Socialist Republic of Viet Nam

FY 2017 Ex-Post Evaluation of Japanese ODA Loan Project

"Small-Scale Pro Poor Infrastructure Development Project (III)"

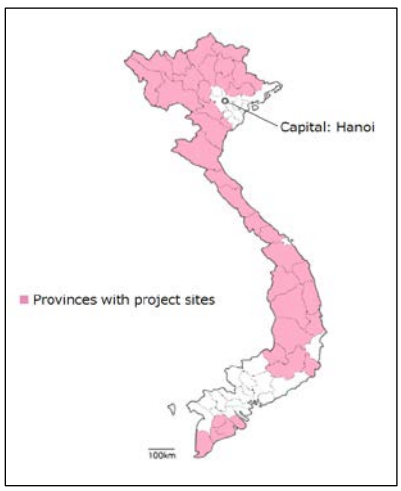
External Evaluator: Takako Haraguchi, OPMAC Corporation

0. Summary

The objectives of this project were to facilitate the transportation of goods to markets, to improve access to public services (electricity and water supply), and to increase agricultural productivity by conducting small-scale infrastructure improvement (subprojects) in road, electricity, water supply, and irrigation in rural areas in 36 provinces in Viet Nam, thereby contributing to poverty reduction. The relevance of these objectives is high, as they are consistent with Viet Nam's development policy and development needs as well as with Japanese aid policy that all aim to reduce poverty in rural areas through small-scale infrastructure development. The effectiveness and impact are high, as a total of 141 subprojects, with some exceptions, have mostly achieved the targets concerning their utilization and effects and produced such impacts as the improvement in agricultural income, the reduction in agricultural cost, and the betterment of quality of life. However, the degree to which the project cost exceeded the plan was disproportionate to the implementation of additional subprojects, and the project period significantly exceeded the plan. Therefore, the efficiency of the project is low. On the other hand, the sustainability is high, as no major problems were observed in the institutional aspects, technical aspects, and financial aspects of operation and maintenance.

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

1. Project Description



Project Locations

The traveling time from a mountain village to the district center was reduced from three days on foot to three hours and a half by motorcycle after the completion of a road subproject. (Kon Tum Province)

1.1 Background

The poverty rate in Viet Nam had decreased from 37.4 percent to 13.4 percent between 1998 and 2008 due to factors such as the economic growth during the 1990s. However, while the urban poverty rate was 6.7 percent in 2006, the rural poverty rate was high, at 16.1 percent, thus urban-rural gaps existed.[1] Those gaps were influenced by geographical factors (inhabiting geographically disadvantageous areas) and factors related to social overhead capital (inadequate infrastructure and services), among other factors.

The Japan International Cooperation Agency (JICA) had assisted the government of Viet Nam's rural development efforts through a series of projects targeting urgent small-scale infrastructure development: “Rehabilitation Loan,” “Rehabilitation Loan (II)” (Fiscal Years 1993 and 1994), and “Rural Infrastructure Development and Living Standard Improvement Project (I)” including the phases (II) and (III) of the same project (Fiscal Years 1995, 1996, and 1998) (hereafter, "SPL I," SPL II," and "SPL III"; "SPL" stands for Sector Program Loan). In addition, JICA had also implemented “Small-Scale Pro Poor Infrastructure Development Project (I)” and its (II) project (Fiscal Years 2002 and 2005) (hereafter, "SPL IV" and "SPL V") to assist small-scale infrastructure development that targeted poor areas with a greater emphasis.[2] While the ex-post evaluations for SPL I and SPL II acknowledged the effects such as the improved accessibility to social services in areas where subprojects in road, electricity, and water supply were implemented, there still remained many impoverished areas with an inadequate level of infrastructure development. In comparison to other agricultural regions, poverty was particularly severe in mountainous and remote North West and Central Highland where ethnic minorities are concentrated.

1.2 Project Outline

The objective of this project is to facilitate the transportation of goods to markets, to improve access to public services (electricity and water supply), and to increase agricultural productivity by conducting small-scale infrastructure improvement in road, electricity, water supply, and irrigation in rural areas in Viet Nam, thereby contributing to poverty reduction.

[1] Figures according to the General Statistics Office of Viet Nam.
[2] For the ease of reading, standardized projects names are used here; refer to "1.2 Project Outline" for official names.

Loan Approved Amount / Disbursed Amount	17,952 million yen / 17,280 million yen	
Exchange of Notes Date / Loan Agreement Signing Date	October 2009 / November 2009	
Terms and Conditions	Interest Rate	1.2% (road, electricity, irrigation, and Rural Promotion Center), 0.55% (water supply), 0.01% (consulting services)
	Repayment Period	30 years (road, electricity, irrigation, Rural Promotion Center, consulting services), 40 years (water supply) (Grace Period 10 years)
	Conditions for Procurement	General Untied
Borrower / Executing Agency	The Government of the Socialist Republic of Viet Nam / Ministry of Planning and Investment (MPI)	
Project Completion	Not completed as of March 2018	
Main Contractor(s) (Over 1 billion yen)	–	
Main Consultant(s) (Over 100 million yen)	Nippon Koei Co., LTD. (Japan) / Thai Engineering Consultants Co., Ltd. (Thailand) (JV)	
Related Studies (Feasibility Studies, etc.)	"Special Assistance for Project Formation (SAPROF) for Small-Scale Pro Poor Infrastructure Development Project (III) (SPL 6), Socialist Republic of Viet Nam" (September 2008)	
Related Projects	[Japanese ODA Loan] • "Rehabilitation Loan" (January 1994) • "Rehabilitation Loan (II)" (April 1995) • "Rural Infrastructure Development and Living Standard Improvement Project" (March 1996) • "Rural Infrastructure Development and Living Standard Improvement Project (II)" (March 1997) • "Rural Infrastructure Development and Living Standard Improvement Project (III)" (March 1999) • "Small-Scale Pro Poor Infrastructure Development Project" (March 2003) • "Small-Scale Pro Poor Infrastructure Development Project (II)" (March 2006) [Technical Cooperation] • "Master Plan Study on Improvement of Rural Living Conditions in Northwestern Mountainous Region in Viet Nam" (2007－2008) [The World Bank] • "Poverty Reduction Support Credit (Operation)" (2001, 2003, 2004, 2005) [The Asian Development Bank] • "Support to Implementation of Poverty Reduction Program" (2004, 2005, 2006, 2007, 2008)	

This project, known as SPL VI, consisted of a total of 141 subprojects in 118 districts in 36 provinces.[3] Each subproject was implemented by the District People's Committee (the district-level executing agency) via the Department of Planning and Investment (hereafter, "DPI") (the province-level executing agency), under the direction of the Ministry of Planning and Investment (hereafter, "MPI") (the national executing agency).

2. Outline of the Evaluation Study

2.1 External Evaluator

Takako Haraguchi, OPMAC Corporation[4]

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: August 2017-August 2018

Duration of the Field Study: November 19-December 2, 2017, and March 4-March 10, 2018

2.3 Constraints during the Evaluation Study

Although it was necessary in ex-post evaluation to grasp the status of each subproject, data regarding the status at and after the end of 2015 have not been collected at the central (MPI) and provincial (DPI) administrative levels. For this reason, data were collected by individually sending a questionnaire (hereafter, "subproject questionnaire") to the executing agency (District People's Committee) of each subproject. Although the subproject questionnaire was returned by 117 out of 141 cases (83 percent response rate), missing data and uncertain information could not be verified in detail due to the limited duration and budget of ex-post evaluation, except for the subprojects in the six[5] provinces targeted for site visits. For this reason, among the evaluation results, those results based on the aggregate of all questionnaire responses may not be as reliable as the survey results of the visited subprojects.

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[3] Target provinces: (Red River Delta Region) Ninh Binh Province, (North East) Ha Giang Province, Cao Bang Province, Bac Kan Province, Tuyen Quang Province, Lao Cai Province, Yen Bai Province, Thai Nguyen Province, Lang Son Province, Bac Giang Province, Phu Tho Province, (Northwest Mountainous Region) Dien Bien Province, Lai Chau Province, Son La Province, Hoa Binh Province, (North Central Coast Region) Thanh Hoa Province, Nghe An Province, Ha Tinh Province, Quang Binh Province, Quang Tri Province, Thua Thien Hue Province, (South Central Coast Region) Quang Nam Province, Quang Ngai Province, Binh Dinh Province, Phu Yen Province, (Central Highland Region) Kon Tum Province, Gia Lai Province, Dak Lak Province, Dak Nong Province, Lam Dong Province, (South East) Ninh Thuan Province, (Mekong River Delta Region) Tra Vinh Province, Hau Giang Province, Soc Trang Province, Bac Lieu Province, Ca Mau Province.

[4] Participated from i2i Communication, Ltd.

[5] On-site interviews were conducted for 24 subprojects (10 road; two electricity; six water supply; four irrigation; and two Rural Promotion Centers) in a total of 17 districts among the 30 target subprojects in 23 target districts in six target provinces : Thai Nguyen Province and Phu Tho Province in the North East; Thanh Hoa Province in the North Central Coast Region; Dien Bien Province in the Northwest Mountainous Region; Kon Tum Province in the Central Highland Region; Soc Trang Province in the Mekong River Delta Region. The selection of the provinces was done in a manner to include the target locations of pilot projects (Dien Bien Province and Thanh Hoa Province) and the priority regions (the Northwest Mountainous Region and the Central Highland Region) as well as to take into consideration the geographical balance (the North East and the Mekong River Delta Region).

3. Results of the Evaluation (Overall Rating: B[6])

3.1 Relevance (Rating: ③[7])

3.1.1 Consistency with the Development Plan of Viet Nam

At the time of appraisal, the government of Viet Nam was attempting to improve the living standards of farmers, eliminate famine, and continuously reduce the number of the poor by promoting the development of basic infrastructure (roads, electricity distribution networks, water supply, irrigation, etc.) especially in rural areas, under the long-term *10-year Socio-Economic Development Strategy* (2001-2010) and the mid-term *8th Five-Year Socio-Economic Development Plan* (2006-2010). Furthermore, the government was seeking socio-economic development especially in ethnic minority communes and those communes located in mountainous areas under the *Socio-Economic Development Programme for Extremely Difficult Communes in Ethnic Minorities and Mountainous Areas (Program 135)* (2006-2010).

At the time of ex-post evaluation, the *Socio-Economic Development Strategy (Sustainable Development Strategy)* (2011-2020) and the *Five-Year Socio-Economic Development Plan* (2016-2020), which respectively succeeded the aforementioned long- and mid-term plans, continue to accelerate poverty reduction through infrastructure development prioritizing poor areas and a synergy between infrastructure and social services. In areas with particularly high poverty rates, small-scale infrastructure development in roads, small-scale irrigation, schools, water supply, electrification, etc. is promoted by Vietnamese government's *Program 135* (2016-2020) and *National Target Program on Poverty Reduction* (2016-2020), as well as the *New Rural Development Program* (2016-2020) of the Ministry of Agriculture and Rural Development.

3.1.2 Consistency with the Development Needs of Viet Nam

Although a downward trend of the poverty rate exists in Viet Nam, poverty rates in the target provinces and districts of this project continue to be relatively high (Table 1), and the needs for poverty reduction have been present at the time of both appraisal and ex-post evaluation. In the electricity sector among the four target sectors of this project (road, electricity, water supply, and irrigation), the needs for developing new electricity distribution facilities have diminished since the time of appraisal as electrification has mostly been completed by the time of ex-post evaluation.[8] However, there continue to exist villages where further development in other sectors is needed.

The selection of the target provinces and districts of this project, which attempted to assist areas where needs for poverty reduction are high, seems mostly appropriate. However, although

[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[7] ③: High, ②: Fair, ①: Low
[8] In 2016, the average electrification rate was 99 percent in the country and 97 percent in the target provinces of this project (the General Statistics Office of Viet Nam data).

this is limited to a single case, the target areas of an irrigation subproject included an area where the hill tribes that had settled in that area traditionally disliked to increase production through double cropping; consequently, the irrigation facilities developed in this project are not adequately used in that area. The site visits and interviews indicated that the target areas were impoverished and there were significant needs for poverty reduction, and the provincial and district governments also were promoting a settlement policy and irrigated agriculture in the target areas of this subproject; however, the selection may not have been appropriate considering social aspects.

Table 1: Change in poverty rate

Unit: %

	2008	2010	2012	2013	2014	2015	2016 (Tentative)
National average (1)	13.4	14.2	11.1	9.8	8.4	7.0	5.8
Average among the target provinces of this project (1)	23.3	25.9	20.9	18.9	16.0	13.7	11.5
Average among the target districts of this project (2)	n/a	28.9	24.2	21.7	17.9	22.5	21.9

Source: (1) Calculated from the General Statistics Office of Viet Nam data; (2) calculated from the District People's Committee questionnaire responses (valid responses from 62 of 118 districts).

3.1.3 Consistency with Japan's ODA Policy

At the time of appraisal, by recognizing "Agriculture and Rural Development/Local Development" as a priority area of "Improvements in Living and Social Conditions and Corrections of Disparities," which was one of the four pillars of assistance efforts for Viet Nam, the *Country Assistance Program* (July 2009) of the Ministry of Foreign Affairs stated that those efforts would prioritize the development and management of basic and productive infrastructure (water supply, village roads, electrification, agricultural water utilization, flood control, etc.) in impoverished areas. In addition, the *Country Assistance Implementation Report* (April 2009) of JICA promoted a policy, as part of "Improvement in Living and Social Conditions and Corrections of Disparities," to assist the creation of a just society by alleviating poverty and overcoming economic vulnerability among income strata below or near poverty line, and by redressing the discrepancies widened by economic growth.

In light of the above, this project has been highly relevant to Viet Nam's development plan and Japan's ODA policy, and mostly to Viet Nam's developing needs. Therefore, its relevance is high.

3.2 Efficiency (Rating:①)

3.2.1 Project Outputs

The outputs of the projects included new installation and rehabilitation (subprojects) of small-scale infrastructure in rural provinces and consulting services. Among the 36 target provinces, subprojects were preferentially selected for high priority provinces that consisted of 14 highly

impoverished covering the northwestern mountainous region and the "Development Triangle."[9] In addition, pilot projects involving the multi-faceted construction of Rural Promotion and Training Center (hereafter, "Center") that would serve as the center of infrastructure development and training for multiple sectors were implemented in Tuan Giao District in Dien Bien Province and Hoang Hoa District in Thanh Hoa Province to improve livelihood through the promotion of agricultural production.[10]

The number of subprojects has increased by 39 and decreased by two (cancelled). Consequently, the number of target provinces, the number of target districts, and the number of subprojects were 100 percent, 127 percent, and 136 percent, respectively, of those at the time of appraisal (Table 2). The increase in the number of subprojects was a response to the needs by utilizing the unused balance of the Japanese ODA Loan created by exchange rate fluctuations, and is judged to be appropriate because it was confirmed that those subprojects were proposed by the executing agencies in accordance with the selection standards for subprojects (needs, feasibility, etc.) used in appraisal and were properly approved by JICA following technical assessment among consultants.

Table 2: The Number of Target Provinces, Districts, and Subprojects

Sector	Plan			Actual			Status of Increase or Decrease (reasons)
	Province	District	Subprojects (pilot projects)	Province	District	Subprojects (pilot projects)	
Road	34	57	52 (2)	36	87	89 (2)	Increased in 27 out of 36 provinces (used remaining balance)
Electricity	14	16	14 (0)	14	14	14 (0)	No change
Water Supply	16	17	16 (1)	17	17	17 (1)	A cancellation in Lai Chau Province (A mining development project, the condition for the subproject, was postponed.) Increased by one in Kon Tum Province and Ca Mau Province (used remaining balance)
Irrigation	16	16	18 (2)	15	16	18 (2)	No change
Center, etc.	2	2	4 (4)	2	2	3 (3)	A cancellation in Dien Bien Province (no prospects for organizing and securing a budget for operation and maintenance)
Total	36	93	104 (5)	36	118	141 (4)	

Source: Ex-ante evaluation sheet; documentation provided by JICA; documentation/questionnaire responses provided by the executing agencies
Note: The numbers for the target provinces/districts and pilot projects for each sector show cumulative totals and differ from the actual totals.

[9] The "Development Triangle" is the least developed region located in a mountainous region where three countries-Cambodia, Laos, and Viet Nam−meet; in Viet Nam, it corresponds to Gia Lai Province, Kon Tum Province, Dak Lak Province, and Dak Nong Province in the Central Highland Region.
[10] In other target districts, only a single subproject was selected from one of the sectors among road, electricity, water supply, and irrigation.

When the scope of individual subprojects that were implemented is compared to those at the time of appraisal, there were cases in which the scope expanded in response to strong needs, while there were cases in which the scope became narrower when a project with urgent needs had partially been undertaken using domestic funds or under projects with other development partners, and when there was shortage of funds on the Vietnamese side.[11]

Based on the reporting from the executing agencies as well as the on-site evaluation of 24 subprojects, the completion status of outputs is evaluated to be mostly satisfactory, although there is one incomplete subproject at the time of ex-post evaluation (new construction and improvement of roads in Thanh Son District, Phu Tho Province). This subproject has been delayed due to the shortage of funds on the Vietnamese side (which in turn caused a delay in land acquisition and design changes to avoid part of the planned land acquisition, as well as the insufficient capacity of the contractors and consequent hiring of new contractors to replace some of the original contractors. As a result, the subproject did not complete the pavement for approximately 2 kilometers of the total of 17 kilometers. In addition, the road including the finished sections was damaged by flood and landslide disasters in October 2017. At the time of ex-post evaluation, the District People's Committee, which is the subproject's executing agency, is conducting repairs using the disaster recovery budget of the district and province. According to the District People's Committee, although the Committee is attempting to resume the main construction upon the completion of the repair with a goal of completing it by the end of 2018, it has not secured a required amount of budget for the main construction. With that being said, at the time of ex-post evaluation, the entire length of the road including the sections with unfinished pavement is open and is traveled by vehicles.

Consulting services—assistance on detailed design, assistance on tendering and contracts, assistance on construction management strengthening of organizational capacity for project implementation as well as operation and maintenance, assistance on collecting baseline values for operation and effect indicators, etc., for subprojects—were carried out as planned. In response to the increase in the number of subprojects, the work volume grew to 150 percent of the plan for foreign consultants and 143 percent of the plan for Vietnamese consultants.

[11] For the road length in the road sector, for example, among 52 original subprojects, two cases added length (+2.7 km in total) and 11 cases reduced length (-29.17 km in total). As a result, the average road length per road subproject of approximately 17 km at the time of appraisal has been reduced to an average of approximately 12 km among all subprojects.

Electricity subproject. Power lines in low-income areas (Soc Trang Province)

Irrigation subproject. Reservoir and dam head works (Kon Tum Province)

Road subproject. Flood damages (Phu Tho Province)

Water supply subproject. Water treatment plant (Dien Bien Province)

Pilot project. Center facilities (Dien Bien Province)

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total project cost was 31,278 million yen and exceeded the plan (145 percent of the plan; the Japanese ODA Loan portion was within the plan). The project cost increase was due to an increase in the Vietnamese-side funds—caused mainly by the rise in construction cost reflecting material price hike and the implementation of additional subprojects—and the delay caused by shortage of funds resulted in further inflation of the construction cost. The land price had increased during the delay, raising the cost of land acquisition. The increase in the project cost was evaluated to be disproportionate to the increase in the outputs, as the construction cost for the outputs planned at the time of appraisal (hereafter, "original") was 146 percent of the plan,[12] and the cost for the outputs that were additionally implemented (hereafter, "additional") was also higher than the plan that had existed at the time of detailed design.[13]

[12] The planned construction cost for the original outputs at the time of appraisal was 13,335 million yen (approximately 2.26 trillion VND) compared to the actual cost of 19,533 million yen (approximately 4.95 trillion VND).
[13] The planned cost for the additional road subprojects at the time of detailed design was 1,301 million VND, while the actual cost was 1,376 million VND.

3.2.2.2 Project Period

Due to such reasons as the increase in subprojects and the delay in the disbursement on the Vietnamese side, the project period significantly exceeded the plan (210 percent or more of the plan; see Table 3). Sixty percent of the original subprojects had been completed by the end of 2013, which was immediately after the scheduled project completion date in the plan at the time of appraisal, and 80 percent of the original subprojects had been completed by the end of 2014. Furthermore, all additional subprojects had been completed by the end of 2016. Since there is one incomplete subproject at the time of ex-post evaluation as mentioned above, however, we must see the project as a whole as incomplete in light of the definition of project completion ("commencement of the service") as well as the rating standards for JICA's project evaluation.[14]

Before the consulting services were terminated in December 2015, the executing agencies and consultants had created an action plan and monitoring sheet for each incomplete subproject. Although it was planned for 2016 and onward that executing agencies of subprojects would renew those materials, the DPI would put them together and report to the MPI, and the MPI would report to JICA, none of those did materialize; nor did JICA urge the MPI. Interviews at the time of ex-post evaluation revealed that JICA Viet Nam Office and the MPI assumed that this project had completed upon the completion of loan disbursement (February 2016).

Table 3: Planned and Actual Project Period

	Plan (at the time of appraisal)	**Actual (as of March 2018)**
Loan Agreement Signing Date	November 2009	November 2009
Consulting Services	August 2010-November 2013 (40 months)	May 2011-December 2015 (56 months)
Tendering / Contracts	November 2009-October 2010 (12 months)	September 2009-December 2014 (88 months)
Construction	November 2010-October 2013 (36 months)	December 2009-Incomplete (100 months or more) Of those, additional subprojects: December 2012-December 2016
Total Period	November 2009-October 2013 (48 months)	November 2009-Incomplete (101 months or more)

Source: Documentation provided by JICA; documentation provided by the executing agency

3.2.3 Results of Calculations for Internal Rates of Return (Reference Only)

At the time of appraisal, an internal rate of return of each subproject was not calculated for the project, which consisted of numerous, small-scale subprojects, because it was judged that the amount of effort it would take to make such calculations with high reliability for all subprojects

[14] This was determined by simply comparing the plan and the actual results, as those incomplete subprojects were part of the original outputs. It should be noted that the number of incomplete subprojects at the time of final disbursement (February 2016) was 13 for the original subprojects and five for the additional subprojects.

would not justify the utility of the results. Therefore, internal rates of return were not calculated in the ex-post evaluation.

In light of the above, the project cost exceeded the plan, and the project period significantly exceeded the plan. Therefore, the efficiency of this project is low.

3.3 Effectiveness and Impacts[15] (Rating: ③)

A number of indicators for quantitative effects (operation and effect indicators) and qualitative effects were established for this project at the time of appraisal. By sorting them into the immediate outcomes of the project (i.e., facilitation of transportation of goods to markets, the improvement in accessibility to public services, and the growth in agricultural productivity) (effectiveness) and the impacts (i.e., [contribution to] poverty reduction), this ex-post evaluation assessed those indicators in the following method:

- The target for indicators was marked as "to be reviewed in the detailed design" at the time of appraisal; the baseline and target were both revised during the detailed design. Therefore, the degree of achievement was evaluated by comparing between the revised target and actual results.
- Even though the indicators were established separately for the total values of all subprojects in each sector and for individual values of those subprojects that comprised pilot projects, this evaluation gave greater weight to the results of the former by considering the fact that pilot projects constituted only a part of the entire project.
- Since the number of indicators agreed on between JICA and the executing agency at the time of appraisal was numerous, the evaluation was conducted by giving greater weight to those indicators that were specifically mentioned in the ex-ante evaluation sheet under an assumption that they represented the key indicators.

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)[16]

Although the operation indicators for pilot projects have been only partially achieved, the quantitative effects are considered to have mostly materialized in this project, as the operation indicators when assessed for all subprojects as well as the effect indicators for all subprojects and pilot projects have been mostly achieved.

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[15] Sub-rating for Effectiveness is to be made with consideration of Impact.

[16] About resetting the target year: The ex-ante evaluation sheet set the planned project completion date to October 2013 and the target year for the operation and effect indicators to 2016, two years from project completion. As mentioned in "Efficiency," the actual includes one incomplete subproject. By taking into consideration that 88 percent of subprojects had been completed by December 2015, this ex-post evaluation sets the target year to December 2017, two years from that date.

(1) All Subprojects

In terms of the five-item operation indicators (a total of 11 sub-items), this project, based on the calculation for those subprojects whose data were obtained, has attained 80 percent or more of the revised target, except for one road sub-item (annual average daily traffic volume for newly constructed provincial roads) and one electricity item (annual interruption duration) (neither of which was part of weighted indicators). Although the precise reasons are unclear for those two items that missed the target, it might be the case, for the road item, that the mean value was influenced by outliers.[17] All seven-item effect indicators (a total of 10 sub-items) achieved above 80 percent of the revised target (Table 4).

In most individual subprojects, the achievement rate of the revised target for key operation and effect indicators was over 80 percent. There were four road subprojects, three water supply subprojects, and two irrigation subprojects that did not reach an achievement rate of 80 percent; among these, a water supply subproject and an irrigation subproject had an achievement rate lower than 50 percent. Known reasons for partial attainment or nonattainment included road traffic restrictions due to natural disasters (road), sluggish or declining demand (water supply), social traditions among farmers (irrigation), among other things (Figure 1).[18]

Despite the presence of some clerical errors and ambiguity, the revised baseline and target that were established during project implementation appear to be mostly appropriate, as the executing agencies of the subprojects confirmed in the ex-post evaluation interviews that those values were appropriate, and this assessment was mostly consistent with other obtained information and observations.

[17] The reasons why these items did not reach the target are unknown, and information that would help judge whether the values will improve before the end of 2018 also could not be obtained. Regarding the annual average daily traffic volume of newly constructed provincial roads, it should be noted that responses were obtained from two subprojects among five relevant subprojects, and one of these two cases (Quang Tri Province) had an revised target of 2,500 PCU (Passenger Car Unit) and the actual of 1,500 PCU, both representing highest values across this project, and has likely influenced the mean value.

[18] Responses to the subproject questionnaire and interviews identified the following reasons for missing the target.

Water Supply: The actual water supply population of a water supply subproject that covered multiple districts including Pho Yen District in Thai Nguyen Province was 5,600 in 2017, significantly smaller than the revised target of 43,350. According to the provincial water supply company that carries out operation and maintenance, the reasons are: 1. Sluggish demand (residents continue to use well water, which is free, except for drinking water); 2. A large factory of a foreign electronics manufacturer that was built in the area after this project engages in water source development and water supply in the nearby areas; 3. A shortfall in the expenditures for the water supply network development (external to this project).

Irrigation: The two subprojects that missed the target were both subprojects in the mountainous ethnic minority area in Dien Bien Province. Of these two, the revised target for the size of benefited area in Muong Nhe District was 180 ha, but the actual was only 80 ha. It was consistently pointed out in the interviews with the District People's Committee and the commune officials that the residents who had settled in the area as a result of government policy were not using the irrigation facilities developed in this project because they had an aversion, based on their social traditions, to increasing production through long hours on the field or the use of chemical fertilizers, and continued engaging in the traditional single cropping of rice using meteoric water. The government has not carried out part of rice paddy development due to the absence of demand. It has been reported that some residents who are members of another tribe are engaging in double cropping by using the facilities of this project. For the other irrigation subproject (Tuan Giao District) in this province, refer to "(2) Pilot Projects," as it is part of a pilot project.

Table 4: Operation and Effect Indicators (All Subprojects)

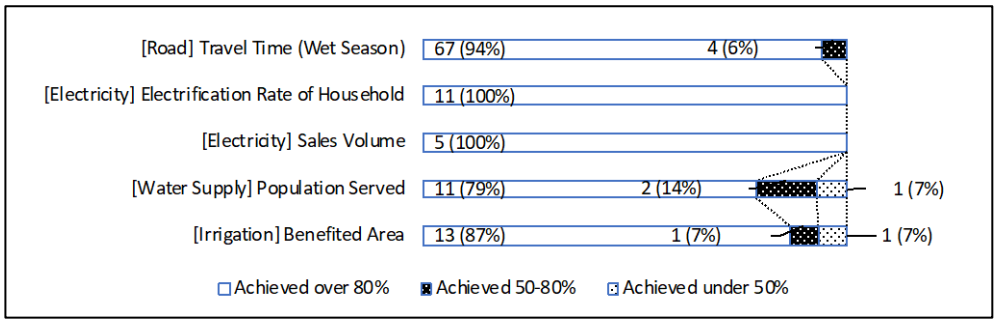
[Sector] Indicator Name (Unit) [1]		Baseline	Target	Revised Baseline	Revised Target [2]	Actual
		2008	2016	2009	2017	2017
		Year Planned	2 Years after Completion	Year Detailed Design was Conducted	2 Years after Completion	2 Years after Completion
Operation Indicator						
[Road] Annual Average Daily Traffic Volume (PCU/Day) (Mean) [3]	New Construction	0	206	0	Provincial Road 1,425 District Road 380	Provincial Road 900 District Road 556
	Improvement	256	601	Provincial Road 221 District Road 132	Provincial Road 394 District Road 340	Provincial Road 357 District Road 357
[Electricity] System Average Interruption Duration (Minute/Household/Year) (Mean)		2,359	700	888	334	460
[Water Supply] Population Served (Person) (Total) ◯		16,437	289,343	31,556	337,932 (319,508)	324,743
[Irrigation] Benefited Area (ha) (Total) ◯	New Construction	0	350	0	1,017 (867)	748
	Improvement	28,370	30,738	32,299	33,842 (32,962)	32,962
[Irrigation] Planted Area by Crop (ha) (Total)	Rice	31,046	39,220	51,005	60,361 (58,001)	56,816
	Maize	723	682	5,248	5,615 (5,465)	5,379
Effect Indicator						
[Road] Travel Time (Wet Season) (Index) (Mean) ◯		100	55	100	23	22
[Road] Travel Time (Dry Season) (Index) (Mean)		100	45	100	33	32
[Electricity] Electrification Rate of Household (%) (Mean) ◯		54.7	97.9	31	100	100
[Electricity] Sales Volume (MWh) (Total) ◯		5,142	12,550	978	5,316 (2,274)	8,703
[Water Supply] Turbidity (NTU)	Tuan Giao	To be established for each subproject		50	50	50
	Others			2-200	2 or lower	0.03-2 (Mean 1.59)
[Irrigation] Major Crop Yield (t) (total)	Rice	To be established before the Loan Agreement becomes effective		238,075	333,056	320,819
	Maize			24,479	27,730	26,361
[Irrigation] Major Crop Unit Yield (t/ha) (Mean)	Rice	To be established before the Loan Agreement becomes effective		4.68	5.42	4.89
	Maize			3.84	4.54	4.17

Source: Ex-ante evaluation sheet; documentation provided by JICA; documentation provided by the executing agencies; subproject questionnaire responses (The number of valid responses was 75 cases out of 89 for road, 11 cases out of 14 for electricity, 16 cases out of 17 for water supply, and 15 cases out of 18 for irrigation)

Note: (1) Those indicators listed in the ex-ante evaluation sheet are designated as key indicators, and are indicated with the symbol "◯".

(2) Since the values in parentheses under revised target do not include the target values for those subprojects that did not respond to the questionnaire in ex-post evaluation, those values can properly be compared to actual values. It should be noted that some numbers with discrepancies were found in different parts of the documentation provided by the executing agency. For such cases, in principle, the values re-calculated by the ex-post evaluator using individual subproject values were used. In addition, corrections were made for obvious clerical errors.

(3) The baseline and target at the time of appraisal appear to be the average for provincial and district roads.



Source: Same as Table 4
Note: The number of cases was counted based on the achievement level of the operation or effect indicators listed in the ex-ante evaluation sheet. Due to rounding, the total may not be 100%.

Figure 1: Number of Subprojects by Achievement Level for Key Operation and Effect Indicators (Breakdown of Valid Responses)

(2) Pilot Projects

As for the operation indicators, a road indicator and a water supply indicator among the six indicators made the target by exceeding the revised target, while the achievement rates of two irrigation indicators were about 70 percent and under 50 percent, respectively. As for the effect indicators, the two indicators related to the Center made the target in Tuan Giao District but not in Hoang Hoa District. Of the five effect indicators, while three indicators for road and water supply achieved 80 percent or more of the target, an irrigation indicator and a Center indicator resulted in partial attainment and nonattainment, respectively (Table 5).

In both operation and effect indicators, the reasons for nonattainment were similar within each sector. First, according to the district executing agency and consultants, the irrigation sector (Tuan Giao District) was affected by such reasons as the splitting of the original target commune into two communes that left only one of them as the target commune, and the delays in rice paddy development (which was planned to be implemented by the district government upon the completion of the subproject). However, as single cropping of maize is currently (at the time of ex-post evaluation) practiced, the pilot projects are considered to have had an effect of increasing the unit yield through the use of irrigation water. In addition, the target commune reported that the development of rice paddy was underway in 2017 and double cropping of rice has been planned to begin in 2018.

Second, as for the Center, Tuan Giao District and Hoang Hoa District presented contrasting pictures. In Tuan Giao District, while the number of training courses was lower than the target, the number of participants exceeded the target, potentially suggesting different ways in which the number of courses was counted.[19] Moreover, in addition to holding training courses and workshops, the Center is actively used as the area's community center, as indicated by the

[19] Themes of the training: regional development, strengthening of community capabilities, strengthening of *Program 135* implementation, forest protection, animal husbandry, protection of children, maternal and child health, etc. The count includes the training by World Vision (an international NGO) that has an office in the Center.

7,300 individuals (2017) who used its food and beverage facilities, swimming pool, etc. that had been built by the company (using its private funding), to which the District People's Committee outsourced the operation of the Center. In contrast, even though it was anticipated for the Center in Hoang Hoa District to be occupied by private-sector tenants, there are no tenants except for an agricultural company[20] that operates in an adjacent land and three-quarters of its space is unused. Although the ownership was transferred from the district to the Department of Agriculture and Rural Development (hereafter, "DARD") in 2014, the Center remains underutilized at the time of ex-post evaluation. However, revitalization in the future is anticipated considering that an operation plan including the recruitment of the private sector that had been submitted by DARD to the Provincial People's Committee was approved in November 2017. The use of the Center at the provincial level has a high potential because the Center is located not in the district's center but rather along a national road, which can be easily accessed from other districts.

Table 5: Operation and Effect Indicators (Pilot Projects)

[Sector] Indicator Name (Unit) (1)		Baseline	Target	Revised Baseline	Revised Target	Actual
		2008	2016	2009	2017	2017
		Year Planned	2 Years after Completion	Year Detailed Design was Conducted	2 Years after Completion	2 Years after Completion
Operation Indicator						
[Road] Annual Average Daily Traffic Volume (PCU/Day)	Tuan Giao	400	800	30	250	350
	Hoang Hoa	800	1,040	175	300	300
[Water Supply] Population Served (Person) ◯ (2)	Tuan Giao	0	2,920 households	0	620 persons	758 persons
[Irrigation] Benefited Area (ha) ◯	Tuan Giao	3	80	0	68	49
[Irrigation] Planted Area (ha)	Tuan Giao	83	160	76	136	49
[Center] Training Courses (Times/Year)	Tuan Giao	13	45	n/a	n/a	20
	Hoang Hoa	4	48	n/a	n/a	0
[Center] Trainees (Person)	Tuan Giao	640	1,350	n/a	n/a	1,620
	Hoang Hoa	370	1,440	n/a	n/a	0

[20] The executing agency explained that although it attempted to recruit tenants by displaying and selling local products, there were no companies that expressed interest. However, an agricultural company who is a tenant and the provincial government jointly conduct demonstrations of piped irrigation at the demonstration farm built next to the Center's building, and it is reported that it receives some visitors although the number is unknown.

(Table 5 continued)

[Sector] Indicator Name (Unit) (1)		Baseline	Target	Revised Baseline	Revised Target	Actual
		2008	2016	2009	2017	2017
		Year Planned	2 Years after Completion	Year Detailed Design was Conducted	2 Years after Completion	2 Years after Completion
Effect Indicator						
[Road] Travel Time (Wet Season) (Index) (Hour) ◯ (3)	Tuan Giao	100	51	3.5	0.25	0.17
	Hoang Hoa	100	52	2.0	0.30	0.40
[Road] Travel Time (Dry Season) (Index) (Hour) (3)	Tuan Giao	100	76	100	8	6
	Hoang Hoa	100	79	100	15	20
[Water Supply] Water Supply Coverage (%) (4)	Tuan Giao	0	80	n/a	n/a	100
[Irrigation] Unit Yield by Crop (t/ha)	Tuan Giao	Spring Lowland Rice 0	Spring Lowland Rice 5.4	Rice 3.0 Maize 2.6	Rice 4.5 Maize 3.5	Rice 0.0 Maize 4.0
[Center] Sales at the Shop (Annual Average; million VND)	Hoang Hoa	5,200	7,800	n/a	n/a	32

Source: Ex-ante evaluation sheet; documentation provided by JICA; documentation provided by the executing agency; subproject questionnaire responses

Note: (1) Those indicators listed in the ex-ante evaluation sheet are designated as key indicators, and are indicated with the symbol "◯".

(2) Although 2,920 households were designated as the target at the time of appraisal, this project constructed water supply facilities that were designed to serve the central area of a single village, and a study preceding the project (documentation provided by JICA) listed 87 households/638 people as the beneficiaries. For these reasons, it appeared—and the subproject's executing agency acknowledged—that the 2,920 households represented the total population of the village including the target areas.

(3) The baseline and target of the travel time at the time of appraisal are represented by index numbers (the rationale for the calculation is unknown). The revised baseline and target are represented by hours (they appear to be the hours it takes to travel between the start and end of the target road).

(4) As it is unlikely that the target at the time of appraisal referred to 80 percent of the district population given the circumstances mentioned in Note (2), this figure is presumed to be the coverage rate in the water supply area of this project. For this reason, the latter coverage rate was used for the actual value.

3.3.1.2 Qualitative Effects (Other Effects)[21]

Although not representative of the results of all subprojects, the evaluation verified among almost all subprojects that were included in the qualitative study[22] that the use of target infrastructure had facilitated transportation of goods to markets, improved access to public services, and improved agricultural productivity. The followings are the most significant changes after the project as identified by the residents who participated in the study.

[21] At the time of appraisal, "to raise and stabilize incomes" and "to bring improvements to living environments" were listed as qualitative effects of this project, but this ex-post evaluation classified them as part of the impact "contribution to poverty reduction."

[22] Qualitative survey was conducted in Dien Bien Province, Thanh Hoa Province, Kon Tum Province, and Soc Trang Province among the provinces visited in the ex-post evaluation. In addition to conducting key-informant interviews with organizations related to subprojects, focus group discussion and semi-structured interviews were administered to examine the residents in the target areas of different subprojects. A request was made to the People's Committee of each target commune to select resident-participants (respondents) in a manner to minimize biases in terms of sex, occupation, income, etc. This resulted in a total of 90 participants (32 women and 58 men). Most of them were farmers, and some were teachers and local government employees. Although age information of the residents could not be comprehensively collected, most of them seemed to be in their 20s to 50s except for a few who were under 20 or over 60.

- Road: That it became more convenient to use (easier; shorter amount of time). That it became easier to transport produce to the market.
- Electricity: Stable supply of electricity. That it became possible to use electronic appliances such as the television, rice cooker, and washing machine at home.
- Water Supply: That it became possible to get safe water easily.
- Irrigation: That it became possible to get agricultural water easily year around. That agricultural productivity has improved. That flood damages were reduced by the development of drainage channels.

3.3.2 Impacts

3.3.2.1 Intended Impacts

Intended impacts—contribution to poverty reduction (raising and stabilizing incomes and bringing improvements to living environments)—were observed.

(1) Quantitative Impacts

Agricultural income and district-level poverty rate data were collected to be used as impact indicators for the operation and effect indicators that were established at the time of appraisal. As shown in Table 6, although the indicators have generally improved despite some fluctuations, the obtained data were limited and do not clearly show associations with this project. However, in light of the qualitative impacts as will be discussed below, and also considering that improvement projects—in addition to the subprojects of this project—for national and provincial roads by the Vietnamese government, public-private partnerships, other development partners (the World Bank, the Asian Development Bank, etc.), and so forth were being implemented concurrently in the target districts of this project, this project is presumed to have contributed to the improvement in agricultural production and reduction in poverty rate even though the effects may not be showing up in macro data.

Table 6: Operation and Effect Indicators for the Level of Impacts

Indicator Name (Unit) [1]		Baseline 2008	Target 2016	Actual 2010	Actual 2011	Actual 2012	Actual 2013	Actual 2014	Actual 2015	Actual 2016
Average for all target districts										
Agricultural Income per Agricultural Household (million VND)		Established before the Loan Agreement becomes effective		25.5	27.8	31.7	34.0	37.1	39.2	42.6
District Poverty Rate (%) ◯		Established for Each Subproject		29.6	30.6	25.2	22.5	18.2	23.1	22.8 (Tentative)
Pilot Project										
District Poverty Rate (%) ◯ [3][4]	Tuan Giao	43.6	16.4	n/a	n/a	45.9	42.3	39.1	33.6	53.6
	Hoang Hoa	24.0	13.3	17.5	15.9	13.1	10.2	7.9	10.7	7.9
Users of District's Health Facilities (Person)	Tuan Giao	118,468	138,648	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Hoang Hoa	167,820	217,820	n/a	n/a	n/a	n/a	n/a	n/a	n/a
District Child Mortality (%)	Tuan Giao	4.1	2.0	n/a	n/a	3.4	2.5	2.6	2.6	3.6
	Hoang Hoa	1.9	1.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: Ex-ante evaluation sheet; documentation provided by JICA; computed from the District People's Committee questionnaire responses (valid responses from 62 of 118 districts)
Note: (1) Those indicators listed in the ex-ante evaluation sheet are designated as key indicators, and are indicated with the symbol "◯".
(2) Revised baseline and revised target were not established in the detailed design.
(3) The baseline for district poverty rate was that of 2006.
(4) Due to the unavailability of actual data for the poverty rate in Tuan Giao District, Dien Bien Province's rural poverty rate was used as a substitute. In addition, Tuan Giao District appears to have relatively favorable economic conditions among the province's rural areas, as it has 14.5% of the provincial population and is responsible for 15% of the total provincial agricultural output, both ranking second after Dien Bien District in the province (the numbers are from 2016; based on data from the General Statistics Office of Viet Nam).

(2) Qualitative Impacts

A number of impacts were identified in the qualitative study (Table 7), and some of them were observed during the site visits. This project appears to be contributing to the reduction of the district's poverty rate through an improvement in agricultural income and a reduction in agricultural cost.

Table 7: Examples of Qualitative Impacts by Sector

Road	• We used to be just subsistence farmers before the project, but access became much easier after a road was constructed next to our farm, so we began selling produce at the market. • The cost of transporting produce has gone down. • Transportation became easier so we began producing new products (acacia plantation, etc.). • New stores opened along the road. • We now make additional income from a store we opened in front of our house that faces the road. • Our income increased after becoming capable of transporting produce and forest products in large quantities, so we built a concrete house. • The truck we purchased using part of everyone's profit in the village has made large-scale shipping possible. • It's now easier for children to go to the school. • It has become easier to take a sick person to the hospital. • We began visiting the commune's health station more regularly. • People now give birth at the clinic in town. (mountainous ethnic minority region) • It has become safe without having to go through the forest (mountainous areas) and water (Mekong River Delta area).

(Table 7 continued)

Electricity	• Home appliances such as the rice cooker have made the life easier. Housekeeping has become less burdensome. • We began to get information about the outside world on the television. • Agricultural cost has gone down.[23] • The electricity bill is higher than the fuel cost for lamps or a generator but not prohibitively so. Benefits we get from electricity such as convenience and access to information are greater than the cost increase.
Water Supply	• Diseases caused by water (digestive system diseases, eye diseases) have gone down. • The school's restrooms that had been shut down for lack of water have become available. • Water has become available again at the school, so we can make aquaculture ponds and vegetable gardens. • We were able to save on the maintenance cost for the well pump and filters.
Irrigation	• Agricultural income has increased. • The expansion of irrigated areas and improved income allowed us to diversify products. We started production of new cash crops (rubber, coffee, etc.) • Production and sales of the produce in the irrigated area increased our income, allowing us to spend more money on education and healthcare. • The water in the canal has become available for everyday use at home. • Because we got enough water, the trouble among residents over water has disappeared.

Source: Qualitative study

An additional income of 4 million VND (approximately 20,000 yen) is being generated by start selling meat after the road improvement (Thanh Hoa Province)

With the construction of a bridge directly connected to the school, it has become possible to go to the school by bicycle rather than small boat (Soc Trang Province)

Clear synergistic effects within each pilot project were not observed. For Tuan Giao District, comments such as "Yields might have increased due to irrigation and training at the Rural Promotion Center (with increased productivity), and agricultural income might have increased as access to the market was improved through road improvement" were made by the executing agency. However, because any tangible situations could not be confirmed, and, as mentioned above, irrigation facilities have not been adequately utilized yet, it is doubtful whether there were synergies or not. In both cases, no situations were observed that would show that the executing agency had arranged some sort of coordination among subprojects within pilot

[23] In Kon Tum Province, for example, it was reported that the monthly fuel (gas) cost of running irrigation pumps for coffee farming, 1 million VND (approximately 5,000 yen), had dropped to an electricity bill of 300,000 VND (approximately 1,500 yen).

projects. It would be more appropriate to say that each one of the multiple subprojects that had been implemented in a given district generated impacts independently.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

At the time of appraisal, this project was categorized as not having significant adverse impact on the environment (Category B) under the *Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations* (2002). According to the executing agency, preparation of an Environmental Impact Assessment (EIA) report was required for 10 original subprojects (two road and eight irrigation subprojects) and one additional road subproject, and each one of them had received approval before construction began.

Regarding environmental mitigation measures and monitoring, although proper evaluation is difficult as specific implementation records could not be obtained, no serious problems have been reported. In addition, residents and communes did not point out problems in the qualitative study.

(2) Resettlement and Land Acquisition

Land acquisitions took place in 79 out of 89 road subprojects and all subprojects of other sectors. Although no details are available about the extent of those acquisitions, the reports from the executing agencies and the results of on-site interviews as a whole seem to indicate that acquisitions were mostly minor (e.g., road widening of less than one meter, lands for pumps, etc.) except for the following single irrigation case. In one irrigation subproject, compensation had to be given to approximately 300 households due to the construction of a reservoir. The shortage of funds for compensation had delayed the construction by 31 months. Although the delay in the execution of compensation had increased the compensation cost in this and several other subproject, the executing agencies reported that an amount stipulated by domestic law had been paid out and the matter had been settled by the time of project completion.

Among those subprojects above, resettlement of residents (a total of 11 households) took place in two cases. Due to the shortage of funds for compensation, construction was cancelled for a portion shorter than 1 kilometer. The status of restoring livelihood is not described in existing documentation or questionnaire responses.

Whether there were complaints among residents over land acquisition and how subprojects handled them are not reported or recorded comprehensively in existing documentation or questionnaire responses. However, there were no significant issues according to the 23 districts in six provinces targeted for the on-site interviews and a province (a district) that provided some information in the questionnaire response. The District People's Committee in Muong

Cha District (Dien Bien Province) and Ma Thi Ho Commune People's Committee in the same district reported, for example, that although acquisitions of part of their fields initially drew oppositions from the residents, the subproject earned their understanding by directly explaining the subproject's detail and its benefits such as easier transportation of produce. It was reported that complaints have not been expressed since then.

(3) Impacts Related to Gender

The following changes pointed out by residents in the qualitative study are considered impacts related to gender.

- Road: Women in the village used to give birth in the village, but more women are giving birth at the hospital in town because road improvement made access better. Before the project, we had to walk through the forest for a whole day to get to town, but I can now go by myself because it has become possible to cover the distance in a short amount of time during the daytime. Because the field now faces the road, it has become safe for a woman even when she is alone. It has become possible for women with small children to come to see the events at the commune (at the time of a site visit, many women and children were enjoying watching a traditional game that was being played).
- Electricity: Home appliances have made housekeeping less burdensome. Women and children now get information about the outside world on the television.

In light of the above, operation and effect indicators have mostly achieved the target except for a few instances, and the contribution of this project toward the improvement of indicators was confirmed by the qualitative data. Although some subprojects had issues, such as the underuse of irrigation facilities and the underuse of the Center in the pilot project, this project as a whole has mostly achieved its objectives. Therefore, the effectiveness and impacts of the project are high.

3.4 Sustainability (Rating: ③)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

The institutional aspect of operation and maintenance of each subproject is summarized in Table 8. Although there have been some changes from the plan that was created at the time of appraisal such as the advancement of privatization in all sectors except for the road sector, responsibilities concerning the organizational structure and operation/maintenance were clearly defined and no understaffing issues were observed.

Table 8: Institutional Aspect of Operation and Maintenance in Subprojects

Sector	At the time of appraisal	At the time of ex-post evaluation
Road	To be undertaken by the Department of Transport of the Provincial or District People's Committee.	Undertaken as planned in 75 of the 89 cases for which survey responses were available (the Provincial Department of Transport for provincial roads; the district Department of Transport for district roads). The forms of conducting operation and maintenance included direct operation or outsourcing (to communes and local residents for routine maintenance and minor repairs, and private companies for further repair works). The number of personnel who were assigned to operation and maintenance was around six in the district's Department of Transport (approximately 45 including laborers in the case of direct operation) in the four cases for which data were obtained among the subprojects that were visited in the field research. Comments that no staff shortage problems.
Electricity	To be undertaken by the electricity distribution division of the Vietnam Electricity (hereafter, "EVN") Group or the electricity division of the Provincial People's Committee.	Among the 10 out of the 14 cases for which survey responses are available, operation and maintenance are undertaken by power companies (electricity distribution companies) under regional power companies, which are self-supporting corporations within the EVN Group, in nine cases (six cases are provincial level, and three cases are district level), and by the District Public Services entity in one case (Kon Ray District, Kon Tum Province). Among the subprojects visited in the field research, the number of personnel assigned to operation and maintenance was approximately 50 in those subprojects served by the district power company (Soc Trang Province), and 12 across the district in those subprojects served by the District Public Services entity (Kon Tum Province). Operation of facilities and inspection of target areas are being carried out in all cases.
Water Supply	To be undertaken by the Water Supply Company (hereafter, "WSC").	Among the 14 out of the 17 cases for which survey responses are available, operation and maintenance is undertaken by the WSC (province-level Joint Stock Company [hereafter, “JSC”]) in eight cases, by the district-level JSC in two cases, by the District Public Services entity in three cases, and by a private corporation (sold by the district in 2017) in one case. Privatization is progressing. In the two sites visited, the number of personnel assigned to operation and maintenance were five and 10, respectively, which are judged to be appropriate for the facility size.
Irrigation	To be undertaken by the Irrigation Management Company (hereafter, "IMC") at main facilities, and by the irrigation association for on-farm canals.	Among 15 cases of the 18 cases for which survey responses are available, operation and maintenance are undertaken by the provincial IMC in five cases, by DARD in two cases, by the province-level One Member Limited Liability Company in three cases, by the district IMC in one case, by a district-level One Member Limited Liability Company in one case, and by the commune's People's Committee in three cases. Among the subprojects that were visited, the number of personnel assigned to operation and maintenance was around 3-5 in the two cases for which data were obtained (around 30 for an entire province). These numbers are judged to be appropriate for the facility size (approximately 70 ha and 50 ha).
Center	To be undertaken by the Provincial or District People's Committee according to the operation plan that will be developed before the completion of construction.	The District People's Committee outsourced the operation to the private sector in Tuan Giao District. In Hoang Hoa District, efforts have been made to improve the utilization by transferring the rights of ownership and operation from the District People's Committee to Thanh Hoa Province's DARD in 2014 and assigning eight employees (however, those efforts have not been successful yet; the situation is such that the Center does not yet require many employees as there is little activity). The Center's demonstration farm is jointly managed by an agricultural company (a tenant) and DARD.

Source: Ex-ante evaluation sheet; documentation provided by JICA; documentation provided by the executing agency; subproject questionnaire responses

Therefore, it is judged that the institutional aspect of operation and maintenance of subprojects is mostly free of problems.[24]

[24] "Mostly" is added to the evaluation because information about operation and maintenance could not be reviewed for every subproject. Likewise for other aspects on the sustainability discussed below.

3.4.2 Technical Aspect of Operation and Maintenance

As all subprojects were typical, small-scale rural infrastructure, all organizations that are responsible for operation and maintenance have experience working with similar infrastructure. The on-site interviews yielded responses acknowledging that operation and maintenance techniques required for regular inspections (all sectors), operation of pumps (water supply, irrigation), and water quality inspection (water supply) had been acquired as well as information about the implementation status of training/technical guidance including hands-on training. Although concerns had been expressed about the operation and maintenance technology in water supply subprojects at the time of appraisal, training was offered as part of consulting services and no problematic situations have been observed. Site visits confirmed that all subprojects were operated smoothly.

In an electricity subproject, which is not operated and maintained by an EVN power company, there are some concerns over the technical capabilities required in the future, though it has not experienced problems so far.[25] In view of the generally satisfactory level of technical capabilities of this project as a whole, however, the rating will not be lowered.

Therefore, it is judged that the technical aspect of operation and maintenance of subprojects is mostly free of problems.

3.4.3 Financial Aspect of Operation and Maintenance

The sustainability of the financial aspect was evaluated mainly by the information gathered through the on-site interviews (Table 9) as it was difficult to obtain financial information only through the survey questionnaire. Concerning district roads in particular, although comprehensive budget data could not be obtained, because the target districts have high poverty rates, it would be a challenge to use the ordinary budget to pay such an amount calculated by (maintenance costs per kilometer x road extension). However, this is mostly not problematic for the sustainability of the project effects (achieving smooth passage) considering that there is a mechanism in place to receive appropriations from higher administrative organizations for high-priority roads, and that road passage is ensured by inspection of the road and reporting of problem areas by residents organizations, mobilization of residents' labor for routine maintenance, and repairs using a provisional budget for cases such as when recovering from disasters. Other sectors also are operating and maintaining the facilities of this project by taking great efforts within the limitation of the budget.

[25] Because the subprojects operated and maintained by EVN power companies are part of the target of the EVN Group's internal training system, all employees receive some kind of training every year. A subproject in Soc Trang Province that was visited reported that it follows EVN's training system. The evaluation observed that the employees of a subproject in Kon Tum Province managed by the District Public Services entity were conducting regular inspections according to the EVN standards. Even though no issues requiring repairs have occurred by the time of ex-post evaluation, it was reported that a request for training was being made by the district to EVN to address possible breakdowns and damages to the distribution lines in the future.

Table 9: Financial Conditions for Operation and Maintenance in Subprojects Visited

Road	• Maintenance expenses are paid from the provincial or district ordinary budget (routine maintenance, minor repairs) or the provisional budget (further repairs) in all subprojects. • The annual expenditure from the district budget for a single district road subproject (which constitutes the bulk of the road sector of this project) ranges between 0 (when the residents provide labor) and 100 million VND (approximately 500,000 yen). For repairs whose extent is beyond the financial capabilities of the district, repairs are conducted by receiving funds by applying to the province, and to the MPI when the province, too, is not capable (e.g., there was a case of repairing district roads using 40 billion VND [approximately 200 million yen] from Dien Bien Province's budget). In general, maintenance is conducted by prioritizing items within the budget. There were no subprojects that were impassable due to the inability to conduct repairs for the lack of budget.
Electricity	• Although the financial conditions of individual power companies could not be obtained, all aspects of the operation and maintenance of the subprojects under EVN are financially supported by the power company. For example, the annual expenditure on a subproject in Soc Trang Province includes 180 million VND (approximately 900,000 yen) for routine maintenance and 4 billion VND on average (approximately 20 million yen) for overhaul (conducted as needed). • The maintenance expenditure for the subproject in Kon Tum Province in which the district carries out O&M is 200 million VND (approximately 1 million yen) annually for routine maintenance.
Water Supply	• As a general rule, the waterworks is to be operated by the water charge revenue. • Among the three subprojects visited for which data were obtained, even though the water charges are kept low at around 7,000 VND per 1 m^3 (approximately 33 yen), two subprojects are managing to carry out routine maintenance within the revenue from this project's facilities (For example, the Dien Bien Province WSC has been able to carry out operation and maintenance using the monthly income of approximately 65 million VND (approximately 320,000 yen) it collects from the subproject of this project. Gravity flow is used where feasible to save the electric bills for water pumps. Moreover, installation of additional tanks at this project's facilities using the WSC's budget has been planned). • If we only look at the facilities of this project, they are in the red at the Thai Nguyen Province WSC, in which the population served is significantly smaller than the plan. However, the income and expenditure of the WSC as a whole including the maintenance of this project's facilities are balanced.
Irrigation	• All irrigation fees are paid by the central government, rather than by the members of the association. The facilities of this project, too, are operated and maintained using the provincial budget (subsidies from the central government). • The amount paid for operation and maintenance ranged between those cases in which the expenses were covered entirely by the residents' labor (no electricity charges are needed because of the use of turbine pumps that do not require electricity) and those cases in which IMC paid some 700 million VND (approximately 3.5 million yen) annually (of which, 400 million VND was personnel cost). In addition, expenditures have been made on an as-needed basis (For example, 3.3 billion VND [approximately 17 million yen] was spent to clean a canal for 4 kilometers in 2016).
Center	• At the Center in Tuan Giao District, the operating company has been stably paying for the operation and maintenance cost using its own revenues (an expenditure of 2.75 billion VND [approximately 13.75 million yen] was made in 2017). • At the Center in Hoang Hoa District, its owner Thanh Hoa Province pays 600 to 800 million VND annually (approximately 3 to 4 million yen) as personnel and utilities expenses.

Source: Documentation provided by the executing agency; interviews at subprojects

Therefore, it is judged that the financial aspect of operation and maintenance of subprojects is mostly free of problems.

3.4.4 Status of Operation and Maintenance

With many of the visited subprojects operating and maintaining the facilities of this project according to and within the operation and maintenance plan and budget, it was confirmed that their status was generally sound. In the road sector, although there have been damages on some roads due to an increase in large vehicle traffic and natural disasters, repair works have

continuously been carried out and the passage has been secured. Sections that were being repaired or had received repairs were confirmed during site visits. Therefore, it is judged that the status of operation and maintenance is mostly free of problems.

In light of the above, no major problems have been observed in the institutional, technical, financial aspects and current status of the operation and maintenance system. Therefore, the sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objectives of this project were to facilitate the transportation of goods to markets, to improve access to public services (electricity and water supply), and to increase agricultural productivity by conducting small-scale infrastructure improvement (subprojects) in road, electricity, water supply, and irrigation in rural areas in 36 provinces in Viet Nam, thereby contributing to poverty reduction. The relevance of these objectives is high, as they are consistent with Viet Nam's development policy and development needs as well as with Japanese aid policy that all aim to reduce poverty in rural areas through small-scale infrastructure development. The effectiveness and impact are high, as a total of 141 subprojects, with some exceptions, have mostly achieved the targets concerning their utilization and effects and produced such impacts as the improvement in agricultural income, the reduction in agricultural cost, and the betterment of quality of life. However, the degree to which the project cost exceeded the plan was disproportionate to the implementation of additional subprojects, and the project period significantly exceeded the plan. Therefore, the efficiency of the project is low. On the other hand, the sustainability is high, as no major problems were observed in the institutional aspects, technical aspects, and financial aspects of operation and maintenance.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Phu Tho Province DPI and Thanh Son District People's Committee are recommended to swiftly complete the unfinished construction of road subprojects. It is necessary not only for the province and district but also for the MPI to be involved to supplement the shortfall of the construction budget.

(2) It is recommended that Thanh Hoa Province DARD soundly implement a revitalization plan for the Center.

4.2.2 Recommendations to JICA

It is recommended that JICA consider utilizing the Center's facilities itself when undertaking some kind of activities in Thanh Hoa Province in the future.

4.3 Lessons Learned

(1) Outsourcing of Center's Operation to the Private Sector

One of the two Rural Promotion Centers constructed in this project has not been adequately used for the lack of capabilities of the local government. In contrast, the other Center, by having its operation outsourced from the local government to a private company, has expanded the facilities through this company and recruited office tenants, and has been actively used for local events and training. When constructing a Center as a general-purpose center for a region, like in this project, rather than for a specific institution, it is recommended to consider outsourcing its operation to a private company with high management capabilities.

(2) Monitoring a Project with a Number of Dispersed Sites from Final Loan Disbursement to Project Completion

In this project, the loan disbursement had completed (consulting services had also terminated) when there still were incomplete subprojects, which were caused by such factors as the shortage of funds on the Vietnamese side. Coupled with subsequent delays, the project period significantly exceeded the plan. Although consultants had created an action plan for each of the delayed subprojects and suggested to institute a reporting structure, from the executing agency of each subproject to the Provincial DPI, then to the MPI/JICA, those suggested actions were not carried out because MPI and JICA were unaware that those were incomplete subprojects. When planning a financial cooperation project with a number of dispersed sites in which the weight of the recipient country's funds is high, it is recommended to foresee a situation in which loan disbursement completes before the completion of the construction and to explore post-ODA Loan disbursement monitoring systems. Furthermore, in case the ODA Loan portion terminates when there are incomplete subprojects, JICA is recommended to prompt the executing agency for proper administration of monitoring and keep track of the project until the project completion.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs Road	52 subprojects Concrete pavement, bridge construction, etc. (Total length of approximately 890 km)	89 subprojects (Total length of 1,064.725 km and 2,506 m of bridges including 2 km of an unfinished road.)
Electricity	14 subprojects Installation, reinforcement, and restoration of medium- and low-voltage power lines, installation of distribution transformers, etc.	14 subprojects A total of 202.33 km of medium-voltage power lines, a total of 555.24 km of low-voltage power lines
Water Supply	16 subprojects Construction of water intake facilities, pump facilities, treatment and filtration facilities, water distribution networks, etc.	17 subprojects (one cancellation; two additions) Same specifications as the plan
Irrigation	18 subprojects Improvement of canals and drainage channels, development of reservoirs, etc.	18 subprojects Same specifications as the plan
Rural Promotion Center and other items	4 subprojects 2 training facilities, 1 production and marketing unit facilities, 1 demonstration farm.	3 subprojects (Cancellation of production/ marketing unit facilities)
Consulting Services	62 man-months for foreign consultants, 80 man-months for Vietnamese consultants, and 230 man-months for assistants	93 man-months for foreign consultants, 114 man-months for Vietnamese consultants, and 303 man-months for assistants
2. Project Period	November 2009 - October 2013 (48 months)	November 2009 - incomplete as of March 2018 (101 months or more)
3. Project Cost Amount Paid in Foreign Currency	825 million yen	914 million yen
Amount Paid in Local Currency	20,780 million yen (3,522,034 million VND)	30,364 million yen (6,365,618 million VND)
Total	21,605 million yen	31,278 million yen
ODA Loan Portion	17,952 million yen	17,280 million yen
Exchange Rate	1 VND = 0.00590 yen (As of April 2009)	1 VND = 0.00477 yen (Average between 2009 and 2016)
4. Final Disbursement	February 2016	