Socialist Republic of Viet Nam

Ex-Post Evaluation of Japanese Grant Aid Project
"The Project for Improvement of Rural Living Condition in Nam Dan District in Nghe An Province"

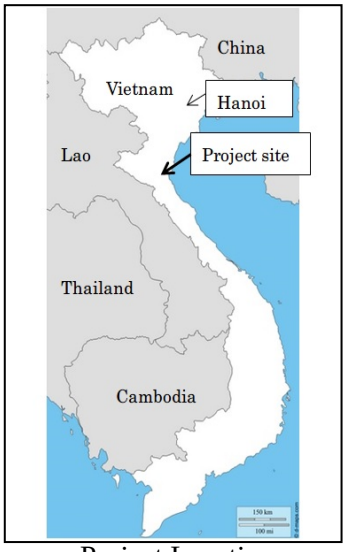
External Evaluator: Kenichi Inazawa, Octavia Japan Co, Ltd.

0. Summary

This project rehabilitated irrigation facilities and roads, and expanded facilities for rural electrification with the aim of recovering the irrigable area, improving traffic accessibility, and stabilizing the electricity supply in the Nam Nam area of the Nam Dan District of the Nghe An Province, located in the north-central part of the Socialist Republic of Viet Nam (hereafter referred to as "Vietnam"). At the time of the ex-post evaluation, the relevance of this project is high as the project is consistent with the policy stipulated in the "Five Year Socio-Economic Development Plan", and with further development needs such as development of agricultural infrastructure, extension of road rehabilitation, and expansion of the electric distribution network. The project cost and project period did not exceed the original plan; thus efficiency is high. In this project, pumping facilities and canals were rehabilitated in the Nam Nam area, which led to the recovery of irrigable areas and reduced labor requirements and working hours for farmers, thereby realizing stable distribution of irrigation water. Through the rehabilitation of National Road 15A and district roads (Nam Kim-Nam Phuc-Nam Cuong road), smooth flow of traffic and reduced travel times have been realized, while improving traffic access to other parts of the country. The electric supply has been stabilized through the rehabilitation of substations and the electric distribution network, and all households in the area are registered members of the electricity service. The results from the beneficiary survey reaffirmed that the level of satisfaction with the project was high, and that the living conditions have been improved; thus, effectiveness and impact of this project are high. In addition, there are no major issues regarding the institutional, technical and financial aspects of the organizational structures, operation and maintenance of each facility developed/rehabilitated by this project; thus sustainability of this project is high.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description



Project Location


Rehabilitated National Road 15A

1.1 Background

The Nam Dan District of the Nghe An Province, located in the north-central part of Vietnam, faces harsh natural conditions: such as unfertile soil, monsoons associated with hot wind (Laos wind), typhoons and flood damage. In the Nam Nam area[1], located at the southern edge of the Nam Dan District, farmers and residents were forced to live with harsh conditions before the project's implementation: such as limited access to markets and cities due to underdeveloped roads, isolation and inundated agricultural lands caused by floods in the rainy season, drought resulting from dilapidated agricultural infrastructures in the dry season, and an unstable power supply. Therefore, it was an urgent task to improve the accessibility through road development, to reduce labor and working hours for farmers through renewing the old irrigation drainage facilities, and to realize a stable power supply, thereby improving the living conditions of the residents, for which the government of Vietnam requested Japanese grant aid assistance.

1.2 Project Outline

The objective of this project is to recover irrigable areas, improve traffic accessibility and stabilize the electricity supply by rehabilitating irrigation facilities and roads and expanding rural electrical facilities, thereby contributing to the improvement of rural living conditions

[1] At the time of the ex-post evaluation, the Nam Nam area is composed of five communes (Khanhson, Nam Trung, Nam Phuc, Nam Cuong, and Nam Kim), 84 communities (an administrative unit which is one level lower than communes). The total area is approximately 7,200ha with a population of approximately 35,000; the total number of households is around 9,100, out of which 8,376 households (approximately 92%) are farmers. Most farmers are small holder farmers with an average area under cultivation of 0.3ha (as of the end of 2013).

through improved agricultural productivity, stable agricultural business and increased income levels in the Nam Nam area of the Nam Dan District of the Nghe An Province, located in the north-central part of Vietnam.

Grant Limit / Actual Grant Amount		1,227 million yen (Phase I: 472 million yen, Phase II: 755 million yen) / 1,181 million yen (Phase I: 463 million yen, Phase II: 718 million yen)
Exchange of Notes Date (/Grant Agreement Date)		Phase I: July 2003 Phase II: May 2004
Implementing Agency		Phase I: International Cooperation Department of the Ministry of Agriculture and Rural Development Phase II: People's Committee of Nghe An Province
Project Completion Date		Phase I: November 2004 Phase II: February 2006
Contractors	Main Contractor	Nishimatsu Construction Co., Ltd.
	Main Consultant	Taiyo Consultants Co., Ltd. / Pacific Consultants International (JV)
Basic Design		July 2002 – February 2003
Detailed Design		N/A
Related Projects		【Technical Cooperation】 "Model Rural Development in the Nam Dan District, Nghe An Province" (1996–1998) (Development Study)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa Octavia Japan Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – December 2015

Duration of the Field Study: October 6–18, 2014 - January 12–18, 2015

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance (Rating:③[3])

3.1.1 Relevance to the Development Plan of Vietnam

Before the project's commencement, the government of Vietnam formulated the "Sixth Five-Year Plan" (1996–2000), in which development of agriculture and rural economies was recognized as one of the priorities. Additionally, the main goals stipulated in the plan were "poverty alleviation and food security", "improvement in rural incomes, social infrastructures, culture, health and sanitation and education", "reduction in regional disparities and urbanization of rural areas", and "increase in forest area and conservation of the natural environment".

At the time of the ex post evaluation, the government of Vietnam formulated the "Five Year Socio-Economic Development Plan" (2011–2015). In this plan, reduction of economic disparities, poverty alleviation, and development of local infrastructures are listed as important issues. The Ministry of Agriculture and Rural Development (hereafter referred to as "MARD") developed the "Five Year Agriculture and Rural Development Plan" (2011–2015), in which the ministry set concrete goals such as improvement of agricultural productivity and social infrastructures. In addition, the People's Committee of Nam Dan district (the implementing agency of this project) in the Nghe An Province has plans for agricultural modernization and sustainable poverty reduction[4].

In light of the above, poverty reduction as well as agricultural and rural development are consistent with the policies stipulated in the national and sector plans of Vietnam at the time of the ex-ante evaluation and ex-post evaluation.

3.1.2 Relevance to the Development Needs of Vietnam

Before the project's implementation, farmers and residents of the Nam Dan District had to work excessively and yet faced low agricultural incomes and living standards due to harsh natural conditions, such as unfertile lands, monsoons associated with hot winds (Laos wind), typhoons and flood damage. Especially in the Nam Nam area, located at the southern edge of the district, people had limited access to markets as roads were underdeveloped. This area would be isolated with agricultural lands submerged due to floods in the rainy season, while it was prone to droughts due to old agricultural infrastructures/facilities in the dry season. In

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory.
[3] ③: High, ② Fair, ① Low.
[4] The target year is 2020.

addition, the electricity supply was also unstable and some areas were not electrified; residents were faced with difficult living conditions. In light of such situations, there was a great need to improve living conditions of residents by improving traffic accessibility through developing/repairing roads, the backbone of rural livelihoods, by stabilizing agricultural production through renewal of irrigation drainage facilities and by realizing a stable power supply through improving distribution networks.

At the time of the ex-post evaluation, the poverty rate of the Nghe An Province is 15.6%, which is higher than the national average of 9.6%[5]. The People's Committee of Nam Dan district is working toward poverty reduction through the development and rehabilitation of infrastructures/facilities, including roads, irrigation/drainage and rural electrification as described below:

1) Road: The People's Committee of Nam Dan district is working toward realizing the smooth flow of traffic by rehabilitating and extending roads connecting to nearby communes[6] that are outside the project's targeted areas.

2) Irrigation/drainage: Drainage facilities are being developed with the aim of improving drainage during heavy rain and increasing agricultural productivity in low lands of the Nam Nam area.

3) Rural electrification: The Nam Dan Office of the Electricity of Vietnam (hereafter referred to as "EVN"), which supplies power in Nam Dan district, is planning to introduce a high voltage 35kV distribution network in addition to the 10kv distribution network developed by this project, with the aim of further strengthening the power supply system in the province.

As described above, the Nam Dan District of the Nghe An Province continues to place importance on the needs of developing agricultural infrastructures, repairing and extending roads and developing the power distribution network; therefore, it can be observed that the objectives of this project are consistent with the development needs of the targeted area before the project's commencement as well as at the time of ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

In 2003, when this project commenced, the ODA Charter of Japan placed importance on Asia; it especially focused on strengthening economic ties with East Asia through ODA. In

[5] It is based on 2012 data released by the Ministry of Labour, Invalids, and Social Affairs (MOLISA). The definition of poverty at the time of the ex post evaluation is a household income of 400,000 VND (approximately 2000 JPY) or less monthly.

[6] Commune is one of the local governmental levels. It normally refers to towns or villages under districts.

addition, the “Country Assistance Program for Vietnam” released by the Japanese Ministry of Foreign Affairs in 2000 identified the following five priority sectors: (1) Human Resource Development and Institution Building (lending particular support to the transition to a market economy); (2) Infrastructure Development such as the power supply and transportation; (3) Agriculture and Rural Development; (4) Education and Health; and (5) Environmental Conservation. Regarding (3) Agriculture and Rural Development, it was stated that supports for infrastructures such as “irrigation drainage”, and “development and dissemination of agricultural technologies”, were necessary. This project provides assistance to Vietnam based on the above priority sector and sectoral assistance policy (i.e., (3) Agriculture and Rural Development); thus it is consistent with the assistance policy of Japan.

This project has been highly relevant to the development plan and development needs of Vietnam, as well as Japan’s ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating:③)

3.2.1 Project Outputs

The planned and actual outputs of this project are shown in Table 1. This project has roughly three components (irrigation facility, roads, and rural electrification).

Table 1: Planned and Actual Project Outputs

Plan (before project commencement)	Actual (at ex-post evaluation)
【Planned Inputs from Japanese Side】 1) Irrigation Facility ・Rehabilitation of Nam Trung’s pump irrigation system: rehabilitation of pumping station and main canal 4.9km ・Rehabilitation of Ho Thanh reservoir irrigation system: countermeasure for reservoir leakage, rehabilitation of existing canal 2.4km 2) Road ・Improvement of National Road 15A (south): 15.7km (asphalt pavement, four bridges, one box culvert, countermeasures for erosion at three sites, raising up road surface at four sections) ・Improvement of District Roads (Nam Kim-Nam Phuc-Nam Cuong road): 6.9km (concrete pavement 2.6 km long, asphalt pavement 4.3km, one bridge and four box	【Actual Inputs from Japanese Side】 1) Irrigation Facility →As planned. 2) Road →As planned.

culverts) 3) Rural Electrification ・Expansion of electrified areas: three areas (Construction of substations on three sites, installation of distribution network 10kV 5.1km, 0.4kV 11.8km) 【Planned Inputs from Vietnamese Side】 1) Securing lands necessary for the construction The Vietnamese side is to secure lands necessary for irrigation facilities, roads, bridges, electrification facilities, temporary office and storage yards, and to clear, level and reclaim the lands.	3) Rural Electrification →Mostly as planned. (Regarding the distribution network, the 10kV line was slightly changed to 4.4km while the 0.4kV line was changed to 11.5km.) 【Actual Inputs from Vietnamese Side】 1) Securing lands necessary for the construction →As planned.

Source: Document provided by JICA (The planned outputs were taken from the basic design study report while the actual outputs were taken from the completion report and answers to the questionnaires and field surveys.)

The originally planned outputs both from the Japanese and Vietnamese sides were mostly implemented as planned. As for the distribution network installation under "3) Rural Electrification", which was to be borne by the Japanese side, the 10kV line was slightly changed to 4.4km and the 0.4kV line to 11.5km, as a result of the site reconnaissance and line survey. The change was made based on the necessity identified during the detailed design; thus it can be judged that the change was appropriate.

Photo 1: Rehabilitated Nam Trung Pumping Station

Photo 2: Control Panel (left) and Pump Unit (right) inside Nam Trung Pumping Station

3.2.2 Project Inputs

3.2.2.1 Project Cost

The planned total project cost was 1,254 million yen (out of which 1,227 million yen was to be borne by the Japanese side, while approximately 27 million yen was by the Vietnamese side). Actually, the total project cost was approximately 1,197 million yen (out of which 1,181 million

yen was borne by the Japanese side, while approximately 16 million yen was by the Vietnamese side); thus it was lower than planned (95% of the plan).

3.2.2.2 Project Period

The planned project period was three years and two months (38 months) from July 2003 to September 2006. The actual period for the Japanese side was roughly two years and seven months (30.6 months) from July 2003 to February 2006. On the other hand, the project inputs by the Vietnamese side continued until the end of June 2006[7], requiring about two years and 11 months (35 months) counting from the beginning of the project. Therefore, the originally planned project period was 38 months, while the actual project period was 35 months or 92% of the plan and the project period was shorter than originally planned.

Both the project cost and project period were within the plan. Therefore, efficiency of the project is high.

3.3 Effectiveness[8] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

This project rehabilitated irrigation facilities and National Road 15A and district roads (Nam Kim-Nam Phuc-Nam Cuong road), and expanded rural electrification facilities in order to recover the irrigable area, to reduce labor requirement and working hours of the farmers, to improve traffic accessibility, and to realize a stable power supply. Tables 2–4 show the targets and actual figures of the indicators before the project commencement and after the project completion that indicate operational effectiveness of each project component.

[7] The activity was to secure, clear, level, and reclaim the lands needed for the main construction (including land for temporary field offices for construction). The Vietnamese side owned the land for some time even after the completion of construction by the Japanese side.

[8] Sub-rating for Effectiveness is to be put with consideration of Impact.

1) Irrigation/Drainage Project

Table 2: Comparison of Indicator Data concerning Irrigation/Drainage Project

Indicator	Before Project Commencement		After Project Completion		
	2002 (Baseline)	2006 (Two years after completion) (Target)	2008 (Two years after completion) (Actual)	2012 (Six years after completion) (Actual)	2013 (Seven years after completion) (Actual)
Irrigable area of the targeted facilities (recovery)	Nam Trung Pump Irrigation System's command area: 370ha	470ha	490ha (470ha)* Note	490ha (470ha)	490ha (470ha)
	Ho Thanh Reservoir Irrigation System's irrigable area: 40ha	70ha	50ha (70ha)	50ha (70ha)	50ha (70ha)
Reduction in labor requirement (cleaning and repair of canals)	Frequency: four times yearly (one day x two times, before and after cropping)	Twice yearly	N/A	Twice yearly	Twice yearly
	Required time: 32 hours (4 x 8 hours)	16 hours (2×8 hours)	N/A	16 hours (2×8 hours)	16 hours (2×8 hours)
	Number of people required: 240 people each time	240 people each time	N/A	120 people each time	120 people each time
	Hours x number of people required: 7,680 man-hours	3,840 man-hours	N/A	1,920 man-hours	1,920 man-hours

Source: JICA document (before the project commencement), Post Basic Design Study Survey (2008), answers to the questionnaire and results from the interviews with the People's Committee of Nam Dan district (2012/2013) (After project completion).
Note: The Nam Trung Irrigation System and Ho Thanh Irrigation System have an overlapping command area (approximately 20ha). As this area gets water distributed from both the two systems, additional figures are presented in brackets.

With respect to the "Irrigable area of the targeted facilities (recovery)" in Table 2, the initial target was achieved after the project's completion. According to the People's Committee of

Nam Dan District, the Nam Trung Commune which operates and maintains the Nam Trung Pump Irrigation System and the Nam Dan Agricultural Irrigation Company (hereafter referred to as "Irrigation Corporation of the Nam Dan District"), a branch of Nghe An South Irrigation Corporation, which operates and maintains the Ho Thanh Reservoir Irrigation System, there is an overlapping area (roughly 20ha) served by both Nam Trung and Ho Thanh Irrigation Systems; and this area receives water either from the two irrigation systems[9]. The initial target was generally achieved regarding the indicator of "Reduction in labor requirement (cleaning and repair of canals)". The People's Committee of Nam Dan District and the Nam Trung Commune were asked during the interviews to comment on the fact that the inputs in terms of people and hours have been reduced to 120 people each time and to 1920 man-hours as shown in Table 2. They commented, "The main irrigation canal installed by this project is larger in size than what existed before; and its structure has been designed in such a way to prevent the build-up of silt and garbage. As a result, the time and frequency required for cleaning have reduced. In reality, it does not require many people to clean; with 120 people it can be maintained properly." This indicates that the cleaning of the canals is being carried out efficiently with reduced labor (both in terms of frequency and hours)[10].

2) Road Project

Table 3: Comparison of Indicator Data concerning the Road Project

Indicator	Before Project Commencement		After Project Completion		
	2002 (Baseline)	2006 (Two years after completion) (Target)	2008 (Two years after completion) (Actual)	2012 (Six years after completion) (Actual)	2013/14 (Seven/eight years after completion) (Actual)
Required travel time on National Road 15A *Note 1	26 minutes (45–60 min) *Note 2	19 minutes (30 min)	18 minutes (18–25 min)	18–25 minutes	18–25 minutes
Number of days that National Road 15A is impassable in a year	14 days	0 day	N/A	0 day	0 day
Required travel time on district	15 minutes	10 minutes	N/A	10 minutes	10 minutes

[9] Hence some figures are in brackets.

[10] Regarding irrigation canal repairs, there has been no repair work because no leakage or damage had been reported after the project completion up until the ex-post evaluation, as will be described in "3.5.4 Current Status of Operation and Maintenance". No problems were observed in particular during the field survey of this evaluation study.

roads (all sections)					
Increase in traffic volume (fixed-route public bus)	None	Existing (a few daily)	Existing (six daily)	None	None

Source: JICA document (before project commencement), Post Basic Design Study Survey (2008), answers to the questionnaire, results from interviews with the People's Committee of Nam Dan District and measurement taken during the field survey (2012–2014) (after the project's completion).
Note 1: Required travel time from the Nam Dan Bridge to the entrance to the district road (approximately 15.7km)
Note 2: According to the People's Committee of Nam Dan District, it used to take 45–60 minutes considering the road condition of this section at that time, before the project's commencement. It was pointed out that they might have made a mistake in the time measurement during the basic design of this project.

As shown in Table 3, with respect to the indicator, "required travel time on National Road 15A", the target was achieved two years after the project's completion and the target is also being met at the time of the ex-post evaluation[11]. Additionally, the "number of days that National Road 15A is impassable in a year" is none at the time of the ex-post evaluation. The target on "required travel time on district roads (all sections)" is achieved at the time of ex-post evaluation[12]. With respect to the indicator, "increase in traffic volume (fixed-route public bus)", a fixed-route public bus was operating two years after the project's completion; however, there is none operation at the time of the ex-post evaluation. According to the People's Committee of Nam Dan District, it is because "up until two years after the project completion (2008), local communities were excited about the national road 15A rehabilitated by this project and the fixed-route public bus was operating. Thereafter, however, passenger demand declined and the route was suspended and discontinued." One of the reasons behind the decline in passenger demand is that residents came to prefer motorbikes or automobiles to the public bus, as the former would not require waiting time and they can easily be on their way. The fact that residents' income levels increased after the project's completion contributed to the purchasing of vehicles; thus it can be attributed to the change in economic situations and traffic needs. Although some changes occurred in terms of transportation means and conditions between two years after the project completion and the time of ex-post evaluation, it can be judged that this does not mean that the effect of this project deteriorated.

[11] "45–60min" is written in brackets because the section from the Nam Dan Bridge to the start of the district road (15.7km) used to take 45–60 minutes considering the road condition at that time according to the People's Committee of Nam Dan District. It was pointed out that they might have made some mistake in time measurement at the time of the basic design. The People's Committee of Nam Dan District also pointed out that the figure for two years after the completion should be 18–25 minutes. Based on such comments, some figures are presented in brackets in Table 3. While it is not clear how the actual values (baselines) were measured before the commencement of the project, it might have been influenced by various traffic conditions (e.g., traffic volume, effects of oncoming cars and cattle blocking vehicle traffic).

[12] The said actual figure was also confirmed through actual measurements taken while riding in a car during the field survey of this evaluation study.

3) Rural Electrification Project

Table 4: Comparison of Indicator Date concerning Rural Electrification Project

Indicator	Before Project Commencement		After Project Completion		
	2002 (Baseline)	2006 (Two years after completion) (Target)	2008 (Two years after completion) (Actual)	2012 (Six years after completion) (Actual)	2014 (Eight years after completion) (Actual)
Electrification rate	69%	96%	100%	100%	100%
Electricity rates	1,100VND/kWh	750VND /kWh	700VND /kWh	N/A	1,660VND /kWh

Source: JICA document (before project commencement); the Post Basic Design Study Survey (2008); the Defect Inspection Report (2008); and answers to the questionnaire (2012/2014) (after the project completion).

As shown in Table 4, it was confirmed two years after the project's completion that all households were electrified in the Nam Nam area. According to EVN's Nam Dan Branch responsible for the operation and maintenance as well as the People's Committee of Nam Dan District, all households were confirmed to be electrified in the sixth and eighth year after the project's completion. Regarding electricity rates, residents in this area used to pay 1,100VND/kWh, which was double the national average (500VND/kWh), due to low-quality distribution lines, unstable power supply voltage and distribution loss, resulting in frequent power cuts. On the other hand, with the installation of a distribution network by this project, the electricity rate went down to 700VND/kWh two years after the project's completion. However, people are paying 1,660VND/kWh, which is the national average, at the time of the ex-post evaluation. As a matter of fact, electricity rate level is uniform throughout the nation eight years after the project's completion, and residents of this area are charged at the same rate as those residing in other area. On the other hand, electricity rate levels differed from region to region until the second year after the completion. Then the practice was that EVN would provide electricity to each commune, and each commune would then sell power to each household by adding their operation and maintenance costs to the price. Now, at the time of the ex-post evaluation, EVN sells electricity to each household directly. When residents of the Nam Nam area were interviewed about current electricity rate levels, many people commented, "We do not think it is particularly expensive. I feel it is a fair price and affordable." The Nam Dan Branch of EVN also commented, "We do not receive any complaints from residents about the electricity rate level." Therefore, one cannot say that the project's effects are deteriorating. Setting

electricity rate level as an indicator might have been appropriate considering the situation surrounding power supply in the targeted area before the project commencement, as this project was expected to reduce maintenance costs by installing distribution networks, thereby decreasing electricity charges. However, it would have also been effective to measure more aspects of power supply by setting indicators on transmission end electrical energy and transmission/distribution loss because the objective of the project was to stabilize the power supply and not to reduce electricity charges.

Photo 3: Nam Nam area and the distribution line

Photo 4: Rehabilitated electric power substation

Source: JICA Document

Figure 1: Locations of the Project Sites
(The area marked with the black dotted line is the Nam Nam area)

3.3.2. Qualitative Effects

1) Irrigation/drainage Project

The rehabilitated Nam Trung pump station recovered its pumping function and is running well. With regard to the irrigation canal, which takes water from the pump station and distributes it to the surrounding farmlands, no water distribution loss or problems are observed. During the field survey of this study, staff members responsible for operating and maintaining the pump station were interviewed. They commented, “There has been no breakage since the completion of this

project. All of the three pump units are functioning well. Given that the units used to break and stop operating often before the commencement of this project, it is amazing." As for the Ho Thanh reservoir, water used to leak from the reservoir before the commencement of the project. As a result of the leakage prevention and other repair works by this project, however, there is no problem with the leakage and water distribution. During the field survey of this evaluation study the leakage points were observed, and it was confirmed that there is no problem with breakage or leakage. According to staff members managing the reservoir, "The reservoir is functioning well. It distributes water to the nearby farmlands without problems." Considering such a comment, it can be judged that irrigation water from the Nam Trung pump station and the Ho Thanh reservoir to the Nam Nam area is being distributed effectively.

2) Road Project

The rehabilitation of the National Road 15A and district roads (Nam Kim-Nam Phuc-Nam Cuong road) dramatically improved the traffic access from the Nam Nam area to neighboring towns and other areas of the Nghe An Province. This project not only promoted interaction among residents in the area but also contributed to the smooth transportation of goods. When residents and the People's Committee of Nam Dan District were interviewed, they commented, "Before the project commencement, the National Road 15A used to be muddy during heavy rain, making vehicle traffic frequently difficult. Due to poor access to other areas, interaction among residents was also limited. Because of the poor accessibility, people were not able to market their crops and used to only consume what they grew and harvested within the household or in some cases even throw them away. As a result of the road development, vehicles and people have become able to come and go easily; and there are more opportunities to market agricultural crops." Based on such a comment, it can be observed that traffic accessibility in the Nam Nam area is improving thanks to the road rehabilitation by this project.

3) Rural Electrification Project

As a result of the development of substations and distribution networks, the system of power supply was strengthened in the Nam Nam area. Residents of this area who were interviewed commented, "Power supply is now stable compared to before the project's commencement. We have more confidence in the power service and began to purchase electronic appliances." Additionally, according to the Nam Dan Branch of EVN, there are no power cuts. Therefore, it can be judged that the system of power supply has been strengthened and stabilized through this

project in the target area.

3.4 Impacts

3.4.1 Intended Impacts

3.4.1.1 Impacts on Stabilization of Agricultural Productivity in the Nam Nam Area

Table 5 shows the changes in yields per unit area of two of the major crops (rice and corn) in the Nam Nam area. It can be seen that the yields per unit area have increased compared to before the project's commencement[13]. According to the interviews with the People's Committee of Nam Dan District and farmers, many think that the yields increased because this project made effective and efficient water distribution possible[14] through rehabilitation of pump stations, while they also attribute it to the improvement of seeds/seedlings/fertilizer/pesticide and the management ability of agricultural farmers, cooperatives and communes.

Table 5: Yields per Unit Area of the Two Main Crops in the Nam Nam Area (rice and corn)

(Unit: ton/ha)

Crop	Before Project Commencement (before 2003)	After Project Completion – Ex-Post Evaluation (2007–2013)
Rice	5.0–5.5	6.5–6.8
Corn	3.5–4.0	4.5–5.0

Source: People's Committee of Nam Dan District and results from farmers' interviews

With regard to rice production (dual cropping: spring and fall) in the Nam Nam area after the project's completion, it turned out that farmers do not really crop in fall although they do so in spring. According to the People's Committee of Nam Dan District, some communes are not so enthusiastic about disseminating rice cropping compared to others within the Nam Nam area in recent years. Now, at the time of the ex-post evaluation, the People's Committee of Nam Dan District is making efforts to promote rice cropping in fall[15].

Table 6 shows production of major crops in the Nam Nam area. It can be observed that vegetable production as a whole is on the increase although rice production is stagnating[16]. This

[13] The yield per unit area was 4.27 ton/ha for rice and 2.73 ton/ha for corn before the project commencement (source: JICA document (The Preparatory Survey Report, 2000)).

[14] In other words, water pumped by the pumping facility along the Lam River is distributed to the targeted areas for irrigation purposes in a stable manner.

[15] For example, they hold workshops for farmers in order to advocate for the expansion of rice production.

[16] There is an increasing demand for corns not only for human consumption but also for fertilizer and livestock feed, and the numbers of corn farmers and production are increasing every year. However, as shown in Table 6, yield was limited in 2012. While corns are usually harvested in the winter, when there is a lot of rain throughout the year, the harvest is expected to reduce dramatically (and there was a relatively high rainfall that year). In 2012, there was a lot

is because vegetables, being a cash crop, are considered to be higher in value than rice and a good source of income, and that more and more farmers are shifting from rice to vegetables. In addition, it can also be attributed to the fact that production and sales are stable thanks to the road rehabilitation through this project. Farmers in the Nam Nam area who were interviewed commented, "Before the rehabilitation of the road we used to consume the vegetables that we grew within the family and extended family; and if there was a surplus we had to dispose of it. As the road was improved, buyers began coming to the area and we became to obtain cash income." Regarding the latter, it can be judged that there is a correlation between road development and vegetable production.

Based on the above facts, it can be observed that this project contributes to stabilizing agricultural productivity in the Nam Nam area.

Table 6: Production of Major Crops in the Nam Nam Area
(rice, corns, sweet potatoes, and peanuts)

(Unit: ton)

Type of Crop	Before Project's Commencement	After the Project's Completion		
	2003	2011	2012	2013
Rice	13,251	14,639	13,279	12,558
Corns	2,199	3,380	1,656	3,732
Sweet Potatoes	1,596	558	454	426
Peanuts	798	942	833	1,148
(Vegetables' total, including the three kinds above)	N/A	6,952	6,991	8,716

Source: JICA document (before project's commencement); answers to the questionnaire; results from interviews with the People's Committee of Nam Dan District; and each commune (after the project's completion).

3.4.1.2 Contribution to the Increase in Farmers' Income in the Nam Nam Area

Before the project's commencement, the average annual income of one farmer in the Nam Nam area was approximately 1.7 million VND (or 150USD, 1996 data[17]), which is below the overall poverty line (1.78 million VND per person per year) set by the World Bank's study at that time (1997–1998). On the other hand, the average annual income of one farmer in the Nam Nam area is 16.34 million VND[18] (or 760USD) at the time of the ex post evaluation, which is much more than before. The inflation rate between 1996 and 2013 is 350–360%[19], setting 1996

of rainfall and the yields were low for the other vegetables, too. As for sweet potatoes, production is decreasing every year because the market price is lower than that before the project's commencement, and not as much is planted nowadays. Peanuts, on the other hand, have increased in demand compared to before the project's commencement and production is on the increase.

[17] Source: JICA document (Reports on Model Rural Development in the Nam Dan District, Nghe An province)

[18] Source: Statistics of Nam Dan District (2013)

[19] Source: Trading Economics Vietnam Consumer Price Index (CPI) (1996–2013)

as 100. Calculating what 150USD (1996) then is worth today by applying the inflation rate, it is approximately 525–540USD. Since the income level at the time of the ex-post evaluation (760USD) is higher than the figure calculated, it can be said that farmers are benefiting from increased income even when inflation is considered. As per the results from a beneficiary survey that will be described in the next section, the majority of the farmers perceive that their incomes have increased. Therefore, it is thought that this project has contributed considerably to the increase in farmers' incomes[20].

3.4.1.3 Impact on Rural Living Conditions in the Nam Nam Area (Beneficiary Survey Results)

As part of this evaluation study, questionnaire-based interviews were conducted with farmers and residents in the Nam Nam area[21]. The results are shown in Figures 2–9 below.

1) Irrigation/Drainage Project

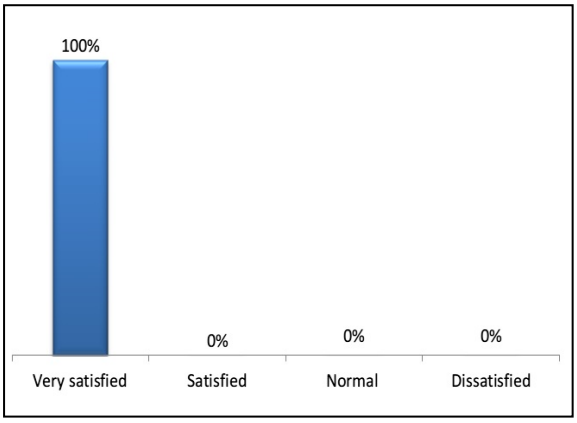


Figure 2: Level of satisfaction with this project (n= 60)

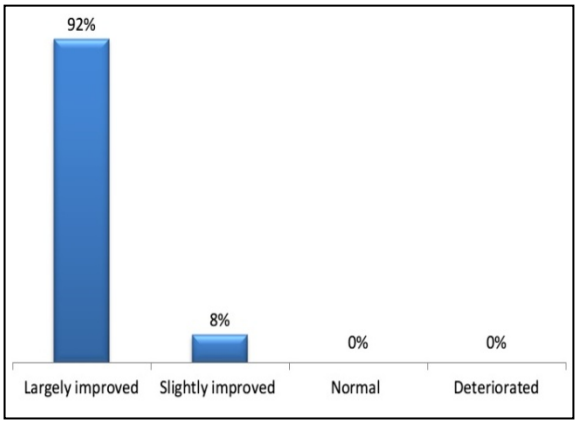


Figure 3: Has agricultural productivity improved over the past 10 years? (n= 60)

[20] As a comparison between income levels of the Nam Nam area and other parts of the district, average annual income of the Nam Dan District is 23.5 VDN (approximately 1,093USD, 2013). The income level of the Nam Nam area is lower than the district average because the area is located rather far from market places of agricultural products and faces a disadvantage in terms of high transportation costs as compared to other areas.

[21] A beneficiary survey was conducted by drawing 60 samples from farmers, 26 samples from people residing along the national and district roads, 29 samples from people residing near the rural electrification facility (in total, 115 samples), using a random sampling method. Beneficiaries who have lived in this area for more than 10 years as farmers or residents were the targets of this survey. Since it has been some time since this project was completed, this beneficiary survey targeted those who have cultivated land or resided in this area for a long period of time (more than 10 years) with a view to accurately capture effectiveness and impacts.

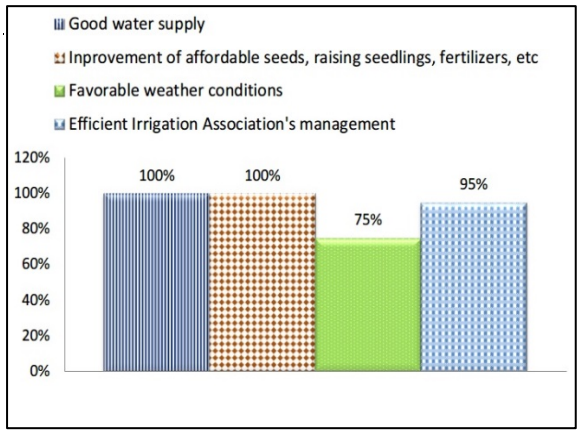


Figure 4: What are the reasons and factors behind the answer presented in Figure 3? (n= 60, multiple answers allowed)

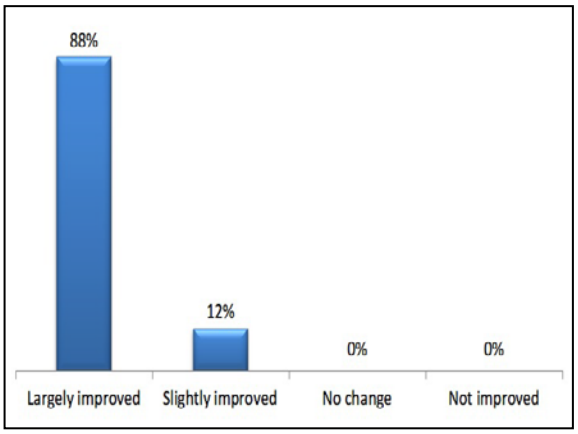


Figure 5: Has agricultural income been increasing for the past 10 years? (n= 60)

From Figure 2 it can be observed that the level of satisfaction with the irrigation/drainage project is high. Figure 3 shows that many farmers responded that agricultural productivity has improved. Figure 4 presents the reasons and factors behind such improvement; respondents said it was thanks to the efficient irrigation water distribution through the pump station and reservoir facilities and several other factors (e.g., improvement of seeds/seedlings/fertilizer/pesticide, and improvement in management ability of agricultural cooperatives and communes). While agricultural productivity was also influenced by factors other than this project, it is presumed that this project contributed to some extent. Additionally, many farmers said that their income levels "largely improved" as shown in Figure 5, confirming a correlation between this project and income increase.

2) Road Project

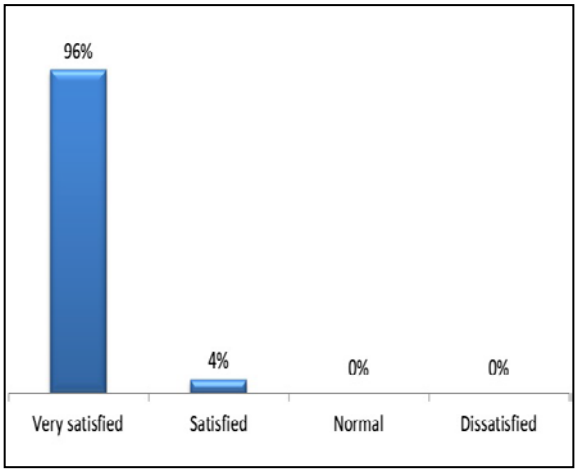


Figure 6: Are you satisfied with this project? (n= 26)

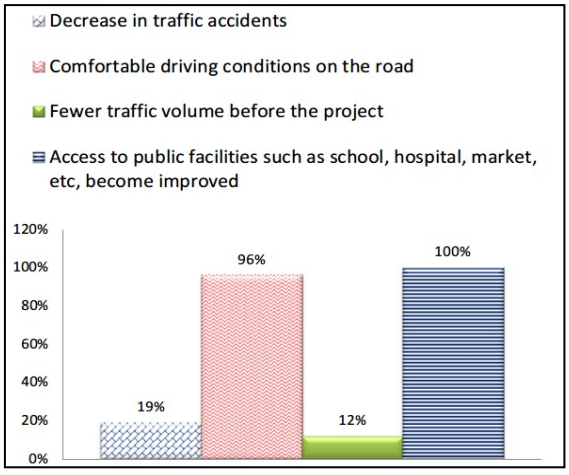


Figure 7: What are the reasons behind your answer presented in Figure 6? (n= 26, multiple answers allowed)

Figure 6 shows that the level of satisfaction with the road project is also high. Figure 7 presents reasons behind Figure 6; many people pointed to the fact that driving and riding in a car on the road became comfortable and that they can now easily access public facilities (e.g., schools and hospitals). It can be presumed that farmers have been able to produce and market more agricultural products and that residents are interacting with other areas because they can now visit neighboring towns easily.

3) Rural Electrification

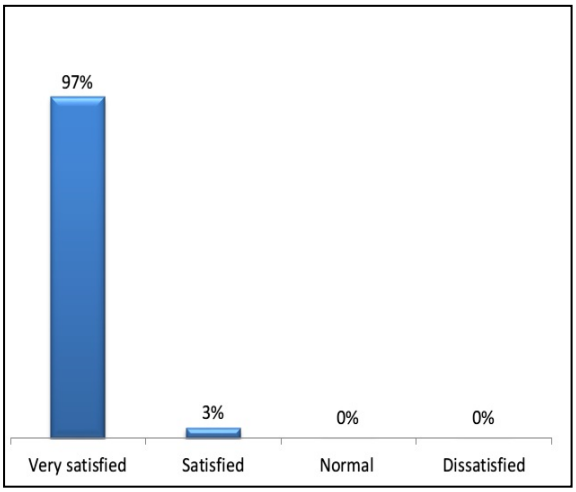


Figure 8: Are you satisfied with this project? (n= 29)

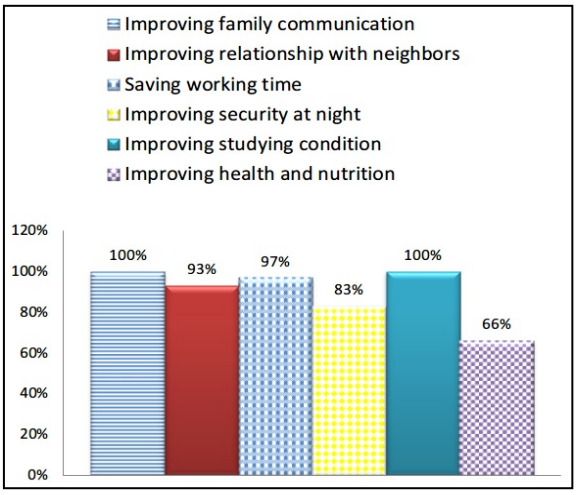


Figure 9: What are the reasons behind the answer presented in Figure 8? (n= 29, multiple answers allowed)

Figure 8 shows that the level of satisfaction is also high with the rural electrification project. Figure 9 presents the reasons; various answers were given, such as longer lighting hours facilitating communication (conversation) among family members and an improved environment for studying at home, as well as improvement of night-time security. Therefore, it is presumed that this project is contributing through electrification to improvements in quality of life.

Considering the above beneficiary survey results, it can be judged that this project is supporting improvements in living conditions of farmers and residents in the Nam Nam area.

Photo 5: Rehabilitated district roads (Nam Kim-Nam Phuc-Nam Coug road)

Photo 6: Ho Thanh reservoir (countermeasure to reservoir leakage was taken from the center to the right-hand side of the photo)

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

It has been confirmed through interviews with the People's Committee of Nam Dan District and residents of the Nam Nam area, as well as through site inspections, that there was no negative impact on the natural environment in particular. It was also confirmed that there were no environmental problems within the area (e.g., noise from the pumping station, dust associated with vehicles and air pollution) either during or after this project.

At the time of the basic design study it was judged that the Environmental Impact Assessment (EIA) was not necessary, as this project was mainly rehabilitation of existing facilities.

3.4.2.2 Land Acquisition and Resettlement

There was no resettlement in this project. On the other hand, land was acquired for the construction of the National Road 15A and district roads (Nam Kim-Nam Phuc-Nam Cuong road). According to the People's Committee of Nam Dan District, which was responsible for the land acquisition process, 5.06 ha of land (out of which 3.32ha was farmland and 1.74ha was residential/garden) was acquired in total, affecting 659 households. The Nam Dan District paid 2,082 million VND (approximately 16 million yen) in total for the compensation. It has been confirmed through interviews that the compensation was duly handled in accordance with the protocol set by the People's Committee of Nam Dan District.

This project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

3.5 Sustainability (Rating:③)

3.5.1 Institutional Aspects of Operation and Maintenance

Table 7 shows responsible bodies for the operation and maintenance of each facility developed by this project at the time of the ex-post evaluation.

Table 7: Operation and Maintenance System at the Time of Ex-Post Evaluation

	Facility	Responsible Body for Operation and Maintenance
1) Irrigation /drainage	Nam Trung pump station	Nam Trung commune
	Nam Trung main canal	Relevant commune for each section
	Ho Thanh reservoir and main canal (No.2)	Irrigation Corporation of Nam Dan District (a branch of Nghe An South Irrigation Corporation)*Note
2) Road	National Road 15A	Management and Maintenance of Road and Navigation Company under the Department of Transportation (DOT)
	District roads (Nam Kim-Nam Phuc-Nam Cuong road)	People's Committee of Nam Dan District (Industry, Construction and Transportation Division), each commune, and private companies
3) Rural Electrifi-cation	Medium and High voltage lines, Distribution Networks and Substations	Nam Dan Branch Office of EVN
	0.4kV Distribution Lines	

Source: Answers to the questionnaire and interviews with each responsible body
Note: It is the Nam Kim Commune that maintains the No.1 main canal.

1) Irrigation/Drainage

Regarding the Nam Trung pump station, main canal, and secondary canals, the operation and maintenance system differs from the pump station to the main canal. The Nam Trung pump station is operated and maintained by the Nam Trung commune. On the other hand, main and secondary canals are operated and maintained by different communes depending on where the canal is located. Communes are under the People's Committee of Nam Dan District. With respect to the actual operation and maintenance works required for the pump station's operation, the management of pump units is required, and each unit is greased and cleaned every time the unit is operated. As for canals and secondary canals, the removal of silt and cleaning is carried out.

The Ho Thanh reservoir system is operated and maintained by the Nam Dan Pump Division

(with 15 staff members) within the Irrigation Corporation of the Nam Dan District[22]. Two staff members are working full time to open and close the water gates, patrol around the reservoir (e.g., watching out for illegal dumping of garbage), and do cleaning and weeding almost on a daily basis.

2) Road

The National Road 15A is operated and maintained by the Management and Maintenance of Road and Navigation Company under the Department of Transportation (DOT) of Nghe An Province. There are in total 150 staff members at the time of the ex-post evaluation, out of which 15 staff members are assigned to the sections targeted by this project. Their tasks include patrolling around the sites, measuring traffic volumes, weeding, cleaning and repairing traffic signs/the road surface/the bridge and they carry out their tasks periodically (daily or monthly depending on the task)[23].

The operation and maintenance of the district roads (Nam Kim-Nam Phuc-Nam Cuong road) is a responsibility of the Industry, Construction and Transportation Division within the People's Committee of Nam Dan District. However, operation and maintenance on the ground is a responsibility of different communes managing targeted sections under the supervision of the Industry, Construction and Transportation Division within the People's Committee of Nam Dan District. In reality, however, communes subcontract the required operation and maintenance to private companies and supervise their works. In other words the actual maintenance work on the ground is carried out by the contracted private companies[24].

3) Rural Electrification

The substations and distribution network facilities are operated and maintained by the Nam Dan Branch Office of EVN[25]. The Nam Dan Branch has in total 60 staff members[26]. Required

[22] The division is operating and maintaining five reservoirs and nine pump stations throughout the Nam Dan district.

[23] The Management and Maintenance of Road and Navigation Company which belongs to the Department of Transportation (DOT) of Nghe An Province and its field staff members commented in interviews, "The number of staff is sufficient given the volume of the required tasks. We are maintaining cracks and pits without problems."

[24] The Industry, Construction and Transportation Division of the People's Committee of Nam Dan District and senior members of each commune commented in interviews, "The quality of the developed roads is high. After the project's completion we have not seen any cracks or pits and the road surface is in good condition. Although we contract private companies to maintain the road targeted by this project, the actual works are limited to cleaning and weeding of the areas along the roads; and maintenance works such as that of the National Road 15A are not necessary. In case the roads require major maintenance or repair, we can receive assistance of the People's Committee of Nghe An Province and Nam Dan District; thus there is no concern."

[25] The corporation has been operating and maintaining all the power transmission and distribution facilities since 2008.

[26] According to the interview with the Nam Dan Branch of EVN, they commented, "The number of staff assigned to operating and maintaining the facilities targeted by this project is sufficient. With the available staff we are patrolling the area, checking and cleaning distribution facilities and collecting electricity charges periodically without problems."

operation and maintenance works include checking transformers and changing oil, weeding around the distribution lines, and collecting electricity charges.

During the field survey of this evaluation study, sites of irrigation/drainage, road and the rural electrification facility developed by this project were visited. Problems, such as insufficient maintenance due to staff shortages and institutional issues, were not observed during the field visits. It was observed that a well-established maintenance system is in place in a manner responsive to the actual situations. Therefore, it is thought that there are no major concerns with the institutional aspect of the operation and maintenance of this project.

3.5.2 Technical Aspects of Operation and Maintenance

Each commune under the People's Committee of Nam Dan District and the Irrigation Corporation of Nam Dan District operating and maintaining the irrigation facilities developed by this project; the Management and Maintenance of Road and Navigation Company operating and maintaining the National Road 15A; the People's Committee of Nam Dan District (Industry, Construction and Transportation Division), each commune and private company operating and maintaining the district roads (Nam Kim-Nam Phuc-Nam Cuong road); and the Nam Dan Branch Office of EVN responsible for the operation and maintenance of the electrification facilities — all have highly experienced staff members. Through the interviews conducted during the field survey of this evaluation study, it has been confirmed that EVN staff members are well aware of the importance of operation and maintenance works. On-the-Job Training (OJT) is also given as needed to newly recruited staff members. It was also confirmed that they have sufficient knowledge of the operation of the equipment and facilities. In addition, training is generally given as needed, and efforts are being made to share information on maintenance technologies and skills. Therefore, it is thought that no major problem exists in relation to the technical aspect of the operation and maintenance.

3.5.3 Financial Aspects of Operation and Maintenance

Table 8 shows data on operation and maintenance costs (recent few years) associated with the facilities developed by this project.

Table 8: Operation and Maintenance Costs for the Facilities of this Project

	Facility	Operation and Maintenance Budget
1) Irrigation/ Drainage	Nam Trung pump station	Average annual budget for the past few years is 500 million VND (*It only represents the budget of Nam Trung commune.)
	Nam Trung main canal	
	Ho Thanh reservoir and main canal (No.2)	200 million VND for 2013. (*Budgets for the other years were not available.)
2) Road	National Road 15A	525 million VND in 2011, 675 million VND in 2012, and 850 million VND in 2013. (*It represents the budget of the entire Nam Dan district.)
	District Roads (Nam Kim-Nam Phuc-Nam Cuong district road)	Approved annual budget is 200–300 million VND on average for the past few years.
3) Rural Electrifica -tion	Medium and High voltage lines, Distribution Networks and Substations	1.1 billion VND in 2011, 1.2 billion VND in 2012 and 1.4 VND in 2013. (*It represents the operation and maintenance budget of the entire Nam Dan district.)
	0.4kV Distribution Lines	

Source: Answers to the questionnaire and interview results

The results of the interviews with the responsible bodies for the operation and maintenance of each facility shown in Table 8 are as follows:

1) Irrigation/Drainage

The average annual budget allocated by the People's Committee of Nam Dan district and executed by the designated Nam Trung commune is 500 million VND in recent years. According to the respective communes and staff working at the pump station, the budget is reasonable.

The budget for operation and maintenance of the Ho Thanh reservoir and main canal No.2 allocated by the Irrigation Corporation of Nam Dan District is 200 million VND although only 2013 data are available. According to the corporation, the budget is sufficient and they do not face any problem of insufficient maintenance owing to budget shortage.

Before the project's commencement water fees used to be collected for the purpose of covering maintenance costs of the irrigation/drainage facilities. However, after the central government issued "Decree 115" which bans collection of water fees, then it has ceased. Actually, maintenance costs needed for the pump station, reservoir, and main canal are allocated by the central government to the People's Committee of Nam Dan district and the Irrigation

Corporation of Nam Dan District as a subsidy in the Nam Dan district[27]. According to the People's Committee of Nam Dan district and each commune interviewed, the subsidy is not necessarily ample, but in most cases, the necessary amount is allocated.

2) Road

The operation and maintenance budget concerning the National Road 15A has been increasing every year, as shown in Table 8. According to the Management and Maintenance of Road and Navigation Company under the Department of Transportation (DOT) of the Nghe An Province, "sufficient budget is allocated by the province." With regard to the operation and maintenance costs for the district roads (Nam Kim-Nam Phuc-Nam Cuong district road), maintenance was covered by contributions from local residents before the project's commencement; however, at the time of the ex-post evaluation, maintenance of the sections targeted by this project is not borne by donations from local citizens. The Nghe An Province allocates the maintenance budget. According to the People's Committee of Nam Dan district (Industry, Construction, and Transportation Division) which oversees the operation and maintenance, "the allocated amount is sufficient."

3) Rural Electrification

According to the Nam Dan Branch Office of EVN, "the operation and maintenance budget for the rural electrification facilities has been increasing every year, which allows staff to carry out their duties without anxiety."

Based on the above facts, there is no issue of budget shortage regarding the operation and

[27] The People's Committee of Nam Dan District allocates 1.3 million VND for each 1ha to each commune, which is used for the maintenance costs of the facilities targeted by this project, as shown in Table 8. On the other hand, for the secondary and smaller canals (that are not targeted by this project) farmers continue to pay water fees to cover the maintenance cost. 540,000VND per ha (or 90kg of rice) is to be paid to agricultural cooperatives under each commune. According to the People's Committee, the water fees for the secondary or smaller canals borne by farmers are affordable. They also mentioned that before Decree 115 came into force, farmers could not afford the water fees most of the time and would borrow from agricultural cooperatives established under each commune. However, repayment did not go smoothly and some agricultural cooperatives went bankrupt due to debt accumulation. In other words, the loan repayment rate was so low that cooperatives could not cover their maintenance costs; thus, they faced a financial problem. Therefore, at the district level cooperatives are better off with the no-fee policy after the enforcement of Decree 115 because they are now able to secure maintenance costs in a more stable manner. However, the exemption of the water fees declared by the law contains a risk of minimizing the commitment of communes and farmers in terms of bearing maintenance costs. It also puts pressure on the national finances. With a view to encouraging farmers' participation in the maintenance of irrigation facilities for sustainability, the country may need to rethink the validity of this law.

maintenance of each facility of this project; thus, it is thought that there are no major issues in the financial aspect of the operation and maintenance.

3.5.4 Current Status of Operation and Maintenance

The facilities and equipment developed by this project are generally well maintained. The status of operation and maintenance of each facility at the time of the ex-post evaluation is as follows:

1) Irrigation/Drainage

Regarding the maintenance of the Nam Trung pump station and main canals, the pump units have never broken since the completion of the project and no major parts change or repair was needed. The rehabilitated irrigation canals, the Ho Thanh reservoir and main canal No.2, for which leakage countermeasures were taken, have had no breakage or leakage problems since the completion of this project.

2) Road

The national road and district roads (Nam Kim-Nam Phuc-Nam Cuong road) rehabilitated by this project are maintained well. In the case of the national road, it was confirmed during the field survey of this study that cracks and dents are being repaired immediately if they occur. It was also confirmed that the surface of the district roads (Nam Kim-Nam Phuc-Nam Cuong road) is in good condition after the project's completion. Regarding the National Road 15A, while cracks and dents are immediately fixed as they occur, the problems are occurring more frequently every year. This is because traffic volume is increasing, especially that of heavy duty vehicles like large trucks[28]. The maximum load capacity is controlled by law and the Management and Maintenance of Road and Navigation Company under the Department of Transportation (DOT), as a body responsible for the operation and maintenance, controls overloaded vehicles[29]; increasingly, more vehicles choose to drive at night in order to avoid such checking points. Since there is only so much that the company can do to enforce the rule on maximum load, the situation there is to some extent worrying.

3) Rural Electrification

The substations and distribution networks are operating without major breakage. Through the interview with the Nam Dan Branch of EVN concerning natural disaster and conditions of the facilities, it has been confirmed that there has not been any major impact of natural disaster, nor

[28] One of the reasons behind the increase in large vehicle traffic is that a gas station was constructed on the road targeted by this project and many heavy-duty vehicles take the road to get fuel, according to some comments.
[29] Loads are checked using a portable measurement device.

breakage or trouble after the completion of the project.

In addition it has been confirmed that there is no particular problem with the ways in which necessary spare parts are procured and stored at each facility targeted by this project and that a system is in place to enable needed procurement in a prompt manner. Furthermore, it has also been observed that manuals on maintenance and operation are in place at each facility and that staff carry out their maintenance duty by referring to these manuals as needed.

No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned, and Recommendations

4.1 Conclusion

This project rehabilitated irrigation facilities and roads, and expanded facilities for rural electrification, with the aim of recovering the irrigable area, improving traffic accessibility and stabilizing the electricity supply in the Nam Nam area of the Nam Dan District of the Nghe An Province, located in the north-central part of Viet Nam. At the time of the ex-post evaluation, the relevance of this project is high as the project is consistent with the policy stipulated in the "Five Year Socio-Economic Development Plan" and with further development needs such as development of agricultural infrastructure, extension of road rehabilitation, and expansion of the electric distribution network. The project cost and project period did not exceed the original plan; thus, efficiency is high. In this project, pumping facilities and canals were rehabilitated in the Nam Nam area, which led to the recovery of the irrigable area and reduced labor requirements and working hours for farmers, thereby realizing the stable distribution of irrigation water. Through the rehabilitation of National Road 15A and district roads (Nam Kim-Nam Phuc-Nam Cuong road), smooth flow of traffic and reduced travel time have been realized, while improving traffic access to other parts of the country. The electric supply has been stabilized through the rehabilitation of substations and electric distribution network, and all households in the area are registered members of the electricity service. The results from the beneficiary survey reaffirmed that the level of satisfaction with the project was high and that the living conditions have been improved; thus, effectiveness and impact of this project are high. In addition, there are no major issues regarding the institutional, technical and financial aspects of the organizational structures, operation and maintenance of each facility developed/rehabilitated

by this project; thus, sustainability of this project is high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

It has been reported that the number of cases in which cracks and dents need repair is increasing every year for the National Road 15A developed by this project. It is thus preferable that the Department of Transportation (DOT) of the Nghe An Province and the Management and Maintenance of Road and Navigation Company which carries out the actual operation and maintenance on the ground, make further efforts to control overloaded vehicles.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

・The necessity of setting appropriate indicators to measure effectiveness and quantitative effects.

With regard to the quantitative indicators set to measure the effects of the rural electrification project, it may have been appropriate to use reduction in electricity charges as an effective indicator until two years after the project's completion (i.e., in the short-term, given the electricity situation of the Nam Nam area at that time). However, in a fast-growing country like Vietnam, it could have been possible to think that the electricity situation might change some time after the project's completion, such as by the time of the ex-post evaluation. Reduction in electricity charges can be attributed to many factors other than the project and is rather an indirect indicator. Therefore, it would have been worth considering setting indicators that can accurately capture the direct effects of the project outputs, such as transmission end electrical energy and transmission/distribution loss[30].

[30] Had the electricity charge not reduced due to some external factors of significant influence, some might have argued that the project was not effective. It is thought instructive to have these two indicators that place emphasis on the power supply aspect.