated. These provinces have high rates of poverty and large ethnic minority populations. The road network consists predominantly of mountainous, unpaved, narrow roads, and many sections are impassable during the rainy season. Project roads have been selected through project preparatory technical assistance (TA) based on social and economic indicators to maximize development benefits and impacts. The time and cost of traveling from mountainous remote areas to social infrastructure will be reduced, and the economic activities along the roads will be increased. The project is consistent with the strategic priorities of the country strategy and program, which emphasizes investments in infrastructure development for pro-poor economic growth.	US\$ 108.89 million				x	x	x
Total number of projects in target province								5	5	4	6	5	6

Source: Website of WB and ADB. The above is loan and on-going projects for ADB, active projects for WB.

Attachment I-4.3.1
Cropping patterns and recent production data
of three target crops in the six target provinces

Attachment I-4.3.1 (1/2) Cropping Pattern of Paddy Rice, Maize and Soybeans in the 6 Provinces

Crop	District	Cropping Type ¹⁾	Dec	Jan	Feb	Mar	Apr	May	Jun	Junl	Aug	Sep	Oct	Nov
Paddy rice Cultivation period [Dry season] 125~130 days [Rainy season] 115~120 days	Dien Bien	W - Sp S - A		[Dry Season]					[Rainy Season]					
	Son La Lao Cai Lai Chau Ha Gian	W - Sp S - A		Land preparation										
	Yen Bai	W - Sp S - A		Land preparation										
Maize Cultivation period 100~120 days	Dien Bien	Sp S - A												
	Son La Lao Chau	Sp S - A												
	Ha Gian	Sp S - A												
	Lao Cai	Sp S - A A - W												
	Yen Bai	Sp A - W												
Soybeans Cultivation period 85~95 days	Dien Bien	Sp S - A												
	Son La Ha Gian	Sp S - A												
	Yen Bai	Sp S - A												
	Lao Chau	A - W												

1) W: Winter, Sp: Spring, S: Summer, A: Autumn
 Source: The Survey Team

Attachment I-4.3.1 (2/2) Area, Production and Yield of Paddy Rice, Maize and Soybeans in 6 Province

Indicator		DB		SL		Lao Cai		Lai Chau		HG		YB		
		Dry season	Rain season	Dry season	Rain season	Dry season	Rain season	Dry season	Rain season	Dry season	Rain season	Dry season	Rain season	
Paddy rice (excluding upland paddy)	2012	Area(ha)	8,169	16,316	10,097	17,559	9,761	19,873	5,670	18,547	9,907	26,499	18,229	22,243
		Production(ton)	48,049	80,147	60,177	79,545	54,767	88,526	30,430	83,300	52,427	148,291	98,392	99,298
		Yield(ton/ha)	5.88	4.91	5.96	4.53	5.61	4.45	5.37	4.49	5.29	5.60	5.40	4.46
	2013	Area(ha)	8,263	16,598	11,147	18,037	9,781	20,441	6,068	19,553	9,713	26,894	18,711	21,798
		Production(ton)	45,490	82,061	67,094	80,637	55,048	92,419	32,250	87,950	54,210	151,007	100,892	97,619
		Yield(ton/ha)	5.51	4.94	6.02	4.47	5.63	4.52	5.32	4.50	5.58	5.62	5.39	4.48
	2014	Area(ha)	8,476	16,928	11,410	18,177	9,880	20,395	6,223	19,565	9,481	27,162	19,036	21,884
		Production(ton)	51,285	85,254	68,522	80,792	54,753	93,079	33,850	88,440	52,949	153,359	101,026	101,376
		Yield(ton/ha)	6.05	5.04	6.01	4.45	5.54	4.56	5.44	4.52	5.58	5.65	5.31	4.63
Maize	2012	Area(ha)		29,246		133,713		33,659		21,410		52,509		24,660
		Production(ton)		71,624		524,747		115,603		57,980		168,706		75,455
		Yield(ton/ha)		2.45		3.92		3.44		2.71		3.21		3.06
	2013	Area(ha)		29,328		162,789		34,658		21,150		52,607		26,713
		Production(ton)		74,216		654,639		122,223		57,340		176,864		84,462
		Yield(ton/ha)		2.53		4.02		3.53		2.71		3.36		3.16
	2014	Area(ha)		29,929		162,961		39,132		22,150		54,215		28,471
		Production(ton)		76,101		661,812		117,702		62,130		178,428		83,612
		Yield(ton/ha)		2.54		4.06		3.01		2.81		3.29		2.94
Soybeans	2012	Area(ha)		6,573		3,595		4,940		2,485		22,125		901
		Production(ton)		8,810		4,700		5,213		2,387		25,786		1,091
		Yield(ton/ha)		1.34		1.31		1.10		0.96		1.17		1.21
	2013	Area(ha)		5,449		2,663		4,903		2,380		22,860		527
		Production(ton)		7,236		3,451		5,248		2,226		28,786		646
		Yield(ton/ha)		1.33		1.30		1.10		0.94		1.26		1.23
	2014	Area(ha)		5,543		2,213		4,881		2,491		23,758		334
		Production(ton)		7,234		2,796		5,323		2,730		30,482		409
		Yield(ton/ha)		1.30		1.26		1.09		1.10		1.28		1.19

Source:

- : Provincial statistic book 2014, 2013, 2012
- : Calculated (production divided by area)
- : DARD activities report 2012, 2013, 2014

Attachment I-4.4.1
GAP related activities in past three years
in the six provinces

ATTACHMENT I-4.4.1 GAP RELATED ACTIVITIES IN PAST THREE YEARS IN THE SIX PROVINCES

Province	Ha Giang	Lao Cai	Yen Bai
Applied Policies	<ul style="list-style-type: none"> + Decision No 01/2012 of Government on a number of policies to support the application of good agricultural practices to agro-forestry-fishery. + Joint Circular No 42/2013 of MARD-MOF-MPI on guiding to implementation Decision No 01/2012. + Resolution No 47 dated 14/7/2012 of Ha Giang People's Council on promulgating a number of policies to encourage the development of socio-economic in Ha Giang province. + Resolution No 209 dated 10/12/2015 of Ha Giang People's Council on promulgating the development of commodities agricultural production in Ha Giang province. 	<ul style="list-style-type: none"> + Decision No 01/2012 of Government on a number of policies to support the application of good agricultural practices to agro-forestry-fishery. + Joint Circular No 42/2013 of MARD-MOF-MPI on guiding to implementation Decision No 01/2012. + Decision No 55/2013 dated 20/12/2013 of Lao Cai PPC on promulgating policies to support the application of good agricultural practices during 2014 – 2020 in Lao Cai province. 	<ul style="list-style-type: none"> + Decision No 01/2012 of Government on a number of policies to support the application of good agricultural practices to agro-forestry-fishery. + Joint Circular No 42/2013 of MARD-MOF-MPI on guiding to implementation Decision No 01/2012. + Decision No 27/2015 dated 31/12/2015 of Yen Bai People's Committee on promulgating policies to support the development of agro-forestry-fishery association agricultural re-structuring in Yen Bai province.
Activities Made	<ul style="list-style-type: none"> + Vegetable: VietGAP certificates have been granted to 2 cooperatives (1 from Ha Giang City and the other from Hoang Su Phi district) and 4 production groups (all from Ha Giang City) with 17 hectares. + Fruit: there are 6 production units getting VietGAP certificates for orange products in Bac Quang district with 134.9 hectares. + Tea: To 14 production units (1 company, 1 cooperative, 4 CPCs and 8 production groups in Bac Quang, Vi Xuyen, Quang Binh and Hoang Su Phi districts), VietGAP certificates have been granted with 1,581.24 hectares. Besides there are 1.673 hectares in Vi Xuyen, Quang Binh and Hoang Su Phi districts getting organic agriculture certificates. 	<ul style="list-style-type: none"> + Tea: In Lung Vai, Ban Lau, Thanh Binh and Ban Sen communes in Muong Khuong district and Phu Nhuan commune in Bao Thang district, VietGAP certificates have been granted with 1035 hectares. + Vegetable: In Sa Pa commune in Sa Pa district and Y Ty in Bat Xat district VietGAP certificates have been granted with 40 hectares and procedures for 75 hectares are preparing. Besides, in Lao Cao city, Bac Ha, Sa Pa, Bat Xat, Bao Thang districts, safety production certificates have been granted with 585 hectares. 	<ul style="list-style-type: none"> + Fruit: there are 2 production groups getting VietGAP certificates in Van Chan and Luc Yen districts for orange production. + Tea: To 70 production groups in Yen Bai city, Van Chan, Tran Yen and Yen Binh districts VietGAP certificates have been granted. + Livestock husbandry: To Hoa Binh Minh company VietGAP certificate has been granted for pig husbandry.
Products GAP can be applied to	<ul style="list-style-type: none"> + Vegetable: Ha Giang City and Bac Quang districts + Fruit: Bac Quang, Quang Binh and Vi Xuyen districts + Tea: Hoang Su Phi, Xin Man, Bac Quang and Quang Binh districts. 	<ul style="list-style-type: none"> + Vegetable: Lao Cai City, Bac Ha, Sa Pa, Bat Xat, Bao Thang district + Tea: Muong Khuong and Bao Thang district. + Fruit: Mandarin in Muong Khuong, grapefruit in Bao Thang, plum in Bac Ha and banana in Muong Khuong, Bao Thang, Bat Xat district and Lao Cai city. 	<ul style="list-style-type: none"> + Vegetable: Yen Bai City and Nghia Lo town + Fruit: Van Chan and Luc Yen districts + Tea: Yen Bai city; Van Chan, Tran Yen, Yen Binh and Van Yen districts.

Province	Dien Bien	Lai Chau	Son La
Applied Policies	<ul style="list-style-type: none"> + Decision No 01/2012 of Government on a number of policies to support the application of good agricultural practices to agro-forestry-fishery. + Joint Circular No 42/2013 of MARD-MOF-MPI on guiding to implementation Decision No 01/2012. + Decision No 02/2014 dated 13/3/2014 of Dien Bien People's Committee on promulgating policies to support the development of agro-forestry-fishery in Dien Bien province. + Decision No 212/2015 of Dien Bien People's Committee on agricultural restructuring. 	<ul style="list-style-type: none"> + Decision No 01/2012 of Government on a number of policies to support the application of good agricultural practices to agro-forestry-fishery. + Joint Circular No 42/2013 of MARD-MOF-MPI on guiding to implementation Decision No 01/2012. + Decision No 1406/2014 dated 30/10/2014 of Lai Chau PPC on approval proposal of agricultural restructuring to 2020 and vision to 2030 in Lai Chau province. + Decision No 29/2013 dated 29/10/2013 of Lai Chau PPC on promulgating regulations of implementation policies to support agricultural development during 2014-2016 in Lai Chau province. 	<ul style="list-style-type: none"> + Decision No 01/2012 of Government on a number of policies to support the application of good agricultural practices to agro-forestry-fishery. + Joint Circular No 42/2013 of MARD-MOF-MPI on guiding to implementation Decision No 01/2012. + Decision No 3067 dated 17/12/2013 of Son La PPC on stipulation a number of policies to support the application of good agricultural practices in Son La province. + Decision No 810 dated 20/4/2015 of Son La PPC on approval proposal to implementation policies to support the application of good agricultural practices in Son La province.
Activities Made	<ul style="list-style-type: none"> + VietGAP certificate have not been granted in Dien Bien yet. However in Dien Bien Phu city, Dien Bien district and Muong Lay town some pilots on vegetable production and livestock husbandry are certified as safe production. 	<ul style="list-style-type: none"> + Tea: To Than Uyen tea production company VietGAP certificate has been granted. Tam Duong tea company is carrying out procedures for issuance of VietGAP certificate. + Some pilots on safety vegetable production and livestock husbandry have been developed in Lai Chau city, Than Uyen and Phong Tho district. 	<ul style="list-style-type: none"> + Vegetable: 2 Production groups have obtained VietGAP certificates (1 from Chieng Hac commune and the other from Dong Sang commune, Moc Chau district) with 12 hectares. + Fruit: there are 3 production units getting VietGAP certificates (orange production farm in Muong Thai commune, Phu Yen district; company in Phieng Luong commune, Moc Chau district for strawberry production; and cooperatives in Dong Sang commune, Moc Chau district for avocado production) with 9.2 hectares. + Tea: 2 tea production companies have got VietGAP certificates (Moc Chau tea production company and private enterprise in Tan Lap commune, Moc Chau district) with 47.55 hectares. + Livestock husbandry: VietGAP certificates have been issued to 3 enterprises (Moc Chau Dairy Cattle Breeding Join-Stock Company; Minh Thuy enterprise in Co Noi commune, Mai Son district and Hong Long company in Phu Yen district)
Products GAP can be applied to	<ul style="list-style-type: none"> + Vegetable: Dien Bien Phu City, Dien Bien and Muong Lay town + Fruit: Muong Nhe and Dien Bien districts + Tea: Tua Chua district. + Coffee: Muong Nhe district. 	<ul style="list-style-type: none"> + Vegetable: Lai Chau City, Phong Tho, Muong Te and Tam Duong district + Tea: Lai Chau city, Tan Uyen and Tam Duong district. + Fruit: Tam Duong district. + Livestock husbandry: Lai Chau city, Tam Duong, Sin Ho, Than Uyen and Tan Uyen district. 	<ul style="list-style-type: none"> + Vegetable: Moc Chau and Mai Son districts + Coffee: Mai Son district + Fruit: Phu Yen district + Tea: Thuan Chau district

Source: Prepared by the JICA Survey team based on the hearing to provincial DARD

Attachment I-5.1.1
Tasks and authorities of MARD

Attachment I-5.1.1 Tasks and Authorities of MARD

MARD performs its tasks and authorities based on Decree No.178/2007/ND-CP dated 3rd December 2007 issued by the Government on stipulation of functions, mandates, authorities and organization structure of Ministries, and conducts specific tasks and authorities as follows:

1. Submit to the Government legal projects, draft resolutions of the National Assembly, ordinances, draft resolutions of National Assembly Standing Board; draft resolutions, decrees based on approved programs, annual law plans of MARD and projects assigned by the Government and the Prime Minister.
2. Submit to the Prime Minister strategies; master plans, long term plans, five-year and annual plans, as well as key programs and projects within the Ministry's mandated areas.
3. Submit to the Prime Minister draft resolutions, directives and other legal documents within Prime Minister promulgating.
4. Approve strategies; master plans, the development program of sectors within the Ministry's mandated areas by decentralization and authorization of the Prime Minister.
5. Issue decisions, directives, circulars, standards, techno-economic norms; organize to develop national standard on sector management within the Ministry's mandated areas; guide how to implement these documents and inspect the implementation process.
6. Announce, direct, guide, supervise, inspect, assess, synthesize report and organize the implementation of approved legal documents, strategies, master plans and plans within the Ministry's mandated areas. Disseminate information and raise public awareness about regulations within areas covered by the Ministry's mandated areas.
7. Inspect legal documents issues by Ministries, Provincial People's Council and Provincial People's Committee relation Ministry's mandated areas; a) Conduct post-review, according to law, of legal normative documents issued by ministries, ministerial-level agencies and provincial-level People's Councils and Committees; to propose for the handling of or to handle at its competence or under authorization by the Prime Minister unlawful legal normative documents.
8. Agriculture (crop production and animal husbandry):
 - a. Govern, guide implementation of agricultural development strategies upon approval of authorized agencies.
 - b. Perform governance and guidance responsibilities for using state budget for prevention and overcoming programs of plants and animals diseases; set up National Governing Board on prevention of plants and animals diseases and make an announcement of contagious outbreaks possibly infect people; standard for plants and animals quarantine; practice certificate and conditions for pesticides and veterinary drugs.
 - c. Announce and perform governance, guidance, inspection and making comprehensive reports responsible for implementation of strategies, master plans, agricultural development plans approved nationwide.
 - d. Perform governance responsibilities for crops, livestock breeds, harvest, storage techniques and make annual assessment reports on crops production and livestock breeds.
 - e. Perform governance responsibilities for setting up and inspect master plans of crop and livestock breeds regions, safe production of agricultural products; plans of using, protecting and improving fertility of agricultural land; prevent erosion, desertification and landslide;
 - f. Announce list of crops and livestock genes; issue certificates for genes exploitation and using; exchange valuable and rare crops and livestock genes; issue lists of i) major crops,

seedlings, and livestock breeds that could be commercially produced and traded; ii) valuable and rare crops and livestock genes needed to be conserved; iii) crops and livestock breeds not allowed for export or allowed to be exchanged (seedlings and livestock breeds be allowed for import are not in the list); issue national standards of seeds classification, multiplication and restoration process of purely genuine breed, production process of short-term industrial, fruit trees, ornamentals and other crops.

g. Issue norm and process of experiment, choosing and creating new crops and livestock breeds; make a decision on approval, issuance or termination of certificates of protection of new crops and livestock.

h. Regulate management, production, trade and using fertilizers; test and approve new fertilizers; issue quality standards of fertilizers; issue national standards of fertilizers.

i. Regulate management, production, trade and using animal feed; test and approve animal feed and ingredients used in animal feed production; issue list of animal feed.

j. Guide import and export of crop seedlings, animal breeds, fertilizers and animal feeds.

k. Plant protection:

- Forecast invasive species; make decisions on making announcements of invasive species in up from 2 provinces and report to the Prime Minister; guide outbreak blocks and cancel outbreak announcement;

- Announce list of plant quarantine; organize quarantine activities for exported and imported plants; issue certificate and conditions for pesticide trade; make decisions on destroy pesticide or return to its origin;

- Regulate experiment and registration of new pesticides, issue certificate for experiment, announce list of possibly used pesticides, restricted or prohibited pesticides;

- Guide import and export of pesticides, ingredients of pesticides.

l. Veterinary for animal (including in fishery):

- Set up and govern implementation of strategies, master plans and plans of prevention animal diseases nationwide;

- Regulate conditions, procedures for approval and guide setting up animal disease resistant regions nationwide;

- Issue list of disease needed to announce outbreaks, list of dangerous animal diseases, list of diseases that should be applied preventive solutions;

- Forecast animal diseases; decide to announce outbreaks and outbreak region of up from 2 provinces, compulsory preventive measures for animals, handling infected animals and animal products, disinfection.

- Announce free of outbreaks and cancel outbreak;

- Issue list of animal and animal products quarantine;

- Regulate process and procedures of animal quarantine and handling measures for animal, animal products, transportation means, tools that do not satisfied hygiene requirements.

- Guide and inspect implementation of regulations, standards of animal quarantine for import and export;

- Regulate procedures and process of animal slaughter, seals, inspection mark of animal quarantine; list of animal and procedures and process of hygiene veterinary inspection, regulate research, experiment, registration procedures, approval veterinary produced in Vietnam.

- Issue national standards of hygiene veterinary, veterinary medicine.

9. Forestry:

a. Perform governance responsibilities for implementation of regulations issued by the Government, the Prime Minister on forestation, forest resource development, valuable, rare and endangered plants and animals protection and preservation; forest management regulations;

- b. Announce and govern, inspect, evaluate and make comprehensive reports on implementation of strategies, master plans, forestry protection and development plans approved nationwide;
- c. Appraise master plans of province's or city's forestry protection and development;
- d. Guide, govern inspection, identification border line of various kinds of forestry, inventory forestry, monitor natural resources in forestry, land for growing forestry, file forestry management documents, make reports on forestry situation and forestry inventory;
- e. Regulate criteria for forestry classification;
- f. Guide integrated production of agriculture, forestry, fishery in defense forestry, socio – economic cost norms and measure of forestry development; issue list of valuable, rare and endangered forestry plant and animal gene that could be exploited and used; issue list of major forestry plants; list of seedlings could be produced and traded, list of forestry plants prohibited export; issue national standards of seed classification, multiplication and restoration of purely genuine seed; issue experiment regulations; make a decision on approval, issue or terminate protection documents of new forestry seedlings; guide import and export of forestry seedlings;
- g. Issue, monitor, inspect implementation of regulations and process of nurturing, improving forestry and forestry product exploitation; regulate prohibited regulations in tourism business in function and defense forestry;
- h. Guide and govern forestry handing over, rent, reclaim, change use of forestry;
- i. Perform governance responsibilities for forestry rangers;
- j. Take the leading role in Anti – desertification national action program;
- k. Perform governance responsibilities for fire forestry and other disaster forecast, for deploying preventive and restore measure, prevent deforestation, mitigate fire forest consequences.

10. Salt production:

- a. Perform governance responsibilities for implementation of salt production regulations and strategies upon approval of powered authorities;
- b. Announce and perform governance, guidance, inspection and making comprehensive reports responsibilities for implementation of strategies, master plans, salt production development plans approved nationwide;
- c. Govern technique production and harvest and make annual comprehensive assessment reports on production;
- d. Regulate and inspect implementation of national technical standards, production, processing and preservation of salt and salt products.

11. Fishery

- a. Perform governance responsibilities for implementation of salt production regulations and strategies upon approval of powered authorities;
- b. Govern and guide following criteria of classification of species conservation areas, management decentralization for national and international conservation areas; regulations on fishery exploitation and protection upon approval of powered authorities;
- c. Announce and perform governance, guidance, inspection and making comprehensive reports responsibilities for implementation of strategies, master plans, fishery development plans approved nationwide;
- d. Guide and inspect implementation of provinces/central cities' master plans of fishery exploitation, protection and development; regulations of classification of species conservation areas;
- e. Govern aquaculture activities based on approved plans and master plans. Regulate import and export of fishery breeds, domesticate, conserve, select, develop breeds, approve

new breeds, trade breeds; issue national technical standards and inspect breeds' quality; set up and manage national breed and breed registration system;

f. Announce list of and national technical standards of feeds, ingredients of aquaculture feeds; drugs and chemicals used in aquaculture; regulate national technical standards of hygiene veterinary, environment protection in aquaculture; announce list of drugs and chemicals could be used or prohibited, restricted in aquaculture;

g. Announce list of fishery species prohibited exploitation and time of no exploitation; exploitation measures, fishery tools prohibited or restricted; species, minimum size of fishery species could be exploited, exploitation seasons; exploitation – prohibited areas, exploitation – restricted areas; fishery species prohibited import and export;

h. Regulate list of fishery species needed to be conserved, protected, regenerated; environment protection measures for fishery ecosystem, gene stock and fishery biodiversity conservation;

i. Guide fishery activities of Vietnamese people and organizations, foreign people and organizations; management decentralization for fishery regions and areas;

j. Govern, guide and inspect implementation of approved regulations on power decentralization in issuance, calling in Fishery certificate. Regulate issuance and call – in process of the certificate;

k. Regulate national technical standards of quality, technical safety and environment protection of fishery vessels/boats;

l. Issue regulations on fishery harbor management, fishery mechanics development, fishery tools and net production, develop focal fishery markets based on approved master plans;

m. Issue, monitor, inspect implementation of national technical standards, processes, socio – economic cost norms in aquaculture, fishery harbor and market development and protection; aquaculture feed producing plants, fishery processing plants, fishery vessel/boat building plants;

n. Make decisions on building up, upgrading aquaculture areas, fishery harbor and market with state fund provided through the MARD.

12. Water resources:

a. Govern, guide implementation of legal documents of water resources, dykes; prevent sanitation effects;

b. Govern, guide implementation of water resource strategies and master plans; strategies of natural disaster mitigation upon approval of the Prime Minister;

c. Take a leading role in setting up water resource master plans of reservoirs serving agriculture and socio – economic sectors;

d. Approve master plans of dike and hydraulic works related to up from 2 provinces serving prevention of flush flooding, floods, drought, sanitation, landslides along riversides and coastal areas, water supply and drainage in rural areas;

e. Announce and perform governance, guidance, inspection and making comprehensive reports responsibilities for implementation of strategies, master plans, fishery development plans approved nationwide;

f. Propose to the Prime Minister and mobilize materials, tools for prevention and effects mitigation of floods, droughts, waterlogging, solve incidents of hydraulic works; govern slowing floods, operate big reservoirs based on assignation and decentralization;

g. Govern decentralization for provincial People's committees on approval of water resource and dike master plans and flood prevention master plans within provincial area;

h. Issue, monitor and inspect implementation of national technical standards, processes, socio – economic cost norms in building, exploitation and protection of water resource works

and dike system, floods, typhoons, waterlogging, drought and water supply and drainage in rural areas;

- i. Regulate loading capacity and transportation certificate for vehicles moving in dikes;
- j. Govern, guide, inspect implementation of specific regulations on emergency situation needed to slow floods, safe emigration; ensure people's lives and production, subsidize people;
- k. Make decisions on investment in, upgrading and consolidating dikes, hydraulic works in mandated areas nationwide with state fund provided through the Minister.

13. Rural development:

- a. Take a leading role in submitting proposals to Government rural development policies, appraisal assignation and decentralization of programs, projects related to emigration and resettlement in rural areas;
- b. Synthesize and submit the Prime Minister for approval of plans of economic structure transformation and comprehensive program of rural development; development strategies of rural sector and trade village; govern, guide and inspect implementation of strategies, master plans, programs upon approval;
- c. Synthesize and submit mechanism, policies of encouraging, supporting household's economy development, rural farm's economy development, agricultural, forestry, fishery, salt production farm;
- d. Guide, govern, inspect implementation of settlement, emigration, resettlement in agriculture and rural areas based on master plans of national socio – economic development;
- e. Govern and manage programs, projects or components of hunger elimination and poverty reduction programs, programs of building up new rural areas assigned by the Government;
- f. In cooperation with other ministries, sectors and localities in governance of building up settlement areas; implementation of rural infrastructure programs assigned by the Government.

14. Govern implementation and manage programs, investment projects and national important programs in sectors within the ministry's mandated areas assigned by the Government.

15. In terms of processing, preserving, transporting, trading agricultural, forestry, fishery products:

- a. Govern, guide implementation of processing development master plans, programs, strategies that attached to commodities' production and market within state management area of the ministry; development policies of sectors, trade and craft villages;
- b. Issue national technical standards of food safety, environment hygiene in cultivation, breeding, aquaculture, harvest, processing, preservation, transportation until agro-forestry, fishery and salt products enter to markets;
- c. Issue national technical standards, technical process and announce list of additives, chemicals could be used in ingredients, agro-forestry, fishery and salt products preservation;
- d. Guide transportation, export and import of agro-forestry, fishery and salt products.

16. Manage national reserve of seedlings, animal breeds, pesticides, veterinary medicine and other goods assigned by the government.

17. Govern scientific research and extension activities in cultivation, husbandry, forestry, fishery, irrigation, salt production, processing, preservation of agro-forestry, salt products and rural trade and careers.

18. In terms of quality and food hygiene and safety management of agro-forestry, fishery and salt products:

- a. Guide application of food hygiene and safety system: Good manufacturing practices (GMP), Good aquaculture practices (GAP), code of conduct (CoC), Good hygiene practices (GHP) and hazard analysis critical control point/risk management – HACCP/RM in production, processing and transportation;
- b. Govern monitoring, inspect antibiotic, harmful and poisonous chemicals and pathogenesis factors for animals and plants before harvest in raw – processing, preserving, processing, transporting; control animal slaughter and conduct hygienic veterinary activities;
- c. Issue regulations, technical standards of food quality and safety, disease – resistance, safe environment in production, preservation, processing and before entrance to market;
- d. Govern inspection, approval, termination of approval of sufficient conditions for food safety in plants, aquaculture areas, harvest, purchase, transportation, preservation, raw – processing, processing agro-forestry, fishery and salt products;
- e. Govern approval of food quality and hygiene safety for imported agro-forestry, fishery and salt products, domestically – produced products for export before market distribution;
- f. Govern, inspect issuance of quarantine certificate for imported and exported alive animal or flora and fauna products could bear pathogens; inspect import or domestic production of food, veterinary medicine, fertilizers, chemicals used in animal breeding, cultivation, agro-forestry activities, fishery and salt production based on decentralization.

19. Protect agricultural and rural environment: guide, and inspect legal issues on environment protection and other decisions on production, exports, chemicals use, and plant protection. Perform governance responsibilities for activities of association and non-government organizations in the domain of the Ministry in accordance with legal documents.

20. Make efforts to inspect, check and deal with complaints, denunciations, corruptive and red-tape behaviors, and violation of law in the areas of agriculture, forestry, salt production, water resources and rural development in accordance with legal documents.

21. Make decision on and steer the implementation of the Public Administrative Reform (PAR) program of the Ministry as required to meet the objectives and contents set out under the PAR Master Program approved by the Prime Minister.

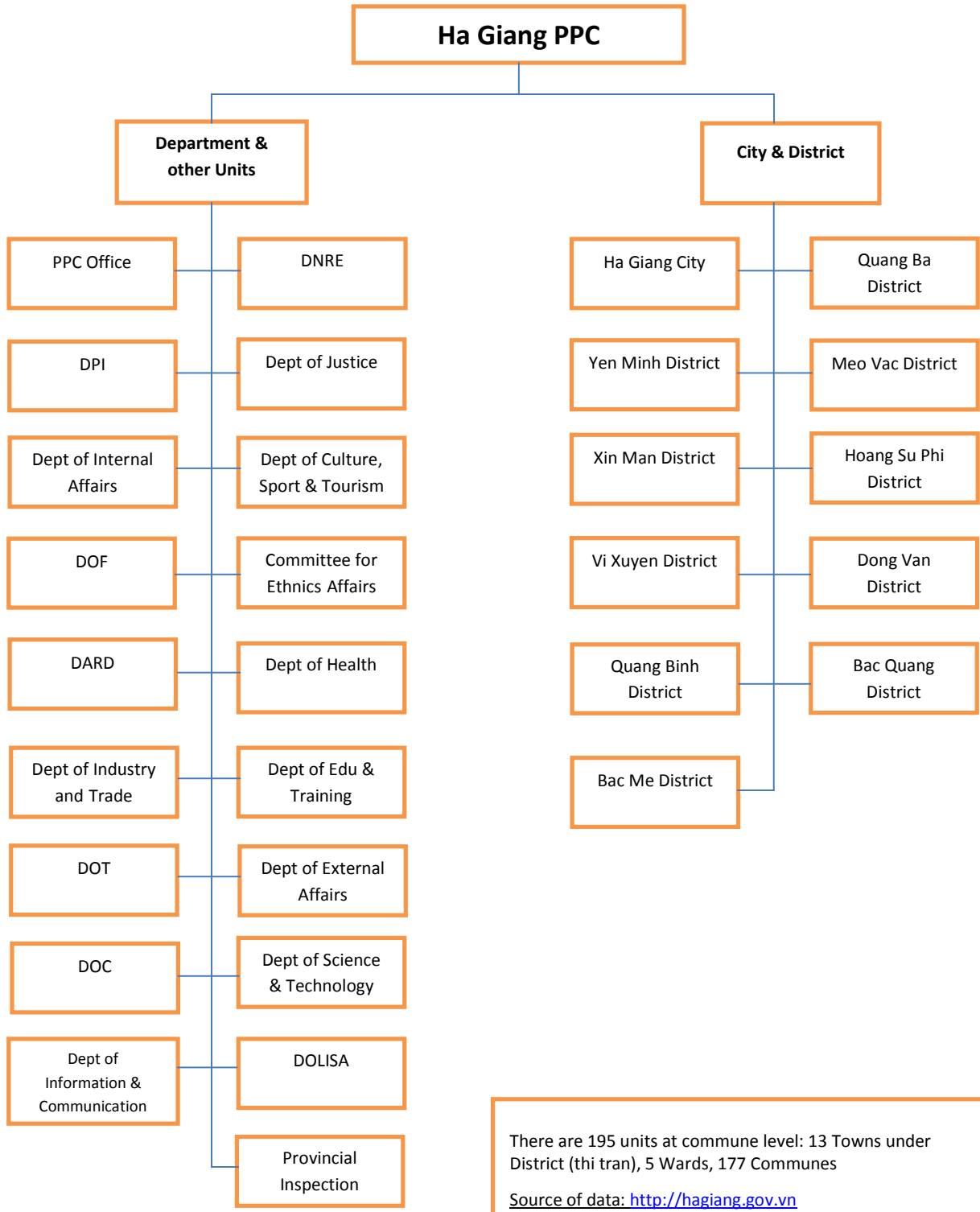
22. Implement the regular tasks and duties of: a) the Central Standing Committee on Flood and Typhoon Control; b) forest protection, forest-fire prevention and anti-desertification; c) the On-line Office of the Mekong Committee of Vietnam; d) control of cross-border trafficking of seriously endangered wild animal and plants, and e) implementation of the National Program for Food Security in accordance with legal documents.

23. Manage the Ministry's organization and staffing, particularly guiding: a) implementation of the charter for salary and other staff beneficiary policies; b) rewards for and disciplinary action against civil servants under the management of the Ministry; c) training and human resource development of civil servants in the domain of agriculture, forest, salt production, water resources and rural development.

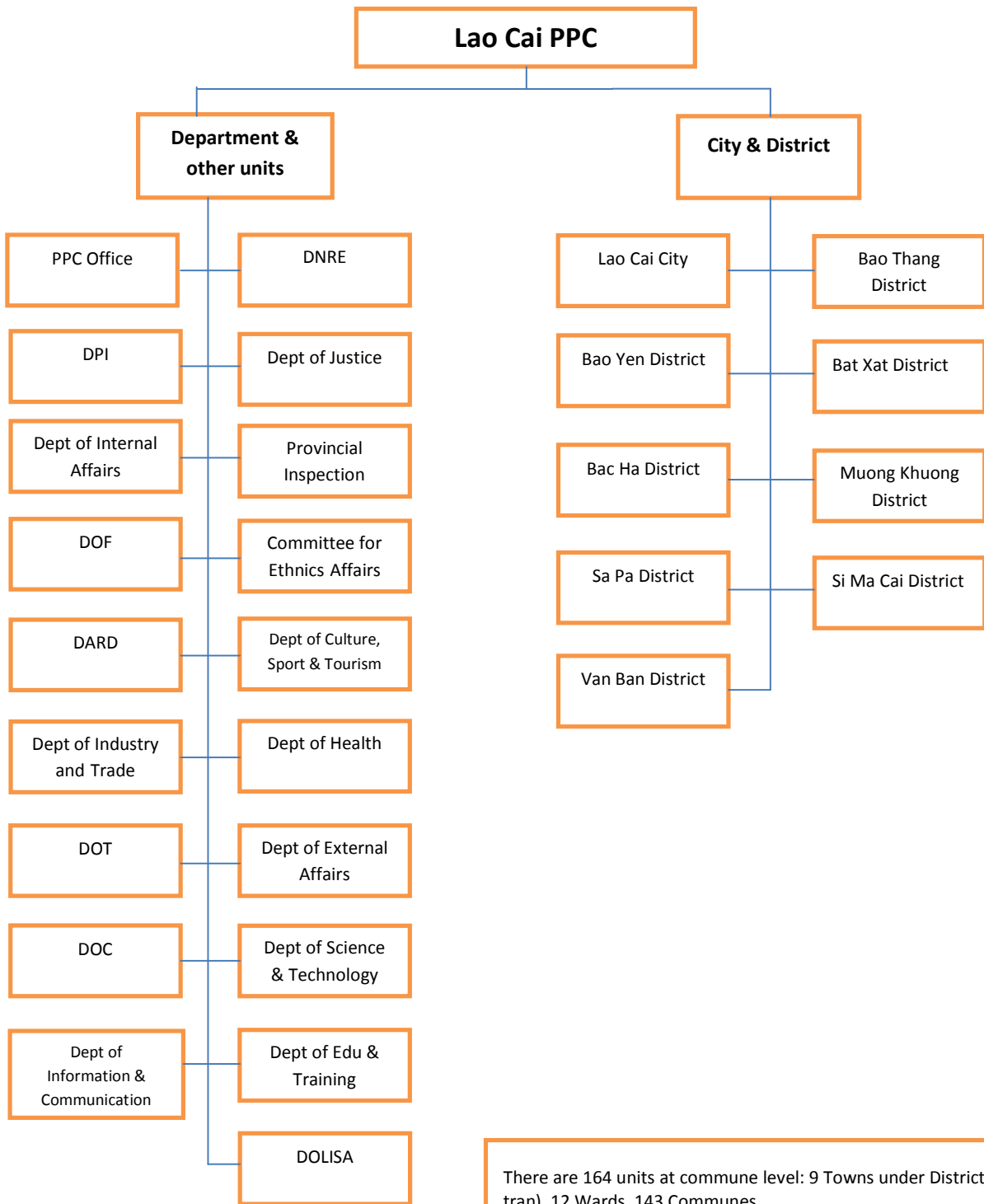
24. Manage financial resources and assets assigned to the Ministry and organize the implementation of allocated budgets in accordance with legal documents.

Source: Decree No. 01/2008/NĐ-CP dated 3rd January, 2008.

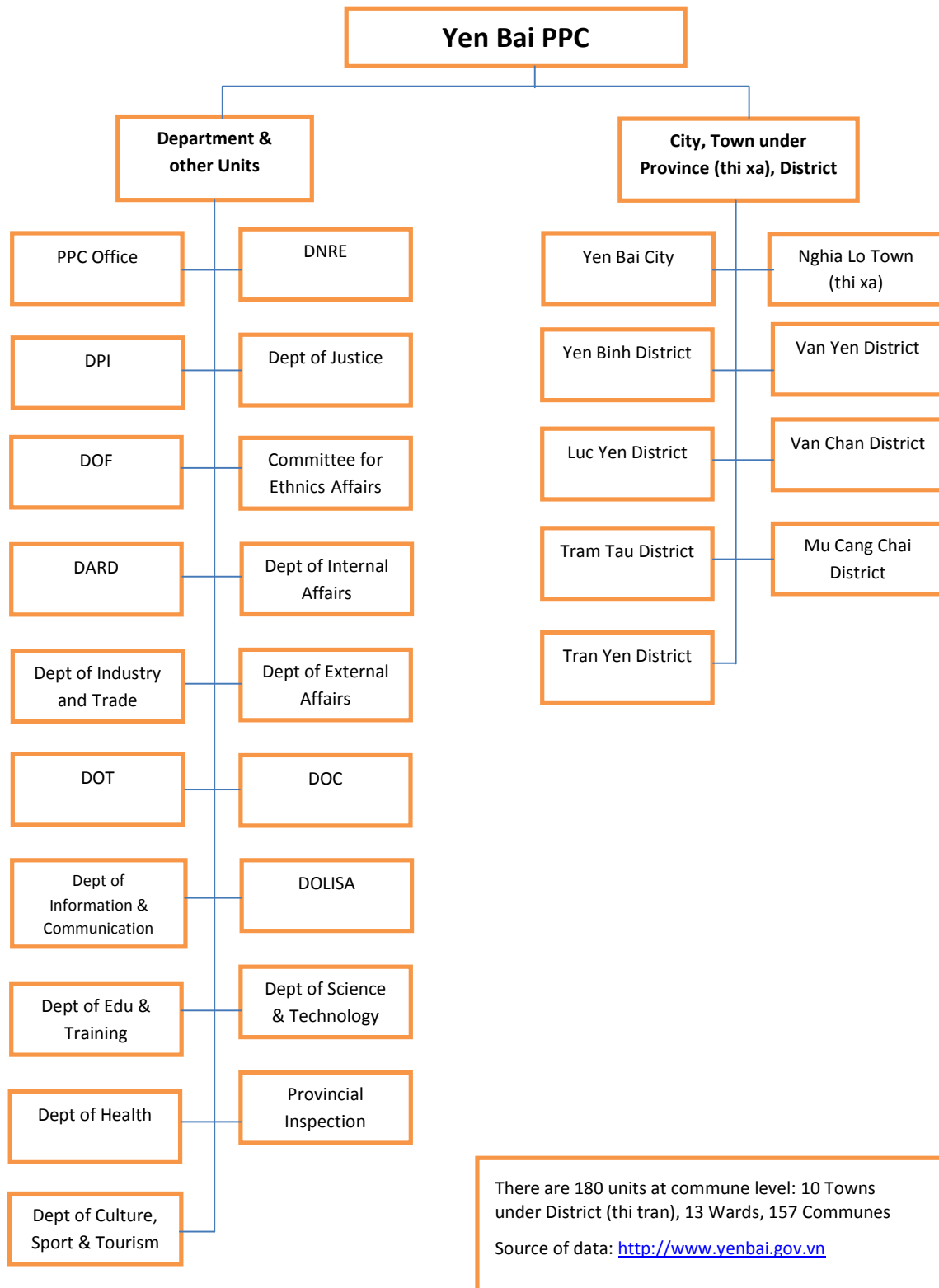
Attachment I-5.1.2
Structures under PPC for target six provinces

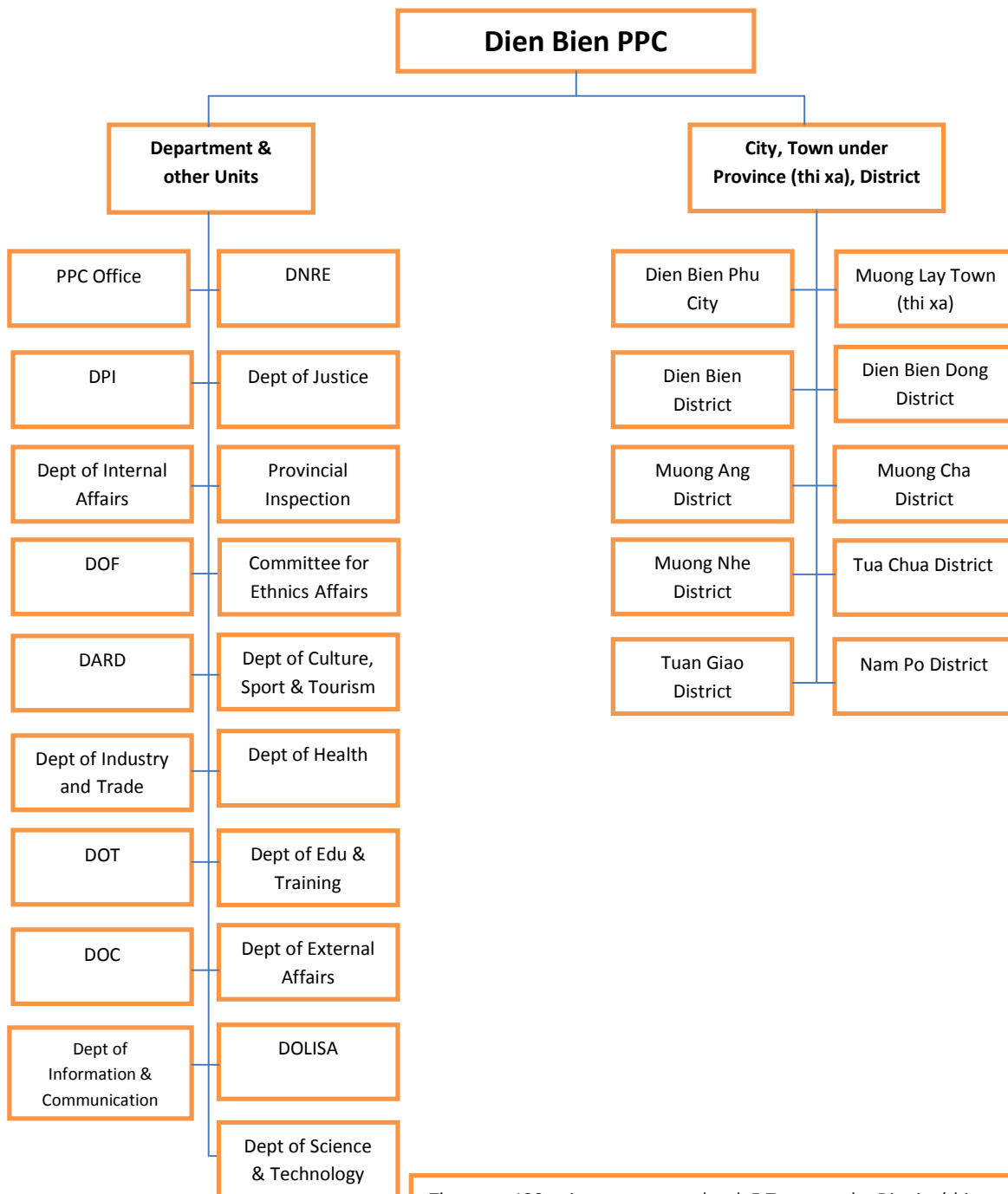


There are 195 units at commune level: 13 Towns under District (thi tran), 5 Wards, 177 Communes
 Source of data: <http://hagiang.gov.vn>



There are 164 units at commune level: 9 Towns under District (thi tran), 12 Wards, 143 Communes.
 Source of data: <http://laocai.gov.vn>



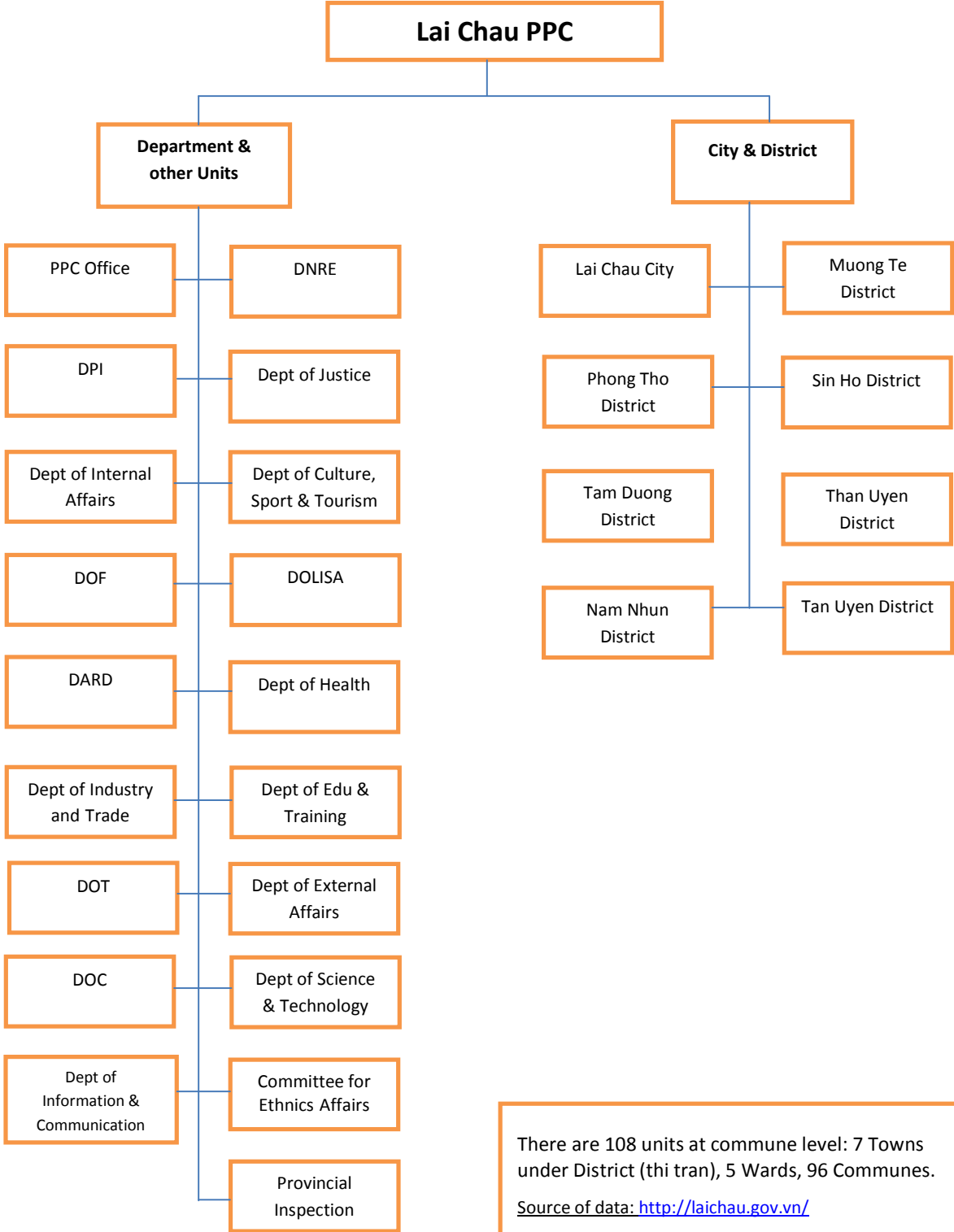


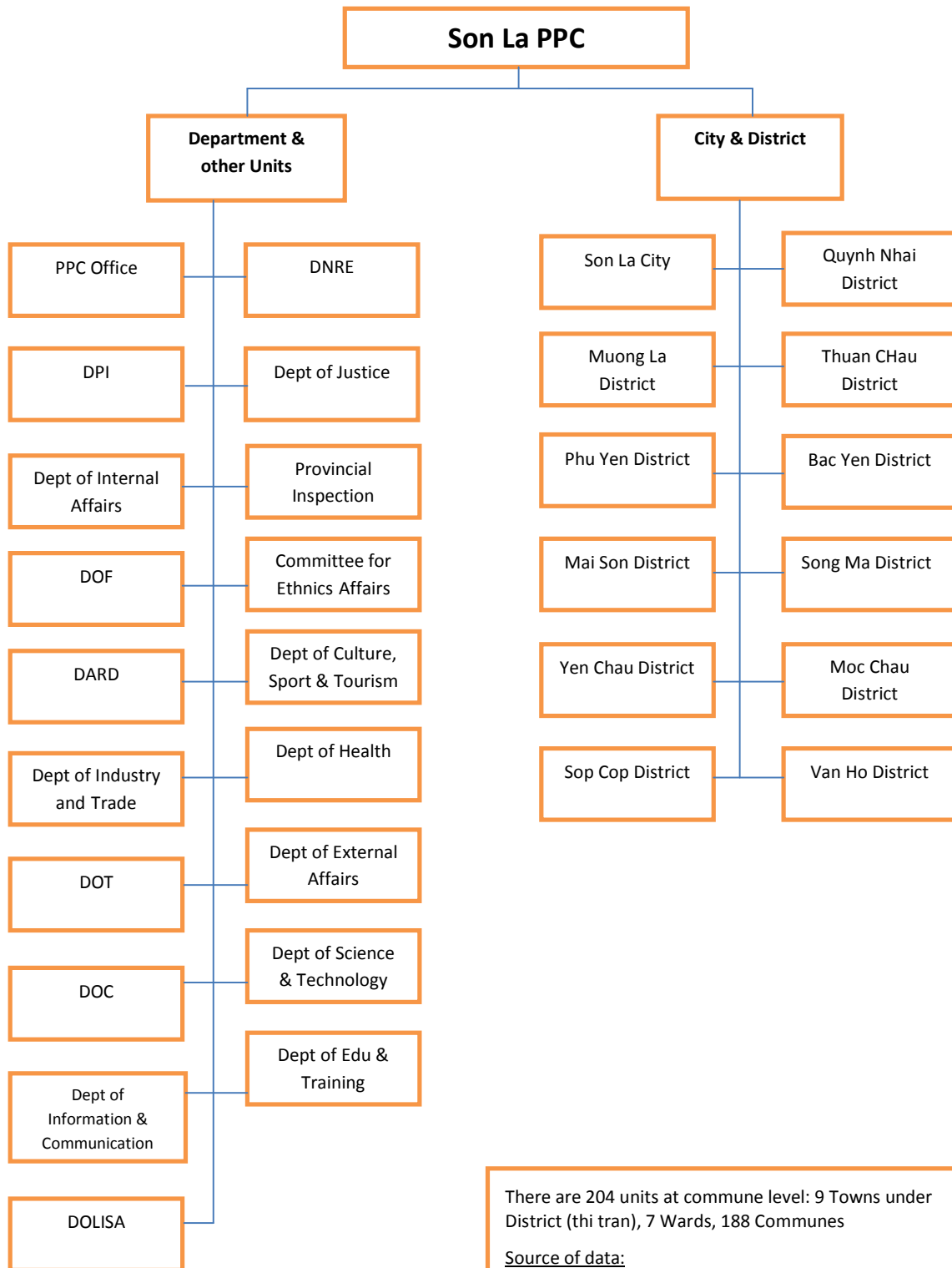
There are 130 units at commune level: 5 Towns under District (thi tran), 9 Wards, 116 Communes

Source of data:

<http://www.chinhphu.vn/portal/page/portal/chinhphu/cactinhvathanhpho/tinhdienbien>

<http://dienbien.gov.vn>





There are 204 units at commune level: 9 Towns under District (thi tran), 7 Wards, 188 Communes

Source of data:
<http://www.chinhphu.vn/portal/page/portal/chinhphu/cac-tinhvathanhpho/tinhsonla>

Attachment I-5.1.3
Functions and duties of DARD

Attachment I-5.1.3 Functions and duties of Department of Agriculture and Rural Development

I. Position and functions

Department of Agriculture and Rural Development (DARD) is the specialized authority under Provincial People's Committee which helps People's Committee to implement the local State management function on: agriculture; forestry; salt, aquaculture; irrigation and rural development; flood and typhoon prevention; safe agricultural, forest, aquatic and salt products during the production process to the market; public services of agriculture and rural development sector. The Department also implements some duties authorized by provincial People's Committee and pursuant to the law.

Department of Agriculture and Rural Development is a legal entity has own stamp and account. The Department is under the guidelines and management of organization, personnel and duty of the provincial People's Committee; at the same time is under the guidelines, checking and major instructions of Ministry of Agriculture and rural development.

II. Duties and Rights

1. Submitting to Provincial People's Committee to issue:

a) Decisions and instructions; master, long-term, 5-years and annual development plan; programs and projects of agriculture, forestry, salt-industry, aquaculture, irrigation and rural development; plan of calamities prevention and reduction according to master plan of socio-economical development, local defense & security objectives; program and implementation method of State administrative reform duties on aspects within the assigned State management scope;

b) Regulations on functions, duties and authorities of branches under DARD;

d) Normative documents which define specifically condition, standard and title for the Head and Vice Head of organizations under DARD; for the Head and Vice Head of agriculture & rural development division of People's Committee in district; for the leader in charge of agriculture subject of People's Committee in town and cities under province.

2. Submitting to Chairman of Provincial People's Committee to issue:

a) Decisions to establish merge or dissolve units of DARD pursuant to the law;

b) Decisions and instructions within issuing authority of Chairman of Provincial People's Committee;

c) Regulations of management, task cooperation and mode of information and report between provincial organizations of agriculture and rural development sector based in districts and People's Committee in district; between technical staffs in commune and People's Committee in commune.

3. Instruction and implementation of approved normative documents, planning, development plan, program, project, national standard, national specifications, socio-technical norms of agriculture, forestry, salt-industry, aquatic, irrigation and rural development; information, propaganda and law education on aspects within the assigned State management scope.

4. On agriculture (cultivation and breeding)

a) Be responsible for implementation the land usage plan for cultivation and breeding after approval and method of degradation prevention for agricultural land in the province as regulated;

b) Instruction and checking the implementation of State management regulations on: plant and domestic animal variety, fertilizer, breeding foodstuff, flora protection and veterinary medicines and other materials served agricultural production pursuant to the law;

c) Helping provincial People's Committee to guide the agricultural production, crops, preservation and process agricultural products; to implement the breeding, seasonal and farming techniques;

d) Organizing tasks of flora and veterinary protection (including aquatic veterinary), preventing and solving consequences of fauna and flora diseases; instructing and implementing local quarantine on animals and plants in the province pursuant to regulations;

e) Preventing and solving consequences of calamities, pestilent insects and diseases in agricultural production;

f) Managing and using local redundant plants and animals varieties, flora protection and veterinary medicines, materials and goods for cultivation and breeding in the area after approved by provincial People's Committee.

5. On forestry

- a) Guiding the setting and be responsible for the assessment of forest planning, forest protection plan and development of People's Committee in district;
- b) Helping provincial People's Committee to setup areas of protective forest, specialized forest and production forest within the local management scope after approval; implementing the forestry classification, borders defining of forest kinds, statistics, inventory, checking the progress according to guidelines of Ministry of Agriculture and rural development;
- c) Implementing the forest handing-over to levels of district and commune after the approval; implementing the forestry handing-over, renting, withdrawal, usage purpose change, usage right confirmation, owner right of planted production forest to Vietnamese organizations or individuals settled in abroad and foreign organizations or individuals implementing investment projects on forestry in Vietnam; organizing the document setting and management of forest handing-over, forest renting and land renting for afforestation;
Helping provincial People's Committee to lead People's Committee in district implementing forest handing-over to community at hamlet and small villages, and forest handing-over and renting to the family and individual as regulated;
- d) Organizing to select and admit the mother-tree, seed tree and forest in the province. Setting the plan and method, leading, checking and be responsible for production of forestry plants varieties and forestry materials usage; afforestation; accessing and preservation of forestry products; preventing diseases which harm forest and cause forest fire;
- e) Be responsible for approval of forest preparing plan, logging design; helping provincial People's Committee to lead and check the afforestation, protection of watershed, specialized forest and protective forest as regulated;
- f) Instructing and checking: the permission of logging opening and transferring the logging plan to the forest owner that is the organization and People's Committee in district after the approval; the implementation of responsibility rules of People's Committee in district and commune in local forest management and protection; the local cooperation, force and means mobilization of organization and individual in forest protection, forest products management and forest fire protection.

6. On salt

- a) Instruction and checking the production, harvest, preservation and process of salt in local area;
- b) Implementing plan of salt reservation of the province once it is approved

7. On aquaculture

- a) Instructing and checking the implementation rules for aquaculture moving when applied kinds of aquaculture excavation; additional announcement of regulations of Ministry of agriculture and rural development on aquaculture species list which forbidden to be excavated and forbidden time; kinds of excavation, forbidden or limited fishing equipments; minimum kind and size of allowed excavation species; excavation harvest; forbidden excavation areas and forbidden with time-limit in order to be suitable for provincial aquaculture excavation activities;
- b) Instruction and checking the implementation of provincial PC decision which regulate excavation areas at river, lake, lagoon and other natural water area within provincial management scope according to guidelines of Ministry of agriculture and rural development;
- c) Evaluating the aquaculture sources in the province area within the assigned State management scope;
- d) Instructing and checking the details planning of aquaculture areas. Be responsible for testing the aquaculture program and plan of the district level and organization who implement the management of centralized aquaculture area;
- e) Giving advice and assisting the provincial People's Committee to hand over, lease and withdraw water surfaces under local management for aquaculture as prescribed;
- f) Testing quality and aquaculture variety guarantee at production locations of aquaculture breed; preventing and solving consequences of aquaculture diseases in the area as regulation.
- g) Guiding, inspecting and implementing regulations on decentralized management of fishing vessels, fishing ports, fish landings, coast lines, storm shelters for fishing vessels and fishing vessels registry which under provincial management and within the assigned State management scope; the provisions on regulations and management of activities by wholesale aquatic product markets.

8. On irrigation

- a) Instructing and checking the implementation of provincial People's Committee regulations on decentralized management of small and medium irrigation projects and the proactive programs of water supply and drainage in the

province; instructing, checking and be responsible for the construction, excavation, using and protection of small and medium irrigation projects; implementing program and objectives of rural water supply and drainage which already approved;

b) Implementing regulations of river and lake management; river and lake excavation, using and development in the province according to plans which approved by authorities;

c) Instructing, testing and be responsible for the dykes construction, excavation and protection; the protection of flood and typhoon preventive projects; setting plan, method and implementing the prevention of flood, typhoon, drought, waterlogged, aluminous, salty contamination, blew-off along the river and sea in the province;

d) Instructing the construction and usage planning of irrigation land, planting the landmark in the field and setting plans and implementation method of moving works, houses related to protection scope of dykes and river beaches as regulations;

e) Instructing and testing the implementation of State management regulations on excavation and protection of irrigation works; protection corridor for IV and V grade dykes; decision distribution and retardation of flood aiming at protecting dykes within the local management scope as prescribed

9. On rural development

a) Generating and submitting to provincial People's Committee the encourage mechanism, policy and method of rural development; developing domestic, rural farm and cooperative economy, cooperative agriculture, forest, fishing attached to rural career and trade village in commune area. Checking, reporting to provincial People's Committee on rural development in the area;

b) Instructing and testing the implementation of regulations of assignment and decentralization on testing programs and projects related to rural emigrant and resettlement; plan of economic structure transformation and rural development program; the development of rural career and trade village attached to households and farmhouses in the province; leading, instructing and testing the implementation after the approval;

c) Instructing to develop: domestic, rural farm and cooperative economy; farmhouses; rural career and trade village in commune area;

d) Instructing and testing the implementation of settled agriculture, emigrant, resettlement in agriculture and rural conformity with planning of local socio-economical development;

e) Implementing programs, projects or components of programs and projects of poverty-alleviation and new rural construction; building residential areas, rural infrastructures as assigned or authorized by province People's Committee.

10. On processing and trade agriculture, forest, aquaculture products and salt:

a) Instructing and testing the implementation of planning, program, mechanism, development policy of processing attached to production and market of goods types within State management scope of Agriculture and rural development Department; development policy of agriculture M&E, career, trade village attached to households and farmhouses after approved by authorities;

b) Instructing, testing and evaluating the progress of process development of goods sectors and M&E aspect, career, rural trade villages, preservation after harvest within management scope of agriculture and rural development Department;

c) Implementing activities of trade promotion for agriculture, forest, aquatic products and salt within management scope of Department of agriculture and rural development;

d) Cooperating to relevant units for organizing activities of market projection and trade promotion for agriculture, forest, aquatic products and salt.

11. Organizing the implementation of agriculture promotion activities, applying advanced scientific technology into production of agriculture, forestry, salt and aquaculture.

12. Setting up and leading the implementation of environmental protection methods in production of agriculture, forestry, salt and aquaculture; and the rural development activities at the local area.

13. Organizing the implementation and be responsible for registering, issuing and withdrawal licenses, trade certificate within management scope of Department of agriculture and rural development pursuant to Law or assignment and authorization by provincial People's Committee and guidelines of Ministry of Agriculture and rural development.

14. Setting up informatics system, documentation storage of agriculture, forestry, salt, aquaculture and rural development; organizing to do the development of agriculture land, forest land, salt land, development of forest, of aquaculture water as regulations.

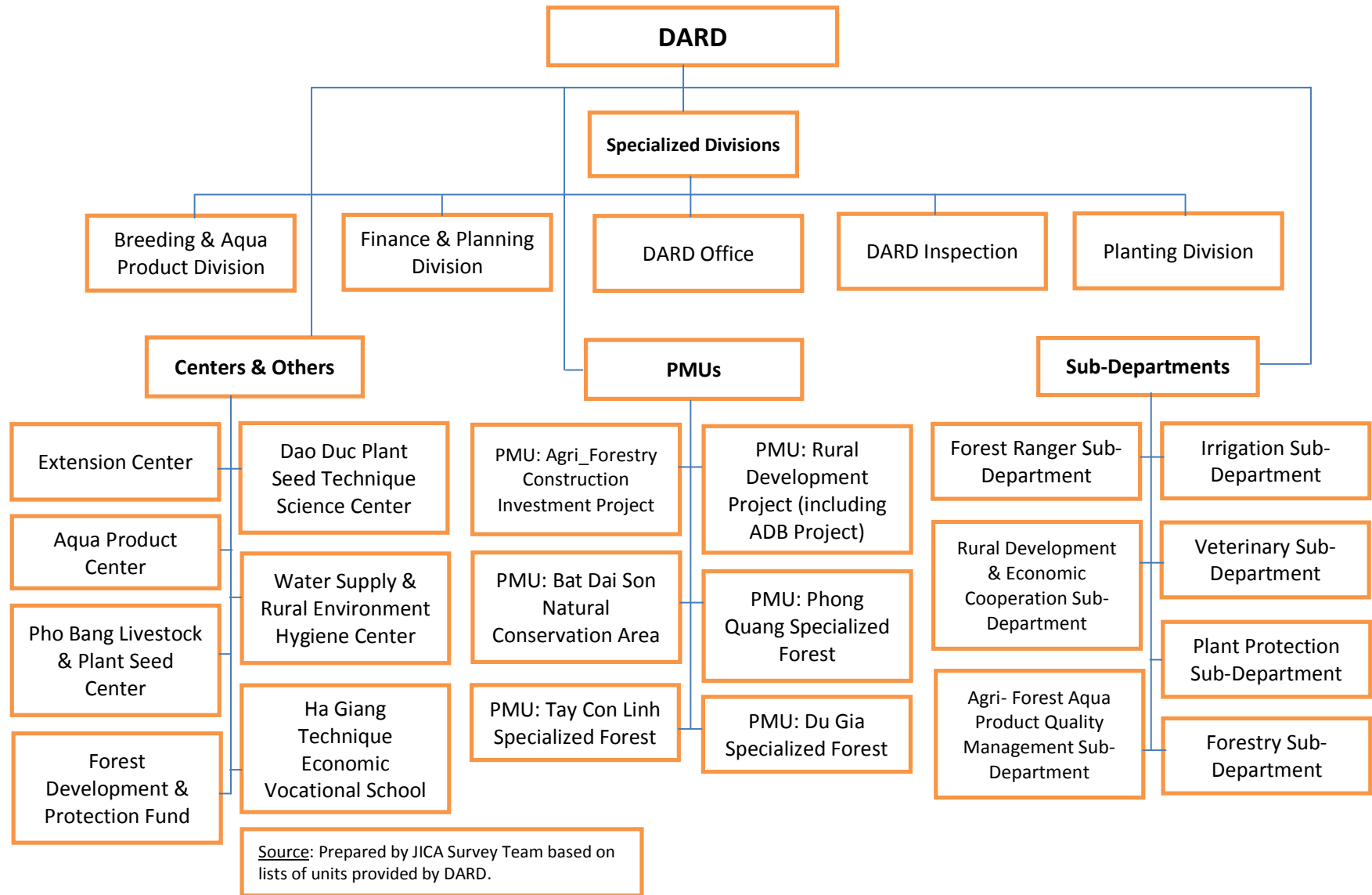
15. Instructing and checking the project implementation and setting up the development model of agriculture, forestry, salt, aquaculture, irrigation and rural development in the province area; be responsible for implementation of assigned programs and projects.
16. Implementing international cooperation on aspects within management scope of Department of agriculture and rural development according to the decentralization of provincial People's Committee and Law guidelines.
17. Instructing and checking the implementation of autonomy and self-responsible mechanism of directly under enterprises or public enterprises operating in field of agriculture, forestry, salt, aquaculture, irrigation and rural development at the province pursuant to Law; be responsible for public services organized by Department of Agriculture and rural development.
18. Helping provincial People's Committee in State management towards community enterprises or economic organization, private economy; instructing and checking activities of non-governmental associations and organizations belong to aspects of agriculture, forestry, salt, aquaculture, irrigation and rural development pursuant to the law.
19. Specialized instructing for Department of Agriculture and rural development in the district and checking the implementation of management guidelines, task cooperation and information report system between the provincial organization of agriculture and rural development based in district area and People's Committee in district; between technical staffs in the commune and the People's Committee in commune.
20. Organizing the research and application of advanced science and technology into production of agriculture sector and rural development in the province area.
21. Inspecting, checking and solving complaints, denouncements, prevention of embezzlement and negative activities; dealing law breach of agriculture, forestry, salt-industry, aquaculture, irrigation and rural development within management scope according to regulations.
22. Implementing permanent tasks of steering committee of flood and typhoon prevention, searching & rescue; urgent issues of forest protection and forest fire prevention and fighting in the province according to law regulations; joining in solving calamities consequences of typhoon, flood, blew-off, drought, waterlogged, aluminous and diseases in production of agriculture, forestry, salt and aquaculture in the province area.
23. Leading and organizing the implementation of administration reform program in aspects within State management scope of Department of agriculture and rural development after approved by Province People's Committee.
24. Defining details of functions, tasks, authorities, organizational structure, tasks relation of organizations and enterprises under Department of agriculture and rural development; managing officers, staffs and employees as law regulations and decentralized by provincial People's Committee; organizing trainings for officers, staffs officers in the commune, ward, town in management of agriculture, forestry, salt-industry, aquaculture, irrigation and rural development according to regulations of Ministry of agriculture and rural development and provincial People's committee.
25. Managing finances, assets of Department of Agriculture and rural development according to law regulations and decentralization of provincial People's Committee.
26. Implementing periodic or unexpected information and report on the implementation of assigned State management tasks according to regulations of provincial People's Committee and Ministry of agriculture and rural development.
27. Implementing several other tasks assigned by provincial People's committee and Ministry of agriculture and rural development.

Sources:

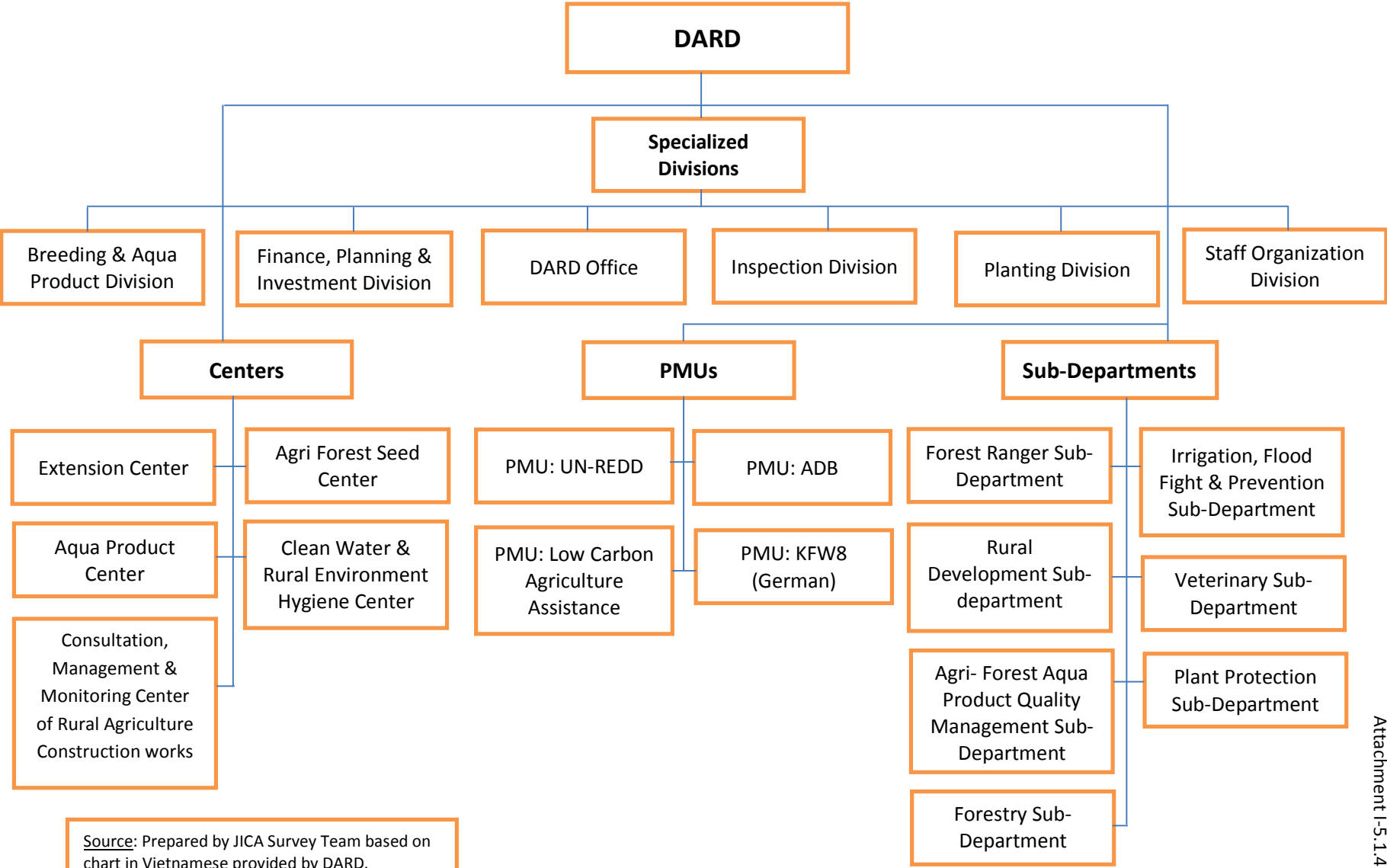
Joint circular 61/2008/TTLT-BNN-BNV dated 15 May 2008 of MARD and Interior Ministry stipulating functions, duties, rights, organization structure of specialised units under provincial PPC, district PPC and state management duties of commune PPC on rural development and agriculture.

Attachment I-5.1.4
DARD organization charts for six provinces

Ha Giang DARD Chart

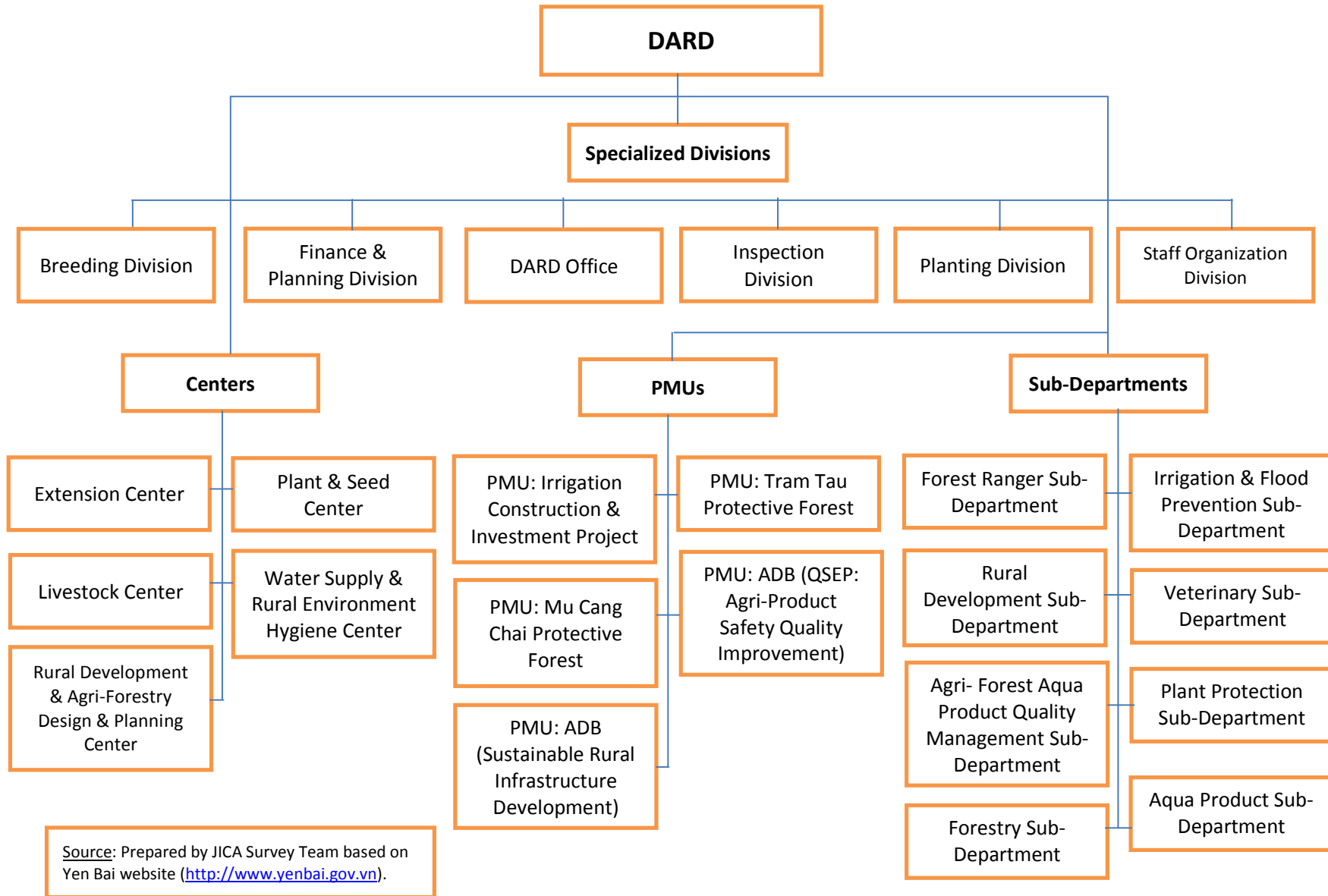


Lao Cai DARD Chart

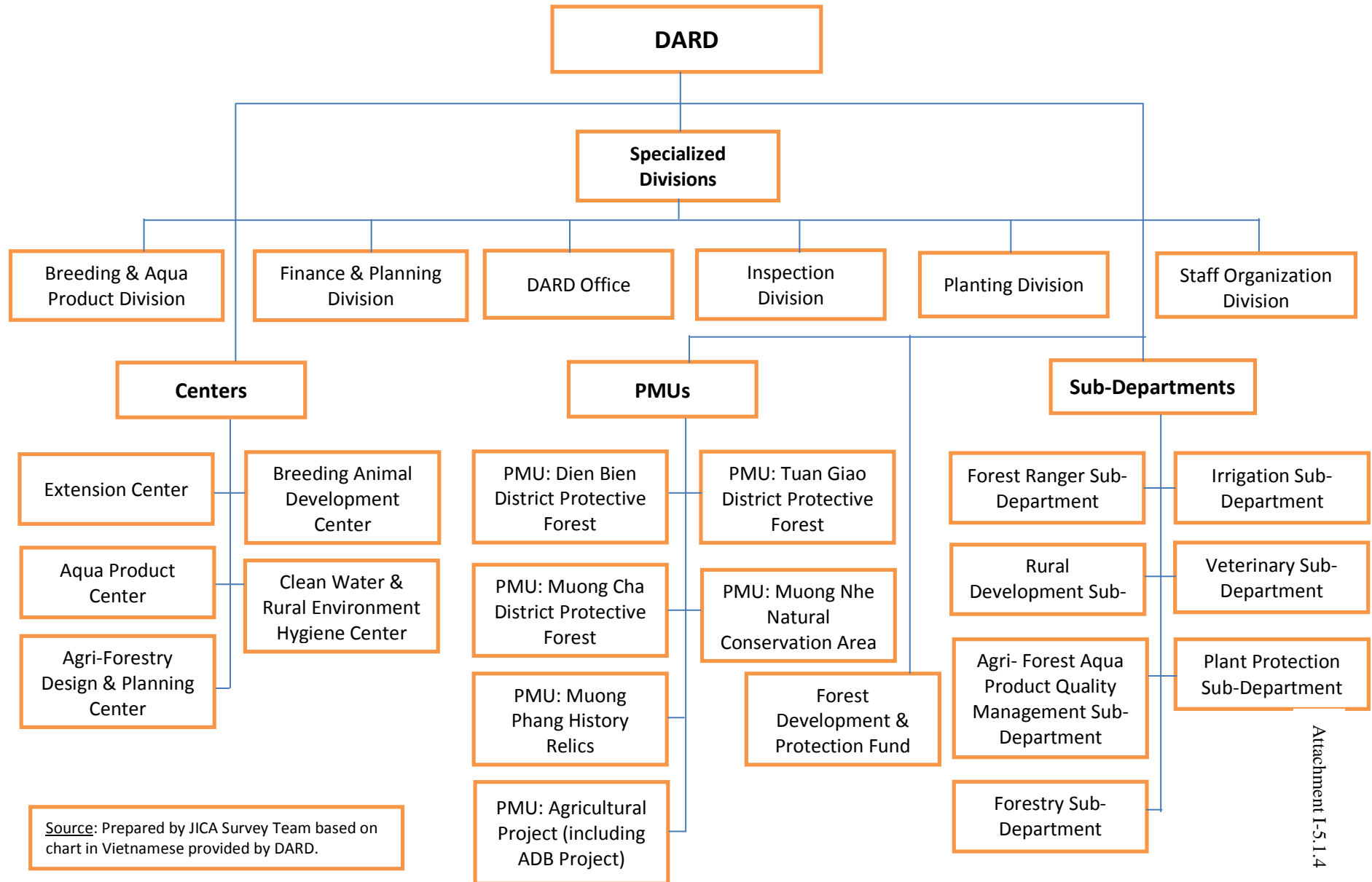


Source: Prepared by JICA Survey Team based on chart in Vietnamese provided by DARD.

Yen Bai DARD Chart

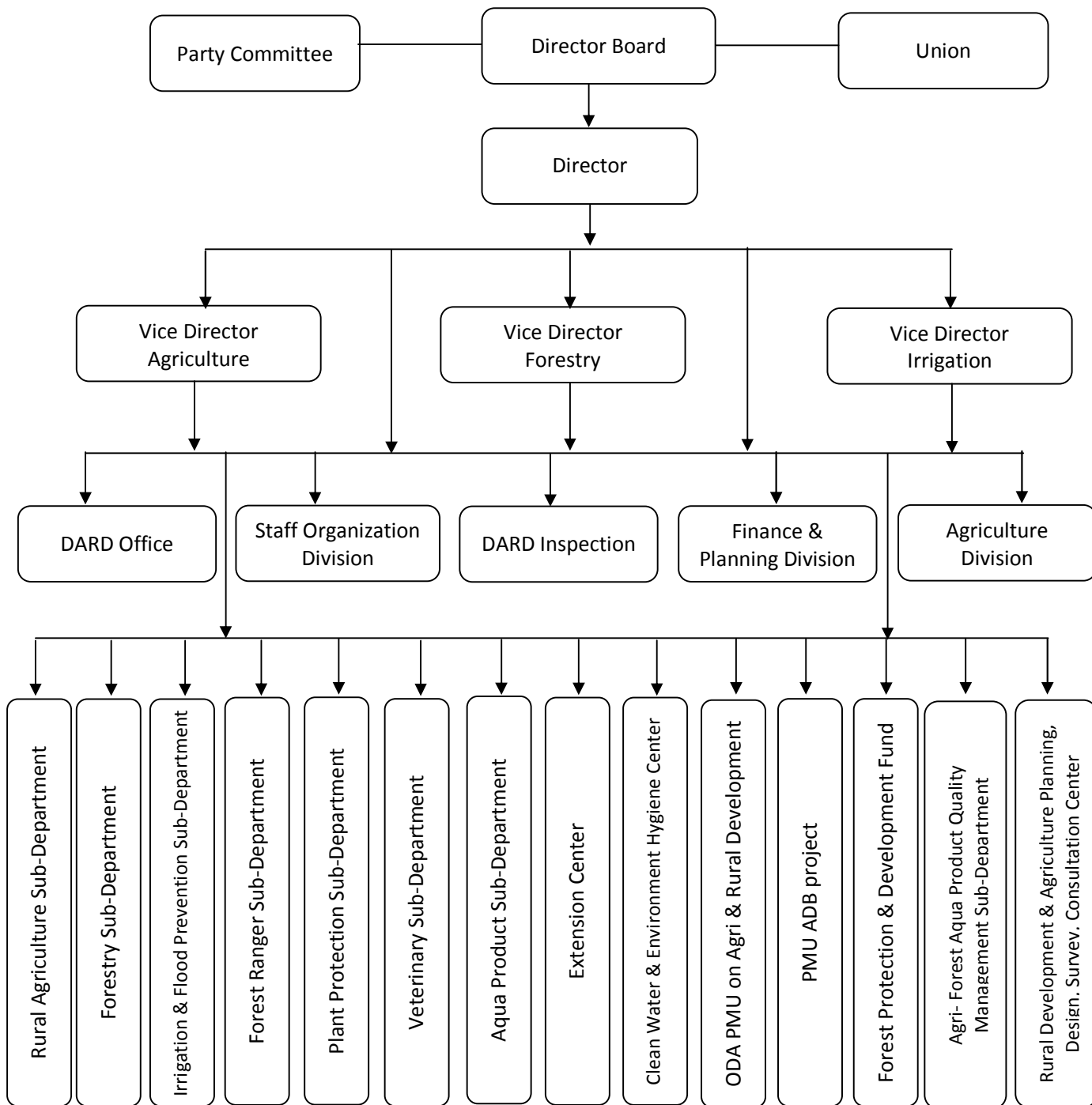


Dien Bien DARD Chart



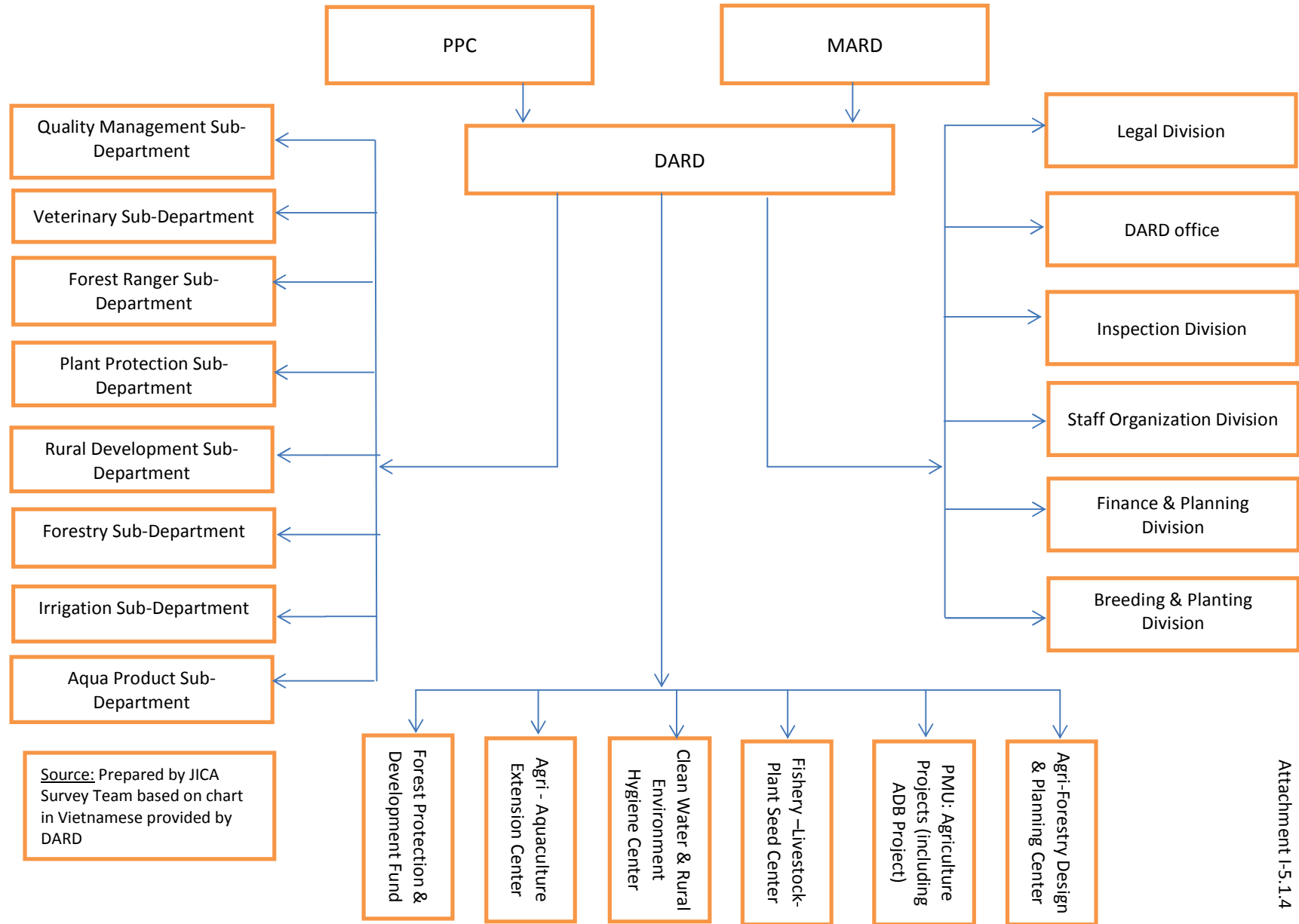
Source: Prepared by JICA Survey Team based on chart in Vietnamese provided by DARD.

Lai Chau DARD Chart



Source: Prepared by JICA Survey Team based on chart in Vietnamese provided by DARD.

Son La DARD Chart



Source: Prepared by JICA Survey Team based on chart in Vietnamese provided by DARD

Attachment I-5.2.1
Actual execution situation of development
budgets

Attachment I-5.2.1 Actual Execution Situation of Development Budgets

Issues	Dien Bien	Son La	Yen Bai	Lao Cai	Ha Giang	Lai Chau
1. Degree of approved budgets <u>against requested ones</u>	Budgets are basically approved against requested one.	Nearly all requested budgets are approved since they are prepared based on Budget Law and instruction by MPI.	Nearly all requested budgets are approved since they are prepared based on Budget Law and instruction by MPI.	There often generate some gap between initially requested budgets and approved ones (which is adjusted during budget preparation). Degree of this gap cannot be specified.	There generate some gap between initially requested budgets and approved ones. Degree of this gap cannot be specified.	There is basically no gap between initially requested budgets and approved ones since they are prepared based on MPI's guideline.
2. Allocation of budgets	Allocation of budgets to respective POs are done in accordance with draft allocation idea of the local budget submitted to National Assembly for approval. It is firstly reviewed by DPI/DOF and is approved by PPC.					
3. Degree of allocated budgets for POs against requested (necessary) ones (DARD/DOT)	There are some cases that sufficient budgets are not allocated.	It is said that sufficient budgets are allocated against requested ones.	It is said that sufficient budgets are allocated against requested ones.	There is basically no gap between requested budget amounts and actually allocated ones.	It is said that sufficient budgets are allocated against requested ones.	There is basically no gap between requested budget amounts and actually allocated ones.
4. Cover portions (by Central and Province) of C/P funds for ODA projects	Central: 90% Province: 10%	Central: 90% Province: 10%	Central: 90% Province: 10%	Central: 80% Province: 20%	Central: 90% Province: 10%	Central: 90% Province: 10%
5. Budget disbursement procedure	Respective POs request payments for State Treasury (ST) with necessary documents. ST reviews these requests/documents and remits requested amounts to accounts of POs and their contractors. There is basically no delay in transferring money as far as POs submit necessary full documents (it usually takes 7~ 15 days from request to money transfer).					
Reallocation						
6. Review on progress of development projects	DPI quarterly basis	DPI/DOF quarterly basis	DPI quarterly basis	DPI/DOF quarterly basis	DPI quarterly basis	DPI quarterly basis
7. Ratio of development projects which are <u>requested by POs</u> to increase their initial allocated budgets	It is difficult to say ratio of these increase requests since it differs depending on year. There are such many cases in 2015.	Many such cases.	Many such cases.	Many such cases.	Not so many cases. (it is inferred that DPI officers think such cases should not happen).	Many such cases.
8. Major reasons for	emergency, price	increase of	price escalation,	price escalation,	additional works,	price escalation,

Issues	Dien Bien	Son La	Yen Bai	Lao Cai	Ha Giang	Lai Chau
requests for increasing initial allocated budgets	escalation, change of project components	construction costs (due to price escalation), additional works,	additional works.	additional works.	price increase of materials.	additional works.
9. Ratio of requests for <u>increase which are approved</u> (accepted) by PPC	Since it needs PPC's approval and availability of local funds, it is more difficult that increase requests for C/P fund portion would be accepted compared with ODA loan portion.	Increase requests due to construction cost increase (including land acquisition) are usually accepted.	How much degree of these requests is accepted depend on the situations (reason, resource availability, etc.). Cases due to price escalation and additional works are usually accepted.	If these requests are special and emergency cases, they are accepted.	Increase requests due to additional works and price increase are usually accepted.	If these requests are special and provincial funds are available, they are accepted.
10. Time required for completing reallocation procedures (from requests up to acceptance)	from 15 days to 1 month depending on project.	1~2 months.	about 1 month, depending on scale of project	1 month for reason of price escalation. 3 months for increase of work volume.	7- 15 days for usual, 3 months at maximum.	several days up to around a month depending on scale and complexity of project.

Source: Hearing from officers of relevant departments (DOF, DPI, DARD, and DOT) of the target 6 Provinces.

General Findings

- It was heard that nearly all requested development budgets are approved by the State Assembly since they are prepared based on Budget Law and instructions by MPI although adjustments are applied for initially requested budgets. However, some cases were heard from Dien Bien that sufficient budgets are not allocated to concerned Departments.
- After the local budget is approved by National Assembly, its allocations to respective POs are decided and approved by PPC. With the ceilings of budgets allocated to respective POs, disbursement of the budgets is done in line with the regular procedure. Thus, there is basically no delay in disbursement of the budgets up to these ceilings as far as POs submit payment requests with necessary full documents.
- Progresses of the development projects are reviewed by DPI and DOF on quarterly basis. There seems no direct links between these reviews and budget reallocation procedures. Requests for increasing allocated development budgets could be submitted from POs in accordance with necessity with such reasons

as price escalation, additional works, emergencies, etc. In case of big changes of the project scopes which require approval from PPC Assembly, these requests should be submitted by around June.

- Ratios of development projects requesting increase of their initial allocated budgets are not specified in all target Provinces. It was heard that there are few such cases in Ha Giang while there are many such cases in other Provinces. Regarding approval on these requests, it was heard that it is relatively difficult to obtain such approvals in Dien Bien while it depends on availability of provincial funds in Yen Bai and Lai Chau.
- Since i) execution of the budgets is done in line with the regular procedure after their allocations, and ii) provincial fund availability affects the process of budget reallocation, it could be thought most important to surely estimate necessary budgets and appropriately allocate them to concerned POs for secure execution of development budgets and smooth implementation of the development projects. In addition, establishment of a new system to facilitate smooth reallocation of the budgets based on progress reviews of the projects is important.

Attachment I-5.5.1
Evaluation of government capacity

ATTACHMENT I-5.5.1 EVALUATION OF GOVERNMENT CAPACITY

I-1. Detailed Indicators and Results

Indicators and results are attached to this Attachment. The following tables explain the idea of each category and indicator.

Table I-1.1 Explanation by Category

Category		
1. Overall Provincial Government	1.1 Government financial capacity	Financial status (focusing on revenue)
	1.2 Development plan	Achievement of the development plan
	1.3 Public opinions	Evaluation on the provincial governments by civil society (individual people)
	1.4 Outcome achievement	Development outcome in the whole province
2. Infrastructure Development	2.1 Development activities	Financial status (development expenditure)
	2.2 O&M	Evaluation from viewpoints of rganization, human resource, O&M expenditure, current status of similar donor project
	2.3 Performance on project management for similar rural infrastructure projects	Assessment on implementation capacity from similar donor' infrastructure projects
3. Agriculture Development	3.1 Extension	Extension development expenditure, human resources, extension capacity evaluation
	3.2 Agriculture growth	Agriculture outcome evaluation

Source: JICA Survey Team

Table I-1.2 Explanation by Indicator for Category 1

Indicator		
1.1 Government financial capacity	1.1.1 Scale of provincial government finance - total provincial revenue/population	Per capita actual all revenue in the provinces. Provinces with more figures are assumed to be able to provide more public service
	1.1.2 Financial capacity of province - % of local revenue/total revenue of province	Share of income that can be handled by the provinces out of total revenue in the provinces. Provinces with more figures are assumed high capacity to deliver pubic services in terms of self discretion
1.2 Development plan	1.2.1 Achievement of the development plan - achievement of New Rural Development Plan (2015)	Achievement of New Rural Development Program of the first half period (5 years). Provinces with higher degree of achievement are assumed to have more capable/willing to achieve development plans in general.
1.3 Public opinions	1.3.1 Citizen's evaluation on provincial government capacity - PAPI indicators average 2011-2014	Individuals interview results on the provincial government capacity based on the UNDP survey as known as PAPI (The Vietnam Provincial Governance and Public Administration Performance Index). Provinces with higher scores are evaluated better by citizens.
1.4 Outcome achievement	1.4.1 Economic Development - growth of GRDP per capita	As a result of service delivery using total revenue in the province, whether economy is developed or not as a proxy indicator to assess outcome of public service.
	1.4.2 Poverty Reduction - reduction of poverty rate	As a result of service delivery using total revenue in the province, whether poverty is reduced or not as a proxy indicator to assess outcome of public service.

Source: JICA Survey Team

Table I-1.3 Explanation by Indicator for Category 2

Indicator		
2.1 Development activities	2.1.1 Capacity for development activities - development expenditure/population - share of development expenditure to total expenditure	Per capita development expenditure and share of development expenditure out of total expenditure in the provinces. Provinces where higher figures are assumed to be able to implement development including infrastructure.
2.2 O&M	2.2.1 O&M institutional arrangement - road: system, budget flow, staff coverage and capacity - irrigation: system, budget flow, staff coverage and capacity	Evaluation on O&M institution is done from the viewpoints of mainly degree of coverage by O&M staff and management capacity
	2.2.2 O&M expenditure - road (annual O&M expenditure/km) - irrigation (average O&M and rehabilitation cost/ha)	Evaluation is done by O&M expenditure per unit facility.
	2.2.3 Actual O&M condition of infrastructure for a donor's project - SPL 6 sub projects (road, irrigation, water, electricity)	Taking the SPL VI project as one example of, current conditions of the subprojects are evaluated to see the O&M capacity of the province.
2.3 Performance on project management for similar rural infrastructure projects	2.3.1 SPL 6 - cost estimate - local budget for construction - land compensation - construction	Subproject implementation of SPLVI is evaluated with four sub indicators. For instance, delay and cost overrun are evaluated negatively.
	2.3.2 ADB Sustainable Rural Infra Pjt (data as of the end of 2014) - total amount of planned infra investment - progress of contract awarding - progress of CP budgeting preparation - progress of disbursement - delay due to allocation of C/P fund, land acquisition and resettlement	Progress of ADB SRIP is evaluated with five sub indicators. Fast or slow progress is judged as the provincial capacity of project implementation for infrastructure.

Source: JICA Survey Team

Table I-1.4 Explanation by Indicator for Category 3

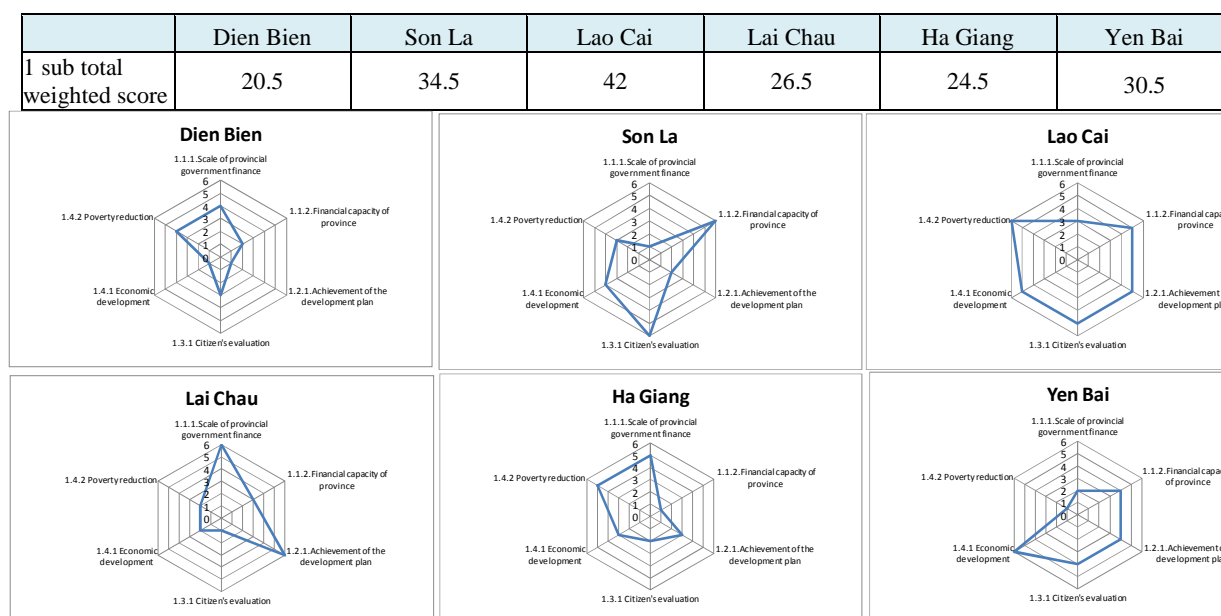
Indicator		
3.1 Extension	3.1.1 Extension expenditure (actual) - estimated amount/extension workers - estimated amount / rural work force in province	Extension activity expenditure is evaluated as the one divided by extension staff and farmer. Provinces with high amount are assumed to be possibly able to implement the extension activities more.

	3.1.2 Number of rural work force/extension workers	This indicator is number of farmers which is covered by one commune extension workers. Provinces with smaller figures are assumed to be able to have better outreach.
	3.1.3 Availability of crop manual (better one, higher score)	Current situation on availability of crop manuals and their contents are evaluated. Provinces with better manuals are judged to have higher capacity of extension.
	3.1.4 Expert judgment on extension activities/capacity	The experts of the Survey team judge extension workers and institutions of each province within the period of the Survey. This judgment is used as one of the indicators.
3.2 Agriculture growth	3.2.1 Increase of yield - % of increase from 2012 to 2014	Evaluation is made on unit yield increase of the target three crops regarded as one of the outcomes of agriculture public service delivery
	3.2.2 Increase of cultivated area - % of increase from 2012 to 2014	Evaluation is made on increase of cultivated areas for the target three crops regarded as one of the outcomes of agriculture public service delivery

Source: JICA Survey Team

I-2. Results by Large Category

I-2.1 Overall Provincial Government



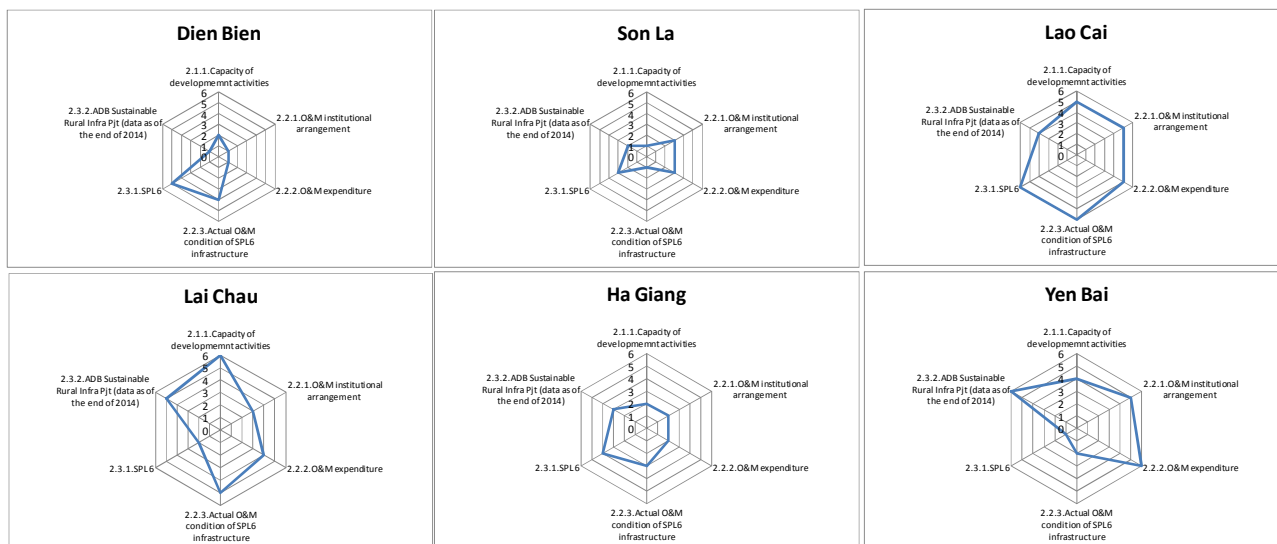
Remarks: Score points in the radar charts shows the scores before adjustment by weighting.

Source: JICA Survey Team

Figure I-2.1 Results of Overall Provincial Government Assessment

I-2.2 Infrastructure Development

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2 sub total weighted score	15	16	36	28.5	18	29.5



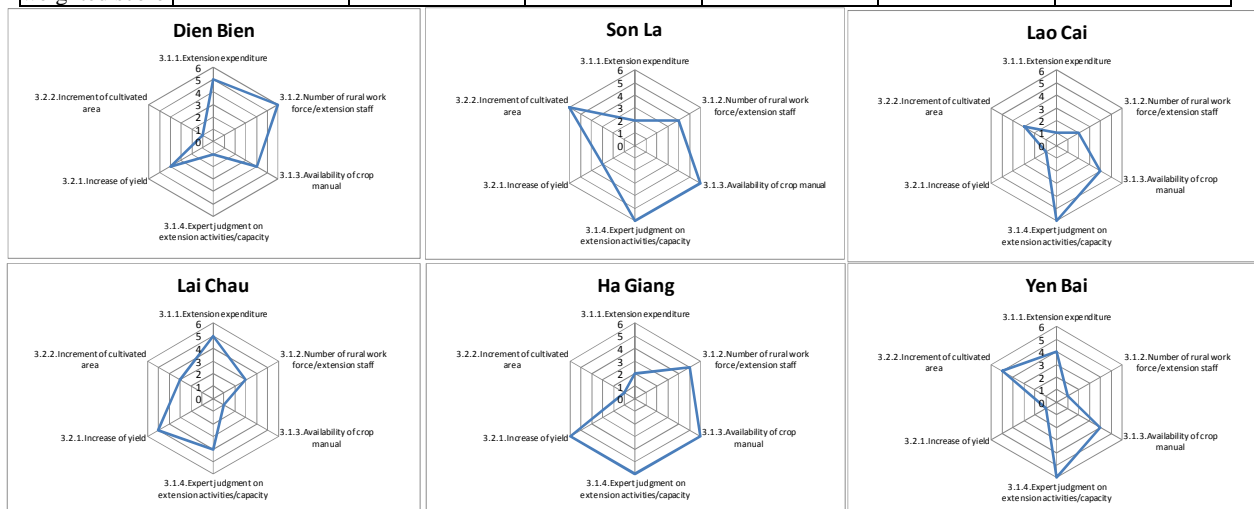
Remarks: Score points in the radar charts shows the scores before adjustment by weighting.

Source: JICA Survey Team

Figure I-2.2 Results of Infrastructure Development Assessment

I-2.3 Agriculture Development

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
3 sub total weighted score	28.5	45	32	28.5	44	36



Remarks: Score points in the radar charts shows the scores before adjustment by weighting.

Source: JICA Survey Team

Figure I-2.3 Results of Agriculture Development Assessment

Capacity Assessment (Evaluation on Achievements)										
Category	Indicator	Weight	Points	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai	
1. Overall Provincial Government	1.1 Government financial capacity	1.1.1 Scale of provincial government finance - total provincial revenue/population		6	4	1	3	6	5	2
		1.1.2 Financial capacity of province - % of local revenue/total revenue of province		6	2	6	5	3	1	4
		Weighting	2.5	15	5	15	12.5	7.5	2.5	10
	1.2 Development plan	1.2.1 Achievement of the development plan - achievement of New Rural Development Plan (2015)		6	1	2	5	6	3	4
	1.3 Public opinions	1.3.1 Citizen's evaluation on provincial government capacity - PAPI indicators average 2011-2014		6	3	6	5	1	2	4
	1.4 Outcome achievement	1.4.1 Economic Development - growth of GRDP per capita		6	1	4	5	2	3	6
		Weighting	1.5	9	1.5	6	7.5	3	4.5	9
		1.4.2 Poverty Reduction - reduction of poverty rate		6	4	3	6	2	5	1
	Weighting	1.5	9	6	4.5	9	3	7.5	1.5	
	Sub-total			51	20.5	34.5	42	26.5	24.5	30.5
2. Infrastructure Development	2.1 Development activities	2.1.1 Capacity for development activities - development expenditure/population - share of development expenditure to total expenditure		6	2	1	5	6	2	4
	2.2 O&M	2.2.1 O&M institutional arrangement - road: system, budget flow, staff coverage and capacity - irrigation: system, budget flow, staff coverage and capacity		6	1	3	5	3	2	5
		Weighting	1.5	9	1.5	4.5	7.5	4.5	3	7.5
		2.2.2 O&M expenditure - road (annual O&M expenditure/km) - irrigation (average O&M and rehabilitation cost/ha)		6	1	3	5	4	2	6
	Weighting	1.5	9	1.5	4.5	7.5	6	3	9	
	2.2.3 Actual O&M condition of infrastructure for a donor's project - SPL 6 sub projects (road, irrigation, water, electricity)		6	4	1	6	5	3	2	
	2.3 Performance on project management for similar rural infrastructure projects	2.3.1 SPL 6 - cost estimate - local budget for construction - land compensation - construction		6	5	3	6	2	4	1
		2.3.2 ADB Sustainable Rural Infra Pjt (data as of the end of 2014) - total amount of planned infra investment - progress of contract awarding - progress of CP budgeting preparation - progress of disbursement - delay due to allocation of C/P fund, land acquisition and resettlement		6	1	2	4	5	3	6
	Sub-total			42	15	16	36	28.5	18	29.5
	3. Agriculture Development	3.1 Extension	3.1.1 Extension expenditure (actual) - estimated amount/extension workers - estimated amount / rural work force in province		6	5	2	1	5	2
3.1.2 Number of rural work force/extension workers				6	6	4	2	3	5	1
3.1.3 Availability of crop manual (better one, higher score)				6	4	6	4	1	6	4
Weighting			2.5	15	10	15	10	2.5	15	10
3.1.4 Expert judgment on extension activities/capacity				6	1	6	6	4	6	6
Weighting		2.5	15	2.5	15	15	10	15	15	
3.2 Agriculture growth		3.2.1 Increase of yield - % of increase from 2012 to 2014		6	4	3	1	5	6	1
		3.2.2 Increase of cultivated area - % of increase from 2012 to 2014		6	1	6	3	3	1	5
Sub-total			54	28.5	45	32	28.5	44	36	
Total Score			147	64	95.5	110	83.5	86.5	96	
Total Ranking				6	3	1	5	4	2	

1. Overall Provincial Government

Final (Actual) Revenue

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2010	Total Local Revenue (mil. VND)*1	4,292,072	5,850,741	6,425,845	4,372,464	5,652,762	4,143,570
	1. Local revenue with 100% entitlement*2 (mil. VND)	125,444	481,940	146,244	277,800	473,131	720,455
	2. Shared revenue in percentage *3 (mil. VND)	191,297	647,985	910,362	0	0	0
	Total (1+2)	316,741	1,129,925	1,056,606	277,800	473,131	720,455
2011	Total Local Revenue (mil. VND)*1	5,985,242	7,865,379	6,826,254	5,701,996	11,064,927	5,270,291
	1. Local revenue with 100% entitlement*2 (mil. VND)	137,074	648,120	832,225	485,305	585,720	852,515
	2. Shared revenue in percentage *3 (mil. VND)	237,731	932,655	662,438	0	0	0
	Total (1+2)	374,805	1,580,775	1,494,663	485,305	585,720	852,515
2012	Total Local Revenue (mil. VND)*1	8,375,719	10,252,225	9,464,133	7,908,154	15,140,138	7,062,234
	1. Local revenue with 100% entitlement*2 (mil. VND)	146,040	879,182	923,803	448,491	746,705	1,072,793
	2. Shared revenue in percentage *3 (mil. VND)	303,331	1,158,441	912,882	0	0	0
	Total (1+2)	449,371	2,037,622	1,836,685	448,491	746,705	1,072,793
	Annual Total Local Revenue(2010-12 average)(mil.VND)	6,217,678	7,989,449	7,572,077	5,994,205	10,619,276	5,492,032
	Annual Total Local Revenue(2010-12 average)(mil.USD)	276.34	355.09	336.54	266.41	471.97	244.09

Source: MOF HP.

Note: *1: Revenue from import/export duties, special consumption tax, VAT on import which are collected by Province but retained in Central Government is not include

*2: Taxes on housing, land, natural resources except crude oil, licenses, agricultural land use, land lease, lottery revenue, etc.

*3: Taxes on enterprises, income, VAT except for import, special consumer tax except for import, charges on gasoline, etc.

Although figures for 2. in Lai Chau, Ha Giang, and Yen Bai are zero (0) in their final statements, it was explained by persons in each DOF that figures were already included under 1.

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
1.1.1.	Annual actual local revenue per person (thousand VND)	11,556	6,831	11,384	14,161	13,400	7,009
	Annual actual local revenue per person (USD)	513.58	303.60	505.95	629.36	595.56	311.52
	Score	4	1	3	6	5	2

Explanation: In order to understand how much each local governments could spend for their activities, actual local revenue per person in each Provinces is

Source: JICA Survey Team

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
1.1.2.	Average share of (1+2)/Total Local Revenue (%)	6.12	19.81	19.32	6.74	5.67	16.06
	Score	2	6	5	3	1	4

Explanation: There is possibility to increase revenues from local taxes (revenue with 100% entitlement) and some shares of national taxes (shared revenue in percentage) by policies and efforts of Provinces. In addition, purposes of use of these revenues are not limited. Thus, share of sum of these revenues against total revenue is regarded as an indicator on financial capacity of Provinces.

Source: JICA Survey Team

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
1	Total population (person, 2014)	538,069	1,169,600	665,152	423,303	792,472	783,534
2	Rural population (person, 2014)	456,874	1,009,700	513,189	351,019	673,700	623,507
	Share of rural population (% , 2014)	85	86	77	83	85	80
3	Population density (persons/km2, 2014)	56.30	83.00	104.00	46.68	100.00	114.00

Source: statistical yearbook

Table NEW RURAL DEVELOPMENT ACHIEVEMENT UP TO 2015

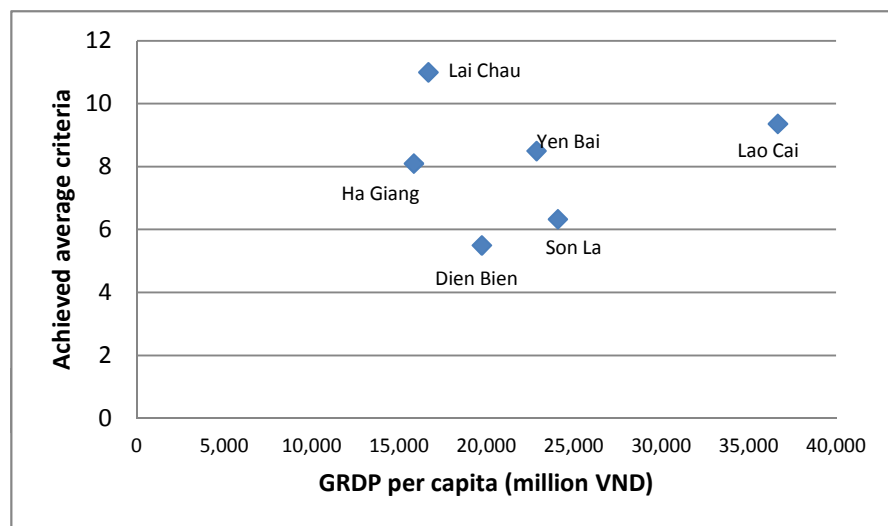
Province	Lao Cai		Yen Bai		Ha Giang		Son La		Dien Bien		Lai Chau	
	Actual to 2015		Actual to 2015		Actual to 2015		Actual to 2015		Actual to 2015		Actual to 2015	
	Criteria/ No. of	%	Criteria/ No. of	%	Criteria/ No. of	%	Criteria/ No. of	%	Criteria/ No. of	%	Criteria/No. of	%
Average achieved criteria per commune	9.36		8.5		8.1		6.33		5.5		11	
Score ranking 1.2.1	5		4		3		2		1		6	
Total number of	144		152		176		188		116		96	
Number of commune achieved full criteria	20	13.9	5	3.29	10	5.7	3	1.6	1	0.86	15	15.6
Number of commune completed 15 -18 criteria	16	11.1	4	2.63	3	1.7	3	1.6	1	0.86	3	3.1
Number of commune completed 10-14 criteria	27	18.8	36	23.7	29	16.5	22	11.7	8	6.89	33	34.4
Number of commune completed 5-9 criteria	72	50	86	56.6	126	71.6	99	52.7	38	32.7	45	46.9
Number of communes completed below 5 criteria	9	6.25	21	13.8	8	4.5	61	32.4	68	58.62	0	0.0
Total	144	100.0	152	100.0	176	100.0	188	100	116	99.93	96	100.0

Source: Secretariat of New Rural Development Program in MARD

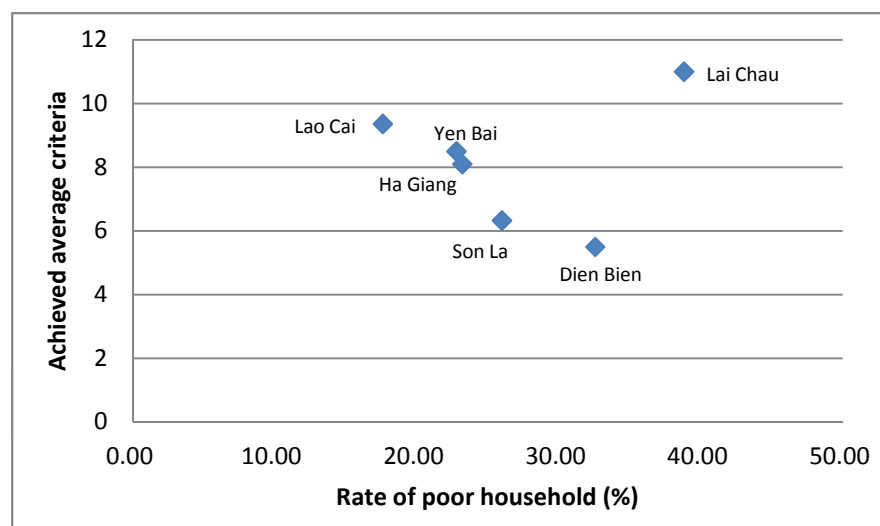
Analysis of Achievement of NTP-NRD

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
GRDP per capita as of 2014 (million VND)	19,732	24,081	36,670	16,673	15,843	22,867
Rate of poor household as of 2014 (%)	32.57	26.00	17.61	38.82	23.21	22.80
Achieved average criteria for NRDP as of 2015 (point)	5.5	6.33	9.36	11	8.1	8.5

Source: preceding tables in the report



Source: JICA Survey Team

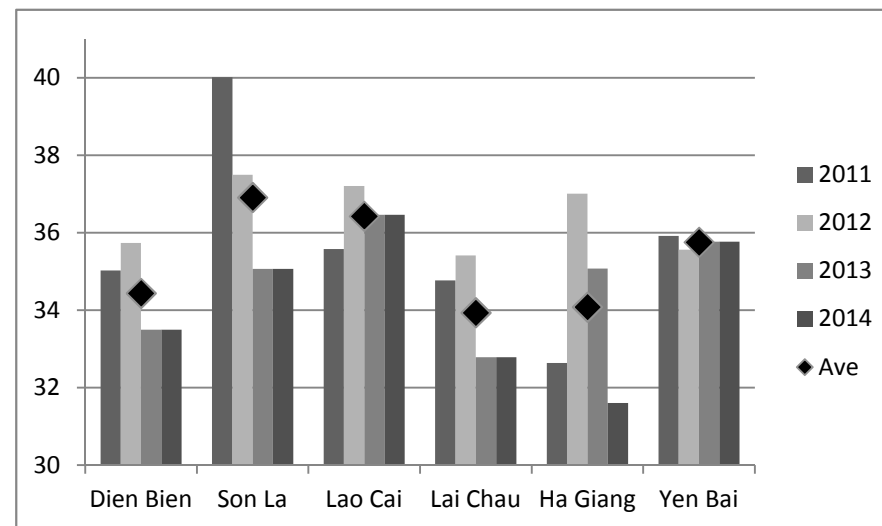


Source: JICA Survey Team

Table PAPI weighted data Indicator 1.3.1

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2011	35	40	36	35	33	36
2012	36	37	37	35	37	36
2013	33	35	36	33	35	36
2014	33	35	36	33	32	36
Ave	34	37	36	34	34	36
Score	3	6	5	1	2	4

Source: PAPI website



Source: JICA Survey Team

Gross domestic product at constant 2010 prices

Unit: Mill. dong

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2010	6,334,039	13,505,110	12,358,827	3,750,150	6,479,302	9,341,768
2011	6,605,130	14,776,010	13,705,793	3,908,630	7,285,822	10,348,744
2012	7,080,336	16,085,400	14,613,083	4,148,340	8,060,167	11,303,681
2013	7,528,354	17,735,100	16,421,938	4,712,220	8,750,373	12,491,377
Prel. 2014	8,045,469	19,735,980	18,212,330	5,118,070	9,303,090	13,874,441

Source: Statistical Year Book, each province

Population

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2010	501,163	1,098,870	626,811	381,889	737,962	751,308
2011	510,778	1,118,528	636,995	393,729	749,922	758,658
2012	519,663	1,134,324	646,530	403,204	763,511	765,700
2013	528,465	1,150,441	655,894	414,789	778,936	774,589
Prel. 2014	538,069	1,166,410	665,157	423,314	792,461	783,542

Source: Statistical Year Book, each province

GDP per capita at constant 2010, (1000 VND) Indicator 1.4.1						
	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2010	12,639	12,290	19,717	9,820	8,780	12,434
2011	12,932	13,210	21,516	9,927	9,715	13,641
2012	13,625	14,181	22,602	10,288	10,557	14,763
2013	14,246	15,416	25,037	11,361	11,234	16,126
Prel. 2014	14,952	16,920	27,380	12,090	11,739	17,707
Growth Average % per year	3.7%	7.5%	7.8%	4.6%	6.7%	8.5%
Score	1	4	5	2	3	6

Source: Statistical Year Book

Exchange rate 1000 VND = USD

Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
19.5	18.9	19.5	19.0	19.5	19.4
20.9	21.0	20.9	21.0	20.6	20.9
20.9	20.9	20.9	22.5	20.9	20.8
21.1	20.9	20.9	20.9	21.0	20.9
21.6	21.1	21.2	21.5	21.2	21.2

Source: JICA Survey Team

Gross domestic product per capita

	Dien Bien		Son La		Lao Cai		Lai Chau		Ha Giang		Yen Bai	
	Vietnam currency, at current prices	Foreign currency, at average exchange rate	Vietnam currency, at current prices	Foreign currency, at average exchange rate	Vietnam currency, at current prices	Foreign currency, at average exchange rate	Vietnam currency, at current prices	Foreign currency, at average exchange rate	Vietnam currency, at current prices	Foreign currency, at average exchange rate	Vietnam currency, at current prices	Foreign currency, at average exchange rate
	Thous. dong	USD	Thous. dong	USD	Thous. dong	USD	Thous. dong	USD	Thous. dong	USD	Thous. dong	USD
2010	12,638.67	648	12,290	649.2	19,717	1,011	9,820	517.92	8,780	450	12,434	642
2011	15,291.73	731	16,391	781.2	25,608	1,225	11,798	561.81	11,140	541	18,325	877
2012	16,824.63	804	18,476	883.5	28,249	1,351	12,745	566.44	12,995	621	19,590	941
2013	17,969.77	851	20,952	1,000.7	32,292	1,542	14,584	696.54	14,817	704	21,106	1,008
Prel. 2014	19,732.20	912	24,081	1,143.8	36,670	1,729	16,673	777.01	15,843	746	22,867	1,081

Source: Statistical Year Book, each province

Table GRDP related Data

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai	
1	Gross domestic product at current prices (mill. VND)	2010	6,334,035	13,505,110	12,358,827	3,750,150	6,479,302	9,341,768
		2011	7,810,680	18,333,800	16,312,175	4,645,220	8,354,134	13,902,414
		2012	8,743,139	20,957,770	18,263,813	5,138,830	9,921,819	15,000,057
		2013	9,496,394	24,104,030	21,180,127	6,049,290	11,541,500	16,348,483
		2014	10,617,283	28,088,330	24,391,308	7,057,920	12,554,953	17,917,244
		Average	8,600,306	20,997,808	18,501,250	5,328,282	9,770,342	14,501,993
2	Share of Agriculture, forestry and fishing (%)	2010	25.27	37.36	18.99	28.47	40.43	30.98
		2011	26.41	38.38	18.47	30.03	39.35	26.84
		2012	25.68	35.64	18.14	28.50	38.72	26.42
		2013	24.80	34.16	17.04	26.12	37.31	25.19
		2014	24.35	31.05	16.13	24.02	36.84	24.09
		Average	25	35	18	27	39	27
3	Gross domestic product at current prices per capita	2010	12,638.67	12,290.00	19,717.00	9,820.00	8,780.00	12,434
		2011	15,291.73	16,391.00	25,608.00	11,798.00	11,140.00	18,325
		2012	16,824.63	18,476.00	28,249.00	12,745.00	12,995.00	19,590
		2013	17,969.77	20,952.00	32,292.00	14,584.00	14,817.00	21,106
		2014	19,732.20	24,081.00	36,670.00	16,673.00	15,843.00	22,867
		Growth Average % per year	11.2%	19.2%	17.2%	14.0%	16.1%	16.8%

Source: Statistical Year Book, each province

Table Poverty Data

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai	
1	Rate of poor households (total, %)	2010	50.01	37.90	42.90	46.78	41.80	26.50
		2011	45.28	34.80	35.29	47.20	35.38	25.20
		2012	38.24	32.00	27.69	42.80	30.13	24.00
		2013	35.22	29.30	22.21	40.98	26.95	23.50
		2014	32.57	26.00	17.61	38.82	23.21	22.80
		Reduction Average % per year	7.0%	6.3%	11.8%	3.4%	8.9%	2.8%
	1.4.2	Score (1-6)	4	3	6	2	5	1

Source: Statistical Year Book, each province

2. Infrastructure Development

Final (Actual) Expenditure

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2010	Total Actual Local Expenditure (mil. VND)	4,246,268	5,814,514	4,920,149	4,198,167	5,630,922	4,041,147
	1.Total Actual Local Expenditure on Development Investment (mil. VND)	987,906	344,175	1,232,804	280,993	1,543,667	788,260
	2. Expenditure for Target Programs (mil. VND)	0	1,095,817	0	1,146,609	364,819	372,796
	Aggregate Actual Expenditure for Development Investment (1.+2.)(mil.VND) *1	987,906	1,439,992	1,232,804	1,427,602	1,908,486	1,161,056
	Total Actual Local Expenditure on Current (mil. VND)	2,215,102	3,246,060	2,633,316	1,791,011	2,981,611	2,226,361
2011	Total Actual Local Expenditure (mil. VND)	5,953,290	7,804,255	6,751,330	5,512,580	11,035,153	5,171,484
	1. Expenditure for Development Investment (mil. VND)	1,208,605	463,012	1,707,211	453,370	1,906,633	976,570
	2. Expenditure for Target Programs (mil. VND)	0	1,379,068	0	1,415,046	0	226,152
	Aggregate Actual Expenditure for Development Investment (1.+2.)(mil.VND) *1	1,208,605	1,842,080	1,707,211	1,868,416	1,906,633	1,202,723
	Total Actual Local Expenditure on Current (mil. VND)	3,076,898	4,436,141	3,150,476	2,280,296	4,027,954	2,813,913
2012	Total Actual Local Expenditure (mil. VND)	8,325,119	10,185,550	9,354,640	7,713,884	15,116,977	6,895,788
	1. Expenditure for Development Investment (mil. VND)	2,152,819	656,837	939,265	646,328	2,983,455	1,140,350
	2. Expenditure for Target Programs (mil. VND)	0	1,663,328	2,227,221	2,120,379	0	425,754
	Aggregate Actual Expenditure for Development Investment (1.+2.)(mil.VND) *1	2,152,819	2,320,165	3,166,486	2,766,707	2,983,455	1,566,104
	Total Actual Local Expenditure on Current (mil. VND)	4,609,525	5,914,446	4,240,917	3,593,159	5,713,311	4,006,752
	Annual Total Local Expenditure(2010-12 average)(mil.VND)	6,174,892	7,934,773	7,008,706	5,808,211	10,594,351	5,369,473
	Annual Total Local Expenditure(2010-12 average)(mil.USD)	274.44	352.66	311.50	258.14	470.86	238.64
	Annual Aggregate Expenditure for Development Investment(2010-12 average)(mil)	1,449,776	1,867,412	2,035,500	2,020,908	2,266,191	1,309,961
	Annual Aggregate Expenditure for Development Investment(2010-12 average)(mil)	64.43	83.00	90.47	89.82	100.72	58.22
	Annual Total Local Expenditure on Current(2010-12 average)(mil.VND)	3,300,508	4,532,216	3,341,570	2,554,822	4,240,959	3,015,675
Annual Total Local Expenditure on Current(2010-12 average)(mil.USD)	146.69	201.43	148.51	113.55	188.49	134.03	

Source: MOF HP.

Note: *1 It seems that Dien Bien, Lao Cai, and Ha Giang include "Expenditure for National Target Program" in "Expenditure for Development Investment" in some years judging from their final statements and explanations from their concerned persons, thus, we combine them into "Aggregate Actual Expenditure for Development Investment".

2.1.1	Aggregate Actual Expenditure for Development Investment per year and per person (2010 ~ 2012 average)(thousand VND)	2,694	1,597	3,060	4,774	2,860	1,672
	Aggregate Actual Expenditure for Development Investment per year and per person (2010 ~ 2012 average)(USD)	119.75	70.96	136.01	212.18	127.10	74.30
	Score	3	1	5	6	4	2
	Share of Aggregate Actual Expenditure for Development against Total Actual Local Expenditure (%) (2010 ~ 2012 average)	23.48	23.53	29.04	34.79	21.39	24.40
	Score	2	3	5	6	1	4
	Total Score	5	4	10	12	5	6
	Final Score	2	1	5	6	2	4

Explanation: In order to understand priority and capacity of Provinces for development activities, share of aggregated actual expenditure for development investment per person as well as its share to total actual local expenditure is calculated.

Source: JICA Survey Team

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
1	Total population (person, 2014)	538,069	1,169,600	665,152	423,303	792,472	783,534
2	Rural population (person, 2014)	456,874	1,009,700	513,189	351,019	673,700	623,507
	Share of rural population (% , 2014)	85	86	77	83	85	80
3	Population density (persons/km2, 2014)	56.30	83.00	104.00	46.68	100.00	114.00

Source: statistical yearbook

O&M Institutional Arrangement for Infrastructure

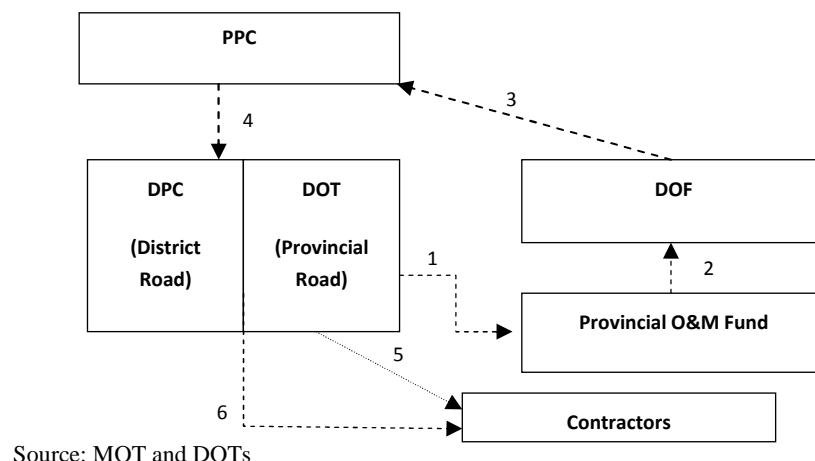
1. Road

For O&M of the road, “Provincial O&M fund” was created according to the Decree No.18/2012/ ND-CP of the VN Government, dated 13/3/2012. O&M activities shall be implemented according to the Decision No.2196/QD/BGTVT of MOT, dated 29/7/2013.

At the provincial level, the responsible organizations are Department of Transport (DOT) for provincial roads and DPCs for district roads. The communal roads shall be basically maintained by CPCs with the assistance of the respective DPCs.

The procedure for budget planning, approval and execution for O&M of roads are made as follows:

1. DPC and DOT shall prepare the O&M budget plan and request to Provincial O&M Fund.
2. Provincial O&M Fund shall assess O&M fund requirement based on verified unit cost and request to DOF.
3. DOF shall verify and prepare O&M budget that is submitted to PPC.
4. PPC shall approve the O&M budget and allocate to DPC and DOT.
5. DOT and DPC shall sign Contract with the outside contractors to carry out O&M activities.
6. DOF/DOT/ DPC shall disburse according to inspection results and contract.



Source: MOT and DOTs

Figure 1 O&M Budget Preparation and Approval for Road

This flow is the same across the six provinces.

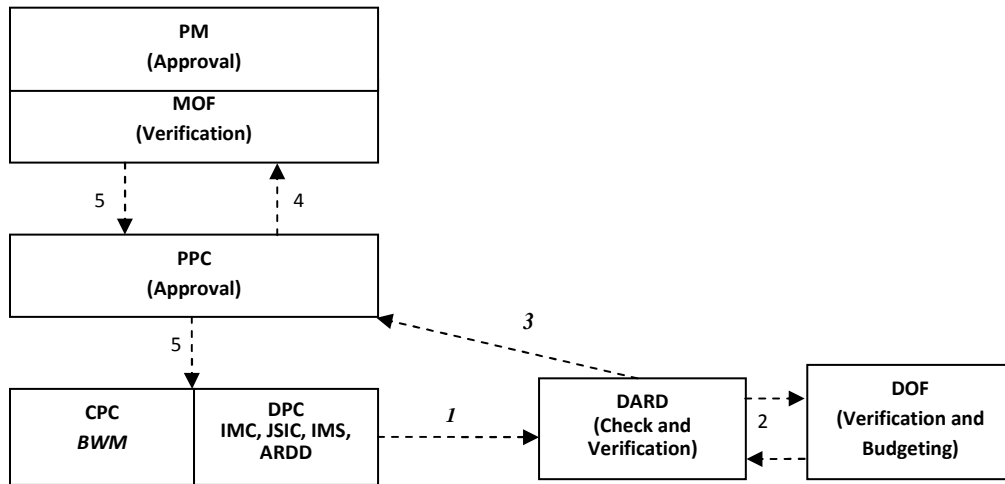
2. Irrigation

2.1 General

In case of irrigation, O&M budget at the provinces are sourcing from irrigation subsidy based on Decree 67/2012 / ND-CP of the VN Government. The procedures are summarized as follows

1. The irrigation O&M organizations such as Irrigation Management Company (IMC), Joint Stock Irrigation Company (JSIC), Irrigation Stations, Agriculture and Rural Development Division under DPC and Board of Water Management (BWM) under CPC shall prepare their O&M plan based on irrigated area, irrigation type of irrigation, and submit to DARD.

2. DARD shall verify and prepare O&M Plan and DOF shall verify O&M budget.
3. Based on the above 2, DARD shall submit the O&M plan and budget to PPC.
4. PPC shall approve and submit O&M budget plan to MOF.
5. MOF shall verify O&M plan and submit to PM for approval. The approved budget shall be transferred by PPC/DOF to the O&M organizations and DPCs.



Source: MARD and DARDs

Figure 2 O&M Budget Preparation and Approval for Irrigation

Norm of irrigation subsidy applied to the mountainous provinces is as follows:

- Pumps : VND 1,811,000 /ha/season (Summer/Spring)
- Gravity : VND 1,267,000/ ha/season
- Gravity and pumps : VND 1,539,000/ ha/season

The above norm of irrigation subsidy is modified by PPCs and DARD based on the provincial condition for practical O&M activities.

2.2 Provincial O&M systems/budget process

	Province	Irrigation management organization	O&M budget process Claim (right to left)/disbursement (left to right)
1	Dien Bien (9 Districts+1 Town)	1. DARD/SUB-IRRIGATION DEPARTMENT; 2. DIEN BIEN IMC/IRRIGATION STATION/TEAM (UNDER IMC); 3. SIC and Historical Relic Management Board (HRMB) 4. ARDD (UNDER DPC)/CPC (BWM)/WUOs; Note: There is one IMC (more than 50 ha). JSIC and HRMB sign the irrigation contracts with DARD.	- MOF >PPC/DOF>IMC>IRRIGATION STATION (UNDER IMC); - MOF >PPC/DOF> DPC/DFD> CPC(BWM)/WUOs ; - MOF >PPC/DOF> DARD> JSIC/HRMB.
2	Son La (11 Districts+1 Town)	1. DARD/SUB-IRRIGATION DEPARTMENT; 2. JSIC / IRRIGATION STATION (UNDER JSIC); 3. IRRIGATION STATION (UNDER DPC); 4. ARDD (UNDER DPC)/CPC(BWM)/WUOs; Note: No IMC. There is one JSIC which sign the irrigation contract with DARD.	- MOF >PPC/DOF>DARD>JSIC; - MOF >PPC/DOF> DPC/DFD> IMS/CPC(BWM) /WUOs;
3	Lai Chau (8 Districts)	1. DARD/SUB-IRRIGATION DEPARTMENT; 2. LAI CHAU IMC/ IRRIGATION TEAM (UNDER	- MOF >PPC/DOF> IMC>IRRIGATION TEAM (UNDER IMC);

	Province	Irrigation management organization	O&M budget process Claim (right to left)/disbursement (left to right)
		IMC); 3. ARDD (UNDER DPC)/CPC (BWM)/WUOs.	- MOF>PPC/DOF>DPC/DFD> CPC (BWM)/WUOs .
4	Lao Cai (8 Districts + 1 City)	1. DARD/SUB-IRRIGATION DEPARTMENT; 2. IRRIGATION STATION (UNDER ARDD of Si Ma Cai DPC); 2. ARDD (UNDER DPC)/CPC (BWM)/WUOs. Note: No IMC	- MOF >PPC/DOF>DPC/DFD >CPC (BWM)/WUOs.
5	Ha Giang (10 Districts + 1 Town)	1. DARD/SUB-IRRIGATION DEPARTMENT; 2. ARDD (UNDER DPC)/CPC(BWM)/CO-OPERATIVES/WUOs. Note: No IMC	- MOF >PPC/DOF> DPC/DFD> CPC(BWM)/CO-OPERATIVES/WUOs.
6	Yen Bai (7 Districts + 1 City and 1 Town)	1. DARD/SUB-IRRIGATION DEPARTMENT 2. Three IMCs UNDER PPC/DARD : i) NGHIA VAN IMC, ii) TAN PHU IMC AND iii) DAI LOI IMC; 3. Two IRRIGATION STATIONS (UNDER DPC) : i) YEN BINH IRRIGATION STATION AND ii) LUC YEN IRRIGATION STATION; 4. ARDD (UNDER DPC)/CPC(BWM)/WUOs	- MOF >PPC/DOF>IMCs : (NGHIA VAN IMC, TAN PHU IMC AND DAI LOI IMC); - MOF >PPC/DOF>DPC/DFD >IRRIGATION STATIONS (YEN BINH AND LUC YEN); - MOF >PPC/DOF>DPC/DFD >CPC(BWM)/WUOs .

Source: DARDs

Abbreviations

MARD	Ministry of Agricultural Rural Devalopment
MOF	Ministry of Finance
PPC	Province's People Committee
DARD	Department of Agricultural Rural Development
DOF	Department of Finance
DPC	District's People Committee
ARDD	Agriculture and Rural Development Division (handles irrigation works at District level)
DFD	District Finance Division
CPC	Commune's People Committee
O&M	Operation and Maitanace
IMC	Irrigation Management Company
IMS	Irrigation Management Station (Under IMC or DPC)
IMT	Irrigation Management Team (Under IMC or IMS)
JSIC	Joint Stock Irrigation Company
HRMB	Histrical Relic Management Board
BWM	Board of Water Management
WUO	Water User Organization

3. Other Two Sectors

The urban water supply systems are managed by the provincial water companies or DPC and the rural water supply systems are managed by CPCs in general. The O&M fund source is basically water fee collecting from users. Some districts allocate their owne budget for assisting and supplementing O&M cost. The O&M of electricity system is made by the Electricity of Vietnam (EVN).

Table O&M Institutional Capacity

(1) Road

Name of Province	Length of Provincial Road (km)	Staff No. of O&M Dept in Provincial DOT	Length/staff	Score for Length/staff	Judgement on staff management capacity	Score for capacity (1,2)
Ha Giang	365	16	22.8	5	A	2
Lao Cai	506	16	31.6	4	A	2
Yen Bai	490	14	35.0	3	A	2
Dien Bien	607	8	75.9	2	B	1
Lai Chau	217	10	21.7	6	B	1
Son La	912	10	91.2	1	A	2

Source: provincial departments and survey team

Ha Giang, Lao Cai: more staff, capacity high.
Dien Bien: less staff, capacity low.
Son La: less staff(more road), capacity high.

(2) Irrigation

Province	Service Area (ha)	Staff assigned for O&M (No.)	Irrigation Area per Staff (ha/staff)	Score for the system at provincial level	Score for the system below district	Judgement on staff management capacity	Score for capacity (1,2, 3)
Ha Giang							
Provincial level	-	-	-	-			
District below	23,003	2,645	8.7		2	C	1
Total	23,003	2,645	8.7				
Lao Cai							
Provincial level	-	-	-	-			
District below	20,667	3,434	6.0		4	A	3
Total	20,667	3,434	6.0				
Yen Bai							
Provincial level	6,720	136	49.4	3			
District below	12,657	2,164	5.8		5	A	3
Total	19,377	2,300	8.4				
Dien Bien							
Provincial level	8,245	145	56.9	2			
District below	10,698	1,112	9.6		1	C	1
Total	18,943	1,257	15.1				
Lai Chau							
Provincial level	8101	127	63.8	1			
District below	15,742	2,250	7.0		3	C	1
Total	23,844	2,377	10.0				
Son La							
Provincial level	491	41	12.0	4			
District below	15,636	3,490	4.5		6	B	2
Total	16,127	3,531	4.6				

Source: provincial departments and survey team

Ha Giang, Dien Bien, Lai Chau: both low.
Lao Cai, Son La, and Yen Bai: both high.
small scale irrigation management: good in the latter group.

(3) Overall ranking

Indicator 2.2.1

Name of Province	Total Score	Final Score
Ha Giang	10	2
Lao Cai	13	5
Yen Bai	13	5
Dien Bien	5	1
Lai Chau	11	3
Son La	11	3

Source: the survey team

Lao Cai and Yen Bai: irrigation, road both OK
Ha Gian road is ok but irrigation is bad.
Lai Chau and Son La: middle class.
Dien Bien: both are bad

Remarks: Institutional system and budget flow across 6 provinces is more or less the same, although they have variations. Therefore, rating and scoring are made based on the above.

Provinces with fewer coverage per staff are given higher score.

Table Operation and Maintenance Cost (Year 2014, Source : Provincial departments)

(1) Road : Annual O&M Expenditure (VND Million/km)

Province/Kind of	Ha Giang	Lao Cai	Yen Bai	Dien Bien	Lai Chau	Son La
National Road	25.0	25.0	25.0	25.0	25.0	25.0
Provincial Road	40.5	40.1	53.0	37.7	41.0	40.3
District Road	5.0	6.0	5.2	4.0	5.4	5.0
Score for Provincial Road	4	2	6	1	5	3
Score for District Road	2	6	4	1	5	2
Total Score	6	8	10	2	10	5

(2) Irrigation

Province	Service Area (ha)	Staff assigned for O&M (No.)	Irrigation Area per Staff (ha/staff)	O&M Cost /1 (VND Million)	Rehabilitation Cost (VND Milion)	Average O&M + rehabili Cost (VND Milion/ha)
Ha Giang						
Provincial /2	-	-	-	-	-	-
District	23,003	2,645	8.7	27,842	11,137	1.7
Total	23,003	2,645	8.7	27,842	11,137	1.7
Lao Cai						
Provincial/ 2	-	-	-	-	-	-
District	20,667	3,434	6.0	40,096	30,995	3.4
Total	20,667	3,434	6.0	40,096	30,995	3.4
Yen Bai						
Provincial	6,720	136	49.4	14,713	5,456	3.0
District	12,657	2,164	5.8	23,700	3,755	2.2
Total	19,377	2,300	8.4	38,413	9,210	2.5
Dien Bien						
Provincial	8,245	145	56.9	17,813	8,196	3.2
District /3	10,698	1,112	9.6	17,251	n.a	1.6
Total	18,943	1,257	15.1	35,064	8,196	2.3
Lai Chau						
Provincial	8101	127	63.8	6,776	3,904	1.3
District	15,742	2,250	7.0	20,356	8,142	1.8
Total	23,844	2,377	10.0	27,131	3,904	1.3
Son La						
Provincial	491	41	12.0	2,260	148	4.9
District	15,636	3,490	4.5	20,733	15,923	2.3
Total	16,127	3,531	4.6	22,993	16,071	2.4

Note: /1 Subsidy provided, /2 Irrigation systems in Ha Giang and Lao Cai are managed by districts and communes. /3 Estimated Source of the all the above tables : provincial departments and survey team

Remark: Provinces which have high figure of budget related to sub indicators have more capacity to implement O&M.

Reference: Execution Rate for O&M Cost for Provincial Road (2014)

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
O&M Budget (thousand VND)	22,725,000	40,360,000	22,956,094	5,296,000	18,542,785	26,065,250
Actual Expenditure for O&M (thousand VND)	22,714,000	40,356,000	22,949,401	5,294,495	18,537,433	26,065,250
Execution rate (%)	99.95	99.99	99.97	99.97	99.97	100.00

Irrigation Summary

Name of Province	Average O&M Cost+rehabili/ha	Score for Average O&M Cost/ha
Ha Giang	1.7	2
Lao Cai	3.4	6
Yen Bai	2.5	5
Dien Bien	2.3	3
Lai Chau	1.3	1
Son La	2.4	4

(3) Overall Score

Indicaor2.2.2

Name of Province	Total Score of (1) and (2)	Score 1-6
Ha Giang	8	2
Lao Cai	14	5
Yen Bai	15	6
Dien Bien	5	1
Lai Chau	11	4
Son La	9	3

Table Evaluation of O&M Status of SPL-VI Subprojects

A. Based of No. of Subprojects

1. Number of Subprojects

(Unit : No. of Subprojects)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total
Ha Giang	0	0	1	2	3
Lao Cai	0	1	2	1	4
Yen Bai	0	0	1	4	5
Dien Bien	0	0	3	5	8
Lai Chau	0	0	3	2	5
Son La	0	0	0	3	3
Total	0	1	10	17	28

2. Distribution of no. of Subprojects (%)

(Unit : %)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total
Ha Giang	0	0	33	67	100
Lao Cai	0	25	50	25	100
Yen Bai	0	0	20	80	100
Dien Bien	0	0	36	64	100
Lai Chau	0	0	60	40	100
Son La	0	0	0	100	100
Total	0	4	36	-	100

3. Scoring on No. of Subprojects

(Unit : Point) Indicator 2.2.3

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total	Final Score
Score	5	3	1	0		
Ha Giang	0	0	33	0	33	3
Lao Cai	0	75	50	0	125	6
Yen Bai	0	0	20	0	20	2
Dien Bien	0	0	36	0	36	4
Lai Chau	0	0	60	0	60	5
Son La	0	0	0	0	0	1

Lai Chau and Lao Cai are doing good.
Dien Bien moderate.
Ha Giang, Yen Ban, Son La are not good.

Source of all the above tables: SPL-VI and the survey team

Back data: O&M Status of SPL-VI Subprojects in Target Six Provinces

Province / Sector/ District	Name of Subproject	Scope	O&M		
			Staff / Organization	O&M Cost	Evaluation
Ha Giang					
Road/ Vi Xuyen	Ngoc Linh - Linh Ho Triway - Phu Linh Commune	<ul style="list-style-type: none"> Total length: 13.8 km Earthwork, drainage, retaining wall, 3 bridges (reinforced concrete slab, 18 m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Vi Xuyen DPC, Industry and Commerce Division (<u>1 head, 1 Deputy, and 4 technical, staff</u> for transport management). Implementation: Ngoc Linh, Linh Ho and Phu Linh Communes by budget of DPC 	<ul style="list-style-type: none"> <u>VND 7 million/km/year</u> 	<ul style="list-style-type: none"> Maintenance work by the communes is limited at cleaning of ditches and pipe culverts. The other works for resurfacing of pavement to be made by contractor. O&M cost is not sufficient : X
Road/ Quang Binh	Tien Yen - Huong Son - Yen Ha	<ul style="list-style-type: none"> Total length: 15.0 km Earthwork, drainage, BPM pavement 	<ul style="list-style-type: none"> Supervision: Quang Binh DPC, Industry and Commerce Division (<u>1 head, 1 Deputy, and 3 technical staff</u> for transport management) Implementation: Tien Yen, Huong Son and Yen Ha Communes by budget of DPC 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> Same as the above (not sufficient) : X
Road/ Dong Van	Ma Ho (Lung Tao) - Gi Thang (Ma Le) (New SP)	<ul style="list-style-type: none"> Total length: 7.7 km Earthwork, drainage, BPM pavement 	<ul style="list-style-type: none"> Supervision: Dong Van DPC, Industry and Commerce Division (<u>1 head, 1 deputy and 4 officers</u> for transport management). Implementation: contract with a contractor 	<ul style="list-style-type: none"> <u>VND 20 million/km/year</u> 	<ul style="list-style-type: none"> O&M cost is sufficient : C
Irrigation/ Vi Xuyen	Ban Tan Irrigation	<ul style="list-style-type: none"> Reservoir Dam : 120m, Weir: 18.6m, Main canal: 3,701m, Secondary canal: 1,609m Total service area: 156 ha 	<ul style="list-style-type: none"> Supervision: DPC of Vi Xuyen District Implementation: CPC of Trung Thanh commune No. of staff: 12 persons (3 are from Ban Tan village and 9 from Trung Thanh) 	<ul style="list-style-type: none"> <u>VND 49 million /year</u> (subsidy from PPC) The budget is for compensation of village O&M staff and for regular/routine maintenance and canal operations/water distribution 	<ul style="list-style-type: none"> O&M staff is well experienced. Training not required : B
Lao Cai					
Road/ Bac Ha	Improvement, Upgrading Province Road 153, Bac Ha - Lung Phing	<ul style="list-style-type: none"> Total length: 9.3 km Earthwork, drainage, retaining wall (120m in total), 1 bridge (reinforced concrete slab, 4m), BPM pavement 	<ul style="list-style-type: none"> Supervision: Lao Cai DOT Implementation: Lao Cai Road Management and Construction Co., Ltd. (1 Manager, 1 Technical Staff, 5 workers). 	<ul style="list-style-type: none"> VND 19 million/km/year 	<ul style="list-style-type: none"> O&M cost is sufficient : C

Province / Sector/ District	Name of Subproject	Scope	O&M		
			Staff / Organization	O&M Cost	Evaluation
Road/ Bat Sat	Improvement, Upgrading Y Ty - A Lu - A Mu Sung	<ul style="list-style-type: none"> Total length: 29.1 km Earthwork, drainage, retaining wall (300m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Lao Cai DOT Same as the above 	<ul style="list-style-type: none"> VND 19 million/km/year 	<ul style="list-style-type: none"> O&M cost is sufficient : C
Road/ Van Ban	Dan Thang - Nam Chay (New SP)	<ul style="list-style-type: none"> Total length: 10.4 km Earthwork, drainage, retaining wall (58m in total), Gravel surfacing 	<ul style="list-style-type: none"> Supervision: DPC (economic and infrastructure division) Implementation: contract with a contractor 	<ul style="list-style-type: none"> VND 8 million/km/year 	<ul style="list-style-type: none"> O&M cost is not sufficient : X
Water/ Bao Thang	Rehabilitation and expand water supply system for Pho Lu town	<ul style="list-style-type: none"> Capacity (New: 3,000 m³/day, Upgrade Existing: 1,200→2,000 m³/day), Water source: Red river, Sedimentation (800 m³), Filtration (132 m³), Reservoir tank (600 m³), Network (main only, 1.7 km), Beneficiary (19,900 persons). 	<ul style="list-style-type: none"> Name of O&M organization : <u>Lao Cai water supply company</u> Experience/ skill/ manpower: The Company has operated water supply system with 12 water treatment plants 	<ul style="list-style-type: none"> Water Tariff: VND 6,600 /m³ 	<ul style="list-style-type: none"> No technical issues : B
Yen Bai					
Road Tram Tau	Improving, Upgrading Tram Tau - Xa Ho	<ul style="list-style-type: none"> Total length: 12.5 km Earthwork, drainage, retaining wall (78m in total), cement concrete pavement/gravel surfacing 	<ul style="list-style-type: none"> Supervision: Tram Tau DPC, Economy and Infrastructure Division (1 Head, 1 Deputy, and 9 technical staff) Implementation: (no data) 	<ul style="list-style-type: none"> VND 0.3 million/km/year 	<ul style="list-style-type: none"> O&M cost is not sufficient : X
Road Tran Yen	Improving, Upgrading Quy Mong - Kien Thanh - Y Can	<ul style="list-style-type: none"> Total length: 24.5 km Earthwork, drainage, 3 bridges (reinforced concrete slab, 14 m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Tran Yen DPC Implementation: (no data) 	<ul style="list-style-type: none"> VND 9 million/km/year 	<ul style="list-style-type: none"> O&M cost is not sufficient : X
Road/ Yen Binh	National Road No.70 to Centre of Phu Thinh (New SP)	<ul style="list-style-type: none"> Total length: 3.6 km earthwork, drainage, BPM pavement 	<ul style="list-style-type: none"> Supervision: Yen Binh DPC Implementation: contract with a contractor 	<ul style="list-style-type: none"> VND 9 million/km/year 	<ul style="list-style-type: none"> O&M cost is not sufficient : X

Province / Sector/ District	Name of Subproject	Scope	O&M		
			Staff / Organization	O&M Cost	Evaluation
Road/ Van Yen	Tan Hop-Dai Son Road (Additional)	<ul style="list-style-type: none"> Total length: 13.3 km earthwork, drainage, 2-spillways, 2 bridges (reinforced concrete slab, 8 m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Van Yen DPC Implementation: contract with contractor(s) 	<ul style="list-style-type: none"> VND 2 million/km/year 	<ul style="list-style-type: none"> O&M cost is not sufficient : X
Irrigation Luc Yen	Tu Hieu Irrigation	<ul style="list-style-type: none"> Reservoir Dam : 428 m, Weir: 5 m, Main canal: 13,830m, Bridge: 42 m Total service area: 660 ha 	<ul style="list-style-type: none"> Supervision: DPC Implementation: CPC through the Irrigation Management Boards of 3 communes. The 3 boards were established in 2008 by the PPC. No. of staff: Total of 13 staffs for O&M (Irrigation Management Board members) 	<ul style="list-style-type: none"> VND 344 million /year (subsidy from PPC) This budget is for compensation of staffs and routine maintenance. Repairs are funded by budget support from PPC based on demand. 	<ul style="list-style-type: none"> The Irrigation Management Boards of the three communes need training on accounting and dam operations. (Training required) : C
Dien Bien					
Road Muong Cha	Ma Thi Ho - Cha To	<ul style="list-style-type: none"> Total length: 31.7 km earthwork, drainage, retaining wall (195m in total), gravel surfacing 	<ul style="list-style-type: none"> Supervision: Muong Cha DPC (via Industry & Commerce Division) Implementation: appoint to contractor 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> No data available (Maybe not sufficient) : X
Road Dien Bien	Na Tau - Pa Khoang	<ul style="list-style-type: none"> Total length: 14.0 km earthwork, drainage, retaining wall (65m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Dien Bien DPC, Industry and Commerce Division (1 Head, 2 Deputy Heads and 7 officers). Two are responsible Implementation: Contract with contractor(s) 	<ul style="list-style-type: none"> VND 15 million/km/year 	<ul style="list-style-type: none"> O&M cost is sufficient : C
Road Tuan Giao	Pieng Phi – Trai Phong and Rang Dong – Ta Ma (Pilot)	<ul style="list-style-type: none"> Total length: 22.5 km earthwork, drainage, gabion retaining wall (4 locations), 1 bridge (reinforced concrete slab, 3 m), BPM pavement 	<ul style="list-style-type: none"> Supervision: Tuan Giao DPC Implementation: Contract with a contractor 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> No data available (Maybe not sufficient) : X
Road Tuan Giao	Nam Din - Khun Tra (New SP)	<ul style="list-style-type: none"> Total length: 6.5 km earthwork, drainage, BPM pavement 	<ul style="list-style-type: none"> Supervision: Tuan Giao DPC Implementation: contract with a contractor 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> No data available (Maybe not sufficient) : X

Province / Sector/ District	Name of Subproject	Scope	O&M		
			Staff / Organization	O&M Cost	Evaluation
Water Dien Bien Dong	Dien Bien Dong water treatment plant	<ul style="list-style-type: none"> Capacity (1,500 m³/day), Water source: Dam reservoir La Co Phuong stream, Sedimentation (- m³), Filtration (- m²), Reservoir tank (100 m³), Network (5.0 km), Beneficiary (6,311 persons). 	<ul style="list-style-type: none"> Dien Bien Construction and Water Supply Company The company has experience in operating 6 water supply systems. This company was established in 1993. Eight staffs were trained and will be assigned for the O&M of the system. 	<ul style="list-style-type: none"> Water Tariff: VND 6,000 /m³ 	<ul style="list-style-type: none"> No technical issues were identified. : C
Water/ Tuan Giao	Domestics Water Supply For Nam Din village, Phinh Sang commune (Pilot)	<ul style="list-style-type: none"> Capacity (75 m³/day), Water source: Nam Din Spring, Sedimentation (47 m³), Filtration (20 m²), Reservoir tank (110 m³), Network (4.5 km), Beneficiary (550 persons). 	<ul style="list-style-type: none"> Dien Bien Irrigation Service and Construction One-member Limited Liability company Experience/ skill/ manpower: The company has experience in O&M of water supply system in other village.. 	<ul style="list-style-type: none"> Water Tariff: VND 5,000 /m³ 	<ul style="list-style-type: none"> No technical issues were identified. C
Irrigation Muong Nhe	Nam Po Irrigation	<ul style="list-style-type: none"> Weir: 26 m, Main canal: 6,126m, Secondary canal: 3,853 m, Access road: 3,874 m Total service area: 180 ha 	<ul style="list-style-type: none"> Dien Bien Irrigation Construction Joint Stock Company will manage eight schemes (two reservoirs and six weir systems including Nam Po subproject in Muong Nhe district) with a total service area of 1,179 ha. 60 staff in total. 30 O&M staff 	<ul style="list-style-type: none"> O&M subsidy will be provided by PPC (not yet arranged by O&M organization). 	<ul style="list-style-type: none"> The resettled households need training on land leveling/paddy development, irrigated crop production and O&M of the facilities. (Training required) : X
Irrigation Tuan Giao	Nam Mu Pump Irrigation (Pilot)	<ul style="list-style-type: none"> Hydro-driven new pump system for irrigation and rural water supply (2 sites). Weir for each pump (2 nos., each 5 m high), hydraulic turbine pump (2 sets), Feeder canal (2.3 km), Main canal (2.2 km), Secondary canal 0.6 km, no on-farm development. Service area: 68 ha 	<ul style="list-style-type: none"> Dien Bien Irrigation Services and Construction One-member Limited Liability Company at Tuan Giao town. The company is managing 17 schemes with total service area of 1,826 ha in four districts, namely: Tuan Giao, Muong Ang, Tua Chua and Muong Cha. 72 staff in total. 40 staff for irrigation service 	<ul style="list-style-type: none"> For CY 2013, the company's approved budget for irrigation service is VND 1,771 million wherein VND 1,472 million is budget for salary and VND 299 million is for minor repairs. This amount does not include budget for Nam Mu Irrigation Subproject. 	<ul style="list-style-type: none"> The irrigation service staff are well experienced and don't need training Farmers need training on irrigated crop production and paddy development The construction was completed in 2014, but the facilities are not functional (damaged main canal by gully. No on-farm facilities and terracing, etc.). (Many technical issues and no O&M plan and activities) ; X

Province / Sector/ District	Name of Subproject	Scope	O&M		
			Staff / Organization	O&M Cost	Evaluation
Lai Chau					
Road Sin Ho, Phong Tho	Pa Tan - Huoi Luong - Pa Nam Cum	<ul style="list-style-type: none"> Total length: 24.3 km earthwork, drainage, retaining wall (1 location), BPM pavement 	<ul style="list-style-type: none"> Supervision: Tam Duong DPC (through Industry and Commerce Division: 2 Managers, 4 technical staff) and Phong Tho DPC Implementation: (no data) 	<ul style="list-style-type: none"> VND 20 million/km/year 	<ul style="list-style-type: none"> O&M cost is sufficient : C
Road Tam Duong, Phong Tho	Then Sin - Muong So	<ul style="list-style-type: none"> Total length: 16.7 km earthwork, drainage, 2 bridges (reinforced concrete girder, 123 m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Tam Duong DPC (through Industry and Commerce Division: 2 Managers, 4 Technical Staff) and Phong Tho DPC Implementation: contract with a contractor 	<ul style="list-style-type: none"> VND 20 million/km/year 	<ul style="list-style-type: none"> O&M cost is sufficient : C
Road Tam Duong	Traffic Road for Life Activities in San Thang - Dong Pao	<ul style="list-style-type: none"> Total length: 18.3 km earthwork, drainage, retaining wall (115m in total), 3 bridges (reinforced concrete girder, 54 m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Lai Chau DOT Implementation: contract with a contractor 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> No data available (Maybe not sufficient) : X
Road Tam Duong	Ban Giang commune - Nung Giang commune (New SP)	<ul style="list-style-type: none"> Total length: 11.7 km earthwork, drainage, retaining walls (30m in total), gravel surfacing 	<ul style="list-style-type: none"> Supervision: Tam Duong DPC (through Industry and Commerce Division: 2 Managers, 4 Technical Staff) Implementation: appoint to contractor 	<ul style="list-style-type: none"> VND 20 million/km/year 	<ul style="list-style-type: none"> O&M cost is sufficient : C
Water Muong Te	Water supply system for Muong Te town	<ul style="list-style-type: none"> Capacity (1,000 m³/day), Water source: Huoi Sang stream, Sedimentation (370 m³), Filtration (110 m²), Reservoir tank (400 m³), Network (11.3 km), Beneficiary (10,200 household). 	<ul style="list-style-type: none"> Muong Te Hydropower Company will be O&M in charge because the Provincial Water Supply Company does not have the office in Muong Te. Experience/ skill/ manpower: The Hydropower company has experience ,but no experience in water treatment. 3 technicians with experience in water treatment will be hired. 	<ul style="list-style-type: none"> Water Tariff: VND 5,000 /m³ 	<ul style="list-style-type: none"> O&M training for the Company and assistance from the provincial water supply company are necessary. (Training required) : X

Province / Sector/ District	Name of Subproject	Scope	O&M		
			Staff / Organization	O&M Cost	Evaluation
Son La					
Road Moc Chau	Tan Xuan - Muong Lat	<ul style="list-style-type: none"> Total length: 10.8 km earthwork, drainage, retaining walls (166m in total), 2 bridges (reinforced concrete girder, 66m in total), BPM pavement 	<ul style="list-style-type: none"> Supervision: Transfer to DOT (after completion, the road section will be upgraded to Provincial Road) Implementation: direct appointment to local contractor 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> No data available (Maybe not sufficient) : X
Road/ Mai Son	Ta Hoc - Ban Kieng	<ul style="list-style-type: none"> Total length: 22.1 km earthwork, drainage, earth shaping 	<ul style="list-style-type: none"> Supervision: Mai Son DPC via Infrastructure & Economy Division (1 Head, 2 Deputies, 7 staff including 3 officers in chart of road and transportation) Implementation: direct appointment to local contractors 	<ul style="list-style-type: none"> No data (PO did not provide data) 	<ul style="list-style-type: none"> No data available (Maybe not sufficient) : X
Water Song Ma	Water supply System for Chieng Khuong cluster communes	<ul style="list-style-type: none"> Capacity (2,400 m³/day), Water source: Intake from the Le stream and pump up, Sedimentation (240 m³), Filtration (17.4 m²), Reservoir tank (500 m³), Network (56.7 km), Beneficiary (10,924 persons) 	<ul style="list-style-type: none"> Centre for Rural Clean Water and Environment Sanitation under DARD. Experience/ skill/ manpower: PO has 22 staffs to manage 7 water supply systems for 11 years. 5 skilled/trained staffs are assigned for the O&M of the system. 	<ul style="list-style-type: none"> Water Tariff: VND 6,100 /m³ 	<ul style="list-style-type: none"> The construction was completed in Oct. 2013. Intake canal and sedimentation basin were totally buried by sand and mud. In the raining season, function of raw water intake, water treatment and clean water supply are not be made. In 2014, PO constructed the temporary intake made by gabions. PO planned raw water intake from the Huu Nghi irrigation canal , but no funds were prepared. (Facilities' defect affects O&M) : X

Note : Evaluation of O&M status : A: Excellent, B: Good, C: Fair, X: Not good

Remark: Electricity sub project, 1 in Lao Cai, 1 in Lai Chau and 1 in Son La are not included in the table, and excluded also from the evaluation. Because they are managed uniformly by EVN (the nationwide company) with collected electricity charge.

Source: SPL-VI

Table Evaluation of Implementation Performance of SPL-VI Subprojects

A. Based of No. of Subprojects

1. Number of Subprojects (Unit : No. of Subprojects)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total
Ha Giang	1	0	1	2	4
Lao Cai	1	1	1	2	5
Yen Bai	0	0	0	5	5
Dien Bien	1	1	4	2	8
Lai Chau	0	0	2	4	6
Son La	0	1	2	1	4
Total	3	3	10	16	32

2. Distribution of no. of Subprojects (%) (Unit : %)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total
Ha Giang	25	0	25	50	100
Lao Cai	20	20	20	40	100
Yen Bai	0	0	0	100	100
Dien Bien	13	13	48	25	100
Lai Chau	0	0	33	67	100
Son La	0	25	50	25	100
Total	9	9	31	-	100

3. Scoring on No. of Subprojects (Unit : Point)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total	Final Score
Score	5	3	1	0		
Ha Giang	125	0	25	0	150	4
Lao Cai	100	60	20	0	180	6
Yen Bai	0	0	0	0	0	1
Dien Bien	65	39	48	0	152	5
Lai Chau	0	0	33	0	33	2
Son La	0	75	50	0	125	3

B. Based on Construction Cost

1. Construction Cost (Unit : VND Million)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total
Ha Giang	14,702	0	36,151	71,800	122,653
Lao Cai	39,417	18,378	32,404	90,691	180,890
Yen Bai	0	0	0	179,654	179,654
Dien Bien	22,293	18,453	148,791	136,049	325,586
Lai Chau	0	0	96,531	224,416	320,947
Son La	0	18,388	49,528	49,931	117,847
Total	76,412	55,219	363,405	752,541	1,247,577

2. Distribution (%) of Construction Cost (Unit : %)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total
Ha Giang	12	0	29	59	100
Lao Cai	22	10	18	50	100
Yen Bai	0	0	0	100	100
Dien Bien	7	6	46	42	100
Lai Chau	0	0	30	70	100
Son La	0	16	42	42	100
Total	6	4	29	61	100

3. Scoring on Construction Cost (Unit : Point)

Province	Excellent (A)	Good (B)	Fair (C)	Not Good (X)	Total	Final Score
Score	5	3	1	0		
Ha Giang	60	-	29	0	89	3
Lao Cai	110	30	18	0	158	6
Yen Bai	0	0	0	0	0	1
Dien Bien	35	18	46	0	99	5
Lai Chau	0	0	30	0	30	2
Son La	0	48	42	0	90	4

2.3.1

Source of all the above tables: JICA Survey Team

Conclusion:

The result of A is taken (because score difference between Ha Giang and Son La in A is larger than B)

Table Evaluation of SPL-VI Subproject Implementation, Six Provinces

Serial No. of Subproject	Province	District	Subproject Name	PO	Construction Progress (%) (as of Nov.'15)	Financial Status			Construction Status		Overall Evaluation By Subproject	Project Cost (VND Million)	Construction Cost (VND Million)	
						Construction cost increase between appraisal time and present	Gap between construction progress and local disbursement	Delay of land acquisition: Time lag between started date of construction and completion date of land compensation	Time lag between planned date of construction completion and actual date of construction completion					
Ha Giang	12-R_2	Vi Xuyen	Ngoc Linh - Linh Ho Triway - Phu Linh Commune Road	Ha Giang DOT	Construction progress (91%)	O 22%	Gap 33	X Physical 91	Local Dis. 58	X more than 3 years delayed	X still ongoing (more than 3 years delayed)	X	36,567	24,057
	12-R_3	Quang Binh	Tien Yen - Huong Son - Yen Ha Road	Quang Binh DPC	Completed in May '12	X 49%	Gap -	O Physical 100	Local Dis. 100	X one year delayed	O On schedule	C	41,931	36,151
	12-R_52	Dong Van	Ma Xo, Lung Tao commune - Gi Thang, Ma Le commune road	Dong Van DPC	Construction progress (81 %)	X 48%	Gap 23	O Physical 81	Local Dis. 58	X 8 months delayed	X 12 months delayed	X	54,162	47,743
	12-I_1	Vi Xuyen	Ban Tan Irrigation Subproject	DPC	Completed in Oct' 11	O 10%	Gap -	O Physical 100	Local Dis. 100	O On schedule	O 2 months delayed	A	16,578	14,702
Lao Cai	16-R_10	Bac Ha	Improvement, Upgrading Province Road 153, Bac Ha - Lung Phing Road	Lao Cai DOT	Completed in May '13	X 97%	Gap -	O Physical 100	Local Dis. 100	X 2 years and 6 months delayed	X 12 months delayed	X	69,791	56,268
	16-R_11	Bat Sat	Improvement, Upgrading Y Ty - A Lu - A Mu Sung Road	Lao Cai DOT	Completed in May '12	O 2%	Gap -	O Physical 100	Local Dis. 100	O On schedule	O On schedule	A	50,744	39,417
	16-R_56	Van Ban	Dan Thang - Nam Chay inter-commune road	Van Ban DPC	Completed in Apr' 15	O 17%	Gap 100	X Physical 100	Local Dis. 0	X 9 months delayed	X 13 months delayed	X	40,756	34,423
	16-W_1	Bao Thang	Rehabilitation and expand water supply system for Pho Lu town	PWSC	Completed in Oct' 13	O 21%	Gap 34	X Physical 100	Local Dis. 66	O On schedule	X 11 months delayed	C	35,527	32,404
	16-E_4	Bac Ha	Electricity supply system in Coc Ly commune, Bac Ha district.	DOIT	Completed in Feb' 12	O 18%	Gap 3	O Physical 100	Local Dis. 97	X 7 months delayed	O 2 months delayed	B	22,534	18,378
Yen Bai	17-R_12	Tram Tau	Improving, Upgrading Tram Tau - Xa Ho Road.	Tram Tau DPC	Construction progress (95%)	X 43%	Gap 7	O Physical 95	Local Dis. 88	X one year delayed	X still ongoing (3years delayed)	X	51,041	43,348
	17-R_13	Tran Yen	Improving, Upgrading Quy Mong - Kien Thanh - Y Can Road	Tran Yen DPC	Construction progress (97%)	X 52%	Gap 8	O Physical 97	Local Dis. 89	X 1 year and 8 months delayed	X still ongoing (almost 3 years delayed)	X	55,675	48,788
	17-R_57	Yen Binh	Road connect National Road No.70 to center of Phu Think commune	Yen Binh DPC	Construction progress (67 %)	Almost no cost change between appraisal time and actual	In 2012 Gap 51	X Physical 87	Local Dis. 36	X 25 months delayed	X 20 months delayed	X / I	33,587	21,438
	17-R_81	Van Yen	Tan Hop-Dai Son Road (Lang Vau village, Tan Hop Da Dung commune)	Van Yen DPC	Construction progress (67 %)	O 17%	Gap 67	X Physical 67	Local Dis. 0	X 10 months delayed	O 9 months delayed	X / I	48,180	41,528
	17-I_4	Luc Yen	Tu Hieu Irrigation Subproject	DPC	Completed in Aug' 15	X 49%	In 2012 Gap 51	X Physical 87	Local Dis. 36	O On schedule	X 38 months delayed	X / I	28,995	24,552
Dien Bien	23-R_18	Muong Cha	Ma Thi Ho - Cha To Road.	Muong Cha DPC	Completed in Nov '11	X 41%	Gap -	O Physical 100	Local Dis. 100	X 1 year delayed	O On schedule	C	66,395	60,861
	23-R_19	Dien Bien	Na Tau - Pa Khoang Road.	Dien Bien DPC	Completed in Feb' 14	O 17%	Gap -	O Physical 100	Local Dis. 100	X 2 years and 6 months delayed	X 2 years delayed	C	42,250	35,455
	23-R_P1	Tuan Giao	Rehabilitation and construction of Pieng Phi - Tram Phong and Rang Dong - Ta Ma road	Tuan Giao DPC	Construction progress (95%)	O 21%	Gap 10	O Physical 95	Local Dis. 85	X almost 2 years delayed	X still ongoing (almost 3 years delayed)	X / I	97,070	82,420
	23-R_61	Tuan Giao	Nam Din - Khun Tra Road	Tuan Giao DPC	Completed in May' 15	Almost no cost change between appraisal time and actual	Gap 100	X Physical 100	Local Dis. 0	X 27 months delayed	O 2 months delayed	C	30,566	23,168
	23-W_6	Dien Bien Dong	Dien Bien Dong water treatment plant	PWSC	Completed in May' 13	X 85%	Gap -	O Physical 100	Local Dis. 100	X 10 months delayed	O 5 months delayed	C	35,830	29,307
	23-W_P	Tuan Giao	Domestic Water Supply For Nam Din village, Phinh Sang commune	DPC	Completed in Jul' 11	O 0%	Gap -	O Physical 100	Local Dis. 100	O On schedule	O On schedule	A	27,000	22,293
	23-I_9	Muong Nhe	Nam Po Irrigation Subproject	DARD	Completed in Jun' 12	O 2%	Gap -	O Physical 100	Local Dis. 100	X 7 months delayed	O 4 months delayed	B	22,052	18,453
23-L_P1	Tuan Giao	Nam Mu Pump Irrigatin Subproject	DPC	Completed in Dec' 14	O 0%	Gap 2	O Physical 100	Local Dis. 98	X 12 months delayed	X 25 months delayed	X / I	59,771	53,629	
Lai Chau	24-R_20	Sin Ho Phong Tho	Improvement, Upgrading Pa Tan - Huoi Luong - Pa Nam Cum Road.	Phong Tho DPC	Completed in Oct' 13	X 34%	Gap 7	O Physical 100	Local Dis. 93	O 6 months delayed	X 17 months delayed	C	78,067	67,221
	24-R_21	Tam Duong, Phong Tho	Improvement, Upgrading Then Sin - Muong So Road.	Tam Duong DPC	Completed in Sep '14	X 68%	Gap 10	O Physical 100	Local Dis. 90	X 1 year delayed	X 3 years delayed	X	136,800	102,020
	24-R_22	Tam Duong	Traffic Road for Life Activities in San Thang - Dong Pao	Lai Chau DOT	Completed in Oct' 13	O 10%	Gap 30	O Physical 100	Local Dis. 70	X 3 years delayed	X 17 months delayed	C	39,000	29,310
	24-R_62	Tam Duong	Ban Giang commune - Nung Giang commune road	Tam Duong DPC	Construction progress (49 %)	Almost no cost change between appraisal time and actual	Gap -2	O Physical 49	Local Dis. 51	X 22 months delayed	X 18 months delayed	X / I	30,000	24,258
	24-W_8	Muong Te	Water supply system for Muong Te town	DPC	Completed in Sep' 13	X 30%	Gap -	O Physical 100	Local Dis. 100	X 15 months delayed	X 17 months delayed	X	21,455	18,016
	24-E_5	Phong Tho Tam Duong	Electricity supply system for communes in Phong Tho, Tam Duong district.	DOIT	Completed in Sep' 13	O 9%	Gap -	O Physical 100	Local Dis. 100	X 15 months delayed	X 21 months delayed	X / I	86,826	80,122
Son La	25-R_23	Moc Chau	Tan Xuan - Muong Lat Road	Moc Chau DPC	Construction progress (94%)	X 81%	Gap 10	O Physical 94	Local Dis. 84	X 1 years and 6 months delayed	X still ongoing (more than 3 years delayed)	X	63,170	49,931
	25-R_24	Mai Son	Ta Hoc - Ban Kieng Road	Mai Son DPC	Completed in Dec '11	X 42%	Gap -	O Physical 100	Local Dis. 100	X almost 2 years delayed	O 2 months delayed	C	36,807	31,140
	25-W_9	Song Ma	Water supply System for Chieng Khuong cluster communes	Water Supply Centre	Completed in Oct' 13	X 41%	Gap -	O Physical 100	Local Dis. 100	O On schedule	X 16 months delayed	C	24,217	18,388
	25-E_6	Sop Cop	Electrification for hamlets in Pung Banh commune, Sop Cop district.	EPC (Son La Power Company)	Completed in Jul' 11	O 0%	Gap -	O Physical 100	Local Dis. 100	X 12 months delayed	O 1 months delayed	B	24,217	18,388

Source: SPL-VI

Note : Excellent A Fit four evaluation factors
 Good B Fit three evaluation factors
 Fair C Fit two evaluation factors
 No good X Fit one evaluation factor or zero

1/: Sub projects of which construction progress as of Nov.15 is below 70%, and of which delay of construction period is more than 20 months are categorized as "No good"

Item	Evaluation Factor	O	X
Cost Estimate	Construction cost increase between appraisal time and present	less than 30 %	more than 30 %
Local budget for	Gap between construction progress and local disbursement at present	less than 30 %	more than 30 %
Land compensation	Completion date from the construction initiation	less than 6 months delayed	more than 6 months delayed
Construction	Target completion date of construction and actual	less than 9 months delayed	more than 9 months delayed

Table Progress evaluation for ADB Sustainable Rural Infrastructure Development

As of the end of 2014 except for	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
1 No. of PPMU staff	5	7	10	8	10	8
2 No. of Subprojects	3	3	4	4	5	5
<i>No. of Subprojects/staff</i>	<i>0.6</i>	<i>0.4</i>	<i>0.4</i>	<i>0.5</i>	<i>0.5</i>	<i>0.6</i>
3 Planned amount of ADB loan (mil. VND)	79,337	116,896	152,231	125,206	203,880	189,844
<i>Loan amount/staff</i>	<i>15,867</i>	<i>16,699</i>	<i>15,223</i>	<i>15,651</i>	<i>20,388</i>	<i>23,731</i>
4 Planned amount of CP fund (mil. VND)	22,716	39,701	45,386	42,933	78,445	56,791
5 Progress of contract awarding score (1~6)	45.8 1.0	99.5 6.0	82.8 4.0	85.2 5.0	51.3 2.0	68.5 3.0
6 Progress of disbursement for ADB loan (%) score (1~6)	2.5 1.0	25.5 3.0	42.4 5.0	48.1 6.0	13.5 2.0	32.9 4.0
7 Progress of disbursement for CP fund (%) score (1~6)	40.5 3.0	44.2 4.0	60.7 6.0	46.0 5.0	38.4 2.0	34.2 1.0
8 Delays due to the reasons of CP funding, land acquisition and resettlement (month) score (1~6)	11 1.0	4 2.0	0 5.0	2 3.0	0 5.0	1 4.0
Total score	6.0	15.0	20.0	19.0	11.0	12.0
Raw Final Score	1	4	6	5	2	3
Factor of adjustment by sub project number/staff (DB=1)	1.0	0.7	0.7	0.8	0.8	1.0
Factor of adjustment by loan amount/staff (DB=1)	1.0	1.1	1.0	1.0	1.3	1.5
Adjusted total score	6.0	11.3	12.8	15.6	11.8	18.7
Adjusted Final Score 2.3.2	1	2	4	5	3	6

Source: 1. from respective PPMU
2.~8. from ADB report.

Lao Cai, Lai Chau and Son La are good in progress as a whole.
Yen Bai has big loan amount/staff, therefore adjusted score becomes

3. Agriculture Development

Table Extension Expenditure (actual) in the year 2014

Province	Dien Bien	Son La*	Lao Cai*	Lai Chau	Ha Giang	Yen Bai
Province Extension Expenditure (mill.VND)	2,793.1	28,418.0	27,893.0	2,707.7	5,809.0	4,160.0
<i>(USD equivalent, 1USD=23,000 VND)</i>	<i>121,439</i>	<i>1,235,565</i>	<i>1,212,739</i>	<i>117,726</i>	<i>252,565</i>	<i>180,870</i>
<i>Annual current expenditure (Mill. VND)</i>	1,641.0	20,165.0	24,022.0	1,492.0	1,350.0	2,927.0
<i>Extension activities (Mill. VND)</i>	1,152.1	8,253.0	3,871.0	1,215.7	4,459.0	1,233.0
Sample District	Muong Cha	Mai Son*	Bat Xat*	Than Uyen	Bac Quang	Luc Yen
District E. expenditure (mill. VND)	1,138.9	2,937.6	3,398.0	2,166.4	1,312.0	2,039.0
<i>Annual current expenditure (Mill. VND)</i>	603.3	2,481.3	3,233.0	819.6	1,042.0	1,638.0
<i>Extension activities (Mill. VND)</i>	535.6	456.3	165.0	450.0	270.0	401.0

Source: Province extension budget form Province Agriculture Extension Center

District extension budget from District Agriculture Extension Station except Maison which was given from Province AEC.

Remarks:

*: Province extension budget of Son La and Lao Cai includes the extension budget of all districts. Budget of Mai Son and Bat Xat districts is included in the provinces budget respectively. Extension budget of province and district of the other 4 provinces are mutually exclusive (each represents each level)

Table Estimated Extension Budget for Comparison among 6 Provinces (excluding recurrent budget)

Province	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
No. of district in province	10	12	9	8	11	9
Extension activities (Mill. VND): all districts	5,356	-	-	3,600	2,970	3,609
Extension activities (Mill. VND): province as a whole	6,508	8,253	3,871	4,816	7,429	4,842
Total number of extension workers at prov., dist., and comm.*	337	518	224	192	472	253
Expenditure E. activities / total E. worker (1000 VND)	19,312	15,932	17,281	25,082	15,739	19,139
Score (1~6)	5	2	3	6	1	4
No.of farmer in province (labor in rural)**	250,177	637,530	327,955	203,259	434,049	407,981
Expenditure E. activities / rural work force in province (1000 VND)	26.0	12.9	11.8	23.7	17.1	11.9
Score (1~6)	6	3	1	5	4	2
Total Score	11.0	5.0	4.0	11.0	5.0	6.0
Final score for this indicator (1~6) 3.1.1	5	2	1	5	2	4

Source: Survey Team, *number of extension workers from Extension related institutions of each province, **: rural work force from Province Statics Book 2014

Remarks:

To compare the all expenditures of extension activities among 6 provinces, province-level activities expenditure is calculated as below:

- Expenditure of Son La and Lao Cai is based on the Province budget provided.

- Expenditure of the other 4 provinces are culcultated by adding the province budget and estimated budget of all districts calculated based on the sample district data.

It is noted that technically advanced provinces might use their extension budget efficiently and effectively with private investment.

Table Extension Staff in the year 2014

Province	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
No. E. staff prov.	21	22	27	32	18	28
No. E. staff dis.	87	125	45	52	87	45
No. E. staff com.	229	371	152	108	367	180
No. of farmer in province (labor in rural)	250,177	637,530	327,955	203,259	434,049	407,981
No. of farmer/1 extention commune worker	1,092	1,718	2,158	1,882	1,183	2,267
Score rank (1~6) 3.1.2	6.0	4.0	2.0	3.0	5.0	1.0
<i>Reference: Sample District</i>	<i>Muong Cha</i>	<i>Mai Son</i>	<i>Bat Xat</i>	<i>Than Uyen</i>	<i>Bac Quang</i>	<i>Luc Yen</i>
<i>No. staff in E. Station</i>	11	12	6	7	12	6
<i>No. Commune</i>	12	22	23	7	23	24
<i>No. Commune E. Worker</i>	12	38	23	12	45	24

Source: No. of extension staff from Province Extension Agriculture Extension Center

No. of rural labor force aged 15 and by residence from Province Statics Book 2014 as a proxy of farmers

Remarks: it is assumed that provinces with less farmers/E. commune worker are given high scores.

However, it is also noted that private sector can also have extention function, and there is tendency that advanced province may have less extension staff.

Table Availability of Crop Manual

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Availability	Available	Available	Available	Available	Available	Available
Guideline manual	NORRD guidelines/ manuals	Brochure, Power point	Brochure, Power point	Brochure, Power point	Book, Brochure, Power point	Brochure, Power point
[Rank]	B	A	B	C	A	B
Score (6, 4, 1) 3.1.3	4	6	4	1	6	4

Source: Survey Team based on the interview and materials shown with AECs of the provinces

Remark

- Better preparation of manual is given higher scores because of high capacity of extension activity.

Table Expert Judgement on Extension Abilities/Capacity

	Dien Bien	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Extension Worker's field visit	1~2 times /week	4~5 times /week	4~5 times /week	4~5 times /week	4~5 times /week	4~5 times /week
Implementing pilot farms		Active Temporary pilot worker employed	Active	Positive effective implementation	Positive effective implementation	Collaboration with the private company
Hamlet extension assistant	Some hamlets (30A program)	1,700 personnel	0	Some hamlets (30A program)	1,967 personnel	0
Employment of Extension Workers	One year contract	Nearly permanet	Nearly permanet	Nearly permanet	Nearly permanet	Nearly permanet
Support from D.B.	—	No need	No need	No need	No need	No need
Others		Coordination with Tay Bac Univ.			Agriculture fund for farmer	Using mass media for extension
[Rank]	C	A	A	B	A	A
Score (3 categories, 6,4,1)	1	6	6	4	6	6

<- 3.1.4

Source: Survey Team based on the interview and materials shown with AECs of the provinces

Remark

- More capable the extension activities are, more score such provinces are given, because more active dissemination activities are expected by higher capacity.

Table Area, Production and Yield of Paddy Rice, Maize and Soybeans in 6 Province to see achievement

Indicator		DB		SL		Lao Cai		Lai Chau		HG		YB		
		Drv season	Rain season	Drv season	Rain season	Dry season	Rain season	Drv season	Rain season	Drv season	Rain season	Drv season	Rain season	
Paddy rice (excluding upland paddy)	2012	Area(ha)	8,169	16,316	10,097	17,559	9,761	19,873	5,670	18,547	9,907	26,499	18,229	22,243
		Production(ton)	48,049	80,147	60,177	79,545	54,767	88,526	30,430	83,300	52,427	148,291	98,392	99,298
		Yield(ton/ha)	5.88	4.91	5.96	4.53	5.61	4.45	5.37	4.49	5.29	5.60	5.40	4.46
	2013	Area(ha)	8,263	16,598	11,147	18,037	9,781	20,441	6,068	19,553	9,713	26,894	18,711	21,798
		Production(ton)	45,490	82,061	67,094	80,637	55,048	92,419	32,250	87,950	54,210	151,007	100,892	97,619
		Yield(ton/ha)	5.51	4.94	6.02	4.47	5.63	4.52	5.32	4.50	5.58	5.62	5.39	4.48
	2014	Area(ha)	8,476	16,928	11,410	18,177	9,880	20,395	6,223	19,565	9,481	27,162	19,036	21,884
		Production(ton)	51,285	85,254	68,522	80,792	54,753	93,079	33,850	88,440	52,949	153,359	101,026	101,376
		Yield(ton/ha)	6.05	5.04	6.01	4.45	5.54	4.56	5.44	4.52	5.58	5.65	5.31	4.63
Maize	2012	Area(ha)		29,246		133,713		33,659		21,410		52,509		24,660
		Production(ton)		71,624		524,747		115,603		57,980		168,706		75,455
		Yield(ton/ha)		2.45		3.92		3.44		2.71		3.21		3.06
	2013	Area(ha)		29,328		162,789		34,658		21,150		52,607		26,713
		Production(ton)		74,216		654,639		122,223		57,340		176,864		84,462
		Yield(ton/ha)		2.53		4.02		3.53		2.71		3.36		3.16
	2014	Area(ha)		29,929		162,961		39,132		22,150		54,215		28,471
		Production(ton)		76,101		661,812		117,702		62,130		178,428		83,612
		Yield(ton/ha)		2.54		4.06		3.01		2.81		3.29		2.94
Soybeans	2012	Area(ha)		6,573		3,595		4,940		2,485		22,125		901
		Production(ton)		8,810		4,700		5,213		2,387		25,786		1,091
		Yield(ton/ha)		1.34		1.31		1.10		0.96		1.17		1.21
	2013	Area(ha)		5,449		2,663		4,903		2,380		22,860		527
		Production(ton)		7,236		3,451		5,248		2,226		28,786		646
		Yield(ton/ha)		1.33		1.30		1.10		0.94		1.26		1.23
	2014	Area(ha)		5,543		2,213		4,881		2,491		23,758		334
		Production(ton)		7,234		2,796		5,323		2,730		30,482		409
		Yield(ton/ha)		1.30		1.26		1.09		1.10		1.28		1.19

Source:

- : Provincial statistic book 2014, 2013, 2012
- : Calculating by production divide Area
- : DARD activities report 2012, 2013, 2014

Three years increment (%) of yields and cultivated area; and their ranking

		Dien Bien	Son La	Lao Cai	Lai Chau	Ha Gaing	Yen Bai	
yield	Dry season paddy	3%	1%	-1%	1%	6%	-2%	
	Score (1~4)	3	2	1	2	4	1	
	Maize	4%	3%	-12%	4%	3%	-4%	
	Score (1~4)	4	3	1	4	3	1	
	Soybean	-3%	-4%	-1%	14%	10%	-2%	
	Score (1,3)	1	1	1	3	3	1	
	Total score	8	6	3	9	10	3	
	Final score (1~6)	4	3	1	5	6	1	<- 3.2.1
cultivated area	Dry season paddy	4%	13%	1%	10%	-4%	4%	
	Score (1~4)	3	4	2	4	1	3	
	Maize	2%	22%	16%	3%	3%	15%	
	Score (1,3)	1	3	3	1	1	3	
	Soybean	-16%	-38%	-1%	0%	7%	-63%	
	Score (0,2)	0	0	0	0	2	0	
	Total score	4	7	5	5	4	6	
	Final score (1~6)	1	6	3	3	1	5	<- 3.2.2

Source: Survey Team

Remarks:

- Dry season paddy is a proxy of irrigated paddy.

***Attachment I-6.1.1
Result of survey in Dien Bien province on
agriculture extension of NORRD project***

ATTACHMENT I-6.1.1 RESULT OF SURVEY IN DIEN BIEN PROVINCE ON AGRICULTURE EXTENSION OF NORRD PROJECT

I-1. Study and Analysis on Extension Possibility in Dien Bien Province

JICA's "Northwest Region Rural Development Project in Vietnam" (NORRD) was implemented in Dien Bien Province for five years, from August 2010 to July 2015. Three Districts namely Dien Bien, Muong Cha, Tuan Giao were selected as pilot districts. The Survey team conducted sample interview survey of local farmers and agricultural extension workers in six communes where pilots were implemented (Thanh Huong, Noong Het, Muong Tung, Ma Thi Ho, Quai Cang, Muong Mun) as well as six non pilot communes in the pilot District (Thanh Luong, Than Xuong, Na Sang, Huoi Leng, Quai To, Quai Nua) and three communes in non-pilot District (Muong Luang, Muong Nhe, Muong Bang) where pilots were not implemented.

Interview findings and related data collected by the District Agricultural Extension Station as well as the Province Agricultural Extension Center are shown in order to analyze the extension results and the possibility of the dissemination of the Guidelines/Manual formulated by NORRD in Dien Bien Province.

The Guideline/Manual was formulated in cooperation of NORRD and Dien Bien DARD, the pilot districts, and the pilot communes. The Guideline/Manual consists of the outputs obtained through the activities of verification farms and trainings on the issues such as yield increase, optimization of fertilization, pest control, and production cost reduction of target crops namely paddy rice, maize and soybeans. The Guideline/Manual contains explanations and many charts on cultivation and extension techniques. It is expected to be widely utilized by those who work in the agricultural field to contribute to better agricultural extension.

I-1.1 Results and Analysis of Interview Survey on Local Farmers

The interview targets intended around 15 local farmers under the pilot communes as well as around 10 local farmers in non-pilot communes of the pilot districts and non-pilot districts. And also agricultural extension workers assigned to each commune were interviewed based on the questionnaire. The actual number of the farmers interviewed were shown in the tables below.

Table I-1.1-1 No. of Sample Farmers for Interview Survey in Dien Bien Province

DPC/CPC	Total no. of farmers		No. of farmers/crop		
			Paddy	Maize	Soybean
I. Dien Bien DPC	Subtotal	48			
1. Pilot (Thanh Huong CPC)	14				
- Team 10		14	14		
2. Pilot (Noong Het CPC)	14				
-Team 18		9	9		
-Team 19		5		5	
3. Non-pilot (Thanh Luong CPC)	10				
- Team 11		10	4	6	
4. Non-pilot (Thanh Xuong CPC)	10				
- C9A		10	6	4	
II. Dien Bien Dong DPC	Subtotal	11			
Non-pilot (Muong Luan CPC)	11				
- Muong Luan 1		11	6	5	
III. Muong Cha DPC	Subtotal	50			
1. Pilot (Muong Tung CPC)	16				
- Pomcai		16	16		
2. Pilot (Ma Thi Ho CPC)	15				
- Ho Chim 2		15	15		
3. Non-pilot (Na Sang CPC)	11				
- Hin 1		11	2	1	
4. Non-pilot (Huoi Leng CPC)	8				
- Huoi Toong		8	1	2	
IV. Muong Nhe DPC	Subtotal	6			

Non-pilot (Muong Nhe CPC)	6				
- Muong Nhe		6	5	1	
V. Tuan Giao DPC	Subtotal 49				
1. Pilot (Quai Cang CPC)	15				
- Cuong		10		10	6
- Sang		5	5		
2. Pilot (Muong Mun CPC)	14				
- Muong 1		14	10	4	1
3. Non Pilot (Quai To CPC)	10				
- Ta		10	10		
4. Non-pilot (Quai Nua)	10				
- Long Hong		10		9	1
Tua Chua DPC	Subtotal 10				
Non-pilot (Muong Bang)	10		6	4	1
-		10			
Total	174		109	51	9

Source: The Survey Team

I-1.1.1 Pilot Hamlet Farmers

The pilot farms were implemented in eight pilot hamlets located in six commune (Thanh Huong, Noong Het, Muong Tung, Ma Thi Ho, Quai Cang, Muong Mun) under the three pilot districts (Dien Bien, Muong Cha, Tuan Giao). The table below contains target crops, cultivated areas and target farmers. Paddy rice in four hamlets is cultivated twice a year. Due to lack of water during the dry season, paddy rice is cultivated twice a year in 60% area in Sang Hamlet, and only once cropping in Ho Chim 2 Hamlet.

Table I-1.1-2 Extension Target of NORRD Project in Pilot Hamlets

District			Dien Bien			Muong Cha		Tuan Giao		
Commune			Thanh Hung	Noong Het		Muong Tung	Ma Thi Ho	Quai Cang		Muong Mun
Hamlet			Team10	Team18	Team19	Pom Cai	Ho Chim2	Sang	Cuong	Muong 1
Target crop			Paddy Rice	Paddy Rice	Maize	Paddy Rice	Paddy Rice	Paddy Rice	Maize Soybean	P. Rice Maize Soybean
Target area (ha)	Paddy rice	SA ¹⁾	21.4	16.8		15.8	46.0	20.6		15.8
		W ²⁾	21.4	16.8		15.8	4.0	13.0		15.8
	Maize	SA			5.5				12.0	4.0
		S ³⁾			5.5					
Soy beans	SA							12.4	0.5	
	S									
No. of target farmers			70	80	58	67	111	88	61 50	85 60 55
Are/farmer (ha)			0.305	0.210	0.09	0.235	0.414	0.234	0.196 0.248	0.185 0.066 0.009

¹⁾SA: Summer-autumn cropping, ²⁾W: Winter-spring cropping, ³⁾S: Spring cropping

Source: JICA Survey Team

(1) Effectiveness and Sustainability of NORRD Project Extension Activities

All pilot hamlet farmers positively evaluated NORRD's recommended techniques as "very helpful" or "helpful," and most of the farmers stated that they would continue to implement the techniques taught. On the other hand, due to economic and other reasons, there were some farmers in Tuan Giao that declined to answer the questions.

Table I-1.1-3 Evaluation and continuity of the recommended techniques

Distric		Dien Bien		Muong Cha		Tuan Giao	
Commune		Thanh Huong	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
No.of farmers		14	14	16	15	15	14
Evaluation (No. of farmers)	Very useful	6	9	10	9	12	11
	Useful	8	5	6	3	3	3
	Not useful	0	0	0	0	0	0
Continuity (No.of farmers)	Continuous	14	14	16	12	5	10
	Not continuous	0	0	0	0	0	0

Source: JICA Survey Team

The recommended techniques that the farmers adopted include field preparation, seed treatment, direct stripe seeding, fertilization, and pest control. These techniques have led to the reduction of production costs, reduction of agricultural labour, improvement of crop quality and increase of yield and production.

Table I-1.1-4 Adopted Techniques and Its effectiveness

	Paddy rice	Maize	Soybeans
Adopted techniques	Land preparation and puddling, Seed treatment, Direct stripe seeding, Fertilization, Pest control	Land preparation, Direct stripe seeding, Fertilization, Pest control	Direct stripe seeding, Plant distance, Fertilization, Pest control
Effectiveness of adopted techniques	Insects decrease, Good growth of rice plants, Reduction of production cost (seeds, fertilizers, chemicals), Reduction of farming load, Improvement of rice quality, Production increase	Reduction of production cost (seeds, fertilizers), Increase of yield and production	Production increase, Reduction of production cost (seeds, fertilizers)

Source: JICA Survey Team

(2) Evaluation of Paddy Rice Cultivation

Below is the comparison of the paddy rice cropping before and after the NORRD Project implementation.

- 1) Variety: Main varieties were Bac Thom So 7, Te Rau, BC 15, IR64, and local variety, showing no changes before and after the Project implementation.
- 2) Seed selection by salt water: Seed selection by salt water before sowing has the effect of removing immature and empty seeds and increasing the germination rate. Most farms (80 to 100%) now use seed selection by salt water.
- 3) Seed volume: Since the high seeding density practices had resulted in low yield and low quality, proper seed volume was recommended. As a result, seed weight of from 20 to 49% was reduced. We have contributed to the reduction of production costs.
- 4) Sowing: Direct stripe seeding has some advantages better than broadcasting in the point of seed volume reduced, easy working, good plant growth. No. of farmers who changed to stripe seeding in all pilot Communes increased. Transplanting is conducted among some farmers in Muong Cha.
- 5) Weeding frequency was slightly decreased from 1.6~2.0times to 1.3~1.9 times.
- 6) Fertilization frequency was slightly increased 0.9~2.9 times to 2.4~3.0 times. Farmers who had applied small quantity of fertilizers before increased its fertilization.
- 7) Chemical spray frequency was slightly increased from 2.0~4.0 times to 2.8~4.4 times. Farmers who had applied small quantity of chemical before increased its spraying.

8) Effect of chemical: Rate of farmers, who recognized the good effect of spray, was improved from 38~67 % to 60~100%.

9) Yield was increased from 3.27~5.28t/ha to 3.93~6.22t/ha.

10) No. of farmers who sold products was slightly increased and their selling income was also increased at 30~45 %.

11) Paddy rice winter-spring cropping: Yield was clearly increased from 3.1~5.1 t/ha to 4.51~6.72 t/ha.

Table I-1.1-5 Paddy Rice for Summer-Autumn Cropping before and after NORRD Project

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Huong		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun	
No. of farmers		14		9		16		15		5		10	
NORRD		Bef.	Aft.	B	A	B	A	B	A	B	A	B	A
Area/farmer	ha	0.28	0.28	0.26	0.26	0.17	0.17	0.64	0.64	0.15	0.15	0.12	0.12
	Min~Max	0.08~0.5		0.1~0.35		0.027~0.4		0.2~0.9		0.05~0.25		0.035~0.2	
Variety		Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7	Bac thom so 7
				Local	Local	Terau	Terau	Local	Local	Local	Local	Local	Local
						BC15	BC15	IR64	IR64	IR64	IR64	IR64	IR64
Seed production	% of farmers	-	-	-	-	56	50	47	40	60	60	80	80
Seed selection by salt water	% of farmers	7	100	11	100	62	81	60	100	80	100	70	100
Seed volume	kg/ha	102	74	119	61	94	75	77	59	96	58	89	61
Direct stripe seeding	% of farmers	0	14	0	56	6	25	0	13	0	60	10	50
Broadcasting sowing	% of farmers	100	86	100	44	69	50	60	40	100	40	80	20
Transplanting	% of farmers	0	0	0	0	25	25	40	47	0	0	10	0
Replanting	Frequency	1	1	1	1	1	1	0.9	0.8	1	1	1	1
Weeding	Frequency	1.7	1.4	1.6	1.3	1.8	1.6	1.7	1.9	1.8	1.8	2.0	1.4
Fertilization	Frequency	2.9	3.0	2.9	2.9	2.3	3.0	0.9	2.4	1.7	2.7	1.3	2.8
Organic fertilizer use	% of farmers	43	50	44	56	69	56	7	13	0	0	50	70
Chemical application	Frequency	4.0	4.4	2.8	3.7	3.2	3.0	2.2	4.1	2.0	2.8	3.6	3.4
Good effect of spray	% of farmers	50	64	67	100	38	63	47	60	40	80	40	80
Yield	t/ha	4.19	5.21	5.28	6.22	4.24	5.19	3.27	3.93	3.73	5.0	4.45	5.90
Selling of product	% of farmers	64	79	78	78	38	44	40	40	0	0	0	10
Income/selling farmer	1000 VND	2,455	3,193	2,703	3,609	796	1,156	1,581	2,253	0	0	0	130

Source: JICA Survey Team

Table I-1.1-6 Paddy Rice for Winter-Spring Cropping

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Huong		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun	
NORRD		B	A	B	A	B	A	B	A	B	A	B	A
Area	ha	0.24	0.24	0.26	0.26	0.15	0.15	0.24	0.24	0.12	0.12	0.12	0.12
Yield	t/ha	4.40	5.15	5.11	6.72	3.94	5.23	3.14	4.51	3.88	5.08	4.92	6.65
Selling of product	% of farmers	29	29	89	89	25	25	20	20	0	0	0	0
Selling income/farmer	1000 VND	3,650	4,350	4,287	5,476	700	1,050	4,708	5,203	0	0	0	0

Source: JICA Survey Team

(3) Evaluation of Maize Cultivation

Below is the comparison of the maize cropping before and after implementation of the NORRD Project.

- 1) Variety: Most of varieties were F1 hybrids of LVN10, LVN85, NK99, NK54, DK8 and some local varieties. Varieties were not changed before and after NORRD Project.
- 2) Volume of seeds was decreased. 32% of seeds were decreased in Noong Het.
- 3) Sowing method: 75~80% of farmers who used broadcasting method in Quai Cang and Muong Mun adopted stripe seeding.
- 4) Weeding frequency was 1.7 ~1.8 times as the same before and after NORRD.
- 5) Fertilization frequency was increased from 0.6~2.0 times to 2.2~2.4 times. Farmers, who applied small quantity of fertilizers before, understood the effect of fertilization, so that they applied more quantity of fertilizers.
- 7) Chemical application frequency was slightly increased. Farmers, who applied less chemical before, increased because of understanding the chemical effect. Farmers who applied much chemical before decreased their frequency.
- 8) Effect of chemical: % of farmers who recognized the good effect of spray was generally increased. 60% of farmers in Noong Het recognized the good effect. In other communities, 25~30% of farmers recognized the good effect.
- 9) Yield was clearly increased from 2.65~4.40 t/ha to 3.50~6.66 t/ha.
- 10) Rate of farmers who sold products was increased from 40% to 60% and the selling income was also improved in Noong Het. There were no farmers who sold products in other communes, because of small cultivated area, less production and using products for livestock feeds.

Table I-1.1-7 Maize cultivation before and after NORRD Project

District		Dien Bien		Tuan Giao			
Commune		Noong Het		Quai Cang		Muong Mun	
No. of farmers		5		10		4	
NORRD		B	A	B	A	B	A
Area	ha	0.22	0.22	0.14	0.15	0.11	0.11
	Min~max	0.1~0.39		0.07~0.2		0.07~0.15	
Variety		LVN10 (F1)	LVN10(F1)	LVN10(F1)	LVN10(F1)	LVN10(F1)	LVN10(F1)
		LVN858(F1)	LVN858(F1)	NK99 (F1)	NK99(F1)	838	838
				NK54(F1)	NK54(F1)	DK8(F1)	DK8(F1)
				Local	Local	NK54(F1)	NK54(F1)
Seed production	% of farmers	0	0	0	0	0	0
Seed Volume	kg/ha	34	23	30	22	27	26

Direct stripe seeding	% of farmers	60	60	0	80	0	75
Weeding	Frequency	1.8	1.8	1.7	1.7	1.8	1.8
Fertilization	Frequency	2.0	2.4	0.6	2.2	1.0	2.3
Organic fertilizer use	% of farmers	20	20	10	20	0	0
Chemical application	Frequency	2.3	2.7	1.7	2.2	1	2
Good effect of spray	% of farmers	40	60	20	30	13	25
Yield	t/ha	4.4	6.7	2.7	3.7	3.4	3.5
Selling of product	% of farmers	40	60	0	0	0	0
Income/selling farmer	1000 VND	1,625	2,000	0	0	0	0

Source: JICA Survey Team

(4) Evaluation of soybeans cultivation

- 1) Variety was DT84 as the same before and after NORRD Project implementation.
- 2) Seed volume was decreased by 34%.
- 3) 100% of farmers who used broadcasting method changed to strip seeding.
- 4) Weeding frequency was 1.7 ~1.8 times as the same before and after NORRD.
- 5) All farmers who had not used fertilizer changed to apply it. Because they understood the effect of fertilizers.
- 6) Frequency of chemical spray was increased from 1.3 times to 2.1 times.
- 7) No. of farmers who recognized the effect of chemical spray was increased.
- 8) Yield was clearly increased from 0.97 t/ha to 1.52 t/ha.
- 9) All farmers sold products and their selling income was increased by 56 %.
- 10) Farmer in Muong Mun cultivated soybeans at first time after the NORRD Project. Though he didn't use fertilizer, chemical and weeding, he obtained the yield 1.7t/ha by the adoption of NORRD recommended the seed volume and sowing method.

Table I-1.1-8 Soybeans Cultivation before and after NORRD Project

District		Tuan Giao			
Commune		Quai Cang		Muong Mun	
No. of farmers		6		1	
NORRD		B	A	B	A
Area	ha	0.15	0.15	0	0.04
	Min~Max	0.07~0.15			
Variety		DT84	DT84	DT84	DT84
Seed production	% of farmers	67	0	0	0
Seed volume	kg/ha	100.33	66.67	0	60
Direct stripe seeding	% of farmers	0	100	0	100
Weeding	Frequency	1.7	1.8	0	0
Fertilization	Frequency	0	1.8	0	0
Organic fertilizer use	% of farmers	0	0	0	0
Chemical application	Frequency	1.3	2.1	0	0
Good effect of spray	% of farmers	33	50	0	0
Yield	t/ha	0.97	1.52	0	1.7
Selling of product	% of farmers	100	100	0	0
Income/selling farmer	1000 VND	3,116	4,516	0	0

Source: JICA Survey Team

(5) Cultivation Techniques which Farmers Want to Acquire More

Farmers improved their conventional techniques and increased yield. And furthermore they want to acquire the cultivation techniques more as the table below states.

Table I-1.1-9 Cultivation Techniques which Farmers Need More

	Paddy rice	Maize	Soybeans
Cultivation techniques	Land preparation, Seed treatment, Stripe seeding, Cultivation techniques in different plant growth stages, Water management, Diagnosis and control of insects and diseases, Weeding	Seeding, Basic cultivation techniques in different plant growth stages, Method of fertilizer reduction, Pest control, Harvesting	Cultivation techniques in different plant growth stages, Pest control, Fertilization, Harvesting

Source: JICA Survey Team

(6) Evaluation of NORRD Project Extension Activities by the Pilot Hamlet Farmers

1) Evaluation of NORRD Project extension activities by pilot farmers

Pilot hamlet farmers were satisfied with access to pilot farm, contents of trials, contents of training and extension worker's visit to farmer's fields. No. of farmers which was small before NORRD means that pilot farm and training had not been implemented.

Table I-1.1-10 Evaluation of NORRD Project Extension Activities

District		Dien Bien				Muong Cha				Tuan Giao				
Commune		Thanh Huong		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun		
No. of Farmers		14		14		16		15		15		14		
NORRD		B	A	B	A	B	A	B	A	B	A	B	A	
Pilot farm	Access	A	0	1	0	3	2	8	1	6	0	3	0	5
		B	0	10	2	11	0	2	1	1	1	8	1	2
		C	0	0	0	0	1	1	0	2	0	0	0	4
	Content of verification trials	A	0	2	0	1	1	8	0	7	1	5	0	10
		B	0	9	1	13	1	6	1	3	1	8	4	1
		C	0	0	0	0	1	0	0	0	0	0	0	1
Training	Content of training	A	0	3	0	7	0	6	0	6	0	7	0	11
		B	0	11	3	6	4	8	1	4	3	5	4	3
		C	0	0	0	0	3	0	0	0	0	0	0	0
	Training materials	A	0	0	0	7	2	11	0	5	0	3	0	9
		B	0	12	0	7	5	2	1	4	2	7	4	3
		C	0	0	0	0	1	0	0	0	0	0	0	1
Extension worker's visit to the farmer		A	0	1	2	5	2	6	3	5	0	4	1	8
		B	0	8	4	9	1	2	4	5	3	3	3	1
		C	0	0	1	0	6	0	0	0	0	0	0	0

*A: Very useful B: Useful C: Not useful

Source: JICA Survey Team

2) Pilot hamlet farmers were involved in the NORRD extension activities.

3) 69~100% of farmers visited pilot farm. However, in Ma Thi Ho only 36% of farmers visited pilot farm due to only one paddy rice cropping yearly in this area, and different characteristics of ethnic group of Mong (they prefer upland crops).

4) Participating in training was increased from 0~1 to 3.8~4.8 times. Farmers commented that it was difficult to understand the training contents first, but they could understand it gradually.

5) 60~80% of farmers used the training materials for farming, except Quai Cang farmers (33 % of farmers).

6) 53~93 % of farmers transferred the acquired techniques to other farmers such stripe seeding, fertilization, plant distance, pest control, etc. In Muong Nun there was low rate at 21 %.

Table I-1.1-11 Participating in the Extension Activities Before and After NORRD Project

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Huong		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun	
No. of Farmers		14		14		16		15		15		14	
NORRD		B	A	B	A	B	A	B	A	B	A	B	A
Visiting pilot farm	% of farmers	0	79	14	100	19	69	13	36	1	80	7	79
Frequency of participating in training		0	4.4	0.4	4.5	1.0	4.8	0.3	3.5	0.6	3.8	0.5	4.0
Use of training material for farming	% of farmers	86		64		81		60		33		86	
Technical transfer to other farmers	% of farmers	64		93		69		53		53		21	

Source: JICA Survey Team

I-1.1.2 Farmers in Non-Pilot Communes

The sample interview survey was conducted in the six communes (Thanh Luon, Than Xuong, Na Sang, Huoi Leng, Quai To, Quai Nua) of the three pilot districts and in the three communes (Muong Luang, Muong Nhe, Muong Bang) of the three non-pilot districts.

(1) Paddy Rice Cultivation

Below is the comparison of the paddy rice cropping between non-pilot farmers and NORRD pilot farmers.

- 1) Main varieties were Bac Thom 7, IR 64 and local variety, mostly the same as the pilot farmers.
- 2) Seed selection by salt water was conducted by 80% of farmers in the communes of Dien Bien and Tua Chua District and in the other communes there was at 33~67%, lower than the pilots.
- 3) All farmers used broadcasting seeding in Muong Cha and the others used stripe seeding or transplanting. Especially, in Dien Bien Don and Muong Nhe 80 % of farmers used transplanting.
- 4) 80~100 % of farmers produced seeds by themselves, which is higher rate than pilot farms. However, continuous self-produced seeds cause low quality and low yield.
- 5) Fertilization frequency was generally less than that of pilot farmers. 50% of farmers in Dien Bien Don didn't apply fertilizer. Of course, less fertilizer results in low yield.
- 6) Chemical spray frequency was almost the same as the pilot farmers, except less spray frequency in Muong Cha and Tuan Giao. Regarding the effect of chemical spray, 50 ~ 100% of farmers recognized it.
- 7) Yield was generally low at 2.83~4.7 t/ha except 6.10 t/ha in Dien Bien. Paddy rice in the communes of Dien Bien is cultivated in the flat and irrigated field which are closed to the pilot commune of NORRD Project.
- 8) 30 % of farmers in Dien Bien sold products. Other farmers used products for self-consumption.
- 9) Current situation of paddy rice cultivation techniques of non-pilot farmers is the same as that of the pilot farmers before the NORRD Project.

Table I-1.1-12 Paddy Rice Cultivation in Non-Pilot Communes

District		Pilot District			Non-pilot District		
		Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Commune		Thanh Luong Thanh Xuong	Na Sang Huoi Leng	Quai To	Muong Luang	Muong Nhe	Muong Bang
No. of farmers		10	3	10	6	5	6
Area	ha	0.16	0.13	0.15	0.307	0.226	0.303
Variety		Bac thom 7	Bac thom 7 IR64 Local var.	Bac thom 7 IR64	Bac thom7 IR64	Bac thom7 IR64	IR64; Nyhihuong 2308 (F1)
Seed Production	% of farmers	100	100	90	83	80	83
Seed selection by salt water	% of farmers	80	67	50	33	60	83
Seed Volume	kg/ha	62	70	83	97	96	130
Direct broadcasting	% of farmers	0	100	0	0	0	0
Direct stripe seeding	% of farmers	40	0	100	17	20	67
Regular transplanting	% of farmers	60	0	0	83	80	33
Replanting	Frequency	1	0.3	0.8	0.8	0.4	0.2
Frequency of weeding	Frequency	1.7	2.7	2.3	0.83	2	1.5
Frequency of fertilization	Frequency	3.1	0.3	2.0	0.83	1.6	3
Non-fertilization	% of farmers	0	0	0	50	0	0
Organic fertilizer use	% of farmers	60	33	70	0	60	17
Chemical spray	Frequency	3.8	1	1.57	3.3	2.8	3.8
Good effect of spray	% of farmers	90	50	85	67	100	50
Yield	t/ha	6.10	3.83	4.7	4.67	4.2	2.83
Product selling	% of farmers	30	0	10	0	0	0
Income/selling farmer	1000 VND	7,000	0	700	0	0	0

Source: JICA Survey Team

Table I-1.1-13 Paddy Rice Winter-Spring Cropping in Non-Pilot Communes

District		Pilot District			Non-pilot District		
		Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Commune		Thanh Luong Thanh Xuong	Na Sang Huoi Leng	Quai To	Muong Luang	Muong Nhe	Muong Bang

No. of farmers		10	0	10	6	5	6
Area	ha	0.16	0	0.15	0.22	0.18	0.17
Yield	t/ha	6.40	0	5.10	5.2	4.0	5.17
Product selling	% of farmers	30	0	0	0	0	17
Selling income/farmer	1000 VND	3,100	0	0	0	0	5,000

Source: JICA Survey Team

(2) Maize Cultivation

- 1) Main varieties were F1 hybrid LVN10, NK54, NK339, MX6 as same as those of pilot farmers.
- 2) Seed volume was 20~38kg/ha as same as that of pilot farmers, except 100kg/ha in one commune.
- 3) Direct stripe seeding was conducted in Dien Bien Don, Muong Nhe and Tua Chua, and in the other communes direct broadcasting was used.
- 4) 50~100% of farmers in the non-pilot districts didn't apply fertilizer.
- 5) Most of the farmers in the non-pilot districts didn't apply any chemicals.
- 6) Yield was 5.5 t/ha in Dien Bien and these farmers applied weeding, fertilization and chemical spray more than the others. Farmers, who didn't apply fertilizer and chemical, obtained low yield. Exceptionally the yield in Dien Bien Don was high due to fertile soil probably.
- 7) Farmers who had high yield and high production sold the products to the market.
- 8) Current situation of maize cultivation techniques of non-pilot farmers is the same as that of the pilot farmers before NORRD Project, except interviewed farmers in Dien Bien and Dien Bien Don.

Table I-1.1-14 Maize Cultivation in Non-Pilot Commune

District	Pilot District			Non-pilot District			
	Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua	
Commune	Thanh Luong Thanh Xuong	Na Sang Huoi Leng	Quai Nua	Muong Luang	Muong Nhe	Muong Bang	
No. of farmers	10	3	9	5	1	4	
Area	ha	0.08	0.08	0.35	1.62	0.5	0.93
Variety	MX6 (F1) NK339 (F1)	LVN10 (F1)	NK54 (F1)	LVN10 (F1)	LVN10 (F1)	LVN10 (F1)	
Seed Production	% of farmers	0	0	11	0	0	25
Seed Volume	kg/ha	28	20	19	26	100	38
Direct broadcasting	% of farmers	0	67	44	100	0	0
Direct stripe seeding	% of farmers	100	33	56	0	100	100
Weeding	Frequency	2.0	1.7	1.7	1.0	2.0	1.5
Fertilization	Frequency	2.4	0.7	1.6	0	0	0.5
Non-fertilization	% of farmers	0	33	0	100	100	50
Organic fertilizer use	% of farmers	40	0	0	0	0	0
Chemical spray	Frequency	3.2	0.7	1	0	0	1
Good effect of	% of	40	33	11	0	0	0

District		Pilot District			Non-pilot District		
		Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Commune		Thanh Luong Thanh Xuong	Na Sang Huoi Leng	Quai Nua	Muong Luang	Muong Nhe	Muong Bang
No. of farmers		10	3	9	5	1	4
spray	farmers						
Yield	t/ha	5.5	2.3	2.45	5.20	1.00	3.25
Product selling	%of farmers	60	0	44	100	0	25
Income/selling farmer	1000 VND	660	0	1,600	28,644	0	4,200

Source: JICA Survey Team

(3) Soybeans Cultivation

- 1) Variety DT84 was the same as that of NORRD Project.
- 2) Direct stripe seeding was practiced with the same volume of seeds as NORRD Project.
- 3) There is one farmer, out of two, who didn't apply fertilizer and chemical.
- 4) Both farmers sold the products. One farmer had low yield 0.4 t/ha, but he had much production due to the wide area of farm.
- 5) Current situation of soybeans cultivation techniques of non-pilot farmers is the same as that of the pilot farmers before NORRD Project, except an interviewed Tua Chua farmer.

Table I-1.1-15 Soybeans Cultivation in Non-Pilot Commune

District		Pilot District		Non-pilot District	
		Tuan Giao	Quai Nua	Tua Chua	Muong Bang
Commune		Quai Nua		Muong Bang	
No. of farmers		1		1	
Area	ha	0.3		0.1	
Variety		DT 84		DT84	
Seed volume	kg/ha	75		70	
Direct stripe seeding	%of farmers	100		100	
Seed Production	%of farmers	100		0	
Weeding	Frequency	2		1	
Fertilization	Frequency	2		0	
Non-fertilization	%of farmers	0		100	
Organic fertilizer use	%of farmers	0		0	
Chemical spray	Frequency	0.5		0	
Effect of chemical spray	%of farmers	0		0	
Yield	t/ha	0.40		2.00	
Selling of products	%of farmers	100		100	
Income/selling farmer	1000 VND	2,760		2,700	

Source: JICA Survey Team

(4) Cultivation Techniques which Farmers Want to Acquire

Farmers want to acquire more cultivation techniques listed in the table below.

Table I-1.1-16 Cultivation Techniques which non pilot farmers want to improve

	Paddy rice	Maize	Soybeans
Cultivation techniques	Diagnosis and control of insects and diseases	Direct stripe seeding Method of fertilizer application	Cultivation techniques Pest control

	Method of fertilizer application Cultivation techniques	Diagnosis and control of insects and diseases Cultivation techniques for yield increase Weeding	Fertilization Harvesting
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Source: JICA Survey Team

(5) Evaluation of Extension Activities by the Non-pilot Farmers

1) Non-pilot farmer's involving with the extension activities

Visit to pilot farms (here pilot farms mean that past farms which are different from NORRD pilot farms): 70% of farmers in Muong Nhe and Muong Bang had visited pilot farms. On the other hand, in Muong Cha and Dien Bien Don pilot farms had seldom been implemented.

2) Frequency of participating in training was 0.8~2.2 times, less than the pilot famers.

3) 5~50% of farmers in non-pilot communes transferred their cultivation techniques to other farmers such fertilization, pest control, land preparation, etc.

4) The participating in extension activities of non-pilot farmers is not so active in comparison with the pilot-farmers. That implicates farmers have less opportunity to learn improved techniques for farming.

Table I-1.1-17 Participating in the Extension Activities

District		Pilot District			Non-pilot District		
		Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Commune		Thanh Luong Thanh Xuong	Na Sang Huoi Leng	Quai To Quai Nua	Muong Luang	Muong Nhe	Muong Bang
No. of farmers		20	19	21	11	6	10
Visiting pilot farm	%of farmers	55	16	43	9	67	70
Frequency of participating in training	Frequency	2.2	1.6	1.5	0.8	1	1.8
Use of training material for farming	%of farmers	55	16	43	9	67	70
Technical transfer to other farmers	%of farmers	45	5	33	9	33	50

Source: JICA Survey Team

(6) Recognition of NORRD Project

All non-pilot farmers didn't recognize NORRD Project. However, farmers are interested in the recommended techniques of NORRD Project when the team explained, and they are expecting the extension activities.

I-1.2 Results and Analysis of Questionnaire for Extension Workers in Communes

I-1.2.1 Pilot Commune in Pilot District

Interview survey for extension workers was conducted in six communes (Thanh Huang, Noong Het, Muong Tung, Ma Thi Ho, Quai Cang, Muong Mun) of three pilot districts (Dien Bien, Muong Cha, Tuan Giao where NORRD Project was implemented).

(1) Production of Major Crops

Two cropping of paddy rice cultivated yearly in Dien Bien District is high yield due to good irrigation facilities and wide farm area. Paddy rice in Ma Thi Ho Commune is cultivated only once during rainy season due to incomplete irrigation facility.

Total area of maize cultivation is the largest in Muong Tung and Muong Mun Commune, but the yield of maize is higher in Dien Bien.

Total area of soybeans cultivation is the largest in Muong Cha followed by Tuan Giao District.

Table I-1.2-1 Production of Major Crops in Pilot Commune

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Hung		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun	
Target Crop for NORRD		Paddy rice		Paddy rice Maize		Paddy rice		Paddy rice		Paddy rice Maize Soybeans		Paddy rice Maize Soybeans	
		Dry	Rain	D	R	D	R	D	R	D	R	D	R
Paddy rice	Area(ha)	275	280	331	392	86	97	10	144	154	245	89	123
	Production(t)	1,870	1,824	2,360	2,499	361	368	44	614	930	1,198	548	616
	Yield(t/ha)	6.80	6.50	7.13	7.02	4.2	3.8	4.4	4.45	6.0	4.8	6.1	4.9
Maize	Area(ha)	148		75		302		129		130		580	
	Production(t)	722		370		545		238		351		1,566	
	Yield(t/ha)	4.9		4.9		1.8		1.8		2.7		2.7	
Soy beans	Area(ha)	21		6		24	210	5		52		30	
	Production(t)	37		10		45	294	1		68		39	
	Yield(t/ha)	1.8		1.6		1.8	1.4	0.2		1.3		1.3	

Source: Extension Workers and Commune Office

(2) Extension System of Pilot Commune

The table below shows the outline of extension workers.

- Two extension workers are assigned in one commune except one extension worker in Noong Het.
- They don't have extension budget.
- No. of farm household which one extension worker handles are different depending on communes. Distance to the farmer's field is also different (2~30km).

Table I-1.2-2 Outline of Extension in Pilot Commune

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
No. of Hamlet	21	27	15	12	24	18
No. of extension worker	2	1	2	2	2	2
Area of 3 crops ¹⁾ (ha)	724	804	719	288	581	822
Area of 3 crops(ha)/E. W.	362	804	359	144	290	411
No. of farm household	1,675	2,079	771	682	1,581	1,078
No. of farm h.h. /E. W.	837	2,079	385	341	790	539
Extension budget (VND)	0	0	0	0	0	0
Distance to the farmer	~ 2 km	~ 3.5 km	~ 30 km	~ 4 km	~ 2.5 km	~ 18 km
Participating in training ²⁾	2 times/year	4times/year	0	participating	2times/year	2~3times/year

1) Paddy rice, maize and soybeans

2) Training for extension workers

Source: Extension workers

(3) Effect of NORRD Project

Farmers adopted the recommended techniques such seed treatment, variety, seeding method, fertilization, pest control, seeder, etc.

The effects of adopting the recommended techniques were yield increased, production cost reduced, field work reduced, income increased. These answers are the same as pilot farmers.

Table I-1.2-3 Adopted Techniques to Farmers and its Effects

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Adopted techniques to farmers	[Paddy rice] Land preparation Seed treatment Hand seeder Fertilization Pest control	[Paddy rice] Cultivation techniques [Maize] Cultivation techniques	[Paddy rice] New variety New techniques	[Paddy rice] Cultivation techniques Sowing Fertilization Pest control	[Paddy rice] Land preparation Variety Seed treatment Sowing Fertilization Plant distance [Maize] Stripe seeding Plant distance Fertilization [Soybeans] Stripe seeding	[Paddy rice] Land preparation Seed treatment Hand seeder Stripe seeding [Maize] Variety Seeding [Soybeans] Seeding
Effects of adopted techniques	Yield increase Sales increase Income increase		Production cost reduced Yield increase	Urea reduce Seeds reduced Farming load reduced Yield increase	Yield increase Production cost reduced Bigger maize grains Sales increase Yield increase	Yield increase Seeds reduced Sales increase Farming load reduced Soybean area increase
	Techniques adopted to 555 ha	100% of pilot Hamlet farmers adopted.	100% of target farmers adopted.	100% of pilot Hamlet farmers adopted.	77 % of pilot Hamlet farmers adopted.	Most of paddy rice area adopted in pilot Hamlet. 100% of maize and soybean farmers participating in training.

Source: The Survey Team

(4) Sustainability and Issues of NORRD Recommended Techniques

All extension workers answered that farmers adopting the recommended techniques will continue to use them. Because the recommended techniques are basic, easy and low cost.

However, extension workers of two communes in Tua Chua concern about the sustainability of NORRD outputs for some poor farmers because they lack of farming fund. And some ethnic group farmers need more consideration in extension for e.g. different languages.

Cultivation techniques are no problems for the sustainability.

Table I-1.2-4 Sustainability and Issues of NORRD Recommended Techniques

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Sustainability	Sustainable	Sustainable	Sustainable	Sustainable	Sustainable	Sustainable

Issues	•Difficulty of seed sprouting treatment for hand seeder	•Pest control •Environmental pollution of excess chemical spray • Small area of one paddy field	-	-	•Some poor farmers and ethnic minority need more consideration for technical continuation.	•Some farmers are difficult to prepare funds for farming.
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Source: The Survey Team

(5) Extension Activities before and after NORRD Project

Frequency of training and no. of farmers participating and frequency of field visit were increased after NORRD Project implementation. These increases were due to the support of NORRD Project.

Female farmers attended the training more than men both before and after NORRD, because women have more responsibility in the farming than men.

Table I-1.2-5 Farmers Training and Farmer Visit Before and After NORRD Project

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Hung		Noong Het		Muong Tung		Ma Thi Ho		Quai Cang		Muong Mun	
NORRD		Bef	Aft	B	A	B	A	B	A	B	A	B	A
Training	Frequency	2 /crop season	6 / crop season	2 / crop season	6 / crop season	—	—	0	3 /year	0	2 /year	0	2 /year
	No. of farmer	35	50~60	30~40	30~40	Target farmer 80%	Target farmer 85%	0	Target farmer 100%	0	Target farmer 80%	0	Target farmer 85%
	Sex ratio ¹⁾	4 : 6	4 : 6	3 : 7	3 : 7	4 : 6	4 : 6	5 : 5	5 : 5	4 : 6	4 : 6	3 : 7	3 : 7
Frequency of visit to farmers		0.5 /week	1 /week	1 /month	4 /month	—	2 /week	1~2 /month	3~4 /month		1 /week		1 /week

¹⁾male :female

Source: The Survey Team

(6) Dissemination of NORRD Outputs to Other Hamlet Farmers

Some farmers of non-pilot hamlet attended the farmers training implemented in the pilot farms. These farmers, who acquired the recommended techniques in the training, introduced it to the other hamlet farmers.

Extension workers also implemented the training in non pilot hamlets to disseminate the recommended techniques to the farmers. Already some non-pilot farmers are using these techniques.

The Guideline/Manual was evaluated very good by all extension workers. Some extension workers are already using the Guideline/Manual for extension activities.

Table I-1.2-6 Evaluation of Guidelines/Manuals by Extension Workers

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Hung	Noong Het	Muong Tung	Ma Thi Ho	Quai Cang	Muong Mun
Participation of other farmers in NORRD training	Participated	Participated	(No comment) ¹⁾	Participated	Participated	Participated
Dissemination of NORRD techniques to other Hamlets	Disseminated	Disseminated	(No comment)	Disseminated	Disseminated	Disseminated
Comment on Guideline/ Manual	• Unnecessary of modification	• Use for extension activity	(No comment)	• Easy to understand • Unnecessary	• Good for extension activity	• Always keeping for extension

	• Use for extension activity			of modification	• Unnecessary of improvement • Use for training	activity • Useful for farmer's question • Unnecessary of modification
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¹⁾The extension worker has employed below one year.

Source: The Survey Team

(7) Problem and Issues in Extension Expansion

- Extension workers don't receive the extension activity budget which causes restriction of the extension activities. So the activity area becomes small and the training to farmers becomes meeting styles. (all communes)
- Access to the farmer's field during the rainy season is difficult due to bad road condition. (Muong Cha, Tuan Giao)
- It's difficult for poor farmers to adopt the costly techniques. (Muong Cha, Tuan Giao)
- It needs special attention for the ethnic group farmers to adopt the techniques due to different language and culture. (Muong Cha, Tuan Giao)
- It needs more care to train the low educated farmers. (Muong Cha)
- A technical issue is a method of seed sprouting for using seeder. (Dien Bien)
- Water pollution caused by excess chemical spray needs to be solved. (Dien Bien)
- Some extension workers and hamlet leaders in the pilot commune have the capacity to support the non-pilot hamlets and communes for extension expansion.

I-1.2.2 Non-Pilot Commune in Pilot District

(1) Production of Main Crops in Non-Pilot Commune

Two cropping of paddy rice cultivated yearly in two communes of Dien Bien District produce high yield of 6.7t/ha due to good irrigation facilities.

Maize cultivated area is large in Huoi Leng of Muong Cha District and Quai Nua of Tuan Giao District. On other hand, yield is the highest in two communes of Dien Bien District.

Table I-1.2-7 Production of Major Crops in Non-Pilot Commune

District		Dien Bien				Muong Cha				Tuan Giao			
Commune		Thanh Luong		Thanh Xuong		Na Sang		Huoi Leng		Quai To		Quai Nua	
		D	R	D	R	D	R	D	R	D	R	D	R
Paddy rice	Area(ha)	405	511	333	412	45	96	529		159	286	97	198
	Production(t)	2,713	3,271	2,237	2,776	215	464	2,647		969	1,419	589	980
	Yield(t/ha)	6.7	6.4	6.72	6.74	4.8	4.7	5.0		6.08	4.95	6.08	4.95
Maize	Area(ha)	88		113		145		425		86		295	
	Production(t)	424		518		293		1,064		229		799	
	Yield(t/ha)	4.8		4.6		1.9		2.5		2.67		2.71	
Soy beans	Area(ha)	32		16		48		—		28		30	
	Production(t)	56		28		57		—		38		40	
	Yield(t/ha)	1.7		1.7		1.2		—		1.35		1.33	

Source: Extension Workers and Commune Office

(2) Issues of Main Crop Cultivation

There are issues listed in the table below which are related to the traditional cultivation techniques and the natural disaster. These situations are similar to that of the pilot commune before NORRD.

Paddy rice: Mixing of different varieties, diseases and insects, excess of chemical spray, lack of water during dry season, excess water during rainy season

Maize: Low yield, variety, insects, low effect of chemical spray, lack of water during dry season, excess water during rainy season

Soybeans: Low yield, insects

Table I-1.2-8 Situation and Issues of Main Crop Cultivation

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Luong	Thanh Xuong	Na Sang	Huoi Leng	Quai To	Quai Nua
Paddy rice	<ul style="list-style-type: none"> • Var. BT7, IR64, • Low effect of chemical spray, • Chemical pollution • Different var. seeds, • Heavy seeder 	<ul style="list-style-type: none"> • Difficulty of water control • Different variety seeds • Less effect of spray • Chemical pollution 	<ul style="list-style-type: none"> • Var. IR64, BT7, NHIU838, Sticky rice 97, • Non-fertilizer • Broadcasting seeding, • Diseases and insects 	<ul style="list-style-type: none"> • Var. Bao Thai • Diseases and insects 	<ul style="list-style-type: none"> • Flood damage, • Lack of water in dry season, • Lack of machinery 	<ul style="list-style-type: none"> • Flood damage, • Difficulty of machinery use • Traditional methods, • Farmers with low education don't accept new techniques.
Maize	<ul style="list-style-type: none"> • Var. MX4, • Excess soil Moisture after paddy rice 	<ul style="list-style-type: none"> • Var. LVN10, • Low yield of local variety, • Less effect of spray, • Lack of water in dry season • Excess water in rainy season 	<ul style="list-style-type: none"> • Var. LVN10, • Low yield, • Insect borer 	<ul style="list-style-type: none"> • Var. VN1, • Low yield 	<ul style="list-style-type: none"> • Non-fertilizer • Low yield 	<ul style="list-style-type: none"> • Non-fertilizer • Non-chemical spray
Soybeans	—	—	<ul style="list-style-type: none"> • Var. DT84, • Low yield, • Insect hopper 	<ul style="list-style-type: none"> • Var. DT84, • Low yield 	<ul style="list-style-type: none"> • Local variety, • Low yield, • Small area and scattered 	<ul style="list-style-type: none"> • Local variety, • Low yield, • Small area and scattered, • Non-fertilizer

Source: The Survey Team

(3) Extension System of Non-Pilot Commune

Two extension workers are assigned in one commune. No. of hamlets, and distance to the farmer's fields are different from one commune to another.

No budget of extension activity in non-pilot communes is the same situation as the pilot Communes.

Table I-1.2-9 Outline of Extension in Non-Pilot Communes

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Luong	Thanh Xuong	Na Sang	Huoi Leng	Quai To	Quai Nua
No. of Hamlet	35	26	10	7	27	21
No. of extension worker	2	2	2	2	2	2

Area of 3 crops ¹⁾ (ha)	1,036	874	334	954	559	620
Area of 3 crops(ha)/E. W.	518	437	167	477	279	310
No. of farm household	1,741	1,405	814	536	1,753	1,223
No. of farm h.h. /E.W.	870	702	407	268	876	611
Extension budget (VND)	0	0	0	0	0	0
Distance to the farmer	~ 3 km	~ 4 km	~10 km	~ 30 km	~ 10 km	~ 10 km
Participating in training ²⁾	5 times/year	4 times/year	2 times/year	0	1~2times/year	1~2times/year

¹⁾Paddy rice, maize and soybeans ²⁾ Training for extension workers

Source: Extension workers

(4) Extension activities

Extension workers have not implemented the farmers training even once per month and also their visiting to farmer's fields is not so active in comparison with the extension workers in the pilot communes.

Two communes only have established pilot farms. In the near future, any supports will be necessary when pilot farms are established there.

Extension workers in Quai Nua have sometimes received technical support from the extension workers in the adjacent pilot communes in order to compensate the lack of experience.

Table I-1.2-10 Extension Activities in the 6 Non-Pilot Communes

District		Dien Bien		Muong Cha		Tuan Giao	
Commune		Thanh Luong	Thanh Xuong	Na Sang	Huoi Leng ¹⁾	Quai To	Quai Nua
Farmer training	Frequency	10 / Year	6 / year	No comment	0 / year	8 / year	10 / year
	Participation % of target farmers	100%	50%	45~50%	—	85 %	85 % 35~40 farmers /training
Frequency of visit to farmers		No comment	1 / week	3~10 / year	1 / month	2~3/month	3 / month
Implementation of pilot farm so far		No	No	No	No	Yes Potato(2014) Maize(2015)	Yes Inter-cropping of coffee and soybeans

¹⁾Extension worker in Huoi Leng has employed less than one year.

Source: The Survey Team

(5) Recognition of NORRD Project

Extension workers didn't directly attended any programs of the NORRD Project. Five extension workers, who participated in the workshop held by Agriculture Extension Station, recognized NORRD Project.

Some extension workers received the Guideline/Manual just before the Survey team arrived there.

Generally extension workers are willing to use the Guideline/Manual for their extension activities.

Table I-1.2-11 Recognition of NORRD Project

District	Dien Bien		Muong Cha		Tuan Giao	
Commune	Thanh Luong	Thanh Xuong	Na Sang	Huoi Leng	Quai To	Quai Nua
Recognition of NORRD	Yes	Yes	Yes	No	Yes	Yes
Recognition of G/M ¹⁾	Yes	Yes	Yes	No	Yes	Yes
Possibility of using G/M	Yes	Yes	No Comment	Yes	Yes	Yes
Comment on G/M	Difficulty for farmers	Practical techniques Now using	Received one month ago	No answer	Received two weeks ago	Received two weeks ago Useful for

						extension
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¹⁾G/M: NORRD “Guidelin/Manual”

Source: The Survey Team

(6) Problem, Issues in extension expansion

- Farmers are interested in practical techniques such new varieties, pest control, etc.
- There are not any extension activity budgets for extension worker in commune such as the ones for implementing pilot farm, motorbike fuel, etc.
- It is difficult to visit the farmer’s fields due to scattered small fields and long access to the fields.
- Extension workers are less to cover wide extension area. (Quai To)
- It needs special considerations to communicate with the ethnic group farmers due to their different language and culture. (Na Sang)
- It needs to consider better ways to train the farmers with different level of knowledge and technique. (Thang Luong, Na Sang, Quai To)
- Farmers who have lack of farming fund are difficult to adopt new techniques. (Quai To)
- Computer, projector, camera are necessary for extension activities. (Thanh Luong, Thanh Xuong, Quai Nua)
- Technical training on crop cultivation is needed for the extension workers. (Na Sang, Quai Nua, Huoi Leng)

I-1.2.3. Non-Pilot Commune in Non-Pilot District

(1) Production of Main Crops in Non-Pilot Commune

Paddy rice area for dry season is less than 40 % of the area for rainy season due to incomplete irrigation facility in the non-pilot communes. Their yield is low.

Area of maize and soybeans are generally large and yield is also low.

Table I-1.2-12 Production of Major Crops in Non-Pilot Commune

District		Dien Bien Don		Muong Nhe		Tua Chua	
Commune		Muong Luang		Muong Nhe		Muong Bang	
		D	R	D	R	D	R
Paddy rice	Area(ha)	114	267	33	103	120	353
	Production(t)	513	1,069	155	45.3	717	1,412
	Yield(t/ha)	4.6	4.0	4.7*	4.4*	5.97	4.00
Maize	Area(ha)	690		200		646	
	Production(t)	2,139		264		1,176	
	Yield(t/ha)	3.1		1.32		1.82	
Soy beans	Area(ha)	60		35		180	
	Production(t)	84		35		240	
	Yield (t/ha)	1.4		1.0		1.33	

Source: Extension Workers and Commune Office, *: Average yield in Muong Nhe District

(2) Issues of Main Crop Production

The table below shows issues of paddy rice, maize and soybeans.

Low yield is due to lack of water, slope cultivation, traditional cultivation techniques. Local varieties are used generally. Self-produced seeds cause the low yield and low quality of the products.

These situations are similar to the pilot Commune before implementation of the NORRD Project.

Table I-1.2-13 Situation and Issues of Main Crop Production

District	Dien Bien Don	Muong Nhe	Tua Chua
Commune	Muong Luang	Muong Nhe	Muong Bang
Paddy rice	Var. IR64, BT57, Local var. Kau Pe, Low yield, Non-fertilization in slope area, Mixing different variety	Var. BT7, Local var. without fertilizer and chemical, Low yield, Lack of water in dry season	Lack of water in dry season, Self-seed production, Low yield and quality, Diseases and insects
Maize	Var. LVN(F1), 2 cropping in low land, 1 cropping in slope land without fertilizer, Low yield	Var. CN10, Without fertilizer and chemical spray, Low yield	Rain-fed cultivation for summer in slope land
Soybeans	Var. DT84, Low yield, Rat damage	Very small area	Area reducing, Effect of spring rain on soybean cultivation

Source: The Survey Team

(3) Extension System of Non-Pilot Communes

Two extension workers are assigned in one commune.

There is no extension activity budget for extension workers.

Table I-1.2-14 Outline of Non-Pilot Commune

District	Dien Bien Don	Muong Nhe	Tua Chua
Commune	Muong Luang	Muong Nhe	Muong Bang
No. of Hamlet	19	17	29
No. of extension worker	2	2	2
Area of 3 crops ¹⁾ (ha)	1,131	371	1,299
Area of 3 crops(ha)/E. W.	565	185	649
No. of farm household	859	1,479	1,875
No. of farm h.h. /E.W.	429	739	937
Extension budget (VND)	0	0	0
Distance to the farmer	~ 4 km	~10 km	~15 km
Participating in training ²⁾	one time/month	0	one time/month

¹⁾Paddy rice, maize and soybeans ²⁾ Training for extension workers

Source: Extension workers

(4) Extension Activities

The farmers training and the visit to the farmer's fields by the extension workers in the three non-pilot districts are somewhat less number of times in comparison with the pilot districts.

Generally the extension activities are not so active in the non-pilot districts. Its causes are listed in the (6).

Table I-1.2-15 Extension Activities

District	Dien Bien Don	Muong Nhe	Tua Chua
Commune	Muong Luang	Muong Nhe	Muong Bang
Farmer training	Frequency	2 / month	No comment
	Participation % of target farmers	80~90 %	No comment
Frequency of visit to farmers	1 / week	2 / week	1 / week
Implementation of pilot farm so far	No	No	Yes Potato (2014)

Source: The Survey Team

(5) Recognition of NORRD Project

All extension workers didn't know the NORRD Project. Some extension workers received the Guideline/Manual just one week before the survey team arrived there.

Most of extension workers are willing to use the Guideline/Manual for extension activities because it is understandable easily and visually.

Table I-1.2-16 Recognition of NORRD Project

Disstrict	Dien Bien Don	Muong Nhe	Tua Chua
Commune	Muong Luang	Muong Nhe	Muong Bang
Recognition of NORRD	No	No	Yes
Recognition of G/M	No	No	Yes
Possibility of using G/M	No comment	No comment	Yes
Comment on G/M	Received one week ago Not yet read	Received one week ago Not yet read	Received two months ago Useful for pest control

Source: The Survey Team

(6) Problem and Issues in Extension Expansion

- There is lack of extension budget for pilot farm implementation. (All Communes)
- It is difficult to visit the farmer's fields during the rainy season due to bad road condition. (Muong Luang)
- Fuel cost of motorbike is own expense. (Muong Liang, Muong Bang)
- No. of hamlets and no. of farm household are too many for the extension activities. (Muong Bang)
- There is lack of training materials for the farmers which contain the pictures and photos with less sentence. (Muong Luang, Muong Bang)
- Computer, printer, projector are necessary to prepare the training materials for extension activities. (Muong Nhe)
- Some ethnic group farmers need considerations in order to understand the extension worker's guidance more (their different language and education level should be well considered). (Muong Luang, Muong Bang)
- Farmers can't understand the reason of low yield, but they are willing to learn the actual cultivation techniques through the training. (All Communes)

I-1.3 Extension Activities in Dien Bien Province

The interview survey was conducted at Agriculture Extension Stations of three pilot districts (Dien Bien, Muong Cha, Tuan Giao) and 3 non-pilot districts (Dien Bien Don, Muong Nhe, Tua Chua) and at Agriculture Extension Center in Dien Bien Province regarding the extension activities and extension system.

(1) Climate in Districts

Climate in Dien Bien Province is hot in summer and relatively warm in winter. Dien Bien Province has two seasons such the rainy season in April to September and the dry season in October to March. Cultivation of paddy rice, maize and soybeans are influenced by the rain period and rainfall, so that there are many different types of their cultivations.

Three meteorological stations in Dien Bien, Tuan Giao and Muong Lay recorded the yearly average temperature at 23.0 degree, 22.2 degree, 24.1 degree respectively and the rainfall at 1,344 mm, 1,633 mm, 2,084 mm. Three stations showed mostly the same tendency of monthly average temperature. However, the rainfall in Muong Lay was much and the rainfall in Dien Bien was somewhat less.

Table I-1.3-1 Average Temperature and Rainfall at Three Stations in Dien Bien Province in 2014

Station	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec

Dien Bien	Temp. (ave)	16.3	18.8	21.8	25.1	26.1	27.1	26.3	25.8	26.0	23.7	21.7	17.1
	Rainfall(mm)	2.4	13.2	97.4	93.3	136.2	206.5	400.9	193.9	112	14.8	64.9	3.7
Tuan Giao	Temp. (ave)	14.7	17.2	21.4	24.8	25.2	25.8	25.5	25.5	26.0	22.8	20.7	16.3
	Rainfall(mm)	3.6	16.9	71.5	119.9	130.7	287.9	514.6	215.6	128.0	78.1	64.5	1.2
Muong Lay	Temp. (ave)	17.2	19.5	23.3	26.9	27.6	27.9	27.5	26.9	27.3	24.4	22.2	18.3
	Rainfall(mm)	15.7	14.9	87.2	82.3	294.1	288.7	548.2	441.4	128	124.5	58.4	0.6

Source: Province Statistical Book 2014

(2) Land Use in Districts

- Ratio of agriculture land (annual crop land + Perennial crop land) to the total land is the highest in TUA CHUA (26.3%) and Tuan Giao (26.2%) and the lowest in Dien Bien (10.6%) and Muong Nhe (9.2%).
- Ratio of forest land to the total land is the highest in Dien Bien (73%) and Muong Nhe (86%) and the lowest in Muong Cha (35%).
- Ratio of irrigated paddy rice land to the total land is the highest in Dien Bien (26.8%) and the lowest in the other Districts (less than 4%).
- Ratio of maize land to the total land is the highest in Dien Bien Don (38.4%) and the lowest in Muong Nhe (10.5%).
- Ratio of soybeans land to the total land is the highest in TUA CHUA (8.7%)

Table I-1.3-2 Land Use in Districts

District	Dien Bien		Muong Cha		Tuan Giao		Dien Bien Don		Muong Nhe		Tua Chua	
		%		%		%		%				
Annual crop (ha)	15,114	9	12,421	10	28,825	25	15,071	12	13,035	8	16,809	25
Perennial crop (ha)	2,234	1	2,513	2	1,011	1	259	1	1,435	1	1,255	2
Forest land (ha)	119,244	73	41,124	35	65,071	57	70,183	58	134,592	86	36,805	54
Others (ha)	27,333	17	62,930	53	18,867	17	34,752	29	8,309	5	13,657	20
Total (ha)	163,926		118,989		113,776		120,897		157,372		68,526	

Source: Province Statistical Book 2014

Table I-1.3-3 Rate of Crop Cultivated Area to Agricultural Land in District

District	Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Total agriculture land (ha)	17,348	14,934	29,836	15,330	14,470	18,064
% of total agri. land to total land	10.6	12.6	26.2	12.7	9.2	26.3
% of paddy rice(D) ¹ to total agri. land	26.8	1.7	2.9	4.1	0.4	2.0
% of paddy rice(R) ² to total agri. land	36.3	7.7	5.8	10.7	6.3	9.2
% of maize to total agri. land	27.2	19.9	21.2	38.4	10.5	27.5
% of soybeans to total agri. land	2.6	2.7	1.9	4.2	2.2	8.7

¹(D): paddy rice for dry season ²(R): paddy rice for rainy season

Source: Province Statistical Book 2014

(3) Present Condition of Main Crop Production in Districts

1) Production of Main Crops

Paddy rice: There are wide areas both for the dry season and rainy season with flat land and good irrigation facility in Dien Bien, which produce high yield (6.34t/ha, 5.92t/ha) in dry and rainy seasons. The low yield is in Dien Bien Don and Tua Chua at less than 4.00t/ha for rainy season.

Highest ratio of paddy rice irrigated area is 74% in Dien Bien, the following 50% is in Tuan Giao and the lowest is 6% in Muong Nhe.

The large area of maize cultivation is in Tuan Giao (6,324ha) and Dien Bien, and the small area is in Muong Nhe (1,523ha). Yield of maize is the highest 4.71t/ha in Dien Bien and the low yield is 1.60~1.87 t/ha in Muong Cha, Muong Nhe, Tua Chua.

Area of soybeans cultivation is the largest 1,574ha in Tua Chua and the other districts have 319~650ha . Highest yield of maize is 1.77t/ha in Dien Bien and the lowest yield is in Muong Cha (1.06t/ha) and Muong Nhe (1.02t/ha).

Yield of paddy rice, maize and soybeans in Dien Bien is the highest among the six districts. In Mung Chao, Muong Nhe, Tua Chua, the low yield is found in maize and soybeans. Average yield of three crops in the five districts except Dien Bien is lower than the national level average.

Table I-1.3-4 Production of Main Crops in District

District		Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua	
Paddy rice	D*	Area (ha)	4,651	255	865	623	56	355
		Production (t)	29,489	1,202	5,210	2,678	248	2,028
		Yield (t/ha)	6.34	4.70	6.00	4.30	4.47	5.71
	R*	Area (ha)	6,295	1,157	1,732	1,645	915	1,668
		Production (t)	37,266	5,452	8,374	6,086	4,431	6,405
		Yield (t/ha)	5.92	4.71	4.80	3.70	4.84	3.84
Maize	Area (ha)	4,713	2,975	6,324	5,890	1,523	4,974	
	Production (t)	22,235	5,567	17,152	11,780	2,436	8,739	
	Yield (t/ha)	4.71	1.87	2.70	2.00	1.60	1.75	
Soy beans	Area (ha)	450	409	571	650	319	1,574	
	Production (t)	796	433	753	845	325	2,014	
	Yield (t/ha)	1.77	1.06	1.30	1.30	1.02	1.28	

* D: Dry season, R: Rainy season

Source: Province Statistical Book 2014

2) Present Condition and Issues of Main Crop Cultivation

Dien Bien Province is located in the mountainous and hill area where crop cultivations are conducted in the slope land and terrace, and traffic condition is not convenient to access to hamlets. Generally the crop cultivation in Dien Bien Province is low yield and low income.

In Dien Bien District there is large, flat and irrigated area in the basin. Paddy rice can be cultivated both in dry and rainy seasons and obtain the high production and high yield. The paddy rice products are famous as a brand rice with high market price.

Most of farmers have used conventional techniques for long years and some farmers don't apply fertilizer, chemical and weeding. Generally improved cultivation techniques have been adopted to the farmers in the limited area. There are also other problems such lack of water during the dry season and soil erosion during the rainy season.

Technical issues of crop cultivation are unsuitable fertilization, low effect of chemical spray, low yield of self-produced seeds, low quality of maize and soybeans products, difficulty of cultivation management and using machines for the slope and small fields, etc.

Table I-1.3-5 Present Condition and Issues of Crop Production

District	Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Paddy rice	<ul style="list-style-type: none"> • 2 cropping/year • Irrigated area • No problem on cultivation • Small field 400m²/farmer • Low yield and quality of self-produced seeds 	<ul style="list-style-type: none"> • Small field • Low yield • Lack of water for dry season • Traditional techniques (fertilization, pest control) 	<ul style="list-style-type: none"> • 2 cropping/year in low land • One cropping in slope land • Not so wide area • Lack of water for dry season • Area reducing due to flood 	<ul style="list-style-type: none"> • 15~20% area irrigated • 70% area in rain-fed slope land without fertilizer and with seed broadcasting • Var. IR64, BT7, Khau Pe, Kha Mac Ma • Different var. seed mixing 	<ul style="list-style-type: none"> • Var. IR64, TB1(F1), NH2308(F1), Quul(F1), Bac Thom7 • Fertilizer use for 80% area 	<ul style="list-style-type: none"> • Lack of water for dry season • Difficulty of machinery use • Low productivity of self-produced seeds
Maize	<ul style="list-style-type: none"> • No problem 	<ul style="list-style-type: none"> • Rain-fed cultivation in slope land • No-fertilizer • Non-spray • Low quality due to rain • Low yield 	<ul style="list-style-type: none"> • Largest area in Province • One cropping/year in slope • Poor farmers can't buy materials. 	<ul style="list-style-type: none"> • Slope cultivation mostly without fertilizer • Low yield • F1 var. (90%) LVN10, DK88 	<ul style="list-style-type: none"> • Slope cultivation mostly without fertilizer, chemical • Low yield • Var. LVN10, Local var. • Product for animal feed 	<ul style="list-style-type: none"> • Erosion in slope land • Low yield • Long distance to the field • Less fertilizer application
Soy beans	<ul style="list-style-type: none"> • Scattered small fields • Low quality 	<ul style="list-style-type: none"> • Scattered field • Extensive farming • Low quality due to rain • Low yield 	<ul style="list-style-type: none"> • Small field • Low yield • Product for home family • One cropping/year in slope 	<ul style="list-style-type: none"> • Main area in two Communes • Var. DT84 • Low yield 	<ul style="list-style-type: none"> • Slope cultivation mostly without fertilizer, chemical • Low yield • Var. DT84, LAK03 • Product for home family 	<ul style="list-style-type: none"> • Problem of post-harvest due to rain
Others	<ul style="list-style-type: none"> • Near to Dien Bien market 		<ul style="list-style-type: none"> • No good social service due to mountainous area • High cost of agr. materials 	<ul style="list-style-type: none"> • Cultivated area 1 ha/farmer • Erosion • Difficulty of soil improvement 	<ul style="list-style-type: none"> • 80% area more than 700m • Small field 	<ul style="list-style-type: none"> • Mountainous and slope area

Source: The Survey Team

(4) Evaluation of NORRD Project

1) Evaluation of NORRD Project by AES Staffs in Pilot Districts

All staffs of Province AEC and three pilot district AESs evaluated the NORRD Project was highly successful. Pilot farmers adopted the recommended techniques such seed treatment, seeding, fertilization, pest control, which resulted in the increase of yield and productivity, reduction of production cost and field works, improvement of income.

Extension capacity of extension staffs was improved through the pilot activities of the NORRD Project.

Implementation of pilot farms and farmers training was very useful for the farmers to acquire the practical techniques.

Paddy rice irrigated area was developed in Dien Bien and Tuan Giao.

Poor farmers in Tuan Giao, who have lack of farming fund, adopted the part of recommended techniques.

AEC and AES staffs recognized the outputs of NORRD Project are sustainable, because the farmers who already adopted the recommended techniques are willing to use them continuously.

Table I-1.3-6 Evaluation of NORRD Project

District	Dien Bien	Muong Cha	Tuan Giao
Evaluation	<ul style="list-style-type: none"> • Rice farmers adopted the recommended techniques and obtained the good results. • Cultivation techniques were improved such seed volume, seeding method, fertilization, pest control). • Yield increased, production cost reduced, income increased. • Paddy irrigated area was expanded in Thanh Hung. • Extension worker's capacity was improved 	<ul style="list-style-type: none"> • Farmers participating in the training acquired techniques such seed treatment, seeding method, fertilization, pest control. • Production and yield increased • 80% of target farmers adopted the recommended techniques. 	<ul style="list-style-type: none"> • Many farmers understood and adopted the recommended techniques such land preparation, seed treatment, fertilization, pest control, organic fertilizer making. • Extension capacity and cultivation techniques of extension workers were improved. • Pilot farm was good for farmers to understand easily. • Paddy irrigated area was increased. • Poor farmers adopted the part of recommended techniques due to lack of money.
Sustainability of NORRD outputs	<ul style="list-style-type: none"> • Sustainable. • Farmers who adopted the techniques understand how to use them for farming. 	<ul style="list-style-type: none"> • Sustainable. • Farmers who adopted the techniques intend to continue use them. • Some farmers transferred the techniques to other farmers. 	<ul style="list-style-type: none"> • Sustainable. • Farmers who adopted the techniques are possible to continue using them.

Source: The Survey Team

2) Evaluation of the Guideline/Manual

The Guideline/Manual was highly evaluated by the extension staffs who are expecting to use them for extension activities.

Technical contents of the Guideline/Manual have no problem, so that its modification is not necessary. Some extension staffs want to publish manuals for other crops in the near future. This work will be formulated by AEC and PPC (Plant Protection Center), and 500,000,000VND yearly will be necessary for its formulation according to their estimation.

AESs of three pilot districts implemented the workshops on the Guideline/Manual for the commune leaders and extension workers and distributed the Guideline/Manual to them.

Supplemental trainings for new and junior extension workers are necessary, who understand the Guideline/Manual not so well as of now.

Table I-1.3-7 Comment on Guideline/Manual

Dien Bien	Muong Cha	Tuan Giao
<ul style="list-style-type: none"> • Senior extension workers understand easily and satisfied with the Manuals. Manuals are very useful to extension activities. • New and junior extension workers don't so much understand the Manuals. • It's difficult for farmers to understand, so that more picture and figure are needed in the Manuals. 	<ul style="list-style-type: none"> • Workshop on the Manuals was implemented for non-pilot Commune. • Manuals are easily understandable and good for extension activities. • Manuals are not necessary to be modified. 	<ul style="list-style-type: none"> • Technical problem on paddy rice, maize and soybeans are not existed in Manuals. • It is easily understandable and satisfied. • Manuals are not necessary to be modified. • Extension workers already implemented workshop for Commune farmers and further some farmers attended the training held by AES. • Manuals for other crops will be expected to be formulated.

Source: The Survey Team

3) Extension Activities of AES for the NORRD Project

Five staffs of Dien Bien AES were assigned for the NORRD Project and implemented the monitoring four times monthly and farmers trainings. On the other hand, two AES staffs of Muong Cha had monitoring twice per month and two AES staffs of Tuan Giao did four times per month. Plant Protection Station (PPS) was also assigned for the NORRD Project in cooperation with AES.

In the farmers' trainings, the staffs of AES and PPS delivered the lectures of cultivation and pest control respectively.

Expenditure for the pilot farms was supported by the NORRD Project, such as seeds, fertilizers, trainings, monitoring, etc. Districts didn't bear the expenditure. The table below shows an example of the expenditures that the NORRD project spent.

AES had mainly administrative works before implementation of the NORRD Project. After NORRD started they disseminated practical techniques to the farmers.

Table I-1.3-8 Some Expenditure Related to NORRD Pilot Farm

Dien Bien	Muong Cha	Tuan Giao
<ul style="list-style-type: none"> • Cost of seeds: Paddy rice 28,000VND/kg Maize 130,000VND/kg Soybeans 30,000VND/kg. 	<ul style="list-style-type: none"> • Allowance for lecturer: 600,000VND 	<ul style="list-style-type: none"> • Allowance for monitoring once a week: 240,000VND (included fuel of motor bike)

Source: The Survey Team

4) Recognition of NORRD Project by the Non-pilot District

The NORRD Project and the Guideline/Manual were recognized by AESs of the three non-pilot districts.

The workshops on the Guideline/Manual for the commune leaders and extension workers were implemented in the three non-pilot districts, and the Guideline/Manual were distributed to the participants according to the AES staffs. However, some extension workers received the Guideline/Manual just one week or one month before the Survey team arrived there. So the workshops implemented by AES might be insufficient. This indicates that the NORRD results might not have reached at commune-level extension workers fully.

Table I-1.3-9 Comment on the Guideline/Manual by AES Staff

Dien Bien Don	Muong Nhe	Tua Chua
<ul style="list-style-type: none"> • The Guideline/Manual are useful for crop cultivation in the District. • Term of cultivation is necessary to be modified (advanced example) • When farmers adopt these techniques, it is needed to be more practically and more detailed. 	<ul style="list-style-type: none"> • The Guideline/Manual are easily understandable because of many pictures, especially pest control. • It is possible to disseminate the manual's techniques to the farmers. • It is some difficult for the new extension workers to understand. 	<ul style="list-style-type: none"> • The Guideline/Manual are easily understandable. • It is very useful for extension activities and good for adaptation to the farmers.

Source: The Survey Team

(5) Extension Activity in Districts

1) Extension staffs

AEC staffs of Dien Bien Province are 21, total staffs of AESs of 10 Districts are 87 and total no. of extension workers are 229 for 130 communes.

Generally two extension workers are assigned in one commune, and a hamlet leader assists the extension workers as a extension collaborator each hamlet in Tua Chua.

Area of three crops and no. of farm household per AES staff vary 344~1,186 ha and 687~2,098 farm household respectively. The highest no. of them is in Dien Bien and Tuan Giao.

Area of three crops and no. of household per extension worker vary 125~372 ha and 328~598 farm household. The more no. of them is in Dien Bien and Tua Chua, and the smallest in Muong Nhe.

Table I-1.3-10 Extension Staffs in the 6 Districts

District	Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
No. of AES staffs	15	11	8	17	8	9
No. of Commune	25	12	19 ²⁾	14	11	12 ³⁾
No. of Commune Extension Workers	45	24	37	28	22	23
No. of Hamlet	463	120	237	240	93	135
No. of Hamlet Extension Assistants	0	0	0	0	0	135 ⁴⁾
Area of 3 main crops ¹⁾ (ha)	16,109	4,796	9,492	8,808	2,757	8,571
Area of 3 main crops/ AES staff (ha)	1,073	436	1,186	518	344	952
Area of 3 main crops/ E. Worker (ha)	357	199	256	314	125	372
No. of farm household	26,929	7,999	16,790	11,680	7,219	9,843
No. of farm household/ AES staff	1,795	727	2,098	687	902	1,093
No. of farm household/ E. Worker	598	333	453	417	328	427

¹⁾3 main crops are paddy rice for dry and rainy, maize and soybeans, ²⁾18 Commune and 1 Town, ³⁾11 Commune and 1 Town

⁴⁾Government 30A Program, Extension Assistant are Hamlet leaders who receive allowance 60,000 VND/month.

Source: DB Statics Book 2014, District AES, NORRD Project Final Report

2) Extension activities

AES staffs visit generally the farmer's field once per week and implement the farmer trainings about 10 times a year and the extension trainings twice a year.

Commune extension workers monitor the farmer's fields and report it to the AES once per month. When the extension workers can't solve the problems, they are supported by AES. Extension workers follow the extension plan of AES at district level.

Employment of extension workers is decided by AES. Salary of extension worker is 1,800,000~2,690,000 VND monthly, which is depended on the final education.

AESs of six districts had experienced to establish pilot farms. The pilot farms implemented in Dien Bien, Muong Cha, Tuan Giao were supported by the overseas donors. On the other hand, the pilot farms in Tuan Giao, Muong Nhe, Tua Chua were established by District AES or Province AEC.

Muong Cha AES has own criteria for pilot site selection such as near the road, near the farmer's houses, easy participating and standard farming field.

Table I-1.3-11 Implementation of Pilot Farm

	Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
Foreign donor	JICA DANIDA SNV	JICA DANIDA	JICA	(No comment)		
Province District			Paddy rice Maize Potato		[2010 year] Paddy rice	Paddy rice: var. Nghi Huong Maize: var. VN10 (F1) Soybeans: var. DT84 [2014 year] Potato

Source: The Survey Team

3) Extension budget

Extension budget of AEC has decreased gradually, which was cut out at 22% from 2013 to 2015 and of which extension activity budget was cut out at 62%. In comparison with before NORRD Project, the extension budget after NORRD was cut out at 30%.

Table I-1.3-12 Extension Budget of AEC in Dien Bien Province the year 2013~2015

(Unit: million VND)

	2013	2014	2015
Extension Budget	2,893.7	2,793.1	2,260.0
Current budget	1,750.0	1,641.0	1,830.0
Extension activities	1,143.7	1,152.1	430.0

Source: AEC

Table I-1.3-13 Extension Budget of AEC before and after NORRD

Before NORRD	During NORRD	After NORRD
3,124 million VND	2,781 million VND	2,200 million VND

Source: AEC

Amount of AES extension budget is different among the districts. In the table below, extension budget of Tuan Giao, Dien Bien Don, Tua Chua was generally decreased as same as other districts.

Extension activity budget of Tuan Giao was 1,072 million VND in 2011, but the budget was cut out at 20% in 2015. Muong Nhe AES proposed 3,500 million VND, but only 30% of proposal was approved.

Table I-1.3-14 Extension budget of Agriculture Extension Station (AES)

(Unit: million VND)

	District	Tuan Giao	Dien Bien Don	Tua Chua
2015	Extension budget	1,212	10,327	8,581
	Current budget	361	1,054	722
	Extension activities	851	9,273	7,859
2014	Extension budget	1,367	10,733	29,639
	Current budget	876	1,593	683
	Extension activities	491	9,140	28,956
2013	Extension budget	1,557	13,995	12,909
	Current budget	790	900	776
	Extension activities	767	13,905	12,133

Source: District Planning and Finance Division, Agriculture Extension Station

4) Problem and Issues of Extension Expansion in Districts

- There is lack of budget for pilot farm establishment and implementation. (All districts)
- Training for the new and less-experienced extension workers is necessary. (Muong Cha, Dien Bien Don, Muong Nhe)
- Additional extension workers for extension expansion are necessary. (Tua Chua)
- Attention/care is necessary in dissemination to the ethnic group farmers considered with different language. (Dien Bien Don, Muong Nhe, Tua Chua)
- Poor farmers who have lack of farming fund are difficult to adopt the new techniques. (Muong Cha, Tuan Giao)
- Difficulty of extension activity and access to the far communes. (Muong Nhe)
- Except the issue of extension budget, in Dien Bien District the extension expansion activity is conducted somewhat easier than other districts.
- Some AES staffs in the pilot district commented that they can support the extension expansion for other districts as necessary. (Tuan Giao)

Table I-1.3-15 Issues of Extension Expansion in Districts

Dien Bien	Muong Cha	Tuan Giao	Dien Bien Don	Muong Nhe	Tua Chua
<ul style="list-style-type: none"> • Different level of farmer's farming • Expansion will be implemented in adjacent commune to the pilot one. • Extension workers need training on post-harvest and marketing. 	<ul style="list-style-type: none"> • Poor farmers are difficult to adopt new techniques due to lack of money. • New and junior Extension workers need training. 	<ul style="list-style-type: none"> • Cultivation techniques are no problem. • Lack of extension budget • Poor farmers impossible to buy materials. • Difficult use of machinery due to small field. • Difficult dissemination to illiterate farmers • Possible to support for non-pilot District 	<ul style="list-style-type: none"> • Difficult set of pilot farm due to non-budget • Ethnic groups have different language. • New staff of AES lack pest control techniques. • 80% Extension Workers need training on implementation of pilot farm. • Drought and cyclone damage crops. 	<ul style="list-style-type: none"> • It takes 5 hr. to the far Commune. • Dissemination to ethnic group needs care due to different language. • New and junior Extension Workers need training. 	<ul style="list-style-type: none"> • 6 of 9 AES staffs are ethnic groups, it is good to communicate to ethnic group farmers. At the same time, their capacity building on new technology and language is also important. • 3 additional extension workers are necessary for expansion.

Source: The Survey Team

(6) Extension Expansion Plan of Dien Bien Province

The first draft of the extension expansion plan to disseminate the NORRD Guideline/Manual was prepared and submitted to the Team by the provincial AEC during the Phase 1 work as attached. Extension budget includes the cost of agricultural materials (seeds, fertilizers, chemicals, etc.) and the training expenditure (training materials, lecturers, meal, transportation, etc.) and meeting implementation cost. For extension expansion, the capacity of extension workers is more important than the number of extension workers. Trainings on extension method and cultivation techniques are necessary for the less experienced extension workers. And also the support for extension activity is needed for them. The budget of the first draft plan for the extension expansion seems large and was necessary to be examined and modified if necessary for actuality of the plan and budget. During the Phase 2 work, the revised plan was prepared and shown in the main report Part II.

(7) Extension Possibility of the Guideline/Manual in Dien Bien Province

1) Factors in NORRD Project success

- Farmers participation in pilot farm activity.
- Introduction of basic and low cost technology.
- Implementation of pilot farms practically, and provision of technical trainings.
- Participation of conventional farming farmers in pilot activities.
- Strong cooperation and linkage among JICA, province, districts and communes.
- Budgetary and technical support from JICA.

- 2) Extension possibility of the Guideline/Manual in the pilot communes
- Extension workers in pilot communes acquired the extension and cultivation techniques from the NORRD Project.
 - Hamlet leaders and farmers in non-pilot hamlets of pilot communes know the NORRD Project activities and recommended techniques.
 - Extension of the Guideline/Manual is possible for the non-pilot hamlets in the pilot communes. However, the extension budget support is preferable for them from districts and provinces.
- 3) Extension possibility of the Guideline/Manual in the non-pilot communes/districts
- Natural and land condition in non-pilot districts and communes are similar to that of the pilot sites.
 - Conventional farming there is similar to that of the pilot sites before NORRD Project implementation.
 - Most of extension workers (at district level) recognized the NORRD Project; they are willing to use the results for extension activities; and farmers are very interested in new techniques. Commune-level extension workers need further information.
 - The recommended techniques are basically appropriate for farmers. However, the support from the province and the pilot districts is necessary considered with the current extension worker's capacity and the expansion budget in the non pilot areas.
 - Finally, the extension of the Guideline/Manual is possible in Dien Bien Province with the budget support and the extension worker's improved capacity.

DIEN BIEN PLANNING EXTENTION OF NORRD PROJECT REPLICABLE RESULTS IN PERIOD 2016-2019

No.	District	Implement period	Taget area (ha)	Taget commu e	Annual plan (No. of training course)					Annual budget requirement (1.000 VND)				
					2016	2017	2018	2019	Total	2016	2017	2018	2019	Total
1	Dien Bien	2016-2017	4.8		24	72	-	-	96	293,376	142,200	-	-	435,576
	<i>Training on cultivation technical</i>		4.8		12	36	-	-	48	245,976		-	-	245,976
	Paddy Rice		3.2	25	8	24			32	196,192	588,576			784,768
	Maize		1.6	25	4	12			16	49,784	149,352			199,136
	<i>Training on WUG</i>			25	12	36			48	47,400	142,200			189,600
2	Tuan Giao	2016-2017	18.6		144	235	-	-	379	851,173	1,936,974	-	-	2,788,147
	<i>Training on cultivation technical</i>		18.6		24	90	-	-	114	222,133	1,176,884	-	-	1,399,017
	Paddy Rice		7.4	14	6	31			37	148,200	765,700			913,900
	Maize		8.6	17	12	31			43	35,408	274,412			309,820
	Soybean		2.6	7	4	9			13	31,616	71,136			102,752
	Technical production of Bokashi			21	2	19			21	6,909	65,636			72,545
	<i>Training on WUG</i>			21	120	145			265	629,040	760,090			1,389,130
3	Muong Cha	2016-2017	11.1		54	168	-	-	222	755,028	2,348,976	-	-	3,104,004
	Paddy Rice		11.1	2	27	84			111	628,344	1,954,848			2,583,192
	Training on WUG			10	27	84			111	126,684	394,128			520,812
4	Muong Ang	2016-2017	20.5		75	140	-	-	215	880,339	1,819,894	-	-	2,700,233
	<i>Training on cultivation technical</i>		21		65	140	-	-	205	844,239	1,819,894	-	-	2,664,133
	Paddy Rice		7.0	9	20	50			70	256,548	641,370			897,918
	Maize		6.5	9	25	40			65	323,003	516,804			839,807
	Soybean		7.0	9	20	50			70	264,688	661,720			926,408
	<i>Training on WUG</i>			10	10				10	36,100				36,100
5	Muong Nhe	2016-2019	5.7	-	85	94	100	106	385	940,295	1,436,482	1,767,275	2,098,066	6,242,118
	<i>Training on cultivation technical</i>		6	-	3	12	18	24	57	165,395	661,582	992,375	1,323,166	3,142,518
	Paddy Rice		1.9		1	4	6	8	19	54,686	218,746	328,119	437,492	1,039,043
	Maize		1.9		1	4	6	8	19	56,871	227,484	341,227	454,969	1,080,551
	Soybean		1.9		1	4	6	8	19	53,838	215,352	323,029	430,705	1,022,924
	<i>Training on WUG</i>				82	82	82	82	328	774,900	774,900	774,900	774,900	3,099,600
6	Tua Chua	2016-2019	6.8		17	25	27	16	85	178,422	272,695	314,921	188,546	954,584
	<i>Training on cultivation technical</i>		6.8		12	19	23	14	68	163,022	254,215	302,601	182,386	902,224
	Paddy Rice		2.2	4	4	6	8	4	22	58,044	87,066	116,088	58,044	319,242

No.	District	Implement period	Target area (ha)	Target commune	Annual plan (No. of training course)					Annual budget requirement (1.000 VND)				
					2016	2017	2018	2019	Total	2016	2017	2018	2019	Total
	Maize		3.0	3	6	9	9	6	30	85,614	128,421	128,421	85,614	428,070
	Soybean		1.6	4	2	4	6	4	16	19,364	38,728	58,092	38,728	154,912
	<i>Training on WUG</i>			7	5	6	4	2	17	15,400	18,480	12,320	6,160	52,360
7	Nam Po	2016-2019	3.2		11	14	14	8	47	195,017	228,252	228,252	140,929	792,450
	<i>Training on cultivation technical</i>		3.2		8	9	9	6	32	182,177	206,852	206,852	132,369	728,250
	Paddy Rice		1.4	14	4	4	4	2	14	99,617	99,617	99,617	49,809	348,660
	Maize		1.0	10	2	3	3	2	10	49,351	74,026	74,026	49,351	246,754
	Soybean		0.8	8	2	2	2	2	8	33,209	33,209	33,209	33,209	132,836
	<i>Training on WUG</i>			14	3	5	5	2	15	12,840	21,400	21,400	8,560	64,200
8	Dien Bien Dong	2016-2019	2.4		18	15	15	14	62	134,485	113,185	113,185	108,085	468,940
	<i>Training on cultivation technical</i>		2.4		6	6	6	6	24	49,285	49,285	49,285	49,285	197,140
	Paddy Rice		0.8	8	2	2	2	2	8	16,361	16,361	16,361	16,361	65,444
	Maize		0.8	8	2	2	2	2	8	16,916	16,916	16,916	16,916	67,664
	Soybean		0.8	8	2	2	2	2	8	16,008	16,008	16,008	16,008	64,032
	<i>Training on WUG</i>			8	12	9	9	8	38	85,200	63,900	63,900	58,800	271,800
	Total		73.1		428	763	156	144	1,491	4,228,135	8,298,658	2,423,633	2,535,626	17,486,052

Source: Dien Bien DARD and AEC

Attachment I-6.2.1
Result of examination on extension possibility
on NORRD project in other five provinces

ATTACHMENT I-6.2.1 RESULT OF EXAMINATION ON EXTENSION POSSIBILITY ON NORRD PROJECT IN OTHER FIVE PROVINCES

I-1. Natural Condition

(1) Climate

The table below shows average temperature and rainfall from 2010 to 2014. In Son La, Lao Cai, Yen Bai average temperature was 21.7~23.8 degree and rainfall was 1,282 ~ 1,889mm. In Lai Chau located in the northern-west mountainous area, it was 16.7 degree and 2,759 mm which means comparatively low temperature and much rainfall. Ha Giang has warm temperature and much rainfall (2,255mm).

The five provinces except Lai Chau have hot summer season and warm winter. On the other hand, Lai Chau has cool climate. All provinces have two seasons with rainy (April ~ September) and dry (October ~ March). Cultivation of paddy rice, maize and soybeans is affected by rainfall and its period, which results in many different cropping patterns.

There is a big temperature difference among altitudes in mountainous region, which affect crop growth. So it should be considered not only average temperature but also altitude with temperature in the crop cultivation area.

Table I-1.1 Average Temperature and Rainfall for 2010~2014 in the 5 Province

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Ave. Total
Son La	Temp ¹⁾	14.6	17.7	20.6	23.5	25.6	25.8	25.6	25.1	24.5	22.5	19.5	15.9	21.7
	Rain ²⁾	46.3	10.1	56.3	101.8	169.2	141.0	279.2	231.0	136.8	33.8	24.0	52.7	1,282
Lao Cai	Temp	15.7	18.8	21.4	25.1	28.2	29.0	28.9	28.3	27.3	24.6	21.6	17.0	23.8
	Rain	23.0	15.3	45.8	101.7	187.5	199.0	320.6	326.4	219.6	75.9	71.3	65.3	1,651
Lai Chau	Temp	10.3	13.7	15.4	18.5	20.1	20.6	20.5	20.2	19.3	16.8	14.2	10.4	16.7
	Rain ³⁾	69	53	22	206	412	543	568	368	207	76	15	220	2,759
Ha Giang	Temp	15.0	18.0	20.7	24.7	27.5	28.2	28.1	28.3	26.9	24.0	21.0	16.5	23.2
	Rain	43.4	15.9	52.6	86.6	223.6	317.6	710.7	326.5	241.6	107.4	66.2	62.5	2,255
Yen Bai	Temp	14.9	17.6	20.2	24.0	27.4	28.6	28.4	27.8	26.9	24.3	21.4	16.6	23.2
	Rain	41.9	31.1	62.3	95.1	260.0	162.7	393.4	349.0	269.6	119.1	62.7	42.0	1,889

¹⁾Temp: Average temperature, ²⁾Rain: Rainfall (mm), ³⁾Data of rainfall in Lau Chau is only from 2013.

Source: 2014 Statistical Book of 6 Province

(2) Land use

The highest share of agriculture land in the total area is about 20% in Son La and Ha Giang and the lowest is 10% in Lai Chau.

Paddy rice: Share of paddy rice area for dry season is the highest 17.4% in Yen Bai and the lowest is 3.9% in Son La. Share of paddy rice area for rainy season is the highest 24.4% in Lao Cai and the lowest is 6.3% in Son La, and Yen Bai has 20.0% for dry cropping as same as dry season. From these points, it is Yen Bai and Son La have high ratio (87%, 63%) of paddy irrigated area and Lao Cai, Lai Chau, Ha Giang have low (48%, 32%, 35 %).

Maize: Maize main production Province Son La has high ratio 56.2% of maize cultivated area, the followed 46.8% in Lao Cai. The lowest share of maize area is 23.8% in Lai Chau.

Soybeans: Share of soybeans cultivated are is the highest 15.3% in Ha Giang and the lowest is less 1.0% in Son La and Yen Bai.

Table I-1.2 Land Use in the 5 Province

	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Annual crop (ha)	246,845	62,656	68,411	126,907	64,187
Perennial crop (ha)	42,226	20,929	24,587	28,655	45,133

Forest land (ha)	641,092	336,210	738,994	561,766	474,121
Others (ha)	487,281	218,595	74,896	74,161	105,188
Total (ha)	1,417,444	638,390	906,888	791,489	688,628

Source: Province Statistical Book 2014

Table I-1.3 Share of Crop Cultivated Area to Agricultural Land in Province

District	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Total agri. land (ha)	289,071	83,585	92,998	155,562	109,320
% of total agri. land to total land	20.4	13.1	10.3	19.7	15.9
% of paddy rice(D)* to total agri. land	3.9	11.8	6.7	6.1	17.4
% of paddy rice(R)** to total agri. land	6.3	24.4	21.0	17.4	20.0
% of maize to total agri. land	56.2	46.8	23.8	34.9	26.0
% of soybeans to total agri. land	0.7	5.8	2.7	15.3	0.3

*: Dry season, **: Rainy season

Source: Calculated based on Province Statistical Book 2014

I-2. Crop Production of Paddy Rice, Maize, Soybeans

(1) Crop Production of Paddy Rice, Maize, Soybean

Paddy rice: The largest paddy rice area for dry season is 19,036 ha in Yen Bai which seems to have good irrigation facilities in the comparatively flat and collective land. Area of paddy rice for rainy season is the largest 27,163 ha at 3 times of dry season's area in Ha Giang which has less irrigation facility. Rice yield is not much different (5.3~6.0t/ha) among provinces.

Maize: Son La is a famous maize production province which has the large maize cultivated area (162,510 ha) and high yield 4.06t/ha. Area and production of maize in Son La occupies 53% and 60% respectively in the 5 provinces. Other province has only small area at 14~33% of Son La and low yield 2.8~3.3 t/ha.

Soybeans: The largest area of soybeans cultivation is 23,758 ha in Ha Giang, and other province has 1.4~21% of Ha Giang's soybean area, especially Yen Bai has only 1.4% with 334ha. Area and production of soybeans in Ha Giang occupy 71% and 73% in the five provinces. Soybean yield is not much different (1.09~1.28t/ha) among the five provinces.

Table I-2.1 Area, Production, Yield of Paddy Rice, Maize, Soybeans in 5 Province

District		Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai	
Paddy rice	D ¹⁾	Area (ha)	11,410	9,880	6,223	9,481	19,036
		Production (t)	68,520	54,753	33,850	52,949	101,026
		Yield (t/ha)	6.01	5.54	5.44	5.58	5.31
	R ²⁾	Area (ha)	18,177	20,395	19,565	27,163	21,884
		Production (t)	80,792	93,079	88,440	153,359	101,376
		Yield (t/ha)	4.45	4.56	4.52	5.65	4.63
Maize	Area (ha)	162,510	39,132	22,150	54,215	28,471	
	Production (t)	657,660	117,702	62,130	178,428	83,612	
	Yield (t/ha)	4.06	3.01	2.81	3.29	2.94	
Soy beans	Area (ha)	2,086	4,881	2,491	23,758	334	
	Production (t)	2,646	5,323	2,730	30,482	409	
	Yield (t/ha)	1.26	1.09	1.10	1.28	1.19	

¹⁾D: Dry season, ²⁾R: Rainy season

Source: Province Statistical Book 2014

Table below shows the comparison of crop production between in 2014 and in 2010, assuming the figures in 2010 is 100.

Paddy rice: Area, production and yield of paddy rice for dry and rainy season in 2014 increased more than in 2010. These results were made through improvement of irrigation facility, introduction of high yield varieties and technical guidance.

Maize: Area of maize cultivation has been reduced at 5% only in Son La, but its production was increased at 22%. Because the policy of Son La Province is to reduce maize area for forest protection with improvement of maize yield. In other provinces, both area and production of maize were increased.

Soybeans: Only Ha Giang has increased soybean cultivation area and other provinces has the same or decreased. Especially the rapid area reduction is in Son La and Yen Bai, which is 28% and 37% of area in 2010. Farmers, who don't get income from soybean cultivation due to much labor required at harvesting period and low quality of products at rainy season, tend to stop soybeans cultivation. In Yen Bai, soybean area was originally small and extension for soybean dissemination was not so active. Son La Province is more interested in maize and industrial crops which bring more income to the farmers.

Table I-2.2 Comparison of Production of Paddy Rice, Maize, Soybeans between 2014 and 2010

		District	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Paddy rice	D	Area (ha)	120 ¹⁾	108	116	102	109
		Production (t)	125	111	120	109	111
		Yield (t/ha)	105	102	104	107	102
	R	Area (ha)	104 ²⁾	107	105	104	93
		Production (t)	102	123	109	107	106
		Yield (t/ha)	98	116	104	103	115
Maize	Area (ha)	95	126	114	114	126	
	Production (t)	122	116	125	131	129	
	Yield (t/ha)	128	92	110	115	103	
Soy beans	Area (ha)	28	97	100 ^{*)}	114	37 ²⁾	
	Production (t)	25	108	114	133	37	
	Yield (t/ha)	88	111	115	116	98	

¹⁾100 is in 2010.

²⁾2014 year data was compared to 2012 year one.

Source: Calculation based on Province Statistical Book 2014

(2) Issues of Cultivation for Paddy Rice, Maize, Soybeans

Summary of AEC staff's comments about issues of 3 crop cultivation are as below.

Paddy rice: Transplanting is used in 90% of paddy area. Issues are shortage of water during dry season, difficulty of machine using in the slope and terrace fields, low level of conventional techniques and lack of material purchase fund.

Maize: F1 hybrid variety is planted in more 95% of maize area. GMO seeds are used in limited area. Issues are low quality of products caused by raining at harvest time, soil erosion in slope cultivation, shortage of water during dry season, low yield of local variety, exporting to China with high selling price and shipping to domestic with low price.

Soybeans: Issues are small field area, low yield, low quality of products caused by raining at harvest time, concentration of labor works at harvesting period, occurrence of diseases and insects, low yield and low quality of self-produced seeds.

Son La has been promoting productivity improvement and area reduction for maize cultivation and also promoted vegetable production.

Table I-2.3 Present Condition and Issues of cultivation for paddy rice, maize, soybeans

	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Paddy rice	<ul style="list-style-type: none"> • Slope, • Terrace, • Non-use of machine • Low level of techniques, • Non-application of organic fertilizer 	<ul style="list-style-type: none"> • Direct seeding: 10%、 4.5t/ha, • Transplanting: 90%, 6.0t/ha, Summer:18~23 days seedlings Winter:25~30 days seedlings 	<ul style="list-style-type: none"> • Lack of water in dry season • No investment in fertilizer • Traditional techniques • Low productivity 	<ul style="list-style-type: none"> • Lack of water in dry season • Lack of money for materials 	<ul style="list-style-type: none"> • Slope and terrace • Difficult use of machine • Lack of water in dry season
Maize	<ul style="list-style-type: none"> • Slope cultivation • F1 variety 95~99%, • GMO seeds for pilot farm, • Land preparation depended on rain, • Erosion, • Low quality due to rain and post-harvest 	<ul style="list-style-type: none"> • Low quality due to rain • High selling cost to China, • Low cost for domestic selling 	<ul style="list-style-type: none"> • Slope cultivation • Soil erosion • Low fertile soil • Thin cultivated soil layer • Local variety • Low yield • No investment for fertilizer and chemical 	<ul style="list-style-type: none"> • Lack of water in dry season 	<ul style="list-style-type: none"> • Slope cultivation • Not so important to apply fertilizer
Soy beans	<ul style="list-style-type: none"> • Low yield due to mixing of many varieties, • Small field, • Inter cropping • Much labor concentrated at harvesting 	<ul style="list-style-type: none"> • Small area, • Not so difficult techniques • Low quality due to self-seed production 	<ul style="list-style-type: none"> • Small field and scattered 	(No comment)	<ul style="list-style-type: none"> • One cropping/year • Low quality due to rain • Diseases and insects • Low yield • Low income
Others	<ul style="list-style-type: none"> • Altitude 600~700 m • Moc Chau Plateau good for cropping and livestock • Province target is maize area reduce and production increase, vegetable production increase 	<ul style="list-style-type: none"> • Low land(300m) good for crops • High land(1000 m) good for medicinal plant and tea • Climate is good for crop cropping • F1 seed production 	<ul style="list-style-type: none"> • Mountainous, slope • 265km boundary of China • Agricultural land 8.3% 	<ul style="list-style-type: none"> • Mountainous, slope 	<ul style="list-style-type: none"> • More buffalo use than machine • Difficulty of technical transfer due to difference of farmers level

Source: Survey Team

I-3. Current Condition of Cultivation Techniques

Based on interviews on extension workers and observations at the pilot sites, the Team summarized the present condition of the cultivation of three crops into the table below and assumed the cultivation technique level.

Paddy rice: There is not much difference in the yield (5.3~6.0t/ha) of paddy rice cultivation for dry season. Ratio of proxy irrigated area to paddy rice area is the highest in Yen Bai with 87%, followed by Son La with 63%. On the other hand, Lai Chau and Ha Giang occupy about 30%. Though direct

sowing is popular in Dien Bien, transplanting method is widely spread in 95% of paddy area in the other 5 provinces. Two cropping of paddy rice is generally practiced per year in irrigated field. Furthermore, three cropping yearly with two paddy rice and one maize cultivation has been gradually introduced to the farmers in Son La and Yen Bai. As a brand rice, specific local variety “Seng Cu” is cultivated in Lao Cai, which can be sold at high market price. In Dien Bien F1 hybrid seeds are not so much used by farmers, but in the 5 provinces F1 hybrid seeds spread more than Dien Bien. And F1 hybrid seeds are produced at Seed Centers (especially Seed Center in Lao Cai. Yen Bai Seed Center also does seed multiplication).

Maize: The cultivation area and yield of maize is the largest in Son La. In terms of cultivated variety, F1 hybrids are used in all provinces, but cultivation trial of GMO seeds with high yielding and herbicide resistance has started at the pilot farms in Son La and GMO seeds are expected to disseminate to actual farmers fields. Seed treatment has started in Son La and Lai Chau to fasten the germination. In terms of new technology, the young plant-cut cultivation for animal feed and the soil erosion protection by using the harvested plants in the slope area during the rainy season have spread in Son La. And use of raising seedlings in pots for winter cropping has gradually spread in Yen Bai and Ha Giang, which is considered advanced.

Soybeans: Soybean cultivation area has gradually reduced in the most provinces. Only in Ha Giang the soybean cultivation area has expanded and taken an overwhelming proportion of cultivation area and production. Its yield is lower than national average, but their cultivation technique is stable.

Overall, it is inferred that the cultivation technical level is high in Son La, Lao Cai, Ha Giang and Yen Bai, and rather lower in Lai Chau.

Table I-2.4 Present State of Main Three Crop Cultivation by Observation in 5 Provinces

	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Paddy rice during dry season	Area 11,410ha	Area 9,880ha	Area 6,223ha	Area 9,481ha	Area 19,036ha
	Yield 6.01t /ha	Yield 5.54t/ha	Yield 5.44t/ha	Yield 5.58t /ha	Yield 5.31t/ha
	Proxy irrigated 63%	Proxy irrigated 48%	Proxy irrigated 32%	Proxy irrigated 35%	Proxy irrigated 87%
	95 % transplanting	95 % transplanting	95 % transplanting	95 % transplanting	95 % transplanting
	3 cropping /year with one maize	2 cropping /year	2 cropping / year	2 cropping / year	3 cropping / year with one maize
F1 var.	F1 var. Brand rice “Seng Cu”			F1 var.	
Maize	Area 162,510ha	Area 39,132ha	Area 22,150ha	Area 54,215ha	Area 28,471ha
	Yield 4.06t /ha	Yield 3.01t/ha	Yield 2.81t/ha	Yield 3.29t /ha	Yield 2.94t/ha
	Direct sowing Green plant- cut method for animal feeds	Direct sowing	Direct sowing	Direct sowing Transplanting with pot seedlings	Direct sowing Transplanting with pot seedlings
	Seed treatment GMO seeds Covering soil		Seed treatment		
Soybeans	Area 2,086ha	Area 4,881ha	Area 2,491ha	Area 23,758ha	Area 334ha
	Yield 1.26t/ha	Yield 1.09t/ha	Yield 1.10t/ha	Yield 1.28t/ha	Yield 1.19t/ha
	Area reduced			Area increased	Area reduced
Others	Winter vegetable	Winter vegetable			Winter vegetable Mulching, Tunnel

Source: The Survey Team

I-4. Extension Manuals

Comparison of the collected manuals with NORRD Guideline/Manual is shown in the table below.

Technical contents of NORRD manual, which are both extension techniques and cultivation techniques on paddy rice, maize and soybeans, are mostly mentioned in the manuals of the 5 Provinces. Each manual introduces suitable techniques for the local areas. About detail technical contents, some of them are not available in NORRD manual, but available in other Provinces' manuals, and vice versa. Technical items mentioned in the manuals include the methods of extension activities and farmer training and the basic and important cultivation techniques such as variety, sowing, fertilization, water management, pest control and post-harvest, etc. These techniques are basic, but important techniques.

The 5 Provinces' manuals have been formulated in the different forms such books, leaflets, power point slides, documents, etc. according to crops and technical subjects. And quantity of technical contents in manuals is different depending on each province. Ha Giang has one compact manual such book type, which are easy to carry for extension activity.

Table I-4.1 Comparison of Extension Manuals in the 5 Provinces

Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
Manuals consist of documents, pamphlet and power point slides which were summarized for each crop. Manuals having photos of practical techniques are useful for extension activity. Other crop manuals also available.	Manuals are for each crop and most of them are documents with less photos. Also power point slides for manuals. Other crop manuals also available.	Manuals are not enough technical contents, so NAEC's manuals are been using for extension. Other crop manuals also available.	Manual is a compact book type to easily carry in the fields, but less no. of photos contained in it. Other crop manuals also available.	Manuals consist of documents, pamphlet and power point slides which were summarized for each crop. Manuals having photos of practical techniques are useful for extension activity. Other crop manuals also available.

Source: The Survey Team

Common basic techniques of the NORRD manual, such as extension method, pest control, water management, post-harvest, etc., are easily used for extension activities in the 5 provinces. Especially many colored photos of the NORRD manual are easily understandable for extension workers and farmers.

The NORRD manual will be much effectively adopted to Lai Chau. And the NORRD manual is also useful for improvement of cultivation techniques and existent manuals in other provinces.

There are some comments that the NORRD manual is described a lot of paddy rice cultivation but less soybeans, and is heavy for carrying.

I-5. Extension Activities

(1) Extension Human Resources

AEC has 18 to 32 staffs whereas AES has 5 to 10 staffs. One extension worker is assigned in one Commune in Lao Cai, Lai Chau, Yen Bai. Other provinces have two extension workers per commune. In Ha Giang one of two extension workers is a temporary employee and one extension collaborator assigned each hamlet.

No. of farm households per commune extension worker is 678 households in Ye Bai and 579 households in Lao Cai, double the amount of households been in Dien Bien and Ha Giang (325 households). Agriculture land area per extension worker is 861 ha in Lai Chau, followed by Son La (779ha). Extension workers in Lao Cai and Ha Giang oversee the smallest land area (423 ha), about half of Lai Chau and Son La.

Table I-5.1 Extension Staffs in the 5 Provinces

	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
No. of Province AEC staffs	22	27	32	18	28
No. of District AES	12	9	8	11	9
No. District AES staffs	125	45	52	87	45
No. of Commune, Town	197	152	103	190	167
No. of Commune Extension W.	371	152	108	367	180
No. of staffs/AES	10.4	5.0	6.5	7.9	5.0
No. Extension W./ Commune	1.9	1.0	1.0	1.9	1.1
No. of farm. household in Prov.*	185,786	88,074	57,425	119,581	122,098
No. of farm. households / E. W.	500	579	531	325	678
Total agri. land (ha)	289,071	83,585	92,998	155,562	109,320
Agri. Land(ha)/ Extension W.	779	549	861	423	607

Source: Province AEC, *:GSO 2011 data

Table I-5.2 Extension Staff of AES in Candidate Pilot Districts

Province	Son La		Lao Cai		Lai Chau		Ha Giang		Yen Bai	
	District	Mai Son	Moc Chau	Bat Xat	Bao Thang	Tam Duong	Than Uyen	Bac Quang	Quang Binh	Luc Yen
No. of AES staffs	12	9	6	6	6	7	12	9	6	5
No. of Commune	22	15	23	15	14	7	23	15	24	27
No. of Commune Extension Workers	38	27	23	15	14	12	45	30	24	27
No. of Extension Workers/Commune	1.7	1.8	1.0	1.0	1.0	1.7	2.0	2.0	1.0	1.0
No. of Hamlet	457	234	246	264	156	166	236	135	278	312
No. of Hamlet Extension Assistants	0	0	0	0	0	Some Comm	236	135	0	0

Source: District AES

(2) Extension Budget

AEC of Son La and Lao Cai have a large amount of extension budget (28,418mill.VND, 27,893mill.VND), because province extension budget includes the extension budget of all district AESs. On the other hand, province extension budget and district extension budget of other three provinces are independent individually.

According to the calculation of extension activity budget per commune extension worker and per farm household, the highest is in Lai Chau (44,589,000VND, 83,900VND) having the low extension budget where level of agriculture is behind. On the other hand, Son La (44,400VND) and Lao Cai (44,000VND) where agriculture is most advanced have the smaller budgets per farm household. Because Lai Chau has smaller populations, the impact as well as the cost effectiveness of extension efforts have been lower.

Extension budget of district samples are shown in the table below.

Table I-5.3 Extension Budget in the 5 Provinces in the year 2014

District	Son La ¹⁾	Lao Cai ¹⁾	Lai Chau	Ha Giang	Yen Bai
Province AEC extension budget (mill.VND)	28,418.0	27,893.0	2,707.7	5,809.0	4,160.0
Annual current budget (mill.VND)	20,165.0	24,022.0	1,492.0	1,350.0	2,927.0
Extension activity budget (mill.VND)	8,253.0	3,871.0	1,215.7	4,459.0	1,233.0
Total AES E. activity budget ²⁾ (mill.VND)	—	—	3,600.0	2,970.0	3,609.0
Total E. activity budget in Prov.(mill.VND)	8,253.0	3,871.0	4,815.7	7,429.0	4,842.0
Budget E. activity / Commune (1000VND)	41,893	25,467	46,754	39,100	28,994
Budget E. activity / E. Worker (1000VND)	22,245	25,467	44,589	20,242	26,900
Budget E. activity / Farm h.h. (1000VND)	44.4	44.0	83.9	62.0	40.0

District	Son La ¹⁾	Lao Cai ¹⁾	Lai Chau	Ha Giang	Yen Bai
District sample	Mai Son	Bat Xat	Than Uyen	Bac Quang	Luc Yen
District E. budget (mill. VND)	2,937.6	3,398.0	2,166.4	1,312.0	2,039.0
Annual current budget (Mill. VND)	2,481.3	3,233.0	819.6	1,042.0	1,638.0
Extension activity budget (Mill. VND)	456.3	165.0	450.0	270.0	401.0

1)Province extension budget of Son La and Lao Cai includes the extension budget of Mai Son and Bat Xat Districts.

2)Total AES extension activity budget was calculated based on District sample.

Source: Province extension budget form Province Agriculture Extension Center(AEC)

District extension budget from District Agriculture Extension Station(AES) except Maison from Province AEC.

(3) Extension Activities

AECs of Son La and Lao Cai have a strong authority in the formulation of the extension plan and the budget, so that AECs are involved in the extension activity of districts and communes more than the other provinces. Two AECs have a decision about employment of extension workers. In other provinces AES has its decision.

Son La AEC has an obligatory goal for extension workers to establish 3 pilot farms and to provide training to 300 farmers every year. Extension workers provide only technical support without materials such seeds, fertilizers, chemicals.

As described before, all provinces (AEC and/or AES) published technical manuals for extension workers and farmers, which are formulated in leaflets, books, power points, etc.

Year by year the extension activity budget in some provinces shows a tendency of decrease as shown below. In this connection, there are some pilot farms which have been operated by the support of private company and NGOs.

Table I-5.4 Extension Budget of Agriculture Extension Center in the 5 Provinces (mill.VND)

	District	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
2015	Extension budget	27,185.0	27,893.0	4,066.0	4,903.6	4,228.6
	Current budget	20,825.0	24,022.0	2,708.0	1,350.0	2,915.0
	Extension activities b.	6,360.0	3,871.0	1,358.0	3,553.6	1,313.6
2014	Extension budget	28,418.0	28,970.0	2,707.7	5,809.5	4,160.0
	Current budget	20,165.0	24,022.0	1,492.0	1,350.0	2,927.0
	Extension activities b.	8,253.0	4,948.0	1,215.7	4,459.5	1,233.0
2013	Extension budget	25,277.0	34,815.0	4,689.6	7,374.8	4,619.0
	Current budget	17,590.0	24,022.0	1,858.0	1,300.0	2,722.0
	Extension activities b.	7,687.0	10,793.0	2,831.6	6,074.8	1,897.0

Source: Province Agriculture Extension Center

In the candidate pilot communes the extension activities are comparatively active. Each commune has experienced to establish pilot farms for paddy rice and maize cultivation and to implement farmer trainings. And extension workers positively visit farmer's field to monitor 3~5 days per week.

Commune extension workers don't have extension activity budget and follow the extension plan of AES. On the other hand, Commune extension workers have formulated monthly-schedule for crop cultivation technique and management and use it for extension.

Commune extension workers are employed permanently and provided social insurance, therefore their working ethic is good and motivation to the work is high. Complaints of extension activities were not nearly heard from them even though they are busy. One of the reasons that Dien Bien's extension activity is not as active compared with the other five provinces may be the unstable employment condition of extension workers. Some workers change jobs probably because extension workers are contracted for a one year term, do not have social insurance.

Overall, the extension capacity of extension workers in the five provinces is recognized to be higher than those in Dien Bien Province.

Table I-5.5 Extension Workers and Activities in Candidate Pilot Commune

Province	Son La		Lao Cai		Lai Chau		Ha Giang		Yen Bai	
District	Mai Son	Moc Chau	Bat Xat	Bao Thang	Tam Duong	Than Uyen	Bac Quang	Quang Binh	Luc Yen	Van Yen
Commune	Muong Bang	Muong Sang	Muong Vi	Phu Nhuan	Ban Bo	Phuc Than	Dong Yen	Xuan Giang	Vinh Lac	An Thinh
No. of Hamlet	26	12	7	33	16	23	8	9	11	18
No. of Farm household	1,678	1,432	508	2,460	1,159	1,936	1,680	1,126	1,121	2,223
No. of Extension Workers in Commune	2	2	1	1	1	1	2	2	1	1
No. of Extension Assistants in Hamlet	0	0	0	0	0	0	8	9	0	0
No. of farm household/ Ext. W.	839	716	508	2,460	1,159	1,936	840	563	1,121	2,223
Pilot farm	2014 Crop	2014 Veget.	2012 Paddy	2013 Paddy	2014 Maize	2014 Paddy	2014 Pea nut	2015 paddy	2015 paddy	Paddy maize
Farmers training	14 / year	2-3 /crop	20 /crop	15-20 /year	3-4 /crop	3~4 / crop	3~4 / crop	3~4 / crop	2/ month	1 / month
Visit to the farmers	Daily	3-4 / week	Daily	Daily	3 / week	3 / week	3 / week	3 / week	Daily	4 / week

Source: The Survey Team

(4) Research and Experiment Organization

Son La AEC has kept a close cooperation with Tay Bac University. Many graduated university students are employed in the offices under AEC. Sometimes the university staff delivers lectures to the extension workers and farmers in the training, and AEC staff attends and changes their ideas in the meetings on research plan and evaluation. Tay Bac University knows JICA activity well because they implemented a JICA Project and now implementing new one.

AECs of the other provinces cooperating with research organization and university were not seen. They are not much interested in cooperation with others. When problems occur in the farmer's field, AECs say that they can solve it by using accumulated techniques, knowledge and private company's techniques.

(5) Recognition of NORRD Project

All AEC staffs already recognized the NORRD Project. However, AES staff and commune extension workers didn't know the NORRD Project mostly.

I-6. Extension Expansion Plan

(1) Candidate Pilot Sites

Candidate pilot Communes are listed in the table below. Three or four districts each province were selected, and 1~3 communes per district were selected as candidate pilot sites during the Phase 1 work.

Table I-6.1 Candidate Pilot Commune for Extension Expansion

	Son La	Lao Cai	Lai Chau	Ha Giang	Yen Bai
District	Mai Son	Bat Xat	Tam Duong	Bac Quang	Luc Yen
Commune	Muong Bang	Muong Vi Quang Kim	Ban Bo Son Binh	Dong Yen Bang Hanh	Vinh Lac Khai Trung Minh Chuan
District	Moc Chau	Bao Thang	Than Uyen	Quang Binh	Van Yen
Commune	Dong Sang Muong Sang	Phu Nhuan Phong Nien	Phuc Than Muong Cang	Xuan Giang Bang Lang	An Thinh Dong An

					Tan Hop
District	Thuan Chau	Van Ban	Tan Uyen	Vi Xuyen	Yen Binh
Commune	Pung Tra	Duong Quy Khanh Yen Thuong	Pac Ta Than Thuoc	Trung Thanh Vet Lam	Bach Ha Vinh Kien
District				Hoang Su Phi	
Commune				(One Commune)	

Source: Province AEC

Outline of candidate pilot sites visited by the Survey team are shown in the table below. Cultivated crops are paddy rice, maize and soybeans with irrigation facility. Some sites don't have enough irrigation facility. All sites are good for access.

Farmers are interested in variety, fertilization, pest control, water management and new cultivation techniques. Additionally farmers are expecting improvement and repair of irrigation facility.

Table I-6-2 Pilot Candidate Sites in Commune for Extension Expansion

Province	Son La			Lao Cai		Lai Chau	
District	Mai Son	Moc Chau		Bat Xat	Bao Thang	Tam Duong	Than Uyen
Commune	Muong Bang	Dong Sang	Muong Sang	Muong Vi	Phu Nhuan	Ban Bo	Phuc Than
Hamlet	Ban Bo	Ban Ang 1 Ban Ang 2	Na Bo I Na Bo II	Dong Cam Lam Tien	Nhuan 1, 2, 3, 4, 5, 6 Tan Ho	Hung Phong Coc Phong Na Van	Na Sa Sa Bo Na Dat Na Phai San Bay
Target crop	Paddy rice Maize Soybeans	Paddy rice	Paddy rice Maize	Paddy rice	Paddy rice	Maize	Paddy rice
Irrigated area(ha)	0		0	40	50	50	150
Non-irrigated area	17		42	0	0	70	0
Total (ha)	17	46	42	40	50	120	150
Access from CPC	1.5 km	Close road	Close road	1.0 km	1.0 km	Close road	Close road
Farmer's interest	Variety, Cultivation Fertilization, Yield Irrigation canal			Variety, Raising seedlings Cultivation, Pest control Yield		Variety, Fertilization Cultivation, Soil moisture Yield	

Province	Ha Giang				Yen Bai	
District	Bac Quang		Quang Binh		Luc Yen	Van Yen
Commune	Dong Yen		Xuan Giang		Vinh Lac	An Thinh
Hamlet	Team 1, Team 2 (Ke Nhan hamlet)	Team 5 (Thuong An hamlet)	Kien hamlet	Tinh hamlet	Yen Thinh Yen Phu Lang Muong	Luong Lon Dai Thinh
Target crop	Paddy rice	Maize	Paddy rice	Maize	Paddy rice	Paddy rice Maize
Irrigated area(ha)	15	0	20	0	40	234
Non-irrigated area	0	6	0	5	0	0
Total (ha)	15	6	20	5	40	234
Access from CPC	3.0 km Close R183	5.0 km Close road	1.5 km Close R183	Close road	100 m	1.0 km
Farmer's interest	Variety, Cultivation Fertilizer, Quality, Yield				F1 variety, Cultivation Pest control Water management Inter-cropping, Yield	

Source: The Survey Team

These candidate pilot sites were confirmed and finalized during the Phase 2 work. Details of final sites are shown in the main report Part II.

(2) Extension Expansion Plan of the 5 Provinces

The first draft of the extension expansion plans to disseminate the NORRD Guideline/Manual was prepared and submitted to the Team by the provincial AECs during the Phase 1 work as attached. Extension budget includes the cost of agricultural materials (seeds, fertilizers, chemicals, etc.) and the training expenditure (training materials, lecturers, meal, transportation, etc.) and meeting implementation cost. During the Phase 2 work, the revised plans were prepared and shown in the main report Part II.

I-7. Extension Possibility of Guideline/Manual in the 5 Provinces

- The five provinces are located in mountainous area of the northern Vietnam, which is under appropriate climate condition, suitable for the cultivation of major crops such as paddy rice, maize and soybeans. Natural environment conditions of the five provinces are similar to those of Dien Bien Province.
- Yield of paddy rice for dry season in the five provinces is 5.3~6.0 t/ha close to national average, but production is not enough for consumer demand. Share of proxy irrigated area to total paddy rice area is the highest in Yen Bai and is low in the other provinces. Maize production in Son La accounts for 60% of total maize area in the five provinces and its yield is mostly the same as national average. Maize yield of other provinces is quite low. Production of soybeans in Ha Giang accounts for 73% of total area in the five provinces, but the yield of soybeans in all the five provinces is low. Through the improvement of cultivation techniques and irrigation management, yield and production of maize and soybeans (even paddy) are possible to increase.
- Each province published technical manuals of extension and cultivation which have been already used in the extension activities. The NORDD Guideline/Manual is possible to use as a supplement to their techniques and for improvement of the existent manuals. Overall, extension workers are much interested in the Guideline/Manual.
- To promote the extension expansion, the plan and budget proposed by each province is necessary to be modified according to the actual extension situation and budget of the provinces. It is also important to secure the expansion budget by the provincial government.
- From the analysis of survey results, the extension of Guideline/Manual in the five provinces is large possibility.

District	Implementation Period (2016 - 2021)	Target area (ha)	Target commune	Annual plan (Number of demonstration sites - 5ha/site)							Annual budget requirement (VND million)						
				2016	2017	2018	2019	2020	2021	Total	2016	2017	2018	2019	2020	2021	Total
9. Dong Van (17 communes, 2 Town)	2019 - 2021	15	3				1	1	1	3				84	84	84	252
<i>* Replication Site</i>		<i>15</i>	<i>3</i>				<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>				84	84	84	252
Soybean		15	3				1	1	1	3				84	84	84	252
WUG																	0
10. Meo Vac (17 communes, 1 Town)	2019 - 2021	15	3				1	1	1	3				84	84	84	252
<i>* Replication Site</i>		<i>15</i>	<i>3</i>				<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>				84	84	84	252
Soybean		15	3				1	1	1	3				84	84	84	252
WUG																	0
Total				13	13	13	28	15	15	97	1188	1188	1188	2528	1340	1340	8772

** Note:*

- *First period*: 2016 - 2017 will establish 26 demonstration sites in 8 communes of 4 districts: Vi Xuyen, Bac Quang, Quang Binh, Hoang Su Phi (6 paddy rice sites; 6 maize sites, 01 soybean site), in which: 03 districts have 02 communes, 1 paddy rice site and 01 maize site per year, 01 district (Hoang Su Phi) have 01 soybean site.

- *2nd period*: 2018 - 2019 replication technical cultivation of paddy rice, maize, soybean to 14 communes in 4 pilot districts (03 districts collected 4 communes, 2 communes/year; Hoang Su Phi district collected 02 communes, 1 commune/1 year), In which: established 01 paddy rice and 01 maize site/commune/year. The difference commune year by year.

- *3st period*: 2018 - 2019 replication technical cultivation of paddy rice, maize, soybean to 30 communes of 6 districts, city. Bac Me, Xin Man districts will established each commune have 01 paddy rice site, 01 maize site, 01 soybean site per year; Ha Giang city each commune established 01 paddy rice site, 01 maize site per year; Dong Van, Yen Minh, Meo Vac each commune established 01 soybean site per year. The different communes was collected year by year.

Source: Ha Giang DARD and AEC

Provincial Plans for the replication of the extension application of pilot activities of JICA

Province: Lao Cai

No.	District	Implementat ion Period (2016 - 2020)	Taget area (ha)	Taget commune	Annual plan (Number of demonstration sites)						Annual budget requirement (VND million)					
					2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total
A	Period 1 (2016 - 2017)		355		1,550	845				1,745	2,979.7	1,711.4				4,691.10
I	Paddy rice		270		1,260	630				1,240	2,153.7	1,085.5				3,239.15
1	Bao Thang district		105		490	245				735	878.6	442.9				1,321.45
-	Demonstration site of new paddy rice varieties	2016 - 2017	105	Phu Nhuan; Phong Nien	490	245				735	878.6	442.9				1,321.5
2	Bat Xat district		75		350	175				525	560.5	295.3				855.8
-	Demonstration site of new paddy rice varieties	2016 - 2017	75	Muong Vi; Quang Kim	350	175				525	560.5	295.3				855.8
3	Van Ban district		90		420	210				630	714.6	347.3				1,061.9
-	Demonstration site of new paddy rice varieties	2016 - 2017	90	Duong Quy, Khanh Yen Thuong	420	210				630	714.6	347.3				1,061.9
II	Maize		45		150	75				225	432	231				663
1	Demonstration site of new maize variety	2016 - 2017	45	Phong Nien commune of Bao Thang dis.	150	75				225	432	231				663
III	Potato		40		140	140				280	394	394.95				789
1	Demonstration production of winter crop	2016 - 2017	40	Phu Nhuan - Bao Thang dis.	140	140				280	394	394.95				789

No.	District	Implementat ion Period (2016 - 2020)	Taget area (ha)	Taget commune	Annual plan (Number of demostration sites)						Annual budget requirement (VND million)							
					2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total		
B	Period 2 (2018 - 2020)		740				3,220	4,270	5,180	12,670			260	350	419	1,028.65		
I	Paddy rice		580				2,380	3,290	4060	9,730			200	275	331	806		
1	Bao Thang district		250				840	1,400	1750	3,990			75	100	120	295		
-	Demonstration site of new paddy rice	2018 - 2020	250	Phu Nhuan, Phong Nien			840	1,400	1750	3,990			75	100	120	295		
2	Bat Xat		150				700	840	1050	2,590			60	85	105	250		
-	Demonstration site of new paddy rice	2018 - 2020	150	Muong Vi, Quang Kim			700	840	1050	2,590			60	85	105	250		
3	Van Ban district		180				840	1,050	1260	3,150			65	90	105.6	260.6		
-	Demonstration site of new paddy rice varieties	2018 - 2020	180	Duong Quy, Khanh Yen Thuong			840	1,050	1260	3,150			65	90	105.6	260.6		
II	Maize		80				420	490	560	1,470			45	60	70	175		
1	Demonstration site of new maize variety	2018 - 2020	80	Phong Nien commune of Bao Thang dis.			420	490	560	1,470			45	60	70	175		
III	Potato		80				420	490	560	1,470			15	15	18.05	48.1		
1	Demonstration production of winter crop	2018 - 2020	80	Phu Nhuan commune of Bao Thang dis.			420	490	560	1,470			15	15	18.05	48.1		
	Total		1,095				1,550	845	3,220	4,270	5,180	15,065	2,979.7	1,711.4	260	350	418.65	5,719.75

Source: Lao Cai DARD and AEC

Provincial Plans for the replication of the extension application of pilot activities of JICA

Province: Yen Bai

No.	District	Implementation Period (2016 - 2020)	Target area (ha)	Target commune	Annual plan (Number of demonstration sites)						Annual budget requirement (VND million)					
					2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total
A	Period 1 (2016-2017)		79								440.6	948.4				1,389.0
I	Paddy rice		45		300	600				900	263.7	527.4				791.1
1	<i>Luc Yen district</i>		<i>15</i>		<i>100</i>	<i>200</i>				<i>300</i>	<i>87.9</i>	<i>175.8</i>				<i>263.7</i>
-	<i>Demonstration site of paddy rice</i>	<i>2016-2017</i>	<i>15</i>	<i>Khai trung, Vinh Lac, Minh Chuan</i>	<i>100</i>	<i>200</i>				<i>300</i>	<i>87.9</i>	<i>175.8</i>				<i>263.7</i>
2	<i>Yen Binh district</i>		<i>12</i>		<i>80</i>	<i>160</i>				<i>240</i>	<i>70.3</i>	<i>140.6</i>				<i>211.0</i>
-	<i>Demonstration site of paddy rice</i>	<i>2016-2017</i>	<i>12</i>	<i>Bach Ha, Vinh Kien</i>	<i>80</i>	<i>160</i>				<i>240</i>	<i>70.3</i>	<i>140.6</i>				<i>211.0</i>
3	<i>Van Yen</i>		<i>18</i>		<i>120</i>	<i>240</i>				<i>360</i>	<i>105.5</i>	<i>211.0</i>				<i>316.4</i>
-	<i>Demonstration site of paddy rice</i>		<i>18</i>	<i>Dong An, An Thinh, Tan Hop</i>	<i>120</i>	<i>240</i>				<i>360</i>	<i>105.5</i>	<i>211.0</i>				<i>316.4</i>
II	Maize		26		120	320				440	106.0	350.1				456.1
1	<i>Luc Yen district</i>		<i>10</i>		<i>40</i>	<i>160</i>				<i>200</i>	<i>35.2</i>	<i>139.9</i>				<i>175.1</i>
-	<i>Demonstration site of hybrid maize</i>	<i>2016-2017</i>	<i>10</i>	<i>Khai trung, Minh Chuan</i>	<i>40</i>	<i>160</i>				<i>200</i>	<i>35.2</i>	<i>139.9</i>				<i>175.1</i>
2	<i>Yen Binh district</i>		<i>6</i>		<i>40</i>	<i>80</i>				<i>120</i>	<i>35.2</i>	<i>70.3</i>				<i>105.5</i>
-	<i>Demonstration site of hybrid maize</i>	<i>2016-2017</i>	<i>6</i>	<i>Bach Ha</i>	<i>40</i>	<i>80</i>				<i>120</i>	<i>35.2</i>	<i>70.3</i>				<i>105.5</i>
3	<i>Van Yen district</i>		<i>10</i>		<i>40</i>	<i>80</i>				<i>120</i>	<i>35.7</i>	<i>139.9</i>				<i>175.6</i>

No.	District	Implementation Period (2016 - 2020)	Target area (ha)	Target commune	Annual plan (Number of demonstration sites)						Annual budget requirement (VND million)					
					2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total
-	Demonstration site of hybrid maize		10	An Thinh, Tan Hop	40	80				120	35.2	139.9				175.1
III	Soybean		8		48	48				96	70.9	70.9				141.7
1	Luc Yen district		4		24	24				48	35.2	35.2				70.3
-	Demonstration site of soybean DT84 variety	2016-2017	4	Khai trung	24	24				48	35.2	35.2				70.3
2	Van Yen district		4		24	24				48	35.7	35.7				71.4
-	Demonstration site of soybean DT84 variety		4	An Thinh	24	24				48	35.2	35.2				70.3
B	Period 2 (2018-2020)		909										473.6	813.6	813.6	2,100.8
I	Paddy rice		449				2,080	2,180	4,000	8,260			237	364	364	965.4
1	Luc Yen district		156				720	1,000	1,400	3,120			88.8	131.3	131.3	351.4
-	Demonstration site of paddy rice	2018-2020	156	Khai trung, Vinh Lac, Minh Chuan			720	1,000	1,400	3,120			88.8	131.3	131.3	351.4
2	Yen Binh district		124				580	80	1,100	1,760			59.2	101.7	101.7	262.6
-	Demonstration site of paddy rice	2018-2020	124	Bach ha, Vinh Kien			580	80	1,100	1,760			59.2	101.7	101.7	262.6
3	Van Yen district		169				780	1,100	1,500	3,380			88.8	131.3	131.3	351.4
-	Demonstration site of paddy rice	2018-2020	169	Đông an, An Thinh, Tan Hop			780	1,100	1,500	3,380			88.8	131.3	131.3	351.4
II	Maize		420				960	1,740	2,340	5,040			177.6	305.1	305.1	787.8

No.	District	Implementation Period (2016 - 2020)	Target area (ha)	Target commune	Annual plan (Number of demonstration sites)						Annual budget requirement (VND million)					
					2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total
1	Luc Yen district		90				240	360	480	1,080			59.2	101.7	101.7	262.6
-	Demonstration site of hybrid maize	2018-2020	90	Khai trung, Minh Chuan			240	360	480	1,080			59.2	101.7	101.7	262.6
2	Yen Binh district		120				180	540	720	1,440			59.2	101.7	101.7	262.6
-	Demonstration site of hybrid maize	2018-2020	120	Bach ha			180	540	720	1,440			59.2	101.7	101.7	262.6
3	Van Yen district		210				540	840	1,140	2,520			59.2	101.7	101.7	262.6
-	Demonstration site of hybrid maize		210	An Thinh, Tan Hop			540	840	1,140	2,520			59.2	101.7	101.7	262.6
III	Soybean		40				120	120	240	480			59.2	144.2	144.2	347.6
1	Luc Yen district		20				60	60	120	240			29.6	72.1	72.1	173.8
-	Demonstration site of soybean DT84 variety	2018-2020	20	Khai trung			60	60	120	240			29.6	72.1	72.1	173.8
2	Van Yen district		20				60	60	120	240			29.6	72.1	72.1	173.8
-	Demonstration site of soybean DT84 variety		20	An Thinh			60	60	120	240			29.6	72.1	72.1	173.8

Source: Yen Bai DARD and AEC

Provincial Plans for the replication of the extension application of pilot activities of JICA
Province: Lai Chau

District	Implementation Period (2016 - 2020)	Target area (ha)	Target commune	Annual plan (Number of demonstration sites - 3ha/site)						Annual budget requirement (VND million)						
				2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total	
1. Tam Duong	2016 - 2020	30	10	2	2	6	6	6	22	85.155	85.155	191.7	191.7	191.7	745.41	
<i>* Demonstration Site</i>	2016-2017															
Maize		12	4	2	2				4	85.155	85.155					170.31
<i>* Replication Site</i>	2018-2020															
Maize		18	6			6	6	6	18			191.7	191.7	191.7		575.1
2. Tan Uyen	2016 - 2020	30	10	2	2	6	6	6	22	80.725	80.725	243.206	243.206	243.206	891.068	
<i>* Demonstration Site</i>	2016-2017															
Paddy Rice		6	2	1	1				2	40.791	40.791					81.582
Maize		6	2	1	1				2	39.934	39.934					79.868
<i>* Replication Site</i>	2018-2020															
Paddy Rice		9	3			3	3	3	9			117.596	117.596	117.596		352.788
Maize		9	3			3	3	3	9			125.61	125.61	125.61		376.83
3. Than Uyen	2016 - 2020	30	10	2	2	6	6	6	22	65.675	65.675	236.7	236.7	236.7	841.45	
<i>* Demonstration Site</i>	2016-2017															
Paddy Rice		12	4	2	2				4	65.675	65.675					131.35
<i>* Replication Site</i>	2018-2020															
Paddy Rice		18	6			6	6	6	18			236.7	236.7	236.7		710.1
Total		90	30	6	6	18	18	18	66	231.555	231.555	671.606	671.606	671.606	2,477.93	

Source: Lai Chau DARD and AEC

Provincial Plans for the replication of the extension application of pilot activities of JICA

Province: Son La

District	Implementation Period (2016 - 2020)	Target area (ha)	Target commune	Annual plan (Number of demonstration sites - 5ha/site (paddy rice; maize))						Annual budget requirement (VND million)					
				2016	2017	2018	2019	2020	Total	2016	2017	2018	2019	2020	Total
1. Moc Chau	2016 - 2020	115	8	1	2	4	6	10	23	57.329	58.463	85.804	109.705	158.54	469.841
<i>* Demonstration Site</i>	2016-2017														
Paddy rice		15	3	1	2				3	57.329	58.463				115.792
<i>* Replication Site</i>	2018-2020														
Paddy rice		100	5			4	6	10	20			85.804	109.705	158.540	354.049
2. Thuan Chau	2016 - 2020	127	13	2	3	5	7	11	28						187.492
<i>* Demonstration Site</i>	2016-2017														
Paddy Rice		15	3	1	2				3	57.329	58.463				115.792
Soybean		6	2	1	1				2	35.850	35.850				71.700
<i>* Replication Site</i>	2018-2020														
Paddy Rice		100	5			4	6	10	20			85.804	109.705	158.540	354.049
Soybean		6	3			1	1	1	3			35.850	35.850	35.850	107.55
3. Mai Son	2016 - 2020	145	16	3	5	5	7	11	31	384.731	481.152	85.804	109.705	158.54	1219.932
<i>* Demonstration Site</i>	2016-2017														
Paddy Rice		15	3	1	2				3	57.329	58.463				115.792
Maize		15	3	1	2				3	273.628	368.915				642.543
Soybean		6	2	1	1				2	53.774	53.774				107.548
<i>* Replication Site</i>	2018-2020								0						
Paddy Rice		100	5			4	6	10	20			85.804	109.705	158.540	354.049
Soybean		9	3			1	1	1	3			53.774	53.774	53.774	161.322
Total		387	37	6	10	14	20	32	82	442.06	539.615	171.608	219.41	317.08	1,877.27

Scale: 5 ha/ commune , expand 0.5 ha for 1 site of paddy rice

Scale: 3 ha for soybean demo farm in Thuan Chau

Scale: 3 ha for soybean demo farm in Mai Son

Source: Son La DARD and AEC