Ex-Post Project Evaluation 2019

Package III-3 (China, Ethiopia, Laos)

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OPMAC CORPORATION

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People's Republic of China

FY 2019 Ex-Post Evaluation of Japanese ODA Loan Project

"Qinghai Ecological Environmental Improvement Project"

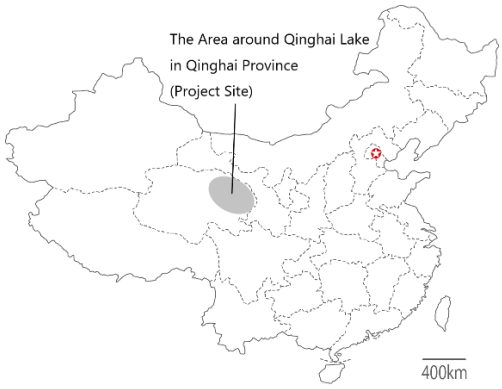
External Evaluator: Toshihiro Nishino, International Development Center of Japan Incorporated

0. Summary

The objective of the Project is to improve the forest coverage ratio and rate of vegetation cover through the improvement of degraded grassland, prevention of desertification, afforestation and soil/water conservation measures in areas around Qinghai Lake in Qinghai Province, thereby contributing to the restoration of the multiple functions of forests and grassland and the prevention of desertification.

The Project advanced the restoration of the multiple functions of forests and grassland and the prevention of desertification through afforestation work, grass planting and construction of facilities to implement soil/water conservation measures in line with the policy of the central government of China and Qinghai Provincial Government to improve the ecological environment. As such, the Project conforms to the development needs of improving the ecological environment in Qinghai Province and Japan's ODA policy. Therefore, the relevance of the Project is high. In the case of the project efficiency, although the outputs were achieved generally as planned or even better with the project cost being within the plan, the project period exceeded the plan. Therefore, the efficiency of the Project is fair. As a result of the materialization of afforestation work, grass planting work and construction of facilities to implement soil/water conservation measures, the target figures for the quantitative indicators (rate of vegetation cover, planted tree survival rate, etc.) set at the time of appraisal were generally achieved at the time of project completion. In addition, wide-ranging qualitative effects of the Project, including (i) acceleration of the growth as well as increased production of pasture grass and (ii) improvement of environment for stock raising, are confirmed as a result of the "improvement of the forest coverage ratio and rate of vegetation cover." Also highly noticeable are the impacts of "the restoration of the multiple functions of forests and grassland" ((i) increase of the water volume usable for farming, etc., (ii) improvement of the frequency and situation of sandstorms, flooding and debris flow and (iii) increased income of stock farmers and farmers due to the vitalization of stock farming). Accordingly, the effectiveness and impacts of the Project are high. The sustainability of the Project is also high as there are no problems regarding the institutional, technical and financial aspects of the Project with confirmation of the good operation and maintenance conditions of the facilities and equipment. In the light of the above, the Project is evaluated to be highly satisfactory.

1. Project Description



Project Location Map

An afforestation site of the Project

1.1 Background

While the Government of China had long adopted afforestation of the national land as one of its basic policies, the ratio of forest area to national land area (the forest coverage ratio) had been well below the international average because of the vastness of its land area, severity of the natural conditions and excessive logging to meet the increasing timber demand. Moreover, desertification was progressing due to such man-made factors as over-grazing and excessive logging. Against this background, the Government of China announced the *National Ecological Environment Construction Plan* in 1999, clearly showing its determination to place greater emphasis on environmental policies. In this plan, concrete target figures were set for the prevention of soil erosion, prevention of desertification, forest area, forest coverage ratio and improvement of degraded grassland. The plan also designated areas to be prioritized by 2010 and priority agendas in each area.

Qinghai Province is located in northwestern China and most of the provincial land is highland with a provincial average elevation of 4,058 m or more. The forest ratio in this province of 4.4% was far lower than the national average of 18.2% due to the harsh natural conditions, including a relatively cold and dry climate, coupled with the excessive use of forests. Some parts of the Project Area lying to the east and south of Qinghai Lake were experiencing a significant decline of the water resource recharging function and soil/water retention capacity due to the excessive logging of trees and resulting soil erosion. Flood damage attributable to soil erosion occurred every year. In 2005, 40,000 people suffered flood damage with the damage amount as high as 4.5 billion CNY. Meanwhile, in areas lying to the west and south of Qinghai Lake constituting part of the Project Area, the process of desertification was ongoing, threatening the habitation of local residents. In addition, the degradation of grassland was also progressing to the extent that 220,000 ha of grassland out of 4.67 million ha of land which could have been used as grassland became bare ground. Accordingly, there was an urgent need for the prevention of desertification, recharging of water sources and improvement of the soil/water retention capacity and degraded grassland in these areas.

1.2 Project Outline

The objective of the Project is to improve the forest coverage ratio and rate of vegetation cover through the improvement of degraded grassland, prevention of desertification, afforestation and soil/water conservation measures in areas around Qinghai Lake in Qinghai Province, thereby contributing to the restoration of the multiple functions of forests and grassland and the prevention of desertification.

Loan Approved Amount / Disbursed Amount	6,300 million yen/5,879 million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	December, 2007/December, 2007	
Terms and Conditions	Interest Rate: Repayment period: (Grace Period: Conditions for Procurement:	0.65% 40 years 10 years) General untied
Borrower/Executing Agencies	Government of the People's Republic of China/Qinghai Provincial People's Government	
Project Completion	July, 2017	
Main Contractor (Over 1 billion yen)	-	
Main Consultant (Over 100 million yen)	-	
Related Study	Feasibility Study by Qinghai Project Advice Centre (April, 2007)	
Related Projects	-	

2 Outline of the Evaluation Study

2.1 External Evaluator

Toshihiro Nishino, International Development Center of Japan Incorporated

2.2 Duration of Evaluation Study

The ex-post evaluation study for the Project was conducted over the following period.

Duration of the Study: September, 2019 – December, 2020

Duration of the Field Survey: December 15 – December 31, 2019

2.3 Constraints during the Evaluation Study

There were several constraints for this ex-post evaluation of the Project as explained next.

There was an outbreak and spread of the new infectious coronavirus disease (COVID-19) in China after the first field survey of this ex-post evaluation and the planned second field survey could not be conducted because of introduction by the Government of China of such measures as (i) suspension of the already issued visa for a specified period and (ii) compulsory quarantine observation period of two weeks for foreign nationals arriving in China. As a result, it became difficult to conduct (i) field reconnaissance and fact-finding work in some areas and (ii) an interview survey with some project-related personnel at the executing agency and beneficiaries, both of which were planned during the second field survey. In the face

of this situation, efforts were made to obtain as much additional information as possible. However, the reality was that essential information for the ex-post evaluation was not fully obtained.

3 Results of the Evaluation (Overall Rating: A[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Consistency with the Development Plan of China

The development plan of the Government of China at the time of project appraisal clearly indicated such directions as the protection of forest resources, improvement of degraded grasslands and prevention of desertification in the upper and middle reaches of Yellow River, indicating the emphasis on the ecological environmental issue as one of the priority policy fields as evidenced by the *National Ecological Environment Construction Plan* (1999 – 2050) and the *Summary of the 11th Five Year National Plan for Economic and Social Development* (2006 – 2010). Particular emphasis was placed on the implementation of proactive efforts for the prevention of soil erosion, prevention of desertification, increase of the forest area and improvement of degraded grassland. Concrete quantitative target figures were set for these objectives with a relevant timeline. Improvement of the ecological environment has been continually stressed in subsequent five year plans. The plan and policy at the time of ex-post evaluation, including the *13th Five Year National Plan for Economic and Social Development* (2016 – 2020), call for "relative improvement of the quality of the ecological environment" as one of the main goals to achieve "moderately prosperous society" and to promote the further advancement of the relevant efforts while improving the related indicators through a review of standards, etc.

In accordance with such policy and plan of the central government, the Qinghai Provincial Government has been advancing the improvement of the ecological environment. Its *13th Five Year Plan for Qinghai Province* (2016 – 2020) promotes protective measures for the ecological environment centering on the prevention of desertification, protection/improvement of grasslands and soil/water conservation and aims at achieving concrete numerical targets for the rate of vegetation cover, forest coverage ratio, achievement ratios of water quality standards, etc.

[1] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory
[2] ③: High, ②: Fair, ①: Low

Table 1 Principal Targets of Development Plans Related to the Project

Category	At the Time of Appraisal	At the Time of Ex-Post Evaluation
National Development Plan	*11th Five Year National Plan for Economic and Social Development* (2006 – 2010) • The plan identified priority programs concerning the protection of the ecosystem identified such targets as the protection of natural forest resources, improvement of degenerated grasslands, prevention of desertification among others in the Upper and Middle Yellow River. • The Government of China planned the injection of 17 trillion JPY over a period of five years for environmental protection. (Principal goals) (i) suppression of outbreaks of new environmental pollution, (ii) suppression of destruction of the ecological environment, (iii) improvement of the environment in designated priority areas for environmental conservation and urban areas and (iv) conservation of the ecological environment at nature reserves. etc.	*13th Five Year National Plan for Economic and Social Development* (2016 – 2020) • The plan targets the achievement of "moderately prosperous society" and the goal related to the Project is "the overall improvement of the quality of the ecological environment." • Part X: Ecosystems and the Environment states that "to improve the quality of the environment and resolve serious ecological and environmental problems, we will step up ecosystem and environmental protection efforts ….. and simultaneously help the people become prosperous, help the country grow strong and build a Beautiful China."
National Policy for the Environment Sector	*National Ecological Environment Construction Plan* (1999 – 2050) • The plan further emphasizes environmental measures and presents the national framework for 50 years for afforestation, water utilization, agriculture and environmental protection. • For afforestation, the plan sets forth concrete numerical targets for short-, medium- and long-term soil erosion prevention, prevention of desertification, forest area, forest coverage ratio and improvement of degraded grassland.	*13th Five Year National Plan for Environmental Protection* and *National Afforestation and Greening Plan* (both 2016 – 2020) • Both plans adopt a policy of "accelerating the greening of the national land, strengthening forest management based on the law and enhancing the basic safeguards". • Numerical targets are set for afforestation, forest coverage ratio, growing stock of forests, etc. up to 2020.
Qinghai Provincial Policy for the Environment Sector	*11th Five Year Plan for Qinghai Province* and *Qinghai Province Ecological Environment Construction Plan* (both 2006 – 2010) • These plans clearly indicate the commitment to prioritize the protection and comprehensive management of the ecological environment in the watershed of Qinghai Lake. • These plans set quantitative targets to be achieved by 2010 concerning the suppression/prevention of soil erosion, afforestation/grass planting, improvement of grassland and prevention of desertification.	*13th Five Year Plan for Qinghai Province* (2016 – 2020) • The plan sets forth the policies of "strengthening inputs in the ecosystem protection field" and "implementing projects designed to restore and/or improve the ecosystem through the prevention of desertification, improvement of grassland, soil/water conservation, etc." *13th Five Year Environmental Protection Plan for Qinghai Province* (2016 – 2020) • The plan sets forth the policy of "comprehensively improving the stability and ecological function of the natural

		ecosystem, targeting such prioritized areas as the Sanjiangyuan Region, through enhancement of the outcomes of ecological improvement efforts."

Sources: Materials provided by JICA and various plan documents.

Based on the above, the objective and contents of the Project are consistent with China's policy for the environmental sector at the time of both project appraisal and ex-post evaluation in that "the Project aimed at preserving the ecological environment and improving the living environment of local people by means of strengthening the improvement and regeneration of forests and grassland through the expansion of related work to protect the ecological environment."

3.1.2 Consistency with the Development Needs of China

As described above, Qinghai Province was experiencing serious deterioration of the ecological environment in the Project Area around Qinghai Lake at the time of appraisal with adverse impacts on civic life although the nature of the problems varied depending on the area. In parts of the Project Area lying to the east and south of Qinghai Lake, the water sources recharging function and soil/water retention capacity were declining due to a decrease of forests, causing much soil erosion and flood damage. Meanwhile, areas lying to the west and south of Qinghai Lake were experiencing the advancement of desertification and degradation of grassland. Accordingly, there was an urgent need for the implementation of afforestation, improvement of degraded grassland and soil/water conservation measures to improve the ecological environment and environment for civic life. As such, the consistency of the Project with the development needs of Qinghai Province was high.

In the interview survey conducted as part of the ex-post evaluation with project-related personnel at the executing agency, such positive comments were made as "the forest and grassland areas have increased," "soil/water conservation measures, such as the improvement of related facilities, have made progress" and "the number of disasters caused by deterioration of the ecological environment has decreased," illustrating a certain improvement of the ecological environment in the target areas and of the level of damage. Around Qinghai Lake, however, there is still a vast area of wasteland, etc. (such as arid land, abandoned cropland, etc.) requiring afforestation and grass planting. Even though positive outcomes of soil/water conservation measures have emerged, the current situation still calls for further strengthening of related projects to continue the suppression of flood damage, etc. As the level of the ecological environment envisaged by the public is becoming higher every year, there is still a strong need for improvement of the ecological environment, making further improvement necessary.

In short, the Project is consistent with the development needs of Qinghai Province at the time of both appraisal and ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

Japan's ODA Charter (2003) at the time of appraisal emphasized efforts to tackle global issues

(environmental issues) while the *Medium-Term Policy on ODA* (2005) emphasized the protection of individuals from the "fear" of environmental destruction, etc. from the viewpoint of "human security" and established "environmental pollution control measures" as a priority field. All of the *Economic Cooperation Program for China* (2001, Ministry of Foreign Affairs), *Medium-Term Strategy for Overseas Economic Cooperation Operations* (2002, JICA) and *Country Assistance Policy for China* (2002, JICA) emphasized environmental conservation, indicating the consistency of the Project with Japan's ODA policies.

3.1.4 Appropriateness of the Project Plan and Approach

No problematic issues are observed with the planning and approach of the Project. In terms of consideration of the socially vulnerable, sufficient efforts were made by actively employing low income earners, women and ethnic minorities for afforestation, vegetation cover and facility construction work under the Project and also the management of afforestation sites after the completion of the Project. Such employment during and after the project period has greatly contributed to the increased income of vulnerable people.

This Project has been highly relevant to the China's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The planned outputs at the time of appraisal and actual outputs of the Project are shown in Table 2. The principal outputs of the Project are (i) grass planting, construction of fencing to keep livestock out and measures to control rodents and pests for "the improvement of degraded grassland," (ii) silviculture and grass planting and control work to present sand dunes from moving for "the prevention of desertification," (iii) creation of water resource recharge forests or soil/water retention forests and forest protection and management for "afforestation," (iv) construction of small-scale sand-trap dams, bank protection work and development of forest land irrigation facilities as "soil/water conservation measures" and (v) training.

The actual outputs generally achieved the planned outputs or were even higher than planned. In the case of those planned outputs which were not fully achieved, most of them showed an achievement rate of 85% or higher. While multiple bodies were involved in the implementation of the Project, the competent administrative body in each field played a leading role in project operation and management. In each county, the deputy governor or a similar high ranking administrator led a command team to manage the Project. As a result, no problems occurred regarding the project operation and management system and relevant capacity with no negative impacts on the outputs.

By project component, in regard to (i) "the improvement of degraded grassland," the actual outputs for grass planting, rodent and pest control measures and construction of livestock sheds exactly matched

the planned outputs. In the case of (ii) “the prevention of desertification” and (iii) “afforestation,” although the actual outputs for “desert closure” and “water resource recharge forests” experienced a slight shortfall compared to the planned outputs, the achievement rate was almost 100%, indicating achievement of the planned outputs in general. According to the findings of the interview survey with project-related personnel at the executing agency, the Project was one of three major projects related to improvement of the ecological environment which were implemented at the same time around Qinghai Lake and the scale of afforestation under the Project accounted for some 10% of the total volume of the three projects. Meanwhile, the actual outputs of bank protection work and procurement of equipment (vehicles and monitoring/office equipment) in the component of (iv) “soil/water conservation measures” was lower than the planned outputs. Similarly, the actual outputs were lower than the planned outputs for the “training in Japan” and “acceptance of experts” in the (v) “training” component. The interview survey mentioned above found several reasons for such under-achievement as shown in Table 3.

Revetment protection work under the Project

Vegetation cover work under the Project

Table 2　Planned and Actual Outputs

	Description	Planned (at the time of appraisal)	Actual	Achievement Ratio
(i) Improvement of degraded grasslands	Grass planting/construction of fences to keep livestock out (ha)	48,054	48,054	100%
	Breakdown: (ha)			
	•Grass planting (Improvement of severely degraded grasslands)	3,916	3,916	100%
	•Grass planting (Improvement of moderately degraded grasslands)	8,310	8,310	100%
	• Construction of fences to keep livestock out	35,828	35,828	100%
	Rodents and pest damage control measures (ha)	950,410	950,410	100%
	Breakdown: (ha)			
	・Measures to control rodents using rodenticide	334,196	334,196	100%
	・Mechanical means to capture rodents	356,840	356,840	100%
	・Measures to control pest damage	259,374	259,374	100%
	Construction of livestock sheds (units)	3,000	3,000	100%
(ii)Prevention of desertification	Desert closure (ha)	37,000	36,651	99%
	Forests for wind/sand protection (ha)	3,823	4,262	111%
	Control work to present sand dunes from moving (ha)	2,500	2,500	100%
(iii)Afforestation	Afforestation for water resource recharge and water/soil retention (ha)	16,000	15,824	99%
	Breakdown: (ha)			
	•Afforestation forests for water/soil retention	14,913	15,246	102%
	•Afforestation for water resource recharge	674	578	86%
	Afforestation for forest protection and management (ha)	24,000	24,289	101%
(iv)Water/soil conservation measures	Small-scale sand-trap dam(sites)	715	726	102%
	Bank protection work (km)	36	25	69%
	Erosion protection walls (sites)	345	334	97%
	Forest land irrigation facilities (ha)	4,567	4,567	100%
	Patrol/work vehicles (vehicles)	17	11	65%
	Monitoring/office equipment (sets)	236	71	30%
	Ecology observation equipment (sets)	10	25	250%
(v)Training	Training in Japan (person)	60	45	75%
	Acceptance of experts (person)	5	0	0%
	Training in China (person)	8,320	13,360	161%
Other	Number of participating cities and counties	10	10	100%
	Number of participating farmers and stock farmers in the Project (thousand person)	-	1,170	-

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.

Table 3 Factors for Non-achievement of Outputs

Type of Work	Description	Factors for Under- or Non-achievement
(iii)Afforestation	Afforestation for water resource recharge	• Some of the planned afforestation sites were removed from the scope of the Project because of poor conditions.
(iv)Water/soil conservation measures	Bank protection work	• At some of the planned sites, construction work was implemented using domestic funds.
	Erosion protection walls	• At some of the planned construction sites, the work was judged to be difficult to implement because of topographical and other reasons.
	Patrol/work vehicles	• Some adjustments were made following a change of the Chinese official rules governing official vehicles.
	Monitoring/office equipment	• Part of the procurement was conducted using domestic funds.
(v)Training	Training in Japan/ Acceptance of experts	• Some adjustments were made to reflect the actual needs and demands.

Source: Findings of the interview survey in Qinghai Province.

As described above, the actual outputs mostly achieved the planned outputs or surpassed them. All of the changes and under-(or non-) achievement of the planned outputs were a reflection of the changing situation or need under the Project. No problems were observed here as the procedure for such change, etc. was properly followed.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 8,168 million JPY, falling by 3% from the planned cost of 8,453 million JPY as shown in Table 4. The reasons for the actual project cost being within the planned cost were (i) many of the successful bids in the competitive tender for the procurement of equipment, etc. were lower than the target prices, resulting in a lower overall procurement cost than planned and (ii) the scale of the Project was reduced for some components, including the procurement of equipment, as described earlier. While the actual costs for such principal components as the prevention of desertification, afforestation and soil/water conservation measures slightly exceeded the planned costs, the excess was small enough to be covered by the reserve fund, partly because of the contribution of the competitive tender outcomes for procurement, thereby resulting in an actual project cost which was within the planned cost.

Table 4　Planned and Actual Project Costs

Unit: million JPY

	Planned (at the Time of Appraisal)			Actual		
	ODA Loan Portion	Chinese Contribution Portion	Total	ODA Loan Portion	Chinese Contribution Portion	Total
Improvement of degraded grasslands	1,268	971	2,239	1,050	1,012	2,062
Prevention of desertification	1,139	0	1,139	1,165	115	1,280
Afforestation	1,428	428	1,856	1,679	568	2,247
Water/soil conservation measures	1,961	139	2,100	1,868	339	2,207
Equipment procurement, etc.	291	0	291	35	2	37
Training, etc.	158	0	158	59	5	64
Price escalation	8	0	8	0	0	0
Reserve fund	23	343	366	0	0	0
Interest during construction	0	200	200	0	234	234
Commitment charge	24	0	24	23	0	23
Administration cost, etc.	0	72	72	0	14	14
Total	6,300	2,153	8,453	5,879	2,289	8,168

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.
Notes: Foreign exchange rate: planned rate at the time of appraisal: 1 CNY = 15.6 JPY (June, 2007); actual rate: 1 CNY = 15.2 JPY (mean exchange rate for the IFS period from 2007 to 2017)

3.2.2.2 Project Period

The actual project period of 119 months (from December, 2007 to October, 2017) greatly exceeded the planned project period of 84 months (December, 2007 to November, 2014) (by 142% or 35 months against the planned period). By project component, prevention of desertification and afforestation were especially delayed. The reasons for such an extended project period were (i) the domestic administrative procedure (preparation of the final F/S report, approval of the Project by the National Development and Reform Commission, etc.) took a long time to complete, making the full-scale implementation of the Project delay by approximately 9 months and (ii) in some of the targeted counties, it took a long time to secure domestic funding which was necessary for the implementation of the Project.

Table 5　Planned and Actual Project Periods

	Planned (at the Time of Appraisal)	Actual
Signing of the Loan Agreement	December, 2007	December, 2007
Entire Project	December, 2007 - November, 2014 (Project period: 84 months)	December, 2007 - October, 2017 (Project period: 119 months)
Improvement of degraded grasslands	March, 2008 - October, 2012	January, 2009 - December, 2013
Prevention of desertification	April, 2008 - July, 2012	January, 2009 - October, 2017
Afforestation	April, 2008 - July, 2012	January, 2009 - October 2017
Water/soil conservation measures	March, 2008 - October, 2012	March, 2009 - December, 2012
Training	May and September, 2008 and May, 2009	December, 2014; September, 2016
Acceptance Inspection	August, 2008 - November, 2014	August, 2009 - October, 2017

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.

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

Financial Internal Rate of Return

As the economic internal rate of return (EIRR) was calculated to be 8.2%[3]at the time of appraisal, it was planned to recalculate in the ex-post evaluation. However, this recalculation did not take place because necessary data for recalculation (benefits of restoration of grassland, prevention of desertification, silviculture, prevention of flooding, etc. were not accumulated or forecast at the executing agency and other stakeholder organizations..

Although the project cost was within the plan, the project period significantly exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness and Impacts [4] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

The situation of the quantitative indicators which were set at the time of appraisal and ex-post evaluation regarding “improvement of the forest coverage ratio and the rate of vegetation cover” is shown in Table 6. Although data for many indictors is unknown, the judgement is made based on the available indicator data.

[3] Costs: Project cost and operation and maintenance cost, Benefits: restoration of grassland, prevention of desertification, silviculture and prevention of flooding. The project life used for calculation is 40 years.

[4] The effectiveness is rated in consideration of not only the effects but also the impacts.

Table 6　Changes of Quantitative Indicators

Indicator	Reference Figure	Target Figure	Actual (Achieved) Figure		
	2005	2012	2012	2017	2019
	Reference Year	At completion of the Project	At completion of the originally planned Project	At completion of the Project	Two year after the completion of the Project (At the time of ex-post evaluation)
【Grass planting (Improvement of severely degraded grasslands)】 Rate of vegetation cover after 2 years (%)	● ≤25	50-60	Unknown	68	69
【Grass planting (Improvement of moderately degraded grasslands)】 Rate of vegetation cover after 2 years (%)	50-60	70	Unknown	76	76
【Construction of fences to keep livestock out】 Rate of vegetation cover after 3 years (%)	60-70	85	Unknown	89	91
【Measures to control rodents using rodenticide】 Reduction rate of burrows after implementation (%)	Unknown	● ≥90	Unknown	90	90
【Mechanical means to capture rodents】 Reduction rate of burrows after implementation (%)	Unknown	≥90	Unknown	89	91
【Measures to control pest damage】 Reduction rate of pests after implementation (%)	Unknown	≥90	Unknown	92	92
【Forests for wind/sand protection】 Survival rate after 1 year (%) Survival rate after 3 year (%)	Unknown Unknown	≥70 ≥65	Unknown Unknown	79 73	79 70
【Afforestation (forests for water /soil retention)】 Survival rate after 1 year (%) Survival rate after 3 years (%)	Unknown Unknown	≥70 ≥65	Unknown Unknown	76 76	76 73
【Afforestation (forests for water resource recharge】 Survival rate after 1 year (%) Survival rate after 3 years (%)	Unknown Unknown	≥70 ≥65	Unknown Unknown	77 81	77 79
Forest area (thousand ha)	763 (2007)	-	Unknown	778	780
Forest coverage ratio (%)	7.7 (2007)	-	Unknown	7.9	8.0
Growing stock of forests （m^3/ha）	Unknown	-	Unknown	Unknown	Unknown
Area of cropland returned to forests (thousand ha)	79 (2006)	-	Unknown	Unknown	Unknown
Grassland area (‘000 ha)	5,795 (2007)	-	5,795	5,795	5,795
- Of which man-made grassland	43	-	58	58	Unknown

area (thousand ha)	(2007)			(2014)	
Rate of vegetation cover (%)	59 (2007)	-	Unknown	66	67
Area of degraded land (thousand ha)	4,100 (2007)	-	Unknown	4,100 (2014)	4,100
Desertified area (thousand ha)	1,759(2009)	-	Unknown	1,750 (2014)	1,750
Area of livestock sheds (thousand m^2)	205.5 (2009)	-	Unknown	237.8 (2014)	258.0

Source: Replies to the questionnaire and interview results during the field surveys.

All of the quantitative indicators for which a target figure was set at the time of appraisal achieved the respective target figure based on their performance at the completion of the Project (2017) except that for "reduction rate of burrows after implementation" for which the actual figure fell slightly short of the target figure. The rate of vegetation cover exceeded the target figure by 4 – 8 points, showing the successful achievement of the target figure. The survival rate of the planted seedlings far exceeded the target figure. For some indicators, the actual figure considerably exceeded the target figure by more than 10 points. Based on these outcomes, it can be judged that the afforestation and grass planting work under the Project led to the sound growth of trees and pasture grass as planned. The reasons for the achievement of the target figures for the rate of vegetation cover and survival rate were (i) the selection of tree species which were expected to achieve a high survival rate because of their physiological characteristics of "deep and spread of roots and drought-resistant" in view of the conditions of the afforestation sites, (ii) employment of sufficient measures to assist successful afforestation, including the proper preparation of the afforestation sites in advance, use of a water retention agent, etc., (iii) sufficient arrangements to supply water which is an important factor to increase the survival rate (introduction of an irrigation system, watering with hoses, etc.), (iv) enhanced monitoring and management after afforestation or grass planting and adequate arrangements for supplementary tree or grass planting when problems occurred and (v) strengthening of the control of grassland conservation and improvement of livestock raising methods. The rodent and pest control measures generally achieved the target figures. The interview survey with project-related personnel at the executing agency and beneficiaries found a prevailing opinion that the number and damage to pasture grass by rodents significantly declined due to the introduction of various control measures. Many other quantitative indicators (from "forest area" downwards in Table 6) for which target figures were not set at the time of approval also show improvement when compared to the pre-project period. Improvement is highly noticeable for the man-made grassland area, rate of vegetation cover and area of livestock sheds. In regard to the area of livestock sheds, the interview survey with project-related personnel at the executing agency found that the construction of such sheds was progressing using domestic funds following the achievement under the Project, resulting in a large increase of their total area. Two year after the completion of the Project (2019 at the time of Ex-post evaluation), the performance of each indicator has also maintained its improvement. Based on these achievements, the effects of the Project to improve the ecological environment is judged to be high.

3.3.1.2 Qualitative Effects

(1) Effects of Improved Forest Coverage Ratio and Rate of Vegetation Cover

As described earlier, the implementation of the Project achieved improvement of the forest coverage ratio and rate of vegetation cover. It has been confirmed that these positive effects produced the qualitative effects described below.

Acceleration of the growth as well as increased production of pasture grass

According to the findings of the field reconnaissance and interview survey with beneficiaries, the growth of pasture grass has been facilitated and the production volume of pasture grass has substantially increased as a result of the implementation of degraded grassland improvement measures, including grass planting, construction of fencing to keep livestock out and control of rodents and pests.

In the area where the field reconnaissance took place, the positive situation was confirmed of a considerable improvement of the height of pasture grass from some 10 cm to more than 50 cm and an increase of the production volume (per unit area) of pasture grass required to raise livestock more than fivefold. There were cases where once difficult situation to graze livestock and to secure the supply of pasture grass because of the low rate of cover by pasture grass was sufficiently improved to make stock raising possible, where an increase of the number of livestock raised became possible because of the increased production of pasture grass and where the sale of pasture grass commenced because of the increased production of pasture grass.

Improvement of the environment for the raising of livestock

According to the findings of the field reconnaissance and interview survey with beneficiaries, the raising environment for such livestock as cattle, sheep, etc. has greatly improved as a result of the construction of livestock sheds.

Before the improvement by the Project, although there are differences between regions, many livestock died during the severely cold winter nights as they were kept in a simple shed or at a site with no roof nor walls. The livestock mortality rate in winter has been drastically lowered as a result of the construction of highly cold-resistant livestock sheds with a roof and walls. The field reconnaissance found a case where the mortality rate of lambs had been greatly reduced from 50% to 10% due to the cold-resistance function of livestock sheds. There was also a case where the milk volume of mother animals increased due to the cold-resistant environment, facilitating the growth of offspring. As indicated by these cases, the construction of livestock sheds has had a particularly great effect on facilitating the growth of young livestock. Another positive outcome of the construction of livestock sheds is elimination of the work for livestock farmers to monitor livestock at night and to deal with injuries and diseases caused by the past situations of “wild wolves attacking sheep at night on pasture land” and “the tendency for a break out of disease among livestock in winter.” As a result, the overall work burden on livestock farmers has been reduced.

(2) Effects of Training in Japan

As mentioned earlier, training was conducted in Japan for project-related personnel. Interviews with the participants found that many of them shared such positive opinions as “the training was practical as it included training featuring improvement of the ecological environment of Huangtu Plateau (loess plateau)” and “the training in Japan made it possible to widely learn about the experience of Japan and other advanced countries and to acquire useful reference materials.” Moreover, the following qualitative effects (improved capacity of the participants and application of the training contents to the actual work) were confirmed as a result of the training in Japan. However, as far as the application of the training outcomes is concerned, while there have been cases of such application, they tend to be the result of individual rather than organizational efforts as the number of participants per county was small due to the involvement of as many as 10 counties in this training.

Improvement of planting and silviculture techniques

While many new and unique planting and silviculture techniques have been developed and employed in China, there are cases where new planting and silviculture techniques learned during the training in Japan are actively applied. According to the findings of interviews with project-related personnel at the executing agency, the introduction of such new planting and silviculture techniques is believed to have made a certain contribution to the improved survival rate of the planted trees. Some examples of improving the planting and silviculture techniques utilizing the outcomes of the training in Japan are listed below.

- Because the target areas of the Project are dry, the method introduced for planting and silviculture involves the digging of planting holes before actual planting so that water and nutrients are directed to the planted seedlings.
- The planting density and growth stage of the seedlings to be planted were altered to ensure effective and efficient afforestation utilizing the results of the training in Japan.

Promotion of concrete approaches, including the silviculture of multiple species, to ensure the diversity of forests

The importance of establishing forests composed of multiple tree species has been pointed out from the viewpoint of “restoring the multiple functions of forests” which is an expected goal of the Project and which is also adopted as an official policy of the Government of China. However, the compatibility of the creation of forests composed of multiple species and improvement of the survival rate has been a challenging issue in areas around Qinghai Lake where the habitat for trees is harsh. Following the relearning of “viable approaches to ensure the diversity of forests” in the training in Japan, concrete approaches to ensure the diversity of forests have been promoted and intensified. These approaches include the planting and silviculture of multiple tree species in urban greening areas.

Promotion of afforestation led by citizens

In China, enterprises and some organizations have been actively leading afforestation efforts. Meanwhile, examination has been in progress to check the viability of enhanced afforestation activities led by citizens based on the new knowledge learned in Japan that there are cases in Japan of ordinary citizens leading afforestation efforts on their own initiative with the support of the administration.

3.3.2 Impacts

3.3.2.1 Intended Impacts

(1) Improvement of the Living Environment for Residents and Prevention of Desertification due to Restoration of Multiple Functions of Forests and Grasslands (Quantitative Effects)

The situation of the various indicators set at the time of appraisal and ex-post evaluation to indicate the qualitative effects of the Project on "improvement of the living environment for residents and prevention of desertification due to the restoration of the multiple functions of forests" is shown in Table 7 below. Although data for many indicators is unknown, the judgement is made based on the available data.

Table 7 Changes of Indicator Figures

Indicators	Reference Figure	Target Figure	Actual (Achieved) Figure		
	2005	2012	2012	2017	2019
	Reference Year	At completion of the Project	At completion of the originally planned Project	At completion of the Project	Two year after the completion of the project (At the time of ex-post evaluation)
Number of beneficiaries (thousand person)	-	1,920	Unknown	Unknown	Unknown
Reduction of soil erosion volume (thousand t)	222	-	Unknown	666	740
Soil erosion area (㎢)	Unknown	-	28,464	27,058	26,635
Number of sandstorms (times)	Unknown	-	Unknown	Unknown	Unknown
Area damaged by rodents (thousand ha)	1,784 (2009)	-	Unknown	1,115 (2014)	Unknown
Area damaged by pests (thousand ha)	5,194 (2009)	-	Unknown	2,250 (2014)	Unknown
Number of livestock animals raised (thousand heads)	5,298 (2009)	-	Unknown	4,928 (2014)	Unknown
Average annual net income of local farmers (CNY)	2,633	-	6,502	10,579 (2016)	Unknown
Average annual income of residents participated in the Project (CNY)	Unknown	-	8,109	10,304 (2016)	Unknown
Average annual income of residents in the Project area (CNY)	4,030 (2009)	-	7,177	10,864 (2016)	Unknown

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.

Although the target figure for the number of beneficiaries of the Project was set at the time of appraisal, the actual number was consistently unknown. According to project-related personnel at the executing agency who were interviewed during the field survey for ex-post evaluation, the Project was implemented in the planned areas, suggesting the reasonable achievement of the target figure. The population of Qinghai Province is approximately 5.7 million and the number of beneficiaries of the Project accounts for some 34% of the provincial population.

According to the quantitative indicators relating to improvement of the living environment for residents, the reduction of the soil erosion volume at the completion of the Project (2017) had trebled compared to the volume before the implementation of the Project (2005). Another improvement is observed with the soil erosion area. The occurrence of soil erosion used to frequently cause significant damage to cultivated land, housing and community infrastructure in nearby areas. During the field reconnaissance, it was often pointed out that the significant reduction of the soil erosion volume had led to a considerable reduction of the damage. In contrast, no data was obtained for the number of sandstorms. However, the interview survey with local residents found that the frequency had been reduced and the situation of sandstorm damage had been improved, confirming the trend of improvement as described later. The area damaged by rodents or pests has been drastically reduced. The area damaged by pests in particular has been reduced to less than half of the pre-project area.

A noticeable improvement has been achieved regarding the “increased income of residents”, another

expected impact of the Project. While such an income increase may well be largely attributed to the high economic growth of China during the project implementation period, it is fair to say that the Project made a certain contribution in this aspect as shown by those cases where the income of local residents increased as a result of new employment opportunities provided by the implementation and subsequent management of the Project and where the Project provided opportunities for new sources of income.

(2) Improvement of the Living Environment for Residents and Prevention of Desertification due to Restoration of Multiple Functions of Forests and Grasslands in the Project Area (Qualitative Effect)

As mentioned earlier, the implementation of the Project led to improvement of the forest coverage ratio and rate of vegetation cover. As a result, the following positive impacts relating to improvement of the living environment for residents and the prevention of desertification were confirmed through the restoration of the multiple functions of forests and grassland in the Project Area.

Increase of the volume of usable water for agriculture, etc.

As a result of the improved forest coverage ratio and increased water resource recharging capacity of forests due to the afforestation of wasteland, many areas now enjoy an increased as well as steady water supply for agriculture and daily life compared to the pre-project period.

The field reconnaissance and interview survey with beneficiaries found that in Wulan County, insufficient water supply from rivers, boreholes, etc. before the implementation of the Project meant a prevailing situation of an inadequate water supply for irrigation, causing conflict between farmers and other residents over the use of water for irrigation. As the Project has increased the volume of usable water, making a sufficient volume of water available for irrigation, there is no longer conflict between farmers and other residents over irrigation water. Moreover, the improved forest environment and increased volume of usable water have made it possible to newly cultivate such highly profitable crops as wheat, maize, mushrooms, etc., diversifying the sources of income and increasing the income of farming households in some areas.

Improvement of the frequency and situation of sandstorms, flooding and debris flow

Before the implementation of the Project, wasteland and grassland in Qinghai Province frequently caused sandstorms, especially in spring when the existence of grass was low. The interview survey with beneficiaries found that as a result of the afforestation and grass planting under the Project, the frequency of sandstorms has been reduced and the severity of sandstorms has been mitigated even if they do occur. In the pre-project period, it was essential to wear a face mask outdoors when a severe sandstorm occurred, causing health concerns for children and the elderly. Many interviewed beneficiaries expressed the opinion that the situation improved after the implementation of the Project, greatly benefiting children and the elderly in particular.

The effect of soil/water conservation measures to reduce flooding and debris flow can also be confirmed. Before the implementation of the Project, heavy rain often caused flooding and/or debris

flow. Today, flooding or debris flow seldom occurs as evidenced by the fact that torrential rain in 2018 after the implementation of the Project did not lead to flooding or debris flow in those areas subject to the implementation of soil/water conservation measures under the Project. The occurrence of flooding or debris flow often caused serious damage to cultivated land, housing and community infrastructure in nearby villages but the significant reduction of the occurrence of flooding and debris flow has led to a highly noticeable reduction of related damage.

Increased water volume and improved water quality of Qinghai Lake and major rivers

As mentioned earlier, afforestation and soil/water conservation measures were implemented at wasteland. As a result, the water resource recharging capacity of forests has been improved, greatly reducing soil erosion. The resulting major decrease of the discharge volume of eroded soil into rivers has led to the improved water quality and increased water volume of Qinghai Lake and major rivers. At the dam located in Datong County which is a key source of water supply for Xining City, the capital of Qinghai Province, the water quality[5] has greatly improved from Grade III (slightly contaminated) to Grade I (drinkable). In addition, the volume of inflowing sediment has been reduced while the inflowing water volume to the dam has increased.

Increased income of stock farmers and farmers due to the vitalization of stock farming

The introduction of grass planting, rodent and pest control measures and the construction of livestock sheds under the Project has led to (i) an increase of the number of livestock raised due to an increased volume of pasture grass to feed livestock and improvement of the raising environment for livestock (the number of livestock is kept in line with the available volume of pasture grass) and (ii) a shift towards more profitable livestock, increasing the income of stock farmers. There are also cases of an increase of the income of farmers through the sale of fresh or processed wolf-berries (goji berries), walnuts and fruit harvested from trees planted under the Project.

Stock farmers in Hudesheng Township in Wulan County where the field reconnaissance was conducted planted grass over an area of some 2,000 mu[6] (managed pasture land: 10,000 mu) and constructed livestock sheds. The existence of livestock sheds has led to facilitation of the growth of sheep before shipping (in summer), reduction of the number of deaths among lambs in winter(the mortality rate dropped from 50% to 10%), facilitation of the general growth of sheep and increase of the production volume of pasture grass (approximately a fourfold increase). The resulting increase of the number of livestock raised (from 300 to 700) has more than doubled the income from stock raising. The positive outcome of the livestock sheds constructed under the Project has prompted villagers to construct similar sheds with their own money, resulting in an increase of the ratio of stock farmers using sheds and also an increase of the income from stock raising.

[5] Based on the “Environmental Standards for Surface Water” in China.
[6] 1 mu is approximately 6.67 ares.

Increase of rare wild animals and birds

The opinion has frequently been expressed that afforestation and vegetation cover under the Project has led to improvement of the ecological environment and habit for wild animals as an increase of rare wild animals and birds (wolves, foxes, pheasants, etc.) has been witnessed. Although the height and density of many of the planted trees and targeted stands under the Project are insufficient at the time of ex-post evaluation, the Project is believed to have had a significant impact on the habitat for rare wild animals and birds even under such circumstances.

Urban greening and improving of the living environment due to the promotion of related projects, including parks for the public

Following the improvement of the ecological environment due to the implementation of afforestation work and riverbank protection work, etc. under the Project, several related projects have been implemented with domestic funding. One such project involves the construction or improvement of public parks and wetland parks along urban rivers. According to the findings of the interview survey with beneficiaries, many people had the impression that urban greening and improvement of the living environment had greatly advanced as a result of much improvement of the ecological environment. Prior to the Project, sufficient consideration was not necessarily given to the ecological environment along urban rivers and, therefore, waterfronts did not have much appeal as recreational sites for the public. The construction of "wetland parks" and "footpaths" and the improvement of related facilities and infrastructure have had the positive effect of making riverside parks along major rivers popular recreational sites for the public at the time of ex-post evaluation. The field reconnaissance as part of ex-post evaluation observed many citizens enjoying their leisure at these parks. As a result of such improvement, Xining City has been designated a model city for the national greening drive.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

The Project was considered to fall under the Category B in the Japan Bank for *International Cooperation (JBIC) Guidelines for Confirmation of Environmental and Social Considerations* (April, 2002) as its potential adverse environmental impacts were judged to be not severe in view of the characteristics of the sector, project and area as explained in the Guidelines. No negative impacts on the natural environment were found by the ex-post evaluation. The interview survey with project-related personnel at the executing agency found that the environmental impact assessment (EIA) for the Project had been conducted by the time of appraisal and that the Project was approved by the Bureau of Ecology and Environment, completing the necessary procedure for the implementation of the Project in China. Environmental protection measures relating to the implementation of the Project were properly implemented based on the EIA (even after the Project, the necessary monitoring of the use of agrochemicals with a small environmental load was conducted as planned). All of the monitored figures were within the standards set by the administration and no problems were found.

Because of the implementation of adequate measures, no negative impacts on the natural environment have occurred by the time of this ex-post evaluation. Therefore, it can be judged that negative impacts of the Project on the natural environment was kept to minimum.

(2) Resettlement and Land Acquisition

Although some parts of the afforestation and vegetation cover work took place at land managed by farming households, the Project did not necessitate any resettlement or land acquisition. Planting of trees and grass on lands managed by farming households was conducted with the consent of those managing the lands in question in accordance with the relevant domestic law.

(3) Promotion of Tourism Utilizing the Ecological Environment in Rural Areas

Some areas have grown as tourist destinations as a result of the improved ecological environment, scenery and basic infrastructure in and around such areas as a result of the Project. Cases of promoting tourism utilizing the improved ecological environment are confirmed in many counties targeted by the Project (see Box 1).

Box 1: Promotion of Tourism by the Improvement of Ecological Environment of the Village

In Bianmagou of Shuobei Tibet Village in Datong County (population of 612 with 162 households), the improved ecological environment due to the Project, etc. has led the government to promote tourism to experience the ecological environment and rural life since 2015 with the introduction of such related facilities as farmhouse accommodation to experience living in a forest (participated by 60 village households), cottages and a garden park.

As a result of these efforts, the area has grown to become a major tourist spot with annual visitors of half a million, mainly individuals and families, including those from other provinces. Tourists can enjoy the natural environment by hiking, etc., rural life and local meals. The promotion of tourism has led to such favorable impacts as (i) an increase of the production and sales volumes of souvenirs (tea, Chinese medicine, etc.) for tourists, (ii) elimination of the need to seek work outside the village due to increased employment related to tourism in the village and (iii) increase of the average annual income of a villager from 2,000 CNY in 2013 to 14,000 CNY in 2019. The afforestation and related work under the Project have been established as great forces to support the promotion of tourism through improvement of the local ecological environment.

Accommodation facility for tourists

Sightseeing facility: Garden Park

(4) Social Advancement and Increased Income of Women

According to the findings of the interview survey with beneficiaries, the role of women in livestock raising was restricted to production activities for self-consumption, etc. before the implementation of the Project, making it difficult for women to make an economic contribution or social advancement in some areas. The implementation of the Project provided the momentum for women to get involved/participated in planting and post-planting management work, the cultivation of seedlings for planting, etc., creating great opportunities for the social advancement of and increased income for women. A similar benefit has been enjoyed by poor people as they were actively encouraged to seek employment for the implementation and management of the Project (600 people were employed on a long-term basis for operation and maintenance of the afforestation work with a monthly salary of between 1,000 CNY and 3,000 CNY in Xining City). There is a case of the Project offering the opportunity for women to expand their role in farming as well as stock raising, achieving an increase of their income (see Box 2).

Box 2: Expanded Roles and Increased Income of Women through Vitalization of Stock Farming

Shala Village of Manggu Township in Guinan County has a population of 1,373 (341 households) and agriculture and stock farming are the main local industries. In this village, 20 livestock sheds (120 m^2) were constructed under the Project. In the pre-project period, villages had very simple livestock sheds and the resulting high mortality rate of livestock in winter made it impossible to increase the number of livestock raised. With the use of the livestock sheds constructed under the Project, the principal livestock raised was changed from sheep focus to diversification into sheep and pigs in an effort to diversity of stock raising, enabling an increase of the number of livestock raised (cultivation of grain, etc. to feed livestock) to increase the income from stock farming in harmony with the ecological environment protection measure (prohibition of stock farming on most of the pasture grass lands in the village). As a result of such positive outcomes of the Project, almost all households in the village now possess a livestock shed (total of some 300) at the time of ex-post evaluation, partly with assistance under other projects. The number of pigs raised in the village has massively increased from 400 to 2,200 and the annual income per stock farming

household has increased to 12,000 CNY.

An especially notable contribution of the Project is the expansion of women's roles (women earn their own income) in addition to increased income from stock farming. Most men in this village used to work away from home and farming and stock raising were conducted by women. However, the local farming and stock raising were primarily for self-consumption and the actual cash income earned by women from farming and stock raising was small. With the implementation of the Project and its spin-off benefit, women now earn a sizable income from stock farming.

Animal shed constructed under the Project

Pigs reared inside the animal shed

(5) Restoration of Habitable Conditions by Preventing the Advancement of Desertification

There are cases in the Project Area where the advancement of desertification has been halted, partly because of the positive effect of afforestation under the Project, restoring the viability of local life (see Box 3). In view of such concrete cases, it can be judged that the Project has made a certain contribution to the development of local communities.

Box 3: Recovery of a Township through Prevention of Desertification by Afforestation

In Guinan County, afforestation under the Project mainly targeted the Huangshatou and Mugetan areas where the process of desertification was prominent. In the past, the targeted areas were grassland or pastureland. The progressive incursion of sand, which accelerated the process of desertification, led to the large-scale migration of residents to other areas because of the difficulty of sustaining stock farming and their own lives. In response to this situation, the local government began a project to prevent desertification, incorporating afforestation and other measures, but could not achieve much due to (i) the small scale of afforestation and (ii) the reliance of silviculture on rainwater due to the difficult local environment for the introduction of irrigated afforestation.

Under these circumstances, tree planting and desertification control measures were implemented in 2009 through 2011 under the Project, targeting those areas suffering from desertification. As a result of large-scale afforestation and the subsequent proper management of the afforestation sites under the Project, the advancement of desertification has been halted in the targeted areas since 2014 with the revival of grassland in some areas. Improvement is also observed in terms of the frequency and severity of

sandstorms. Such improvement of the ecological environment has made it possible to conduct stock raising and to dwell in these areas and some 3,000 former residents of 600 households have returned to their original dwelling areas from their relocated areas. In view of such positive outcomes, these areas have been designated pioneering collectiveness for national sand prevention and control in 2017. These areas have also seen the accelerated construction of government buildings, hospitals and schools, etc., illustrating the rapid progress of the restoration of town functions.

Afforestation work under the Project

Town recovered by the improvement of ecological environment

(6) Improvement of Environmental Awareness among the Residents and Spread of Environment – Friendly Stock Raising Method

In the interview survey with project-related personnel at the executing agency and beneficiaries, many of the interviewees shared the opinion that improvement of the ecological environment through the implementation of the Project led to increased environmental awareness among residents, farmers and stock farmers, in turn leading to the accelerated introduction of more environment-friendly stock raising methods. The Project is believed to have made a certain contribution to the establishment of a virtuous cycle where improvement of the ecological environment leads to increased awareness of the environment among residents, in turn leading to further improvement of the ecological environment.

In grassland areas where stock farming is the main production activity, the increased production volume of pasture grass per unit area due to improvement of the ecological environment has enhanced the awareness of the importance of stressing the ecological environment and the resulting advantages among many stock farmers. As a result, livestock raising methods with a small environmental load, such as the drylot stock raising method (a sufficient area for exercise by livestock is secured for an outdoor enclosure and grazing is withdrawn), have been smoothly as well as rapidly expanded while reducing grazing which has a high load on the ecological environment.

In the targeted counties of the Project, there was a tendency for such activities showing poor environmental awareness on the part of local residents as the cultivation of crops on wasteland which was not managed by anyone, etc. to be often observed. These problematic activities by residents have greatly declined as afforestation work and the improved ecological environment have produced positive outcomes for residents.

(7) Spread of Environment-Friendly Construction Method Adopted by the Project

For the implementation of bank protection work along rivers under the Project, a new construction method utilizing stones and tree planting instead of concrete was actively employed in consideration of the environment. As this method proved its significantly positive effects on the environment, including the notable improvement of the landscape around rivers, it is now actively employed throughout Qinghai Province. As such, the Project is believed to have made a certain contribution to the spread of an environment-friendly construction method.

Based on the above, the effectiveness of the Project is judged to have reached the level where the target figures for the quantitative indicators have been generally achieved at the time of project completion along with positive qualitative effects relating to the facilitation of growth of pasture grass and improvement of the environment for stock raising, etc. In regard to the impacts of the Project, improvement of the living environment for residents of the Project Area and other positive impacts of the Project are confirmed in terms of both the quantitative effects and qualitative effects. The Project has largely achieved its objectives and, therefore, the effectiveness and impacts of the Project are high.

3.4 Sustainability (Rating: ③)

3.4.1 Institutional/Organization Aspect of Operation and Maintenance

The operation and maintenance system for the forest land, grassland and various facilities which were developed or constructed under the Project has been established as planned at the time of appraisal with the administrative organizations responsible for project-related work and farmers/stock farmers performing the central roles as shown in Table 8. The principal body for the maintenance of the afforestation sites in general and the planted trees in particular may be either a county, township or village body or a group of farmers assigned to manage an afforestation site depending on specific conditions, including ownership of an afforestation site (either local farmers or a village), management facilities which were constructed (irrigation facility, etc.), etc. of each area.

Table 8 Operation and Maintenance System

Type of Work	Responsible Organization(s)
Overall Management	Qinghai Provincial Bureau of Administrative Management; Qinghai Provincial Bureau of Forestry and Grassland; County Bureau of Administrative Management; County Bureau of Forestry and Grassland
Improvement of Degraded Grasslands	Qinghai Provincial Bureau of Agriculture and Livestock Farming; County Bureau of Agriculture and Livestock Farming; County Grassland Monitoring Station (monitoring and guidance for stock farmers); stock farmers; villagers assigned to manage grassland
Prevention of Desertification and Forest Land Management	Qinghai Provincial Bureau of Forestry and Grassland and County Bureau of Forestry and Grassland (control of illegal logging); forest rangers; farmers/villagers assigned to manage afforestation sites and county forest fire control organizations (prevention and control of forest fires); county organization for forest disease and pest damage prevention and quarantine (disease and pest control measures)
Soil/Water Conservation	Qinghai Provincial Bureau of Water Utilization; County Bureau of Water Utilization

Source: Replies to the questionnaire survey with the executing agency.

The operation and maintenance system for facilities, etc. improved under the Project is basically the same as the system employed in other cities in China and those organizations responsible for operation and maintenance are also responsible for similar facilities constructed under different projects in their respective counties. Guidance for farmers and stock farmers has been adequately provided and the operation and maintenance of the facilities, etc. constructed under the Project have been smoothly implemented. As such, no special problems have occurred regarding the institutional/organizational aspect of the operation and maintenance.

3.4.2 Technical Aspect of Operation and Maintenance

The organizations responsible for the operational management of the facilities and equipment constructed/introduced under the Project have rich experience of operating and managing similar facilities and equipment outside the scope of the Project as described above. Therefore, they have sufficient technical capability. The manuals and rules to operate and maintain the facilities and equipment are properly established (these manuals and rules are shared with other projects). The maintenance checks of the facilities constructed under the Project are regularly as well as routinely conducted in accordance with the relevant rules of each organization. When any equipment requires repair or mending, the basic principle is for an operation and maintenance organization, which is a specialist administrative body covering a specific field, to do the work. No stoppage of the service due to a defect, etc. of a facility has so far occurred. Farmers, stock farmers and forest rangers in charge of the maintenance of afforestation sites and grass planting sites undergo regular training organized by the relevant administrative bodies. No special problems have been encountered so far regarding the technical aspect of operation and maintenance.

3.4.3 Financial Aspect of Operation and Maintenance

The operation and maintenance of the facilities, etc. constructed or improved under the Project are

funded by the budget of the provincial or county government. The financial situation of the organizations responsible for the operation and maintenance of the project-related facilities, etc. is shown in Table 9. According to the results of interviews with project-related personnel at the executing agency and Table 9, the amount of fiscal expenditure related to the ecological environment has shown an increasing trend since the announcement of "the Policy to Emphasize the Construction of an Ecological Civilization" at the 18th National Congress of the Communist Party of China in 2012. According to the results of the interview survey conducted at the time of ex-post evaluation with project-related personnel at the executing agency and those officials of township or village governments, the necessary budget has been secured as a result of continual enhancement of support related to ecological environment by the central and provincial governments and no financial problems regarding operation and maintenance are observed, suggesting that the necessary budget for operation and maintenance will be secured in the future. Based on the above, there are no problems regarding the financial aspect of operation and maintenance.

Table 9 Financial Situation of the Chinese Government and the Organization Responsible for Operation and Maintenance

Unit: million CNY

Organization	Expenditure	2017	2018	2019
Central Government	Environment	13,400	12,800	14,000
	Ecological environment	10,300	13,000	12,800
Qinghai Provincial Government	Environment	190	260	190
	Ecological environment	10	10	10

Sources: China Statistical Yearbook 2020 and replies to the questionnaire survey with the executing agency.

3.4.4 Status of Operation and Maintenance

The monitoring, maintenance and regular inspection of the facilities constructed under the Project have been properly conducted in accordance with the relevant rules set by the organizations responsible for such work. The field reconnaissance as part of the ex-post evaluation found no problems regarding operation and maintenance as evidenced by such facts that (i) there is a system in place to quickly respond whenever a problem emerges as any unusual occurrence is dealt with by a suitable body, (ii) all facilities are generally kept in a tidy and clean manner, (iii) the use and inspection of each facility are properly recorded, (iv) an irrigation facility and monitoring system are installed at some afforestation sites and (v) no problems are found regarding the procurement of repair equipment. The operation and maintenance of afforestation sites and vegetation cover sites by farmers, stock farmers or forest rangers are smoothly conducted as evidenced by such facts as (i) guidance by the relevant administrative body is regularly provided and (ii) there is active cooperation locally as the improvement of grassland leads to increased income. As a result, the level of operation and maintenance is high.

The utilization rate of individual facilities is high and no major operational problems have occurred during the period from the commencement of their operation to the time of ex-post evaluation. The field reconnaissance conducted by the evaluator confirmed that (i) the conditions of the principal facilities

are generally good and they are functioning as initially planned, (ii) the planted trees and seeded grass have been growing without any problems and (iii) supplementary planting has been conducted when the initially planted seedlings have died. However, although some small-scale sand-trap dams, erosion protection walls are still functioning at present, some have already seen the large deposit of sand, making additional improvement work necessary.

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

4. Conclusions, Lessons Learned and Recommendations

4.1 Conclusion

The objective of the Project is to improve the forest coverage ratio and rate of vegetation cover through the improvement of degraded grassland, prevention of desertification, afforestation and soil/water conservation measures in areas around Qinghai Lake in Qinghai Province, thereby contributing to the restoration of the multiple functions of forests and grassland and the prevention of desertification.

The Project advanced the restoration of the multiple functions of forests and grassland and the prevention of desertification through afforestation work, grass planting and construction of facilities to implement soil/water conservation measures in line with the policy of the central government of China and Qinghai Provincial Government to improve the ecological environment. As such, the Project conforms to the development needs of improving the ecological environment in Qinghai Province and Japan's ODA policy. Therefore, the relevance of the Project is high. In the case of the project efficiency, although the outputs were achieved generally as planned or even better with the project cost being within the plan, the project period exceeded the plan. Therefore, the efficiency of the Project is fair. As a result of the materialization of afforestation work, grass planting work and construction of facilities to implement soil/water conservation measures, the target figures for the quantitative indicators (rate of vegetation cover, planted tree survival rate, etc.) set at the time of appraisal were generally achieved at the time of project completion. In addition, wide-ranging qualitative effects of the Project, including (i) acceleration of the growth as well as increased production of pasture grass and (ii) improvement of environment for stock raising, are confirmed as a result of the "improvement of the forest coverage ratio and rate of vegetation cover." Also highly noticeable are the impacts of "the restoration of the multiple functions of forests and grassland" ((i) increase of the water volume usable for farming, etc., (ii) improvement of the frequency and situation of sandstorms, flooding and debris flow and (iii) increased income of stock farmers and farmers due to the vitalization of stock farming). Accordingly, the effectiveness and impacts of the Project are high. The sustainability of the Project is also high as there are no problems regarding the institutional, technical and financial aspects of the Project with confirmation of the good operation and maintenance conditions of the facilities and equipment. In the light of the above, the Project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Importance of implementing all-inclusive improvement of the ecological environment, incorporating project contents which offer direct advantages for residents of the project area

For the implementation of such projects as afforestation and improvement of the ecological environment where it is generally difficult to expect direct and clear advantages for residents of the project area, it is important for JICA to examine the incorporation of related projects (such as a soil/water conservation project, a project to support agriculture and stock raising, etc.) in the main project at the project planning stage. By doing so, it becomes possible to facilitate the understanding of the project on the part of residents and their participation, enabling the realization of smooth project implementation and expansion of the project effects. Such work is particularly important in areas where the planting of fruit trees, etc. is difficult due to the climate and ground conditions although the use of such tree species as fruit trees which can be expected to increase the income of residents may constitute an important element in facilitating the understanding and participation of residents.

As improvement of the ecological environment does not often offer any direct, clear and swift advantages for residents of a targeted area, it was difficult at the onset of the Project to obtain sufficient understanding of and cooperation for the Project on the part of residents. However, such understanding and cooperation became possible by explaining that the Project included components offering direct and clear advantages for residents, including “an increase of the number of livestock raised and increased income due to grass planting and the construction of sheds,” “reduction of damage due to a decrease of the discharged volume of eroded soil” and “improvement of the living environment due to the reduction of frequency and mitigation of the severity of sandstorms,” resulting in the smooth implementation of the Project and expansion of the project effects. It is, therefore, important to fully recognize such positive outcomes of the approach described above and to make the best use of such approach in the planning of similar projects in the future.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	[Improvement of degraded grasslands] 1) Grass planting and construction of fences to keep livestock out: 48,054 ha 2) Rodents and pests control measures: 950,410 ha 3)Construction of livestock sheds: 3,000 sheds [Prevention of desertification] 1)Desert closure: 37,000 ha 2)Wind/sand protection forest: 3,823 ha 3)Control work to present sand dunes from moving: 2,500 ha [Afforestation] 1)Water resource recharge forest and water/soil retention forest: 16,000 ha 2) Forest protection and management: 24,000 ha [Water/soil conservation measures] 1)Small-scale sand-trap dam: 715 sites 2)Bank protection work: 36 km 3)Erosion protection walls: 345 sites 4)Development of forest land irrigation facilities: 4,567 ha 5)Patrol/work vehicles: 17 vehicles 6)Monitoring and office equipment: 236 sets 7)Ecology observation equipment: 10 sets [Training] 1)Training in Japan: 60 trainees 2)Acceptance of experts: 5 experts	[Improvement of degraded grasslands] 1) Grass planting and construction of fences to keep livestock out: 48,054 ha 2) Rodents and pests control measures: 950,410 ha 3)Construction of livestock sheds: 3,000 sheds [Prevention of desertification] 1)Desert closure: 36,651 ha 2)Wind/sand protection forest: 4,262 ha 3)Control work to present sand dunes from moving: 2,500 ha [Afforestation] 1)Water resource recharge forest and water/soil retention forest: 15,824 ha 2) Forest protection and management: 24,289 ha [Water/soil conservation measures] 1)Small-scale sand-trap dam: 726 sites 2)Bank protection work: 25 km 3)Erosion protection walls: 334 sites 4)Development of forest land irrigation facilities: 4,567 ha 5)Patrol/work vehicles: 11 vehicles 6)Monitoring and office equipment: 71 sets 7)Ecology observation equipment: 25 sets [Training] 1)Training in Japan: 45 trainees 2)Acceptance of experts: None
2. Project Period	December, 2007 – December, 2015 (84 months)	December, 2007 – October, 2017 (119 months)
3. Project Cost Amount Paid in Foreign Currency Amount Paid in Local Currency Total ODA Loan Portion Exchange Rate	 359 million yen 8,094 million yen (519 million CNY) 8,453 million yen 6,300 million yen 1 CNY = 15.6 JPY (as of June, 2007)	 123 million yen 8,045 million yen (529 million CNY) 8,168 million yen 5,879 million yen 1 CNY = 15.2 JPY (mean for 2007 through 2017)
4. Final Disbursement	September, 2017	

People's Republic of China

FY 2019 Ex-Post Evaluation of Japanese ODA Loan Project

"Jilin Province Afforestation Project"

External Evaluator: Toshihiro Nishino, International Development Center of Japan Incorporated

0. Summary

The objective of the Project is to improve the forest coverage ratio and to regenerate grassland through afforestation and vegetation cover, improvement of related facilities and procurement of equipment in Jilin Province and training, thereby contributing to the restoration of the multiple functions of forests and prevention of desertification.

The Project advanced the restoration of the multiple functions of forests and grassland and the prevention of desertification through afforestation work, vegetation cover work and improvement of equipment at related facilities in line with the policy of the Government of China and Jilin Province to improve the ecological environment. As such, the Project conforms to the development needs of improving the ecological environment in Jilin Province and Japan's ODA policy. Therefore, the relevance of the Project is high. In the case of the project efficiency, although the outputs were achieved generally as anticipated by the revised plan with the project cost being within the plan, the project period significantly exceeded the revised plan. Therefore, the efficiency of the Project is fair. As a result of the materialization of the facilities required for afforestation work, vegetation cover work and improvement of the ecological environment, the target figures for the quantitative indicators (planted tree survival rate and forest coverage ratio) set at the time of appraisal were achieved at the time of ex-post evaluation and other quantitative indictors (grassland coverage ratio, forest/grassland area, etc.) have shown some improvement. In addition, wide-ranging qualitative effects of the Project are confirmed, including (i) functional improvement of the facilities related to improvement of the ecological environment and (ii) establishment of forests with multiple functions. Also highly noticeable are the impacts of "the restoration of the multiple functions of forests and grassland" ((i) reduction of the occurrence of sandstorms, flooding and soil erosion and (ii) increase of income other than farming and/or stock farming for women and poor people). Accordingly, the effectiveness and impacts of the Project are high. The sustainability of the Project is also high as there are no problems regarding the institutional, technical and financial aspects of operation and maintenance of the Project with confirmation of the good operation and maintenance conditions of the facilities and equipment. In the light of the above, the Project is evaluated to be highly satisfactory.

1. Project Description

Project Location
(The star mark indicates the location of Beijing)

A footpath built under the Project
(Model forest ecology park)

1.1 Background

While the Government of China had long adopted afforestation of the national land as one of its basic policies since the founding of the nation in 1949, the forest coverage ratio had been well below the international average (29.3% based on the year 2000 data and 16.6% as the national average of China in 1998) because of the vastness of its land area, severity of the natural conditions and excessive logging to meet the increasing timber demand. Moreover, desertification was progressing due to such man-made factors as over-grazing and excessive logging. Against this background, the Government of China announced the *National Ecological Environment Construction Plan* in 1999, clearly showing the attitude to place greater emphasis on environmental policies. In this plan, concrete target figures were set for the prevention of soil erosion, prevention of desertification, forest area, forest coverage ratio and improvement of degraded grassland. The plan also classified the national land into eight regions with such goals as the prevention of desertification in the three northern areas (northeast, north and northwest China), the prevention of soil erosion in the black soil region of northeast China, etc.

In Jilin Province, even though the forest coverage ratio of 38% in 2005 was above the national average, it was experiencing the severe degradation of forest land as well as a decline of the capacity to retain water due to its history of the excessive logging of forest land and the cultivation of grassland to meet the timber demand and to expand the land for crops. As a result, the soil erosion volume in Jilin Province reached 130 million tons a year and flood damage was becoming increasingly serious. Meanwhile, the frequency of sandstorms increased to 93 times a year. Under these circumstances, the Jilin Provincial Government formulated the "*11th Five Year Forestry Development Plan and Medium to Long-Term Plan for Jilin Province*." This plan called for the afforestation and vegetation cover of waste land and areas of desertification in progress as its priority agenda and adopted target figures of 360,000 ha for afforestation and 133,000 ha for vegetation cover to be achieved by 2010, making the work of afforestation and vegetation cover urgent tasks to improve devastated land and to prevent desertification.

1.2 Project Outline

The objective of the Project is to improve the forest coverage ratio and to regenerate grassland through afforestation and vegetation cover, improvement of related facilities, procurement of equipment in Jilin Province and training in Japan, thereby contributing to the restoration of the multiple functions of forests and prevention of desertification.

Loan Approved Amount / Disbursed Amount	9,500 million yen/7,385 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2007/March, 2007
Terms and Conditions	Interest Rate: 0.75% Repayment period: 40 years (Grace Period: 10 years) Conditions for Procurement General untied
Borrower/Executing Agencies	Government of the People's Republic of China/Jilin Provincial People's Government
Project Completion	December, 2016
Main Contractor (Over 1 billion yen)	-
Main Consultant (Over 100 million yen)	-
Related Study	Feasibility Study by Jilin Forestry Investigation and Design Research Institute (October, 2004)
Related Projects	-

2. Outline of the Evaluation Study

2.1 External Evaluator

Toshihiro Nishino, International Development Center of Japan Incorporated

2.2 Duration of Evaluation Study

The ex-post evaluation study for the Project was conducted over the following period.

Duration of the Study: September, 2019 – December, 2020

Duration of the Field Survey: January 1 – 18, 2020

2.3 Constraints during the Evaluation Study

There were several constraints for this ex-post evaluation of the Project as explained below.

Firstly, the outbreak of the new infectious COVID-19 in China occurred at the time of the implementation of this ex-post evaluation and the planned second field survey originally scheduled to take place in March, 2020 could not be conducted because of introduction by the Government of China of such measures as (i) suspension of the already issued visa for a specified period and (ii) compulsory quarantine observation period of two weeks for foreign nationals arriving in China. As a result, it became difficult to conduct (i) field reconnaissance and fact-finding work in some areas and (ii) an interview survey with some beneficiaries, both of which were planned during the second field survey. In the face of this situation, efforts

were made to obtain as much additional information as possible. However, the reality was that essential information for the ex-post evaluation was not fully obtained.

Meanwhile, an interview survey with beneficiaries was conducted with some 15 people. It was originally planned to employ the random sampling method for the selection of the target persons for the interview survey with beneficiaries from resident lists to ensure the objectivity of the survey. However, because even government-sponsored research institutes in China do not use the random sampling method to obtain the opinions of ordinary citizens and also because the executing agency had no experience of employing the said method, it was decided to entrust the concrete selection of the target persons to the executing agency while designating the area of residence, gender, age and other parameters (including that the target persons should not have any direct link to the administration). Therefore, the findings of the interview survey may not be fully devoid of arbitrariness.

3. Results of the Evaluation (Overall Rating: A[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Consistency with the Development Plan of China

The development plan of the Government of China at the time of the appraisal clearly indicated such directions as the prevention of soil erosion in the black soil region of northeast China and the prevention of desertification in north, northwest and northeast China, indicating the emphasis on the ecological environment issue as one of the priority policy fields as evidenced by the *National Ecological Environment Construction Plan* (1999 – 2050) and *the 11th Five Year National Plan for Economic and Social Development* (2006 – 2010). Particular emphasis was placed on the implementation of proactive efforts for the prevention of soil erosion, prevention of desertification, increase of the forest area and improvement of degraded grassland. Numerical targets were set for these objectives with a relevant timeline. Improvement of the ecological environment has been continually stressed in subsequent five year plans. The plan and policy at the time of ex-post evaluation, including the *13th Five Year National Plan for Economic and Social Development* (2016 – 2020), call for "relative improvement of the quality of the ecological environment" as one of the main goals to achieve "moderately prosperous society" and to promote further improvement of the relevant indicators while reviewing the standards, etc.

In accordance with such policy and plan of the central government, the Jilin Provincial Government has been advancing the improvement of the ecological environment. Its *13th Five Year Plan for Jilin Province* (2016 – 2020) promotes protective measures for the ecological environment centering on forest management and protection, improvement of the forest coverage ratio in the midwest area and development of water conservation forests near water sources and aims at achieving concrete numerical targets for the forest area, forest coverage ratio, afforestation area in areas around major rivers, implementation area of forest management and protection measures, etc.

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[1] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory

[2] ③: High, ②: Fair, ①: Low

Table 1 Principal Targets of Development Plans Related to the Project

Category	At the Time of Appraisal	At the Time of Ex-Post Evaluation
National Development Plan	*11th Five Year National Plan for Economic and Social Development* (2006 – 2010) • The plan identified priority programs concerning the protection of the ecosystem identified such targets as the prevention of soil erosion in the black soil region of northeast China, prevention of desertification in the three northern areas and the improvement of degraded grassland among others. • The Government of China planned the injection of 17 trillion JPY over a period of five years for environmental protection. (Principal goals) (i) suppression of outbreaks of new environmental pollution, (ii) suppression of destruction of the ecological environment, (iii) improvement of the environment in designated priority areas for environmental conservation and urban areas and (iv) conservation of the ecological environment at nature reserves. etc.	*13th Five Year National Plan for Economic and Social Development* (2016 – 2020) • The plan targets the achievement of "moderately prosperous society" and the goal related to the Project is "the overall improvement of the quality of the ecological environment." • Part X: Ecosystems and the Environment states that "to improve the quality of the environment and resolve serious ecological and environmental problems, we will step up ecosystem and environmental protection efforts and simultaneously help the people become prosperous, help the country grow strong and build a Beautiful China."
National Policy for the Environment Sector	*National Ecological Environment Construction Plan* (1999 – 2050) • The plan further emphasizes environmental measures and presents the national framework for 50 years for afforestation, water utilization, agriculture and environmental protection. • For afforestation, the plan sets forth concrete numerical targets for short-, medium- and long-term soil erosion prevention, prevention of desertification, forest area, forest coverage ratio and improvement of degraded grassland.	*13th Five Year National Plan for Environmental Protection* (2016 – 2020) and *National Afforestation and Greening Plan* (2016 – 2020) • Both plans adopt a policy of "accelerating the greening of the national land, strengthening forest management based on the law and enhancing the basic safeguards." • Numerical targets are set for afforestation, forest coverage ratio, growing stock of forests, etc. up to 2020.
Jilin Provincial Policy for the Environment Sector	*11th Five Year Forestry Development Plan for Jilin Province* (2006 – 2010) and *Medium to Long-Term Plan* • These plans adopted the policy of "prioritizing afforestation and vegetation cover in devastated land and desertification areas." • Numerical targets were set for afforestation, vegetation cover, etc. up to 2010.	*13th Five Year Plan for Jilin Province* (2016 – 2020) • The plan adopted the policy of "promoting protection measures for the ecological environment, centering on forest management and protection, improvement of the forest coverage ratio in the Midwest area and development of water conservation forests around water sources." *13th Five Year Forestry Development Plan for Jilin Province* (2016 – 2020) • Numerical targets are set for afforestation,

		forest coverage ratio, afforestation areas around major rivers and implementation area of forest management and protection, etc. up to 2020. *13th Five Year Environmental Protection Plan for Jilin Province* (2016 – 2020) • Numerical targets are set for the forest coverage ratio, afforestation areas around major rivers, implementation area for forest management and protection, etc. up to 2020.

Sources: Materials provided by JICA and various plan documents.

Based on the above, the objective and contents of the Project are consistent with China's policy for the environmental sector at the time of both the appraisal and ex-post evaluation in that "the Project aimed at preserving the ecological environment and improving the living environment of local people by means of strengthening the improvement and regeneration of forests and grassland through the expansion of related work to protect the ecological environment."

3.1.2 Consistency with the Development Needs of China

As described above, Jilin Province was experiencing various serious deterioration of the ecological environment, adversely impacting civic life. The devastation of forest land and decline of the water retention capacity of the ground led to a serious increase of soil erosion, flood damage, etc. Accordingly, there was an urgent need for afforestation, vegetation cover and improvement of related facilities to improve the ecological environment and environment for civic life. As such, the consistency of the Project with the development needs of Jilin Province was high.

At the time of ex-post evaluation, a trend of shifting focus of ecological improvement measures from afforestation to the strengthening of forest management and protection in response to the degree of improvement in terms of the ecological environment and damage caused by the once deteriorated ecological environment. This improvement is illustrated by such comments made during the interview survey with project-related personnel at the executing agency as "forest and grassland areas have increased," "the improvement of related facilities has progressed" and "disasters due to worsening of the ecological environment have been reduced." Meanwhile, the level of improvement of the ecological environment hoped for by citizens is rising year by year and interest in a healthy ecological environment among citizens is becoming stronger. Compared to such level of interest, there are still many issues and geographical areas requiring further improvement.

In short, the Project is consistent with the development needs of Jilin Province at the time of both the appraisal and ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

Japan's Official Development Assistance (ODA) Charter (2003) at the time of appraisal emphasized efforts to tackle global issues (environmental issues) while *the Medium-Term Policy on Official*

Development Assistance (ODA) (2005) emphasized the protection of individuals from the "fear" of environmental destruction, etc. from the viewpoint of "human security" and established "environmental pollution control measures" as a priority field. All of *the Economic Cooperation Program for China* (2001, Ministry of Foreign Affairs), *Medium-Term Strategy for Overseas Economic Cooperation Operations* (2002, JICA) and *Country Assistance Policy for China* (2002, JICA) emphasized environmental conservation, indicating the consistency of the Project with Japan's ODA policies.

3.1.4 Appropriateness of the Project Plan and Approach

No problematic issues are observed with the planning and approach of the Project. In terms of consideration of the socially vulnerable, sufficient efforts were made by actively employing low income earners and women for afforestation, vegetation cover and facility construction work under the Project and also the management of afforestation sites after the completion of the Project. Such employment during and after the project period has greatly contributed to the increased income of vulnerable people.

This Project has been highly relevant to the China's development plan and development needs, as well as Japan's ODA policy at the time of both the appraisal and ex-post evaluation. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

Of the components of the Project, the vegetation cover work was planned to be conducted and supervised by the Provincial Bureau of Forestry and Grassland (the Provincial Forestry Agency at the time) which was the executing agency and responsible for vegetation cover work at the time of the appraisal. However, the responsibility for the implementation and management of this work was transferred to the Provincial Bureau of Agriculture and Livestock Farming, which was not part of the implementation system for the Project, after the commencement of the Project. As a result, it became difficult to implement the vegetation cover work (part of the work not yet implemented) as part of the Project after the change of the supervisory body for this work. (In the end, the planned vegetation work was conducted using domestic funds (not included in the scope of the Project) after the change of the supervisory body.) Consequently, the planned outputs and cost for the Project were revised and the scale of planned outputs was slightly reduced. Following the revision of the planned contents of the Project, parts of the planned components were placed outside the scope of the Project as described above. However, the development needs remained the same and the change did not appear to have significantly affected the achievement of the project purpose.

(i) The planned outputs at the time of the appraisal, (ii) planned outputs after the revision and (iii) actual outputs of the Project are shown in Table 2. In accordance with a request by the executing agency, JICA agreed to a change of the original implementation plan regarding the change for the vegetation

cover work. For the comparative analysis of the planned and actual outputs in this ex-post evaluation, the basic approach is to compare the planned outputs after revision (see Table 2 for concrete contents) reflecting a change of the vegetation area necessitated by the change of the jurisdiction of administrative body in China (which was nothing to do with the Project) with the actual outputs in view of the fact that the revised plan was formulated based on mutual agreement between Japan and China, following the change of circumstances for the Project as described earlier.[3]

The principal outputs of the Project are (i) afforestation to create protection forests (137,000 ha), (ii) vegetation cover for the prevention of desertification (11,000 ha), (iii) renovation of nine related facilities, (iv) procurement of related equipment and (v) training (in Japan and China). A total of 23 counties, five cities and six areas directly controlled by the provincial government participated in the Project. Comparison between the planned outputs after revision and actual outputs while considering the reduction of the planned output for vegetation area shows that the actual performance under the Project generally met or even exceeded the planned outputs. In the case of the planned outputs which were not fully achieved, many of them recorded an achievement rate of 80% or higher. Multiple bodies were involved in the implementation of the Project but the competent administrative body in each field played a leading role in project operation and management. In each county, the deputy governor and others formed a command team to manage the Project. No negative impacts on the outputs occurred because of the fact that an adequate project operation and management system and capacity were established.

By project component, regarding the "afforestation and vegetation cover," the actual area of vegetation cover achieved the planned output after revision. However, the actual afforestation area was 80% of the revised output. The reason for this was that the actual afforestation area of the land management by farming households was as low as 19% of the revised output because of adjustment made to reflect the changing need for afforestation (meanwhile, the actual afforestation area of national forest sites exceeded the revised output). The factors for the failure to fully achieve the planned output (afforestation) of the land managed by farming households were (i) emphasis on afforestation of national forest sites where the potential afforestation area was large and the available afforestation skills were strong so that the efficiency and management level of the work would be high to increase the survival rate and (ii) it was difficult for farmers to understand the initial request for them to bear part of the afforestation cost because of the lack of an immediate and direct economic advantage of the afforestation work (the township and village authorities were concerned about a possible financial burden on farmers). According to the findings of an interview with the executing agency, the afforestation of national forest sites characterized by a high level of specialist skill as well as equipment and large planting area resulted

[3] As far as revision of the original plan for outputs is concerned, some outputs other than that for vegetation work were also revised. It was decided for the purpose of ex-post evaluation that the basic approach for the comparative analysis of other outputs would be to compare the originally planned outputs at the time of appraisal and the actual outputs because (i) it was believed to be important to evaluate and examine the factors and circumstances for discrepancies between the originally planned outputs at the time of appraisal and the actual outputs, (ii) simple comparison of the revised planned outputs and actual outputs would always lead to a planned output completion ratio of 100% as the revised outputs were based on the actual outputs due to delayed confirmation of the revised plan in writing and (iii) changes of the outputs other than the vegetation area could be judged to be minor as they occurred within the framework of the Project.

in a high survival rate and better growth of the planted trees compared to the afforestation of land managed by farming households. Meanwhile, the actual outputs for “improvement of related facilities” were as planned. In the case of “training,” training in Japan took place three times (compared to four times in the revised plan) with 58 participants (compared to 80 participants in the revised plan). The reason for this was the withdrawal of the fourth training because of China’s government policy of suppressing the overseas training of civil servants.

Table 2 Planned and Actual Outputs

	Description	Planned (at the Time of Appraisal)	Planned (after Revision)	Actual	Performance Against the Plan
Afforestation/ Vegetation Cover	Afforestation (Protection Forest) (ha)	171,100	171,100	136,900	80%
	Breakdown: (ha) [Purposes of Afforestation] •Water conservation forest and erosion control forest: •Windbreak and sand fixation forest [Afforestation Land] Land managed by farming households (ha) (Number of households) National forest sites (ha) (Number of sites)	 130,100 41,000 78,672 (15,316) 114,218 (199)	 130,100 41,000 78,672 (15,316) 114,218 (199)	 100,300 36,700 15,300 (2,982) 121,600 (212)	 77% 90% 19% 106%
	Vegetation Cover (Prevention of desertification) (ha)	22,000	10,840	10,840	100%
Improvement of Related Facilities	Renovation of seed collection and distribution facility ・Number of facility sites (number) ・Seed storage capacity (t)	 1 620	 1 620	 1 620	 100% 100%
	Renovation of model nursery gardens ・Number of facility sites (number) ・Annual seedling production volume (‘000)	 4 1,000	 4 1,000	 4 1,000	 100% 100%
	Renovation of model forest ecology gardens ・Number of facility sites (number) ・Land area (ha)	 4 583	 4 583	 4 583	 100% 100%
Procurement of Equipment	Patrol/ work vehicles (number)	32	32	32	-
	Irrigation equipment (sets)	-	-	550	-
	Monitoring equipment (sets)	-	-	22	-
	Monitoring huts (number) Fencing (number) Information boards (number)	-	-	4 22 3,858	-
Training	Training in Japan: Number of trainees (person) (frequency)	80 (4 times)	80 (4 times)	58 (3 times)	73%
	County level domestic training: number of trainees (person)	660	660	660	100%
	Township/village level domestic training: number of trainees (person)	5,220	5,220	5,598	107%
	Number of trainees for afforestation and vegetation cover work (person)	25,250	25,250	26,231	104%
Other	Number of cities and counties where the Project was implemented	23 counties, 5 cities/ areas under direct control by the provincial government	23 counties, 5 cities/ areas under direct control by the provincial government	23 counties, 5 cities and 6 areas under direct control by the provincial government	-
	Number of farming households participating in the Project (number)	15,316	15,316	17,982	117%

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.

Nature Exhibition Room introduced under the Project (Model forest ecology garden)

An afforestation site under the Project

An afforestation site under the Project

The same site shown left before the afforestation work

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 8,890 million JPY, falling by approximately 36% from 13,942 million JPY in the revised plan as shown in Table 3. It can be judged that the project cost was within the plan based on the revised plan for the Project. Especially in the case of afforestation and vegetation cover, their actual costs were as much as approximately 67% and 50% less than their corresponding costs in the revised plan respectively. The reasons for the actual project cost being much less than the cost in the revised plan are (i) in the competitive tender for the procurement of equipment, etc., the successful bid prices were often lower than the target prices, making the overall procurement cost lower than planned and (ii) the scale of the Project was reduced for such components as afforestation, vegetation cover, etc.

Table 3　Planned and Actual Project Costs

Unit: million yen

	Planned (at the Time of Appraisal)			Planned (after Revision)			Actual		
	ODA Loan Portion	Local Currency Portion	Total	ODA Loan Portion	Local Currency Portion	Total	ODA Loan Portion	Local Currency Portion	Total
Afforestation	7,281	3,571	10,852	7,281	3,571	10,852	6,122	1,352	7,474
Vegetation Cover	955	338	1,293	472	167	639	293	27	320
Civil Engineering Work/ Equipment	1,187	0	1,187	1,187	0	1,187	923	126	1,049
Training	60	32	92	60	32	92	12	0	12
Price Escalation	8	0	8	8	0	8	0	0	0
Contingency	9	662	671	9	662	671	0	0	0
Interest during Construction	0	269	269	0	269	269	0	0	0
Land Acquisition Cost	0	0	0	0	0	0	0	0	0
Administration Cost, etc.	0	224	224	0	224	224	35	0	35
Total	9,500	5,096	14,596	9,017	4,925	13,942	7,385	1,505	8,890

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.
Notes
Foreign exchange rate: planned rate at the time of appraisal: 1 CNY = 14.8 JPY (December, 2006); planned rate after the revision: 1 CNY = 14.8 JPY (December, 2006); actual rate: 1 CNY = 15.2 JPY (mean exchange rate for 2007 through 2016)

3.2.2.2　Project Period

The actual project period of 118 months (from March, 2007 to December, 2016) greatly exceeded the planned project period of 70 months (March, 2007 to December, 2012) (by 169% or 48 months against the planned period). The reasons for such an extended project period were (i) the changes and modifications of the project contents meant that the preparation and approval of the revised plan took some time to complete, (ii) as Jilin Province is situated in northern China with limited time suitable for the planting of trees (a suitable period for tree planting last for approximately 6 months), the delay of project implementation caused a delay of the planting by almost one year at some sites and (iii) in some of the targeted counties, it took a long time to secure farmers to participate in planting on land managed by farming households ((i) was the primary reason for the extended project period). As a result, a delay was especially observed with the civil engineering work to renovate related facilities and part of the afforestation work.

Table 4　Planned and Actual Project Periods

	Planned (at the Time of Appraisal)	Planned (after Revision)	Actual
Signing of the Loan Agreement	March, 2007	As left	June, 2006
Entire Project	March, 2007 - December, 2012 (Project period: 70 months)	As left	March, 2007 - December, 2016 (Project period: 118 months)
Afforestation	July, 2007 - August, 2012	As left	April, 2008 - October, 2015
Vegetation Cover	July, 2007 - May, 2011	As left	April, 2012 - May, 2013
Civil Engineering Work. Equipment	July, 2007 - October, 2008	As left	January, 2008 - December, 2016
Training	July, 2007 - December, 2010	As left	July, 2007 - July, 2016
Acceptance Inspection	September, 2012 - December, 2012	As left	- December, 2016

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.

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

Financial Internal Rate of Return

At the time of the appraisal, only the financial internal rate of return (FIRR) was calculated, thus this FIRR was recalculated in the ex-post evaluation.

At the time of the appraisal, the project cost, construction cost and operation/maintenance cost were considered to the cost while revenue from the sale of forest products (timber and seeds, etc.) was considered to the benefit. Based on the project period of 40 years after the start of operation, the FIRR for the Project was calculated to be 6.8%. In this ex-post evaluation, the same cost, benefit and project period were used for recalculation of the FIRR with the relevant numerical data being supplied by the executing agency. The resulting FIRR was 12.1%. The reason for the recalculated FIRR exceeding the FIRR calculated at the time of the appraisal is the reduction of the cash outflow to cover the construction cost, the maintenance cost, etc. of the Project.

Although the project cost was within the revised plan, the project period significantly exceeded the revised plan. Therefore, efficiency of the project is fair.

3.3　Effectiveness and Impacts [4]　(Rating: ③)

3.3.1　Effectiveness

3.3.1.1　Quantitative Effects (Operation and Effect Indicators)

The situation of the quantitative indicators which were set at the time of the appraisal and ex-post evaluation regarding “improvement of the forest coverage ratio and restoration of vegetation cover” is shown in Table 5.[5] Of those indicators listed in Table 5, the “survival rate of the planted trees” and

[4] The effectiveness is rated in consideration of not only the effects but also the impacts.
[5] At the time of revising the original plan, no changes were made to the operation and effect indicators regarding the quantitative effects.

"forest coverage ratio" are indicators set at the time of the appraisal. Other indicators are added at the time of ex-post evaluation as they are thought to be useful to judge the effectiveness of an ecological environment project. Although some figures are unknown, judgement is made using data obtained for some indicators.

Table 5 Changes of Operation and Effect Indicators (Construction of Centralized Heat Supply Facilities)

Indicators	Reference Value	Target Value	Actual (Achieved) Value		
	2005	2013	2013	2017	2019
	Reference Year	At completion of the Project	At completion of the originally planned Project	At completion of the Project	Two year after completion of the Project (ex-post evaluation)
Survival rate of planted trees (%) ・After the first growth period of afforestation ・After the third growth period of afforestation	 Unknown Unknown	 95 85	 ≥95 ≥85	 ≥95 ≥85	 ≥95 ≥85
Forest coverage ratio (%)	34	36	40	40	44
Forest area (thousand ha)	Unknown	-	131	137	137
Growing stock of forests (thousand ㎥/ha)	Unknown	-	Unknown	35,770	36,860
Grassland coverage ratio (%)	Unknown	-	52	55	59
Grassland area (thousand ha)	Unknown	-	1	11	11
Wasteland area (thousand ha)	1,460	-	1,460	1,450	1,450
Desertification area (thousand ha)	Unknown	-	Unknown	Unknown	Unknown
Area of cropland returned to forests (thousand ha)	Unknown	-	Unknown	Unknown	Unknown

Source: Replies to the questionnaire and interview results during the field surveys.
Note: "After the first growth period after planting" means the autumn of the year of planting. "After the third growth period after planting" means the autumn of the two years after the year of planting.

The actual project performance regarding the quantitative indicators for which the target figures were set at the time of appraisal shows that the target figures for the (i) survival rate of planted trees and (ii) forest coverage ratio are both achieved. At the time of ex-post evaluation (2019), the forest coverage ratio exceeds the target figure by 8 points. These two indicators were actually already achieved in 2013 which was the year for project completion in the original plan. While the project period substantially exceeded the planned period as described earlier, the target figures for the quantitative indicators were achieved as planned. Other quantitative indicators for which target values were not set at the time of the approval also show an improving trend in recent years. The grassland coverage ratio improved by 7 points in six years from 2013 to 2019 and both the forest and grassland areas increased in the same period. In the interviews with project-related personnel at the executing agency, it was pointed out that the Project had several positive effects, including (i) the production of pasture grass at land subject for vegetation cover increased by some 600 tons by the time of ex-post evaluation and (ii) the eastward expansion of desertification was suppressed due to an increase of the grassland area (grain production areas in central Jilin Province were protected). Based on the above, the improvement effect of the ecological environment by the Project is judged to be substantial.

3.3.1.2 Qualitative Effects

(2) Effects of the Renovation of Facilities Related to the Ecological Environment, Improved Forest Coverage Ratio and Regenerated Grassland

As described earlier, the implementation of the Project renovated facilities related to the ecological environment, improved the forest coverage ratio and regenerated grassland. It is confirmed that these positive effects produced the qualitative effects described below.

Functional enhancement of facilities related to improvement of the ecological environment

The project components included the renovation of facilities related to improvement of the ecological environment (model nursery gardens, seed collection and distribution facilities and model forest ecology parks), all of which are important for the promotion of measures and activities to improve the ecological environment. As a result, many of the functions of these facilities are enhanced as shown in Table 6, achieving the strengthening of ecological environment improvement activities (see Box 1).

Table 6 Improvement of the function of facilities for ecological environment improvement

Facility	Improvement by the Project	Functional Enhancement	Improvement of Ecological Environment
Model Nursery Garden	• Construction of new storage for seeds and seedlings • Improvement of the irrigation facilities	• Adequate storage of seedlings until the temperature is suitable for planting • Storage of cultured seedlings through the winter • Adequate and uniform watering of seedlings	• Substantial increase of seedling production (supply of seedlings to meet the local demand for seedlings: 100%) • Improved quality of the supplied seedlings • Availability of seedlings during the appropriate planting season • Stable temperature control and increased supply of seedlings
Seed Collection and Distribution Facilities	• Introduction of seed processing equipment • Construction of a new seed processing center	• Improved quality of seeds to produce seedlings (supply of seeds passing the national standard; lowering of the damaged seed ratio) • Improvement of the seed processing efficiency and processing capacity • Realization of uniform management of seeds	• Increase of seed production • Improved quality of cultured seedlings
Model Forest Ecology Park	• Improvement of facilities protecting the ecological environment on the park • Planting in the park • Improvement of facilities for visitors and research purposes (nature exhibition room; footpaths; facilities for wild animals)	• Improvement of the protection of the ecological environment of the park • Opening of a nature exhibition room and start of educational events on nature • Start of a nature learning curriculum in cooperation with educational institutions • Improved breeding rate through improvement of the rearing environment for protected wild animals (the breeding number of Siberian tigers has increased from 8 to 21 a year)	• Increase of the number of visitors and number of participants in educational events on the ecological environment (increased opportunities for learning about the ecological environment for the general public) • Increased number of wild animals returned to nature

Source: Reply to the questionnaire survey with the executing agency.

Box 1: Improvement of Seedling Production Through Renovation of Model Nursery Gardens

Improvement of the Jiutaiqu Erdaogou Forest Land Protection Station (model nursery garden) under the Project included the construction of two boreholes, a water storage tank and two underground seedling storages, improvement of roads and introduction of sprinkler and soil

improvement systems.

Prior to the Project, water was diverted from a nearby river for sprinkling through rubber pipes. With the construction/introduction of boreholes, water storage tank and sprinkler system, it became possible to uniformly water seedlings in a sufficient quantity. As a result, the annual production volume of seedlings substantially increased from 200,000 to 3,000,000 with a greatly improved quality. Prior to the Project, 80 – 90% of the seedlings to be planted at national forest sites were purchased from external sources. At the time of ex-post evaluation, the entire seedlings are supplied from the model nursery gardens at the national forest sites. This local supply of seedlings is believed to have contributed to (i) the supply of high quality seedlings as deterioration during transportation no longer occurs and (ii) the swift supply of seedlings at an appropriate time for planting.

Cultured seedlings for planting

Sprinkler system introduced under the Project

Formation of forests with multiple functions and establishment of an afforestation model

For the implementation of the Project, emphasis was placed on the formation of "mixed forests" consisting of various species and believed to have a high level of water yield and soil retention with a rich natural ecosystem from the viewpoint of facilitating the enhancement of multiple forest functions. In the case of thin stands (forest land with a relatively small number of trees) often observed in eastern Jilin, the seedlings for planting were selected to ensure the diversity of trees in terms of the species, i.e. needle-leaved trees and broad-leaved trees, etc., and tree height. According to the results of interviews with project-related personnel at the executing agency and local residents, although not necessarily supported by quantitative effects, this conscious approach is believed to have enhanced such multiple forest functions as the suppression of harmful insects, improvement of the soil retention performance (no soil erosion occurred during the especially heavy rain in 2017), lowering of the forest management cost and improvement of the forest landscape.

Because of such positive effects of the afforestation efforts to create forests with multiple functions under the Project and the wide recognition of this approach among those involved in the improvement of forests and ecological environment as this approach adopted for the Project has been employed at other model forest ecology parks with PR and educational functions, this approach has been introduced to a certain extent to other areas of Jilin Province as it is considered to be important as a model for

afforestation to create forests with multiple functions. Accordingly, the Project is believed to have contributed to improvement of the ecological environment and enhancement of the multiple functions of forests in wide areas through the formation and spread of the afforestation model.

(2) Effects of Training in Japan

As mentioned earlier, training in Japan took place for project-related personnel. Interviews with the participants found that many of the participants shared such positive opinions as “the way that Japan conducts forestry work and afforestation in a systematic manner is a very useful reference” and “the training in Japan made it possible to widely learn about the experience of Japan and other advanced countries along with the acquisition of useful reference materials” Moreover, the following qualitative effects (improved capacity of those involved in afforestation, etc. and application of the training contents to the actual work) were confirmed as a result of the training in Japan. However, as far as the application of the training outcomes is concerned, while there have been cases of such application, they appear to be the result of individual rather than organizational efforts as the number of participants from individual specific areas was small due to the involvement of many areas in the Project.

Improvement of planting and silviculture techniques

While many new and unique planting and silviculture techniques have been developed and employed in China, there are cases where new planting and silviculture techniques learned during the training in Japan are actively applied. According to the findings of interviews with project-related personnel at the executing agency, the introduction of such new planting and silviculture techniques is believed to have made a certain contribution to the improved survival rate of the planted trees. Some examples of improving the planting and silviculture techniques utilizing the outcomes of the training in Japan are listed below.

- Re-examination of seedling composition and culture technique enabling the smooth implementation of planting and silviculture so that the entire afforestation work can smoothly proceed
- Introduction of a planting technique which uses a tree guard to improve the survival rate
- Strengthening of the measures to prevent illegal felling by means of employing a Japanese method, etc.

Promotion of the construction/improvement of forest parks and model forest ecology parks

As some of the participants of the training in Japan were responsible for the management of forest parks and model forest ecology parks which are facilities for the general public to have contact with and learn about forests and nature, there have been cases where the experience of the training in Japan is utilized. Some concrete examples are listed below.

- The information boards and information on display have been improved for easier understanding by visitors.

- A new management organization has been established to improve the management level of the work.

3.3.2 Impacts

3.3.2.1 Intended Impacts

(1) Improvement of the Living Environment for Citizens (Quantitative Effects)

The situation of the various indicators set at the time of the appraisal and ex-post evaluation to indicate the qualitative effects of the Project on “improvement of the living environment for residents and prevention of desertification due to the restoration of the multiple functions of forests” is shown in Table 7 below. Of those indicators listed in Table 7, the “number of beneficiaries”, “reduction of soil erosion volume”, “average annual income of local residents” and “average annual income of residents participating in the Project” are indicators set at the time of the appraisal. Other indicators are added for ex-post evaluation and are thought to be effective to judge the impacts of an ecological environment project. While some figures are unknown, judgement is made using the data obtained.

Table 7 Changes of Indicator Values

Indicators	Reference Value	Target Value	Actual (Achieved) Value		
	2005	2013	2013	2017	2019
	Reference Year	At completion of the Project	At completion of the originally planned Project	At completion of the Project	Two years after the completion of the project (ex-post evaluation)
Number of beneficiaries (thousand person)	-	16,020	16,670	16,670	16,670
Reduction of soil erosion volume (thousand t)	-	8,030 (When planted trees have matured)	1,020	1,230	1,230
Average annual income of local residents (CNY)	3,264	3,500	22,275	26,530	28,319
Average annual income of residents participating in the Project (CNY)	3,000	-	13,280	18,161	18,161
Annual CO_2 absorption volume (thousand t)	-	610 (When planted trees have matured)	Unknown	563	563
Soil erosion volume (thousand t)	130,000	-	124,970	121,970	121,970
Soil erosion area (㎢)	31,519	-	31,000	31,000	31,000
Number of flood victims (thousand person)	950	-	Unknown	700	700
Economic loss due to flooding (thousand CNY)	1,797,190	-	Unknown	Unknown	Unknown
Number of sandstorms (times)	12	-	8	6	4
Days of sandstorms (days)	6	-	≤4	≤ 3	≤ 3
Economic loss due to sandstorms (thousand CNY)	Unknown	-	Unknown	Unknown	Unknown
Production volume of commercial forests and forest products	Unknown	-	Unknown	Unknown	Unknown
Production value of commercial forests and forest products (thousand CNY)	Unknown	-	Unknown	Unknown	Unknown
Number of employment created (persons)	-	-	26,231	26,231	26,231
Poor population among agricultural population (person thousand)	890	-	860	130	20
Average annual income of the poor (CNY)	637	-	2,300	3,485	3,747

Source: Materials provided by JICA and replies to the questionnaire survey with the executing agency.

The actual number of beneficiaries of the Project of 16.67 million exceeded the target figure of 16.02 million set at the time of the appraisal, indicating that the Project benefitted many people as planned. As the Project targeted many areas of Jilin Province, the beneficiaries of the Project were spread over a wide area of the province.

Among the quantitative indicators relating to the situation of the living environment for residents, the performance of measures against “soil erosion, flooding and sandstorms” showed some improvement

under the Project.[6] The effect on the number of flood victims and suppression of sandstorms were particularly positive (the number of flood victims decreased from 950,000 in 2005 to 700,000 in 2019 and the number of sandstorms decreased from 12 times in 2005 to four times in 2019). The interview survey with beneficiaries found that the frequency of flood and soil erosion decreased as typically evidenced by the fact that heavy rain in 2017 did not cause any flooding or soil erosion. Even when flooding or soil erosion did occur, the damage was less than before.[7] The occurrence of flooding or soil erosion often caused major damage to farmland, houses and living infrastructure in nearby villages (for example, 1,000 *mu* (approximately 666,700 m^2) of farmland was damaged in Huinan County in 2005) but the decrease of flooding and soil erosion has led to a noticeable decrease of the damage.

Another expected impact of "increasing the income of residents (escape from poverty)" is that the average annual income of local residents for which a target figure was set at the time of the appraisal increased to 26,530 CNY in 2017 when the Project was completed, far exceeding the target figure of 3,500 CNY. This income improvement was widespread, including the poor. While such an income increase may well be largely attributed to the high economic growth of China during the project implementation period, it is fair to say that the Project made a certain contribution in this aspect as shown by the creation of new employment for the implementation and management of the Project (26,231 jobs were created mainly for the poor and women). Furthermore, the annual CO_2 absorption volume reached 560,000 tons, already achieving 91% of the target 610,000 tons when the planted trees mature in the future).

(2) Restoration of Multiple Functions of Forests in the Project Area (Qualitative Effect)

The implementation of the Project achieved improvement of the forest coverage ratio and regeneration of grassland as described earlier. These achievements led to the following impact relating to the restoration of the multiple functions of forests in the project area.

Increase of rare wild animals and birds

The opinion has frequently been expressed that afforestation and vegetation cover under the Project led to improvement of the ecological environment and habitat for wild animals, resulting in confirmed increases of rare wild animals and birds. Typical examples showing the improvement of the natural environment are (i) the number of Siberian tigers has increases and their area of activity has expanded and (ii) 3,000 hooded cranes (*Grus monacha*) which is a designated Class 1 rare bird for state protection, have been observed near the project area (the number was very small before the implementation of the Project). Moreover, the numbers of Class 2 birds for state protection, pheasants, wild boars, hares, deer,

[6] The actual reduction of the soil erosion volume was far below the target value. However, the target is that expected to be achieved when the planted trees are mature. According to the interviewed project-related personnel at the executing agency, the target value is expected to be achieved when the planted trees mature. Meanwhile, the reduction of the soil erosion volume has shown an increasing trend in recent years.

[7] According to the interviewed personnel at the executing agency, afforestation under the Project has facilitated "the withdrawal from farming and a return to forests (meaning the planting of trees on farmland of poor condition to make the land return to forest)" at sloping land and the resulting less use of agricultural chemicals has achieved soil improvement, in turn suppressing soil erosion.

squirrels, etc. have also increased.[8] Although the height and density of many planted trees and targeted stands under the Project are insufficient at the time of ex-post evaluation, they have still had a significant impact on the habitat for rare wild animals and birds.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

No negative impacts on the natural environment were found by the ex-post evaluation. The interview survey with project-related personnel at the executing agency found that the environmental impact assessment (EIA) for the Project had been conducted by the time of the appraisal and that the Project was approved by the Bureau of Ecology and Environment, completing the necessary procedure for the implementation of the Project in China. Environmental protection measures relating to the implementation of the Project were properly implemented based on the EIA (even after the Project, the necessary monitoring of the use of agrochemicals with a small environmental load was conducted as planned). All of the monitored values were within the standards set by the administration and no problems were found.

Because of the implementation of adequate measures, no negative impacts on the natural environment have occurred by the time of this ex-post evaluation. Therefore, it can be judged that the Project did not cause any negative impacts on the natural environment.

(2) Resettlement and Land Acquisition

Although some parts of the afforestation and vegetation cover work took place at land managed by farming households, the Project did not necessitate any resettlement or land acquisition.

(3) Increase of Non-Agricultural/Stock Farming Income among Women, Poor Residents, etc.

The interviews with beneficiaries and project-related personnel at the executing agency found that there were areas where women and poor residents without sufficient access to earning opportunities accounted for a certain proportion of the local population prior to the implementation of the Project. As the recruitment and use of women and poor people were actively sought for the work of afforestation and facility construction and the post-planting management of the planted trees during the implementation process of the Project in addition to an increase of such jobs as the culture of seedlings for planting, etc., the income of women and poor residents increased (creation of new employment for 26,231 people, many of whom were women or poor residents). Among the employed people for afforestation, women and poor residents accounted for more than 50% and they received a daily wage of between 80 CNY and 150 CNY. There is also the case of increased income for local residents, including women, at a model forest ecology park and forest exhibition room newly introduced or

[8] According to some of the interviewed beneficiaries, the increased number of wild boar means expansion of the damage to farming in some areas (Huinan County, etc.)

improved under the Project which also constituted a new sightseeing attraction, lengthening the stay of tourists in the local area (for example, operation of restaurants and hotels catering for tourists).

(4) Strengthening of Environmental Education and Research and Increase of Environmental Awareness among the Residents

During interviews with beneficiaries and project-related personnel at the executing agency, many of those interviewed expressed the opinion that the implementation of the Project led to (i) strengthening of environmental education and research and (ii) increase of environmental awareness among farmers and stock farmers through improvement of the ecological environment. Some concrete examples are listed below.

- After the implementation of the Project, the number of visitors to model forest ecology parks, which have a function of educating the general public, has substantially increased, partly because of improvement of the nature exhibition room, illustrating the intensification of environmental education for the general public. There are cases where the model forest ecology park functions as a base for environmental education through the acceptance of visits by university students specializing in the environment or dendrology.
- At the National Forest Protection Center in the Jilin Provincial Forestry Experiment District, a seedling culture room/laboratory was newly established under the Project, enabling detailed soil survey, vegetation research and the long-term preservation of seeds. As a result, provincial level work can be entrusted to this center and basic research at the center has been enhanced. At the time of ex-post evaluation, more than 100 master's degree and Ph.D. students have produced their research papers using the facilities of the center.
- Prior to the implementation of the Project, such activities showing the poor environmental awareness among local residents as illegal deforestation and farming on sloping land (thin stands/degraded land) and others were often observed. These problematic activities by residents have greatly declined as afforestation work and the improved ecological environment has produced positive outcomes for residents.

In short, it is believed that the Project has somewhat contributed to the establishment of a virtuous cycle where improvement of the ecological environment leads to increased environmental awareness among residents, in turn leading to further improvement of the ecological environment.

(5) Utilization of Experience of the Project for Other Large-Scale Ecological Projects

According to the results of interviews with project-related personnel at the executing agency, the experience of the Project has been utilized for subsequent large-scale ecological environment projects (protection of natural forests, reforestation, withdrawal from farming and return to forests, etc.) To be more precise, the experience has been used to improve the project contents and proceedings, including the development of cooperative/collaborative projects involving broad ranging organizations, emphasis

on and strengthening of the preliminary design of projects, enhancement of training for stakeholders and beneficiaries and implementation of outcome-oriented evaluation. In addition, the utilization of international cooperation has been in progress based on the experience of the Project. As such, it can be judged that the Project has made a certain contribution to the promotion of subsequent projects related to the ecological environment in general in Jilin Province.

Based on the above, the effectiveness of the Project is judged to have reached the level where the target values for the quantitative indicators have been generally achieved along with many positive qualitative effects relating to the local ecosystem. Regarding the impacts of the Project, improvement of the living environment for residents in the Project Area and other positive impacts of the Project are confirmed in terms of both the quantitative effects and qualitative effects. The Project has largely achieved its objectives. Therefore, effectiveness and impacts of the Project are high.

3.4 Sustainability (Rating: ③)

3.4.1 Institutional/Organization Aspect of Operation and Maintenance

The operation and maintenance system for afforestation sites, vegetation cover sites and various facilities which were developed, constructed or renovated under the Project has been established as planned at the time of appraisal with the administrative organizations responsible for project-related work and farmers/stock farmers performing the central roles as shown in Table 8.

Table 8 Operation and Maintenance System

Type of Work	Responsible Organization(s)
Overall Management	Provincial Bureau of Forestry and Grassland; county bureaus of forestry and grassland
Afforestation Site and Vegetation Site Management	[National forest sites] National forest sites (use of forest guards) [Land managed by farmers/stock farmers] Farmers, stock farmers and villages responsible for the management of afforestation sites; forest security offices of county bureaus of forestry and grassland (illegal logging control); forest fire control organizations (prevention and control of forest fires)
Facility Management	[Seed collection facilities; model nursery gardens; model forest ecology parks] provincial bureau of forestry and grassland

Source: Replies to the questionnaire survey with the executing agency.

The operation and maintenance system for facilities, etc. improved, constructed or renovated under the Project is basically the same as the system employed in other cities in China and those organizations responsible for operation and maintenance are also responsible for similar facilities constructed under different projects in Jilin Province or the relevant counties. Guidance for farmers and stock farmers has been adequately provided and the operation and maintenance of the facilities, etc. constructed under the Project have been smoothly implemented. As such, no special problems have occurred regarding the institutional/organizational aspect of the operation and maintenance.

3.4.2 Technical Aspect of Operation and Maintenance

The organizations responsible for the operational management of the facilities and equipment constructed/introduced under the Project have rich experience of operating and managing similar facilities and equipment outside the scope of the Project. Therefore, they have sufficient technical capability. The manuals and rules to operate and maintain the facilities and equipment are properly established (these manuals and rules are common to other projects). The maintenance checks of the facilities constructed under the Project are regularly as well as routinely conducted in accordance with the relevant rules of each organization. When any equipment requires repair or mending, the basic principle is for an operation and maintenance organization, which is a specialist administrative body covering a specific field, to do the work. No stoppage of the service due to a defect, etc. of a facility has so far occurred. Farmers, stock farmers and forest rangers in charge of the maintenance of afforestation sites and vegetation cover sites undergo regular training organized by the relevant administrative bodies. No special problems have been encountered so far regarding the technical aspect of operation and maintenance.

3.4.3 Financial Aspect of Operation and Maintenance

The operation and maintenance of the facilities, etc. constructed, procured or renovated under the Project are funded by the budget of the provincial, municipal or county governments or national forest sites. The financial situation of the organizations responsible for the operation and maintenance of the project-related facilities, etc. is shown in Table 9. According to the results of interviews with project-related personnel at the executing agency and Table 9, the amount of fiscal expenditure related to the ecological environment has shown an increasing trend since the announcement of *the Policy to Emphasize the Construction of an Ecological Civilization* at the 18th National Congress of the Community Party of China in 2012. At the time of ex-post evaluation, the necessary budget has been secured and no financial problems regarding operation and maintenance are observed. Although the Chinese economy is severely affected by the spread of the new coronavirus, the GDP growth rate for April through June, 2020 returned to positive growth of 3.2%. The *IMF Global Economic Outlook* (June, 2020) forecasts China's overall economic growth rate of 1.0% for 2020 (compared to -4.9% for the world and -8.0% for advanced economies) and 8.2% for 2021 (compared to 5.4% for the world and 4.8% for advanced economies). As such, the high level of economic growth is expected to continue in China, suggesting that the necessary budget for operation and maintenance is secured. Based on the above, there are no problems regarding the financial aspect of operation and maintenance.

Table 9 Financial Situation of the Chinese Government and the Organization Responsible for Operation and Maintenance

Unit: million CNY

Organization	Expenditure	2017	2018	2019
Central Government	Environment	13,400	12,800	14,000
	Ecological environment	10,300	13,000	12,800
Jilin Provincial Government	Environment	21,500	23,900	24,500
	Ecological environment	45,500	48,800	46,900
Bureau of Forestry and Grassland, Jilin Province	Ecological environment	140	180	170

Sources: China Statistical Yearbook 2020 and replies to the questionnaire survey with the executing agency.

3.4.4 Status of Operation and Maintenance

The monitoring, maintenance and regular inspection of the facilities constructed under the Project have been properly conducted in accordance with the relevant rules set by the organizations responsible for such work. The field reconnaissance as part of the ex-post evaluation found no problems regarding operation and maintenance as evidenced by such facts that (i) there is a system in place to quickly respond whenever a problem emerges as any unusual occurrence is dealt with by a suitable body, (ii) all facilities are generally kept in a tidy and clean manner, (iii) the use and inspection of each facility are properly recorded, (iv) an irrigation facility and monitoring system are installed at some afforestation sites and (v) no problems are found regarding the procurement of repair equipment. The operation and maintenance of afforestation sites and vegetation cover sites by farmers, stock farmers or forest rangers are smoothly conducted as evidenced by such facts as (i) guidance by the relevant administrative body is regularly provided and (ii) there is active cooperation locally as the improvement of grassland leads to increased income from livestock farming. As a result, the level of operation and maintenance is high.

The utilization rate of individual facilities is high and no major operational problems have occurred during the period from the commencement of their operation to the time of ex-post evaluation. The field reconnaissance conducted by the evaluator confirmed that (i) the conditions of the principal facilities are generally good and they are functioning as initially planned, (ii) the planted trees and seeded grass have been growing without any problems and (iii) supplementary planting has been conducted when the initially planted seedlings have died.

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

4. Conclusions, Lessons Learned and Recommendations

4.1 Conclusions

The objective of the Project is to improve the forest coverage ratio and to regenerate grassland through afforestation and vegetation cover, improvement of related facilities and procurement of equipment in Jilin Province and training, thereby contributing to the restoration of the multiple functions of forests and

prevention of desertification.

The Project advanced the restoration of the multiple functions of forests and grassland and the prevention of desertification through afforestation work, vegetation cover work and improvement of equipment at related facilities in line with the policy of the Government of China and Jilin Province to improve the ecological environment. As such, the Project conforms to the development needs of improving the ecological environment in Jilin Province and Japan's ODA policy. Therefore, the relevance of the Project is high. In the case of the project efficiency, although the outputs were achieved generally as anticipated by the revised plan with the project cost being within the plan, the project period significantly exceeded the revised plan. Therefore, the efficiency of the Project is fair. As a result of the materialization of the facilities required for afforestation work, vegetation cover work and improvement of the ecological environment, the target figures for the quantitative indicators (planted tree survival rate and forest coverage ratio) set at the time of appraisal were achieved at the time of ex-post evaluation and other quantitative indictors (grassland coverage ratio, forest/grassland area, etc.) have shown some improvement. In addition, wide-ranging qualitative effects of the Project are confirmed, including (i) functional improvement of the facilities related to improvement of the ecological environment and (ii) establishment of forests with multiple functions. Also highly noticeable are the impacts of "the restoration of the multiple functions of forests and grassland" ((i) reduction of the occurrence of sandstorms, flooding and soil erosion and (ii) increase of income other than farming and/or stock farming for women and poor people). Accordingly, the effectiveness and impacts of the Project are high. The sustainability of the Project is also high as there are no problems regarding the institutional, technical and financial aspects of operation and maintenance of the Project with confirmation of the good operation and maintenance conditions of the facilities and equipment. In the light of the above, the Project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

<u>Realization of early and steady improvement of internal facilities of the exhibition room of the Model Forest Ecology Park in Huinan County and commencement of its service</u>

As part of the renovation of model forest ecology parks under the Project, a building housing the exhibition room was constructed at the National Forest Protection Center in Huinan County for the purpose of conducting PR and educational activities for visitors. However, the internal facilities planned to be arranged through domestic funding were not procured due to the government policy of restraining PR-oriented government facilities and the planned exhibition room has not been opened by the time of ex-post evaluation. Although parts of the building are used for forest fire prevention monitoring and internal meetings, a large part of the building remains unused.

As funding for the internal facilities of the exhibition room is now in the pipeline, the related work started in May, 2020 with the prospect of commencing the service of this exhibition room towards the end of 2020. Accordingly, it is necessary for the Huinan County Bureau of Forestry and Grassland and

the Huinan National Forest Protection Center to smoothly progress with the work to arrange internal facilities so that the service of the exhibition room can commence as planned. Meanwhile, it is desirable for the Jilin Provincial Bureau of Forestry and Grassland to provide adequate guidance for the Huinan County Bureau of Forestry and Grassland as well as the Huinan National Forest Protection Center so that the arrangement of the internal facilities and the commencement of its service can proceed early and steadily.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Importance of the establishment of an overall, systematic mechanism to facilitate training participants to utilize the training outcomes when the participants undergoing training in Japan come from many areas and organizations with only a small number of participants per area or organization

When the training participants in Japan come from many areas and organizations and the number of participants per area or organization is small, there is concern for the emergence of a considerable gap in the application of the training contents and outcomes to the practical work of the trainees as such application largely depends on the willingness and ideas of individual trainees. It is, therefore, important for JICA and the project executing agency to establish an overall, systematic mechanism at the project implementation stage with a view to making the training participants utilize the training outcomes. To be more precise, they should examine the viability of "information exchange on cases of utilizing the training outcomes by the training participants (establishment of a network using SNS, etc. to enable such exchange)" and "convening of regular meetings for the training participants to facilitate their use of the training outcomes."

The contents of the training in Japan were highly appraised by the participants and the utilization of the positive outcomes of the training in Japan under the Project was confirmed in relation to "improvement of the planting and silviculture techniques" and "promotion of the construction or improvement/ renovation of forest parks and model forest ecology parks." However, many target areas of the Project and the small number of training participants representing each area mean that the utilization of the training outcomes is largely dependent on the willingness and ideas of individual participants, resulting in differences in the utilization of the training outcomes between individual participants and between areas.

Importance of implementing an afforestation project based on sufficient examination of and consultation with the executing agency on the project effects and efficiency and suitability of financial contribution by individual persons in the case where the project is planned for land owned or managed by individual persons

When an afforestation project is planned, the target sites may be owned and managed by individual persons or farming households in view of the actual conditions of the target country or area. In such a case, it is important for JICA to conduct the necessary examinations and discussions with the executing agency

at the project planning stage on such issues as the project effects (impact on the survival rate, etc., implications of conducting afforestation work at privately owned and managed land, etc.), the efficiency of the project and suitability of financial contribution by individual persons towards the cost of implementing the project. In this way, it is possible to prevent modification of the plan and non-achievement of the planned outputs at the project implementation stage.

The original plan for the Project envisaged that the afforestation of land owned and managed by individual persons (farming households) would be conducted with a financial contribution by each owner (approximately 500 CNY/*mu* (1 *mu* = 666.7 m^2); planned afforestation area of 78,672 ha with 15,316 participating farming households). However, it was subsequently judged that (i) it would be more efficient to plant on much larger national land than privately owned land of which the area per farming household was small, (ii) afforestation on national land could be expected to achieve a high survival rate as a high level of specialist skills and equipment could be mobilized and (iii) it would be problematic to request a financial contribution from individual persons for an afforestation project which offered little direct and short-term economic advantage. Based on such judgement, the actual performance of planting at privately owned land fell short of the planned output due to (i) encouragement of afforestation at national land and (ii) cancellation of a personal contribution (actual performance: afforestation area of 15,300 ha with 2,982 participating farming households). While such judgements and modifications are believed to be based on specific local circumstances, careful attention is required to the afforestation work at privately owned land. This is because such afforestation work to improve the natural environment takes place near residential areas for local residents/farmers and cultivated land and can have a substantial impact on civic life. The Qinghai Ecological Environmental Improvement Project succeeded in achieving direct advantages for individual persons (farmers) by including erosion control measures as a project component in addition to afforestation. Such an approach may be a useful reference when planning to request a financial contribution by individual persons.

Comparison of the Original and Actual Scope of the Project

Item	Plan (after Revision)	Actual
1. Project Outputs	[Afforestation and Vegetation Cover] 1)Afforestation (Protection Forest): 171,000 ha 2) Vegetation cover (prevention of desertification): 10,840 ha [Improvement of Related Facilities] 1) Renovation of seed collection and distribution facility: One site 2) Renovation of model nursery gardens: 4 sites 3) Renovation of model forest ecology parks: 4 sites [Equipment Procurement] 1)Patrol/work vehicle 2)Irrigation equipment 3)Monitoring equipment 4)Monitoring hut, fencing and information boards [Training] 1) Training in Japan: 80 trainees	[Afforestation and Vegetation Cover] 1)Afforestation (Protection Forest): 136,900 ha 2) Vegetation cover (prevention of desertification): 10,840 ha [Improvement of Related Facilities] 1) Renovation of seed collection and distribution facility: One site 2) Renovation of model nursery gardens: 4 sites 3) Renovation of model forest ecology parks: 4 sites [Equipment Procurement] 1)Patrol/work vehicle 2)Irrigation equipment 3)Monitoring equipment 4)Monitoring hut, fencing and information boards [Training] 1) Training in Japan: 58 trainees
2. Project Period	March, 2007 – December, 2012 (70 months)	March, 2007 – February, 2016 (118 months)
3. Project Cost Amount Paid in Foreign Currency Amount Paid in Local Currency Total ODA Loan Portion Exchange Rate	 9,017 million yen 4,925 million yen (332 million CNY) 13,942 million yen 9,017 million yen 1 CNY = 14.8 JPY (as of December, 2006)	 7,385 million yen 1,505 million yen (99 million CNY) 8,890 million yen 7,385 million yen 1 CNY = 15.2 JPY (mean for 2007 through 2016)
4. Final Disbursement	July, 2016	

Federal Democratic Republic of Ethiopia

FY2019 Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Construction of Primary and Secondary Schools in the Southern Nations, Nationalities and Peoples' Regional State"

External Evaluator: Maki Hamaoka

Foundation for Advanced Studies on International Development

0. Summary

This project was implemented to upgrade eight incomplete primary schools (primary schools targeting grades [hereinafter referred to as "G"] 1-4 only instead of all eight grades) into complete ones, and extend/upgrade three primary schools by increasing the number of classrooms in order to mitigate the number of overcrowded classrooms, and increase the number of total classrooms by constructing 10 secondary schools in the Southern Nations, Nationalities and People's Regional State (hereinafter referred to as "SNNPR"), thereby contributing to improved access to and educational environment of basic education in the SNNPR.

This project's implementation is highly consistent with Ethiopia's development policy, which emphasizes improved access to basic education and educational environment as well as the target region's developmental needs for basic education, and with Japan's assistance policy for Ethiopia, which emphasized the education sector. Therefore, the project's relevance is high. Although the project outputs and the project costs were as planned, the project period exceeded the plan. Therefore, the project's efficiency is fair. The implementation of the project contributed to alleviating the overcrowding of existing primary schools, improving access to basic education, and improving the educational environment through constructing new secondary schools. The project generally achieved the initial project effect indicators. In addition, the facilities constructed by the project are fully operational in both primary and secondary schools. Impacts such as enhanced motivation among teachers for teaching, class management, and students' motivation for learning by improving the educational environment were also confirmed. The project's effectiveness and impact were judged to be high. Some minor problems have been observed in terms of the financial aspects and the current status of the operation and maintenance system. Therefore, the sustainability of the project's effects is fair.

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

1. Project Description

Project Location


Secondary school constructed by this project

1.1 Background

During the planning stage, access to primary and secondary education in Ethiopia was improving year by year, but disparities between town and rural areas as well as gender disparities in enrollment were significant problems. In addition, due to the rapid improvement in access to primary education, problems manifested such as a shortage of teachers and classrooms as well as quality of education and access to secondary education. In the SNNPRS, the gross enrollment ratio (GER) in first cycle primary (G1–4) reached 122.9% in FY 2010/11, while the GER for second-cycle primary (G5–8) remained at 73.8%. Secondary GERs are even lower at 35.5% for general secondary (G9–10) and 5.9% for preparatory secondary (G11–12). The higher the education level, the lower the access indicator, which could be attributable to the limited number of complete schools that can teach all eight grades at the primary level. The number of schools that cover G5 education or higher was particularly limited. The limited access to higher grades was especially critical in rural areas. On the other hand, classrooms were overcrowded with students in complete schools, due to the limited number of classrooms. The number of secondary schools was also limited. Most secondary schools were concentrated in urban areas; accordingly, the classrooms in urban secondary schools were highly overcrowded. On the other hand, there were almost no secondary schools in rural areas, leaving access to secondary education very difficult. Under these circumstances, the grant aid project was implemented to increase the number of classrooms in primary schools and to construct new secondary schools. in the SNNPRS

1.2 Project Outline

The objective of this project was to upgrade eight incomplete primary schools (primary schools targeting G1–4 only instead of all eight grades) into complete ones, and extend/upgrade three primary schools by increasing the number of classrooms in order to mitigate the number of overcrowded classrooms, and increase the number of total classrooms by constructing 10 secondary schools in the SNNPR, thereby contributing to improved access to and quality of primary and secondary education in the SNNPR.

Grant Limit / Actual Grant Amount	1,310 million yen/1,310 million yen
Exchange of Notes Date /Grant Agreement Date	December 2012/December 2012
Executing Agency(ies)	Southern Nation Nationalities Peoples Regional State Education Bureau (hereinafter referred to as "Regional Education Bureau")
Project Completion	December 2016
Target Area	Ten zones and one city in the SNNPR
Main contractor(s)	**Construction works** Group 1: Seven secondary schools and nine primary schools Lot 1: Yotek Construction PLC (one secondary school and one primary school) Lot 2: Teklehaymanot Asgedom BC (one secondary school and one primary school) Lot 3: Crafts Construction PLC (one secondary school) Lot 4: Mela Engineering & Construction (one secondary school and two primary schools) Lot 5: FE Construction PLC (one secondary school and three primary schools) Lot 6: Pyramid Construction (one secondary school and one primary school) Lot 7: 3M Engineering & Construction PLC (one secondary school and one primary school) <Group 2> (three secondary schools and two primary schools) Lot 8: Emnete Endesshaw General Contractor (one secondary school and one primary school) Lot 9: Yotek Construction PLC (Two secondary schools and one primary school) <Group 3> (Four primary schools) Lot 10: Yotek Construction PLC **Procurement of school furniture** Lot 1: Ketsela Bekele General Metal Work & Furniture Lot 2: Maika Household and Office Furniture
Main consultant(s)	Mohri Arrchitect & Associates, INC.
Procurement agency	Japan International Cooperation System
Outline design	November 2011 – February 2012
Related projects	・ African Development Bank: Support for the construction, expansion, and renovation of primary schools (1998–2011) ・ World Bank: General Education Quality Improvement Program (GEQIP) (2009–2013)

2. Outline of the Evaluation Study

2.1 External Evaluator

Maki Hamaoka, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

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

Duration of the Study: September, 2019 – December, 2020

Duration of the Field Study: January 8, 2020 – January 16, 2020

2.3 Constraints during the Evaluation Study

(1) In the first field study, the external evaluator and a local assistant planned to survey all of the target schools. However, the local assistant was unable to reach the primary school (P-4) in Sawra Town Woreda in Gamo Gofa Zone since the road to the school was blocked due to heavy rain. Therefore, the status of operation and maintenance of the primary schools' facilities were verified at the 10 primary schools through interviews with concerned parties at the schools and through visual observation except for P-4.

(2) The second field study was cancelled due to the influence of coronavirus disease 2019 (hereinafter called "COVID-19"), which spread throughout the world since March 2020. The external evaluator tried to collect additional information through the local assistant. Lockdowns in Ethiopia forced government officials and the field assistant to work from home. Under these circumstances, the internet environment was worse than usual, and it took a long time to collect information. In addition, the information that was to be collected directly from the implementing agency's database could not be obtained due to the cancellation of the second study.

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Consistency with the Development Plan of Ethiopia

During the ex-ante evaluation, the Government of Ethiopia formulated a series of poverty-reduction plans for it to become a middle-income country by 2020–2023 and was implementing the *Growth and Transformation Plan* (hereinafter referred to as "GTP") (2010/11-2014/15). One of the goals of GTP was to achieve the Millennium Development Goals in the social sector by expanding education and health services. In addition, the Government of Ethiopia was implementing the *Education Sector Development Program* (hereinafter referred to as "ESDP") *IV: 2010/2011-2014/2015* as an education sector strategy. ESDP-IV was aimed at i) improving the quality of education and ii) access to and equity of education, thereby realizing universal primary education by 2015 and universal general secondary education (G9–10) by 2020.

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[2] ③: High, ②: Fair, ①: Low

During the ex-post evaluation, in *GTP II (2015/16-2019/20)*, the Government of Ethiopia listed the "acceleration of human development and technological development and ensuring their sustainability" as one of the foundations of its strategy for achieving its national goal to become a low- and middle-income country by 2025. *GTP II* places education in an important role to make the national labor force a driver of industrialization and economic growth, and it establishes the strategy of securing primary education and promoting admission to secondary and higher education.[3] Regarding the education sector strategy, *ESDP-V (2015/16-2019/20)* focuses on improving the quality, access, equity, and internal efficiency of general education. The aim of ESDP-V is to increase the GER of primary education to 106% for both boys and girls by FY 2019/2020, as compared to 98% for girls and 105% for boys in FY 2013/2014. Another aim is to increase the GER of general secondary education to 74% for both boys and girls by FY 2019/2020, as compared to 37% for girls and 40% for boys in FY 2013/2014.[4]

In light of the above, this project which was implemented to improve access to and the educational environment of general education was highly relevant to the Government of Ethiopia's development policy, during both the ex-ante evaluation and the ex-post evaluation.

3.1.2 Consistency with the Development Needs of Ethiopia

(1) Need for Construction of Primary Education Facilities

During the ex-ante evaluation, the number of students and GER remained at high levels in the SNNPR (see Table 1). Although a number of primary schools were being built rapidly, there were many incomplete schools that could not teach all eight grades at the primary level. In fact, the number of students enrolled in second cycle primary (G5–8) is only half of the total number of students enrolled in the first cycle primary (G1–4), and the enrollment rate in second cycle primary was lower compared to that of first cycle primary.[5] During the ex-post evaluation, the number of students and GER remained at high levels. In view of the high dropout rate in G1, the Government of Ethiopia started preschool education one year before entering primary school, such as on reading and writing, in FY 2015/16, in order to reduce the dropout rate and repetition rate in first cycle primary. As a result, classrooms are required for preschool education in primary education facilities, and the need is high for more classrooms in primary education facilities.[6]

[3] Source: GTP II (2015), p80-81
[4] Source: ESDP-V (2015), p38
[5] Source: Preparatory survey report (2012) p1-3--1-4
[6] Source: Interviews with target schools during the field study.

Table 1: Primary Education Enrollment Status in the SNNPR

Enrollment /GER	Grade	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Enrollment	G1-4	2,404,787	2,524,903	2,524,314	2,552,697	2,734,514	2,884,592	3,103,661	3,133,283	3,084,808
	G5-8	1,267,381	1,267,381	1,323,207	1,290,021	1,305,585	1,392,728	1,492,096	1,530,793	1,616,512
	Total	3,672,168	3,792,284	3,847,521	3,842,718	4,040,099	4,277,320	4,595,757	4,664,076	4,701,320
GER (%)	G1-4	122.9	129.1	125.4	123.1	128.1	131.3	137.3	136.9	128.9
	G5-8	73.8	103.3	101.8	98.7	100.8	105.0	108.3	108.5	104.6
	Total	98.4	116.2	113.6	110.9	114.5	118.1	122.8	122.7	116.8

Source: Documents provided by the executing agency

(2) Need for Construction of Secondary Education Facilities

During the ex-ante evaluation, the Government of Ethiopia set a goal to achieve universal general secondary education (G9–10) by 2020. The GER of general secondary education (G9–10) was 35.5% in FY 2010/11 in the SNNPR (Table 2). This low GER was due to the low completion rate of primary education and the lack of construction funds, resulting in a limited number of secondary schools. Although GER is steadily increasing, it remained at 48% in FY 2018/19. Although the number of secondary schools has increased rapidly in recent years, there is gap between the goals for and the current situation of GER because the number of schools is insufficient for the enrollment and because many students give up going on to secondary school after completing their primary education because there is no school nearby.[7]

Table 2: Secondary Education Enrollment Status in the SNNPR

Enrollment /GER	Grade	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Enrollment	G9-10	276,207	n.a.	278,425	301,378	331,604	371,506	453,931	503,183	464,597
	G11-12	42,819	n.a.	47,562	57,662	66,766	77,178	96,767	118,571	110,086
	Total	319,026	n.a.	325,987	359,040	398,370	448,684	550,698	621,754	574,683
GER (%)	G9-10	35.5	n.a.	34.7	36.5	39.0	42.5	50.5	55.2	48.8
	G11-12	5.9	n.a.	6.4	7.5	8.4	9.5	11.6	14.0	12.4
	Total	21.2	n.a.	21.0	22.5	24.3	26.6	31.7	35.3	31.2

Source: Documents provided by the executing agency

In light of the above, the need for educational facilities was high for both primary and secondary education, at both the ex-ante and ex-post evaluation stages.

3.1.3 Consistency with Japan's ODA Policy

The Country Assistance Policy for Ethiopia (2012) of the Ministry of Foreign Affairs established education as a priority area for cooperation with Ethiopia from the perspective of human resource development to support food security and industrialization. In addition, in the *Yokohama Action Plan* (2008) formulated at the 4th Tokyo International Conference on African Development (TICAD IV), this project was positioned as an important project that could contribute to the realization of Japan's commitment in the education sector and to achievement of

[7] Source: Interviews with the regional education bureau, woreda education bureaus, and the target schools during ex-post evaluation.

the Millennium Development Goals in the education sector.[8] As seen above, this project was consistent with Japan's ODA policy during planning.

3.1.4 Appropriateness of the Project Plan and Approach

The obligations of the Government of Ethiopia included land formation and construction of the access roads for both primary and secondary schools. The obligations required only for secondary schools included securing the land; construction of the gates, fences, and guard rooms; removal of obstructions; electrical and water connections; the construction of sports grounds; and the provision of computers, science laboratory materials, educational equipment, books, etc.

The obligations for primary schools were completed as planned. Regarding the obligations for secondary schools, five of 10 secondary schools did not complete their electrical and water connections, and four schools did not construct fences and did not install computers and apparatus for distance learning curriculum. These incomplete obligations affect the operation of laboratories (for chemistry, biology, and physics) and Information and Communication Technology (hereinafter referred to as "ICT") centers (ICT education using computers), which require electricity and water.

At the project implementation stage, the procurement agency regularly checked the progress of the Government of Ethiopia's obligations at each step, such as the budget acquisition status, electric wire/utility pole installation, and transformer installation. When there was a delay, the procurement agency requested the Regional Education Bureau to promote to implement its obligations, in writing and through monthly meetings. The JICA Ethiopia office also requested that the Regional Education Bureau implement the obligations in writing several times. In response, the Regional Education Bureau requested that the zone education bureau and woreda education bureau complete the obligations.

In this way, the concerned parties within the project took all possible measures to deal with delays in the Ethiopian side's obligations, and the approach was generally appropriate. However, the SNNPR is composed of zones for each ethnic group, and the roles and presence of zones and woredas are stronger than in other regions. Given these characteristics of the region, it seems necessary for concerned parties to press directly not only the Regional Education Bureau but also the zone and woreda education bureaus and woreda administration, to think together about how to prepare financial resources with the target schools and communities. In fact, with regard to the schools, which shared the costs of electricity and water connections with the Parent Teachers' Association (hereinafter referred to as "PTA")[9] and the woreda education bureau, the local

[8] Source: Ex-ante evaluation table (2012), p1

[9] The basic structure of PTA is seven board members (2-4 teachers, 4-7 parents, and 1-2 students). Whether students participate as members depends on the school (Source: Interviews with the schools visited during the field study).

population paid a certain amount of money, in close cooperation with the woreda education bureau, the school, and the community.

In light of the above, this project's implementation has been highly relevant to Ethiopia's development plan and development needs as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

(1) Outputs of Japanese Side

Through this project, the construction of additional classrooms at 11 primary schools and school facilities at 10 secondary schools as well as the procurement of furniture for the target schools were carried out as planned (see Tables 3–6). In the case of grant aid implemented under a procurement management method, the planned value was the value of the detailed design, which was determined after the design was modified, so the plan in Tables 3 to 6 is the result of the third detailed design regarding the use of the remaining balance of the bid, and there was no difference between the plan and the actual results. As a change in the implementation stage, 32 additional classrooms in eight stories were constructed at four primary schools by utilizing the balance generated by the bids of the first and second groups of construction works.

Table 3: Planned and Actual Outputs of Construction of Additional Classrooms in Primary Schools

Item	Planned	Actual
Number of sites	11	11
Regular classrooms (story of 4 classrooms)	26	26
Total classrooms	104 (story of 4 classrooms × 26 stories)	104 (story of 4 classrooms ×26 stories)

Source: Documents provided by JICA

Table 4: Planned and Actual Furniture-Procurement Outputs in the Primary Schools

Room	Quantity		Furniture and Quantity (The number in parentheses indicates the quantity per room)	
	Plan	Actual	Planned	Actual
Regular classrooms	104	104	Combined desk (25), teacher's desk (1), teacher's chair (1), chalkboard (1), notice board (1)	As planned

Source: Documents provided by JICA

Table 5: Planned and Actual Outputs of Facility Construction in the Secondary Schools

Building	Planned	Actual	Remarks
Number of sites	10	10	
Regular classrooms	204	204	Regular classrooms (story of 4 classrooms) 17 × 4 = 68 classrooms Regular classrooms (story of 8 classrooms) 17 × 8 = 136 classrooms Total 204 classrooms
Library	10	10	
Science laboratory	30	30	Type A (1 science laboratory) 17 stories Type B (1 biology laboratory, 1 ICT center, and 1 satellite receiving room) 10 stories; Type C (1 science laboratory, 1 ICT center, and 1 technical drawing room) 3 stories
Administration building A	10	10	Director's office, secretary's office, deputy director's offices, administration and finance room, janitor room, and mini-media room
Administration building B	10	10	Staff room, department head's room, record room, and storeroom
Toilet A	20	20	8 booths (for students and teachers)
Toilet B	16	16	4 booths (for teachers and staff)

Source: Documents provided by JICA

Table 6: Planned and Actual Outputs of Furniture Procurement in the Secondary Schools

Room	Quantity		Furniture and Quantity (The number in parentheses indicates the quantity per room)	
	Planned	Actual	Planned	Actual
Regular classrooms	204	204	Tablet chair (40), teacher's desk (1), teacher's chair (1), chalkboard (1), notice board (1)	As planned
Library (capacity: 100)	6	6	Library desk (17), library chair (103), catalogue box (1), file cabinet (1), kneehole desk (1), bookshelf (10), chalkboard (1), notice board (1)	As planned
Library (capacity: 200)	4	4	Library desk (34), library chair (205), catalogue box (1), file cabinet (1), kneehole desk (1), bookshelf (20), chalkboard (1), notice board (1)	As planned
Science laboratory (physics)	10	10	Stool (40), teacher's desk (1), teacher's chair (1), demonstration table (1), work bench (20), cupboard A (4), cupboard B (1), chalkboard (1), notice board (2)	As planned
Science laboratory (chemistry)	10	10	Ditto	As planned
Science laboratory (biology)	10	10	Ditto	As planned
Technical drawing room	3	3	Teacher's desk (1), chair (41), drawing desk (40), chalkboard (1), notice board (1)	As planned
ICT center	10	10	Computer desk (20), chair (41), teacher's desk (1), shelf (1), whiteboard (1), notice board (1)	As planned
Director's office (incl. Secretary's office)	10	10	Office desk (2), meeting table (1), armrest chair (2), office chair (14), cupboard A (2), file cabinet (2), notice board ((1)	As planned
Vice director's offices (2 offices)	10	10	Office desk (2), armrest chair (2), office chair (4), cupboard A (2), file cabinet (2), notice board (2)	As planned
Department head's room	10	10	Office desk (8), office chair (8), cupboard A (8)	As planned
Staff room	10	10	Office chair (30), meeting table (5), chalkboard (1), locker (for 32 people)	As planned
Administration and finance office	10	10	Office desk (4), armrest chair (4), office chair (8), cupboard A (4), file cabinet (4)	As planned
Storeroom and record room	10	10	Office desk (1), office chair (1), cupboard A (5), file cabinet (1), bookshelf (4)	As planned

Source: Documents provided by JICA

(2) Outputs of Ethiopian Side

The outputs to be undertaken by the Ethiopian side prior to the commencement of construction works included securing the land for the secondary schools, forming the land construction of access roads (four secondary schools, three primary schools), and removing the obstructions. These were carried out as planned.

As shown in Table 7, the outputs required only for secondary schools were significantly delayed compared to the plan and were to be completed before the schools started operation (see 3.1.4 Appropriateness of the Project Plan and Approach). One reason for the delay was the delay in the process of securing budgets among woreda education bureaus. According to the procurement agency's monitoring on the progress of outputs as of June 2014, four out of the 10 target schools planned to "request budget in the next fiscal year" for electrical connection and

three out of 10 target schools for water connection. Considering that the fiscal year starts in July for Ethiopia, even if the application and approval process for budget acquisition were completed in the next year, namely in FY 2015, the budget would have been allocated in FY 2016. Considering that the project's completion was expected in FY 2015 in the initial plan, the budget acquisition procedure undertaken by woreda education bureaus undeniably was delayed.

Table 7: Progress on the Ethiopian Side's Obligations in the Secondary Schools

Item		At the time of final inspection (2016-17)			At the time of ex-post evaluation (2020)			Reasons for non-completion
		Completed	Underway	Not undertaken	Completed	Underway	Not undertaken	
1	Connection of Electricity	5	2	3	6	1	3	(1) Budget shortage of woreda. PTA cannot bear the necessary cost due to the large amount of cost. (S-2, S-5) (2) The woreda education bureau used the budget allocated for connection of electricity for teachers' residence construction and provided generator to the target school. The generator was out of operation at the time of the ex-post evaluation. (S-9) (3) Under procedure with Ethiopian Electric Power Authority. (S-6)
2	Water connection to school facilities[Note]	5	1	4	4	1	5	(1) The connection to the building is not completed due to lack of budget from the woreda. (S-1, S-2, S-4) (2) Water pipeline cannot be installed due to lack of budget of woreda. The zonal and woreda education bureau are planning to dig a well in the school. (S-5) (3) The fence installation is not completed because the residents of the neighboring woreda interfere with the fence installation. The school has not started connecting water pipes to the school building for fear of being cut by residents of the neighboring woreda. (S-6)
3	Construction of the gates, fences, and guard rooms	1	1	8	7	2	1	(1) Although the compensation for land acquisition was properly paid to the residents of the neighboring woreda, they requested further compensation and interfered with the installation of the fence. (S-6) (2) The fence installation delayed because the school could not raise funds for the fence installation. At the time of the ex-post evaluation, the community is installing a fence with the accumulated funds. (S-2, S-8)
4	Construction of drinking fountains	n.a.	n.a.	n.a.	9	1	0	
5	Installation of apparatus for distance learning curriculum	n.a.	n.a.	n.a.	6	1	3	(1) Apparatus was not installed because electricity has not been connected. (S-2, S-5) (2) The fence has not been constructed due to land problems with the neighboring woreda. The apparatus has not been installed since the school is afraid of the theft. (S-6)
6	Provision of computers	n.a.	n.a.	n.a.	7	0	3	
7	Provision of science laboratory materials	n.a.	n.a.	n.a.	10	0	0	
8	Provision of educational equipment and books for libraries	n.a.	n.a.	n.a.	10	0	0	

Source: Prepared by the evaluator based on the field study results
Note: The budget estimation during planning referred the water connection as connection of water to the school compound and did not include the costs of connecting water pipelines to the school facilities. However, because the facilities such as laboratory and handwashing facilities installed beside toilets can be operated properly with water, the evaluator judged the water connection to be completed if water pipelines were connected to the building.

3.2.2 Project Inputs

3.2.2.1 Project Cost

As for the project cost, because no information on the actual costs borne by the Ethiopian side was available, only the planned and actual costs borne by the Japanese side were evaluated. The total cost during planning was 1,394 million yen, with 1,310 million yen borne by the Japanese side and 84 million yen borne by the Ethiopian side. The actual cost borne by the Japanese side was 1,310 million yen (100% of the planned budget), which was as planned.

3.2.2.2 Project Period

As shown in Table 8, the actual project period was 47 months, against a planned 36 months (130% of the planned period). The difference between the plan and the actual result was because the construction period was 183% to 220% of the plan, as a result of the construction works from the schedule being delayed for all of Groups 1, 2, and 3 involved in the facility construction. The main reasons for the delay are as follows. (1) Under Japan's Grant Aid for Community Empowerment, Ethiopian contractors undertook the construction works of this project. Most of the contractors were not conscious of complying with the contract construction period. (2) Many Ethiopian contractors tend to struggle to raise funds when undertaking multiple constructions in parallel. In fact, the contractors engaged in this project were unable to allocate workers or purchase materials in time for the construction period.

In response to this situation, the concerned parties took all possible measures. The construction supervision consultant took more time to control the process than they did for the general grant aid, for which construction works are undertaken by a Japanese contractor, and confirmed the contractors' financial status in detail. In addition, the procurement agency convened with the construction supervision consultant and the contractors every month, confirmed the progress with all the parties concerned, requested that the contractors take remedial measures against delays, and checked the implementation status of the remedial measures the following month. Through these measures, some contractors showed improvement, but others did not, resulting in delays in the overall construction period.

Table 8: Planned and Actual Project Periods

	Planned [Note]		Actual result	
	Period	Months	Period	Months
Overall period	January 2013- December 2015	36 months	January 2013– November 2016	47 months

Source: Documents provided by JICA

Note: The period started on the month when the procurement agency contract was concluded and ended when all of the works and procurements were completed. However, the period for the reimbursement procedure is not included. The schedule was revised in August 2014, when additional procurement (Group 3) was approved, and it was regarded as the plan after design changes.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, the project's efficiency is fair.

3.3 Effectiveness and Impacts[10] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

(1) Number of Students per Classroom in the Project Primary Schools (Table 9)

A total of 72 classrooms were constructed for the 11 schools through this project. The number of students per classroom was 55, against the target of 59. Classroom overcrowding has been significantly reduced at all of the target schools, and the degree of achievement of the indicators is high.

Table 9: Number of Students per Classroom in the Project Primary Schools

Indicator	Baseline (2012)	Target (2018) 3 years after completion	Actual (2019) 3 years after completion
Number of students per classroom in the project primary schools	94 Note 1	59 Note 2	55

Source: Documents provided by JICA, the executing agency, and the construction supervision consultant
Note 1: The baseline in 2012 was the number obtained by dividing the total number of classrooms (121) at the 10 target schools by the total number of students enrolled (11,382) as of 2012.
Note 2: Assuming that the number of enrolled students did not change, the total number of classrooms after the project's completion (193) was divided by the total number of enrolled students (11,382) at the 10 target schools in 2012.

(2) Number of Newly Enrolled Students in the Targeted Secondary School Catchments in Rural Areas

In this project, six secondary schools were constructed in the target rural areas. During planning, this indicator was regarded as the enrollment capacity at the secondary level in the targeted school catchments in rural areas in the preparatory survey report. During the ex-ante evaluation, this indicator was changed to the number of newly enrolled students, but the calculation basis was the same as that for the enrollment capacity (Table 10). The evaluator judged that enrollment capacity was not suitable as an indicator for measuring the project's effects because the indicator is naturally achieved when the classrooms are constructed as planned. In this ex-post evaluation, in light of the project objective of improving access to basic education, the forecast and actual results of the number of enrolled students were compared (Table 11).

[10] The sub-rating for effectiveness is to be considered with impacts.

Table 10: Number of Newly Enrolled Students in the Targeted Secondary School Catchments in Rural areas (indicator as of ex-ante evaluation)

Indicator	Baseline (2012)	Target (2018) 3 years after completion	Actual (2019) 3 years after completion
Number of newly enrolled students in the targeted school catchments in rural areas	0	6,080 Note	6,080

Source: Documents provided by the construction supervision consultant
Note: Basis for calculating the target value: Number of planned classrooms (76) ×the number of students who can be accommodated (40 students) ×2 shifts = 76×40 students ×2 shifts = 6,080 students

Table 11: Number of Newly Enrolled Students in the Targeted Secondary School Catchments in Rural Areas (Indicators as of Ex-post Evaluation)

School ID	Plan			Result					
						(b) Enrollment			
	Classrooms	Enrollment capacity	(a) Projected number of students Note	Classrooms	Enrollment capacity	2016/17	2017/18	2018/19	Result/ prediction (b/a)
S-2	16	1,280	1,097	16	1,280		1,620	491	45%
S-3	16	1,280	1,043	16	1,280	507	485	498	48%
S-5	12	960	935	12	960	492	1,692	863	92%
S-7	8	640	610	8	640	158	209	267	44%
S-8	16	1,280	1,231	16	1,280	1,018	1,311	1,999	162%
S-9	8	640	372	8	640	208	268	345	93%
Total	76	6,080	5,288	76	6,080	2,383	5,585	4,463	84%

Source: Documents provided by JICA and the executing agency
Note: The secondary enrollment in FY 2014/15 (G9–10) of each project school was projected based upon the actual primary enrollment of FY 2011/12 (G6–8) in the catchment. Additionally, the student increase/decrease associated with promotion from one grade to the next was considered: G6 => G7:100%, G7 => G8: 100%, G8 => G9: 75%, and G9 => G10: 70%. As for G6 => G7, G7 => G8, and G9 => G10, the coefficients were based upon the annual average over the past 5 years, while the coefficient of G8 => G9 was obtained from the short-term target indicator of the Education Bureau of SNNPR (Source: Preparatory survey report).

The number of students who were newly enrolled in the six target secondary schools in rural areas was 4,463, against the forecast of 5,288 (84% of the forecast). Although the result was lower than the forecast in some secondary schools, it was judged that the indicator was almost achieved as a whole. The main reason why the actual results were lower than the forecasts was that new secondary schools had been established in the neighborhood, and this information could not be confirmed at the planning stage of this project.

(3) Number of Students per Classroom in the New Project Secondary Schools in Urban Areas

Table 12 shows the average number of students per classroom at the four target schools constructed in urban areas by this project.

Table 12: Number of Students per Classroom
in the New Project Secondary Schools in Urban Areas

Indicator	Baseline (2012)	Target (2018) 3 years after completion	Actual (2019) 3 years after completion
Number of students per classroom in the new project urban secondary schools	165 Note 1	65 Note 2	74

Source: Documents provided by the construction supervision consultant
Note 1: The baseline is the number calculated by dividing the total number of students (13,556 students) at four existing urban secondary schools before the start of the project (2012) by the total classrooms (82 classrooms) of the four schools.
Note 2: The target is the number calculated by dividing the number of existing classrooms (82) by the number of planned classrooms (128) in this project (210 classrooms), assuming that the number of students was 13,556, which is the same as during planning.

The number of students per classroom was 74, against the target of 65 (achievement level 87.8%). The status by school is as follows. As shown below, overcrowding of classrooms was alleviated in three of the four target school zones, so this indicator was almost achieved.

- S-1: The existing school in the school zone had 85 students per classroom before the project's implementation. After the project's completion, the number of students per classroom at S-1, constructed by this project, decreased to 40.[11] Overcrowding at the existing school has also been alleviated.
- S-4: Overcrowding at the existing school in the school catchment has been significantly reduced, as compared to before the project's implementation.[12]
- S-10: The number of students per classroom before the project's implementation was 76.4. It was 60 after the project's completion. Overcrowding has been alleviated.
- S-6: The number of students per classroom at the existing school in the school catchment before the project's implementation was 79.6, but overcrowding has hardly changed after the project's completion. Fences and gates remain uninstalled at S-6 because of obstruction by residents of the neighboring woreda due to land issues. Therefore, students cannot go to school with peace of mind. In addition, residents prefer the existing school to S-6, since S-6 is not equipped with electricity and water supply, while there are abundant educational materials such as laboratory materials, books in the library, and computers at the existing

[11] Source: Interviews with the target school. The executing agency requested data from the existing school, but the data could not be obtained.
[12] Source: Interviews with students at the target school who attended the existing school before the project's implementation.

school.[13]

3.3.1.2 Quantitative Effects (Operation Indicators)

In the ex-post evaluations of similar projects for primary and secondary school construction, it is common to confirm whether the facilities constructed by the project are operated according to the original purpose, as operation indicators. Therefore, operation indicators were judged as necessary in this ex-post evaluation, and they were added with the consent of the concerned parties.

Table 13 shows the operational status of the school facilities constructed for this project during the ex-post evaluation. The regular classrooms at the primary schools are being used as intended. At the secondary schools, it was confirmed that regular classrooms were being used for purposes other than classes, such as club activities for schools with vacant classrooms due to smaller numbers of enrolled students than expected. Nevertheless, 80% of the regular classrooms are used as regular classrooms, as originally intended.[14] In addition, although the operation of special classrooms such as laboratories (for chemistry, biology, and physics) and ICT centers varies depending on the status of electricity and water connections, these facilities are operated as originally intended or partially so in 70–80% of the target secondary schools. The fact that special classrooms that require electricity and water are not fully operational in some schools is mentioned in 3.2.1 (2) Outputs of the Ethiopian Side. In addition to delays in the woreda education bureau's budget-acquisition process, intensified ethnic conflicts in some parts of the SNNPR since 2016 have led to significant population influxes into the surrounding areas. As a result, budget allocations have prioritized measures for internally displaced persons, which has a great influence on woreda education bureaus in securing the budget.[15] In this ex-post evaluation, as a result of the emphasis on the operation of regular classrooms, in light of the social factors that made it difficult to secure the budgets and the project objective of improving access to basic education, it was judged that the facilities constructed by this project were fully operational.

[13] Source: Interviews with the target school and its zonal education bureau and woreda education bureau.
[14] Source: On-site observation and interviews.
[15] Source: Information provided by JICA.

Table 13: Operational Status of Facilities

	Facility	Quantity	Operational status				Remarks
			A: Used as originally intended	B: Partially used	C: Unused	D: Used for other purposes	
Primary schools							
1	Regular classrooms	104	103	0	0	1	One regular classroom is used as a teaching material preparation room at one school.
Secondary schools							
1	Regular classrooms	214	167	0	0	37	In schools where the number of students is small relative to the number of classrooms, regular classrooms are unused or used for other purposes such as tutoring, club activities, storeroom and guard room.
2	Science laboratory (chemistry)	10	3	5	1	1	At six schools, the laboratories are unused for reasons such as no water supply being installed in the school compound, water pipes not connected to the laboratory building, lack of experimental equipment, no laboratory technicians assigned or their turnover. They are used as a self-study room or a regular classroom.
3	Science laboratory (biology)	10	3	5	1	1	
4	Science laboratory (physics)	10	3	4	1	2	
5	Library	10	10	0	0	0	
6	ICT center	10	3	2	2	0	Partially used or unused due to no electricity connection and no computer deployed.
7	Drawing room	3	0	0	3	0	At the time of the planning, drawing was a subject to be learned in G12, but at the time of the ex-post evaluation, it was excluded from the curriculum of preparatory secondary education due to the curriculum revision of the Ministry of Education.
8	Administration building [Note]	10	10	0	0	0	
9	Toilets for teachers and students	10	10	0	0	0	

Source: Prepared by the evaluator based on the field study results
Note: The administration building includes the office of director and secretary, vice director's offices, administration and finance office, record room, store room, staff room and department head's room.

In light of the above, as a result of comprehensively evaluating the three effect indicators, it is judged that access to basic education and improvement of educational environment are sufficiently achieved. In addition, the facilities constructed by this project are fully operational in both primary and secondary schools. There are cases where facilities other than regular classrooms are not used as original purpose, but as a result of focusing more on the operational status of regular classrooms in line with the purpose of this project, such as alleviating overcrowding of classrooms in urban areas and improving access to secondary education in rural areas, it is judged that the facilities constructed by the project are fully operational.

3.3.2 Impacts

3.3.2.1 Intended Impacts

In this project, improved access to basic education and education environment was assumed as an impact. In the ex-post evaluation, regarding these impacts, (1) improved school attendance, (2) changes in teachers' motivation to teach and in their class management by upgrading

incomplete schools to complete ones, and (3) changes in students' motivation to attend school have been verified.

(1) Improvements to School Attendance

1) Repetition Rate and Dropout Rate

Quantitative data was unavailable for primary schools, but through interviews with school directors and teachers at the 10 schools that were visited in this ex-post evaluation, it was confirmed that overcrowding of classrooms was alleviated, and students were able to concentrate on their classes after additional classrooms were constructed through this project. It was also confirmed that the motivation for learning increased and that the repetition and dropout rates decreased. Regarding the secondary schools, the data provided by the executing agency was inadequate and could not be confirmed by quantitative data, but at the six secondary schools in rural areas, the commuting distances and times decreased as compared to before the project's implementation. From this, it was confirmed that late arrivals and dropouts decreased.

(2) Changes in Teachers' Motivation to Teach and in Their Class Management by Upgrading Incomplete Schools to Complete Schools

Before the project's implementation, eight of the 11 targeted primary schools were incomplete, but all of them were upgraded to complete schools after the project's implementation. As a result of alleviating classroom overcrowding and reducing the number of students per teacher, the burden of teachers to manage class was reduced and teachers' motivation to teach was improved.[16] For example, before the project's implementation, teachers could not practice group discussions in their class due to overcrowding, but after the project's completion, they could practice group discussions. The alleviation of overcrowding has also allowed teachers to treat their students more comfortably. It was also confirmed that the construction of high-quality facilities has improved teachers' motivation to teach, such as through teachers staying at school and spending more time preparing for classes.

(3) Changes in Students' Motivation to Attend School

The increase in students' motivation to attend school due to the alleviation of classroom overcrowding was confirmed in all of the surveyed primary and secondary schools. Before the project's implementation, at the primary schools, students were sitting on the floor of the classroom, bringing chairs from home to school, or sitting at a two-seater combined desk with 3–4 students, so they were unable to study at ease. After the project's completion, the students were

[16] Source: Interviews with school directors, teachers and parents of primary schools visited.

able to sit at two-seater combined desks with two students and could write at the desk without feeling cramped, as a result of the improved learning environment. Before the project's implementation, students sometimes went outside because they could not enter the classroom, but this situation disappeared after the project's completion.[17]

Regarding the secondary schools, before the project's implementation, at the existing target schools' zones in urban areas, students attended classes in a cramped state; two students would share a tablet chair designed for one person. After the project's completion, all students were able to sit in a tablet chair and concentrate on class. In rural areas, before the project's implementation, students either attended a secondary school 15–20 km away or stayed in the town where the secondary school was located. After the project's completion, students in the target rural areas were released from long-distance commuting, and late arrivals and absenteeism decreased. These results are due to improvements in students' motivation to learn. In addition to the reduced commuting distances and times, schools having laboratories and libraries also motivates students to learn. In addition, the construction of separate toilets for men and women in the secondary schools has made it possible for female students, in particular, to comfortably use the toilets without encountering the sexual harassment that had previously occurred.

Furthermore, in rural areas, economic effects were confirmed, such as reduced household spending by reducing the burden of commuting to school and increased sales profits because students buy goods at kiosks (retail stores) in the community.

Regarding the impacts, the alleviation of classroom overcrowding and the construction of high-quality facilities, including additional classrooms for primary schools, through this project improved teachers' motivation to teach as well as class management. In addition, the alleviation of overcrowding in classrooms reduced student absenteeism and late arrivals and improved learning motivation. Furthermore, the numbers of late students, dropouts, and repetitions decreased in the secondary schools after the project's completion due to the alleviated overcrowding of classrooms in urban secondary schools and the shortening of commuting distances and times in rural areas, and the motivation for learning has improved. In light of the above, it has been confirmed that improving the learning environment has improved the motivation among teachers to teach, and the impacts of improving class management and students' motivation to learn have been realized.

[17] Source: Interviews with school directors, teachers and parents of primary schools visited.

Students concentrating on class
in a primary school

Students sitting on tablet chairs
in a secondary school

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

This project had no negative impacts on the natural environment.

(2) Resettlement and Land Acquisition

At the planning stage, when the parties involved in the preparatory survey confirmed woreda administration of the target sites, resettlement and land acquisition due to this project's implementation were not planned, and no negative social impacts were expected. During the ex-post evaluation, the following two cases of resettlement and land acquisition during the construction of the secondary schools were confirmed.

1) Wolkite Town Woreda in Guraghe Zone (S-6)

In the construction of school S-6 in Wolkite Town Woreda, Gurage Zone, it was necessary to relocate some of the residents in order to use the neighboring woreda's residential area as a sports ground. Compensation was properly paid to the relocated residents of the neighboring woreda during the project's implementation, but the residents demanded additional compensation from the woreda administration. In addition, residents of the neighboring woreda have prevented the school from installing fences multiple times. Because a fence has not been installed, the school is afraid of theft and destruction of school equipment due to invasion by outsiders, and the water pipes have not been connected to the laboratory building, nor have computers been provisioned. The effect is as described in "3.3.1.1 Quantitative Effect (Effect Indicators) (3) Number of Students per Classroom in the New Project Secondary Schools in Urban Areas".

2) Dilla Zuria Woreda, Gedeo Zone (S-5)

During the ex-post evaluation, in Dilla Zuria Woreda, Gedeo Zone, school S-5 was in the process of acquiring land for a sports ground from the land owner.

In light of the above, this project's implementation has fully contributed to alleviating overcrowding at the existing primary schools and to improving access to basic education as well as the educational environment through the construction of new secondary schools. The implementation has generally achieved the initial project's effect targets. In addition, all 20 visited schools had impacts such as reduced dropouts and repetition, improved motivation for learning, improved teachers' motivation for teaching, and improved class management through an improved educational environment. Therefore, the effectiveness and impact of the project are high.

3.4 Sustainability (Rating:②)

3.4.1 Institutional/Organizational Aspect of Operation and Maintenance

The roles of stakeholders in education from the planning stage to the ex-post evaluation are shown below.

Table 14: Administrative Organization in the Education Sector

Organization	Role
Regional education bureau	To formulate and implement regional education development plans, provide professional and technical support to zonal and woreda education bureaus, assign teachers, develop and formulate primary education curricula, standardize education levels in the region, and supervise construction projects by donors
Zonal education bureau	To implement various tasks and activities that cannot be carried out at the woreda level, coordinate the distribution of textbooks, and distribute teaching materials
Woreda education bureau	To establish and manage primary, secondary and vocational training schools, form concrete plans based on regional education development plans and their implementation, comply with federal and regional education standards, form measures for disseminating education in the woreda (especially primary education) and their implementation, and form necessary community-mobilization plans for constructing schools and procuring educational equipment
Community	To provide labor, materials, and funds for the school's operation and maintenance through a PTA and share maintenance costs and form and monitor the school-improvement plan (including the budget)

Source: Developed by the evaluator based on the field study

With regard to the assignment of teachers, almost the required number of teachers is assigned in both primary and secondary schools. Regarding school staff, since the primary schools are existing schools, it was not necessary to increase the number of staff, which was sufficient even at the time of ex-post evaluation. Most of the secondary school staff serve as multiple posts due to a lack of budget, but there is no problem with the school's functioning. Since FY 2016, six out of 10 secondary schools have not assigned laboratory technicians because the budget for internally displaced persons has been prioritized in the SNNPR and has not been sufficiently allocated to the woreda education bureaus. Due to that, there is a problem that experiments cannot be properly conducted in these schools.

PTA is active in all target schools. The main roles of PTA are (1) formulation and monitoring of the school improvement plan, (2) awareness-raising activities to promote school attendance, (3) sharing of school operation and maintenance costs, and (4) provision of labor for school maintenance and so on.

It was confirmed that the operation and maintenance system of the target primary schools did not change from the planning stage to the time of the ex-post evaluation and that the target schools were functioning without any problems. In the secondary schools, the PTA actively participates in the operation and maintenance. Although the operation system is generally functioning, the lack of staff has affected the facility's operation. The support of the woreda education bureau, which plays a central role in operation and maintenance, is weak, and the overall operation and maintenance is judged to be moderate.

3.4.2 Technical Aspect of Operation and Maintenance

(1) Items, Frequency, Implementer, and Records of Daily Maintenance

At almost all the target schools, PTA or school staff inspect facilities and equipment at a frequency set by the school, mainly during school closures (Table 15). The school or PTA repairs the defect, and the local repair company repairs the facilities that the school cannot handle.

Table 15: Frequency of Periodical Inspection

	Frequency			
	Twice a year (end of semester)	Once a year (end of school year)	Every 3 months	Irregular
Primary schools	7	2	1	0
Secondary schools	7	2	0	1

Source: Developed by the evaluator based on interviews conducted at the time of the field study

At the planning stage, it was said that the facilities to be constructed under the project would not require maintenance for a few years after handing them over to the Ethiopian side. As shown in Table 16, the volume of defects in the 10 primary schools visited was small in four schools, medium in four schools, and large in two schools. Overall, the schools are generally dealing with defects without problem. For the secondary schools, although only 3–4 years have passed since the start of operation, observation at the time of ex-post evaluation revealed defects such as the door key and handle coming off, the door itself being damaged or missing, the tablet chair being damaged, and the fittings being loose. The volume of neglected defects in the 10 target schools was large in four schools, medium in four schools, and small in two schools. As a whole, it cannot be said that taking measures to defects is sufficient (Table 17). The schools repair defects collectively during the school holidays between the first and second semesters in February and during the school holidays between school years in July and August. Most of these defects seem

to be able to be repaired in a usable state if they are repaired immediately when they were noticed, but most of the defects are left unrepaired for half a year to over 1 year because they usually repair defects collectively during the school holidays.

Table 16: Technical Sustainability and Maintenance Status by School (Primary Schools)

School ID	Zone	Woreda	School	Defects unrepaired Note1	Results of direct observation	Technical sustainability Note 2
P-1	Dawuro	Mareka	Tercha	3	The classrooms and desks are kept very clean, although some notice boards, blackboards and doors are damaged.	3
P-2	Siltie	Worabe Town	Duna	2	5 desks are damaged out of 46 desks checked. One window glass is left broken.	2
P-3	Wolayita	Areka Town	Addis Fana	2	・ 3 holes in a blackbord. ・ 2 notice boards are damaged out of 2 notice boards observed.	2
P-4	Gamo Gofa	Sawula Town	Botre	n.a.	n.a.	n.a.
P-5	Gamo Gofa	Mearab Abaya	Koyite Millennium	2	The classrooms and desks are kept very clean, although some notice boards and doors are damaged.	2
P-6	Sidama	Malga	Tankaro	2	・ 10% of the desk is damaged. ・ The doors of 7 of the 8 classrooms are	2
P-7	Sidama	Dale	Abosto Tula	1	・ 10% of the desk is damaged. ・ The doors of 5 of the 8 classrooms are damaged. ・ The notice boards in 4 of the 8 classrooms	1
P-8	Gedeo	Yirga Chefe Town	Abeyot Fere	1	・ The doors of 4 of the 8 classrooms are damaged. ・ The notice boards of 3 of the 8 classrooms are damaged.	1
P-9	Kembata Tembaro	Tembaro	Bajo	3	There is a leak in the ceiling in one place, but the desk, bulletin board, and blackboard are not damaged, and the classroom is well cleaned.	3
P-10	Hadiya	Misha	Hagiye	3	Although some notice boards and doors are damaged, the desks are used very carefully and the classrooms are kept clean.	3
P-11	Hawassa City	-	Edget Bandnet	3	Although some notice boards and doors are damaged, the desks are used very carefully and the classrooms are kept clean.	3

Volume of defects unrepaired	Number	Technical sustainability	Number
Small	4	High	4
Medium	4	Medium	4
Large	2	Low	2

Source: Developed by the evaluator based on visual confirmation and interviews conducted at the time of the field study

Note 1: The judgment was made as follows, mainly based on the visual results at the time of the field study: 3: Many defects (e.g., nearly 20% of desks and chairs and more than half of doors and bulletin boards are damaged); 2: Medium (around 10% of desks and chairs and 10 to 40% of other equipment are damaged); and 1: Less (some damage is found, but there are almost no problems in general).

Note 2: The following judgments were made based on visual inspection of the facility at the time of the field study and interviews with school officials: 3: High (fixing defects in a timely and appropriate manner); 2: Medium (fixing defects to some extent); and 1: Low (leaving defects that can be repaired immediately).

Table 17: Technical Sustainability and Maintenance Status by School (Secondary Schools)

School ID	Zone	Woreda	School	Defects unrepaired [Note1]	Results of direct observation	Technical sustainability [Note 2]
S-1	Halaba	Halaba Town	Kulito	2	- The water supply pipes in the laboratory and handwashing facilities in toilets are disconnected. -Taps for hand-washing in the toilet are missing.. - Many electric switches are missing.	1
S-2	Hadiya	Soro	Berkuncho	2	Repairs to electricity and water that have been out of order for more than half a year have not been completed (the school has not been able to identify the cause).	1
S-3	Hadiya	Lemo	Jawe	3	Although there are leaks on the ceiling, there is almost no damage to the tablet chairs, notice boards, and doors found in other secondary schools, and the facilities and equipment are generally well maintained.	3
S-4	Sidama	Aleta WondoTown	Belesto	1	- Half of the doors of the 12 general classrooms observed were damaged (no doorknobs, doors left off, etc.) - Electricity switches are missing in half of the 12 general classrooms observed. -The window glass of the laboratory is left broken.	1
S-5	Gedeo	Dilla Zuriya	Kuka Tumticha	1	- 40 out of 240 tablet chairs observed are damaged. - Most of the electric switches in the regular classrooms and corridors are missing.	1
S-6	Guraghe	Wolkitie Town	Camp Sefer	2	The water supply pipe, faucet and some doors of toilets for students are missing.	2
S-7	Guraghe	Soddo	Tiya	3	Some ceiling leaks and cupboards with the glass doors removed are found, but there was almost no damage to tablet chairs, notice boards, doors, etc. as seen in other secondary schools.	3
S-8	Wolayita	Bolloso Sorrie	Gurumo Koyisha	2	Although there is one leak on the ceiling of the corridor, the facilities and equipment are generally well maintained.	2
S-9	Siltie	Sankura	Jata	1	- 15% of tablet chairs in general classrooms are damaged. - All 8 notice boards observed are damaged. - 5 out of 8 doors observed are damaged. - 4 out of 8 electric switches observed are damaged.	1
S-10	Gamo Gofa	Arba Minch Town	Chamo	1	- All the 4 notice boards in general classrooms observed are damaged. -15 of the 43 tablet chairs observed are damaged. In addition, damaged chairs are piled up behind the school building.	1

Volume of defects unrepaired	Number
Small	2
Medium	4
Large	4

Technical sustainability	Number
High	2
Medium	2
Low	6

Source: Developed by the evaluator based on visual confirmation and interviews conducted at the time of the field study

Note 1: The judgment was made as follows, mainly based on the visual confirmation the time of the field study: 3: Many defects (e.g., nearly 20% of desks and chairs and more than half of doors and bulletin boards are damaged); 2: Medium (around 10% of desks and chairs and 10 to 40% of other equipment are damaged); and 1: Less (some damage is found, but there are almost no problems in general).

Note 2: The following judgments were made based on visual confirmation of the facility at the time of the field study and interviews with school officials; 3: High (fixing defects in a timely and appropriate manner); 2: Medium (fixing defects to some extent); and 1: Low (leaving defects that can be repaired immediately)

As mentioned above, although it is evaluated that the target schools carry out daily inspections at a certain frequency, it was judged that the technical sustainability is moderate because the repairs of secondary schools' defects are not timely and appropriate.

Tablet chair without tablet

Removed doors and notice boards stored in the store

3.4.3 Financial Aspect of Operation and Maintenance

The budget for school operation and maintenance is funded by public subsidies and community support. The former includes (1) Block Grant[18] and (2) GEQIP School Grant,[19] and the latter are (1) PTA annual fees, (2) donations, (3) income-generating activity profits, and (4) tuition fees (25–125 Birrs/year for G11–12 students). Tables 18 and 19 show the evaluation of the operation and maintenance budget and financial sustainability of the target primary schools, and Tables 20 and 21 show those of the target secondary schools.

Table 18: Operation and Maintenance Budget by School (Primary Schools)

Unit: Ethiopian Birr

School ID	P-1		P-2		P-3		P-4		P-5		P-6		P-7		P-8		P-9		P-10		P-11	
	At the time of planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)	At the Time of Planning (2011/12)	At the Time of Ex-post Evaluation (2019/20)
Enrollment	267	379	240	888	2,356	2,332	3,360	2,179	385	431	223	1,200	1,077	1,024	1,752	1,955	645	921	353	614	724	1,150
Source of Budget																						
1. Public Subsidies																						
(1) Block Grant	3,370	0	4,065	30,945	31,491	29,325	n.a.	n.a.	n.a.	6,640	3,587	9,000	15,768	13,972	22,920	11,780	2,600	0	3,375	0	7,960	27,000
(2) School Grant	10,115	8,019	10,480	21,044	94,255	46,261	n.a.	n.a.	n.a.	8,884	14,000	25,000	23,065	45,665	67,038	40,000	21,000	19,933	13,335	12,978	41,200	34,000
(3)Total of Public Subsidies ((1)+(2))	13,485	8,019	14,545	51,989	125,746	75,586	n.a.	n.a.	12,320	15,524	17,587	34,000	38,833	59,637	89,958	51,780	23,600	19,933	16,710	12,978	49,160	61,000
Annual Public Subsidies per Student	51	21	61	59	53	32	n.a.	n.a.	32	36	79	28	36	58	51	26	37	22	47	21	68	53
Comparison of Public Subsidies at the times of Planning and Ex-post Evaluation (%)		42%		97%		61%		n.a.		113%		36%		162%		52%		59%		45%		78%
2. Community Contribution Note																						
(1) PTA Annual Fees and Donations	0	5,000	2,000	5,980	55,494	130,500	n.a.	n.a.	n.a.	15,250	4,000	0	4,400	0	10,000	9,000	2,700	6,000	5,000	52,000	7,200	320,000
(2) Income-generating Activity	0	0	900	0	7,200	10,000	n.a.	n.a.	n.a.	0	0	4,600	0	0	34,000	0	0	6,000	6,000	20,000	0	0
(3)Total Community Contribution ((1)+(2))	0	5,000	2,900	5,980	62,694	140,500	n.a.	n.a.	n.a.	15,250	4,000	4,600	4,400	0	44,000	9,000	2,700	12,000	11,000	72,000	7,200	320,000
Total of Budget (1+2)	13,485	13,019	17,445	57,969	188,440	216,086	188,581	n.a.	12,320	30,774	21,587	38,600	43,233	59,637	133,958	60,780	26,300	31,933	27,710	84,978	56,360	381,000
Budget per Student	51	34	73	65	80	93	56	n.a.	32	71	97	32	40	58	76	31	41	35	78	138	78	331
Comparison of Total Budget at the Times of Planning and Ex-post Evaluation (%)		68%		90%		116%		n.a.		0%		33%		145%		41%		85%		176%		426%

Source: Preparatory survey report and developed by the evaluator based on the interviews at the time of ex-post evaluation.

Note: The amount at the time of planning is the actual result confirmed at the time of the preparatory survey (2011).

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[18] Subsidies distributed by the Federal Government. They are distributed from the Federal Ministry of Education to the regional education bureau and then to the woreda education bureau. The amount per student is 10 Birrs per year for G1–4 and 15 Birrs per year for G5–8 at the time of planning (2011), 25 Birrs per year for G5–8, and 20 Birrs per year for G1–4 at the time of ex-post evaluation (2020). Although the amount is fixed, the actual amount varies depending on the financial situation of the region and woreda (Source: Interviews with the Regional Education Bureau at the time of ex-post evaluation).

[19] As part of the school improvement plan of GEQIP, a fixed amount per student is allocated directly to the school. The amount was 40 Birrs per student per year at the time of planning (2011) and 50 Birrs per year at the time of ex-post evaluation (2020) (Source: Interviews with the Regional Education Bureau at the time of ex-post evaluation).

Table 19: Evaluation of Financial Sustainability by School (Primary Schools)

School ID	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11
(1) Pubic subsidies [Note]	1	3	1	n.a.	1	1	1	1	1	1	3
(2) Community contribution	1	1	3	n.a.	3	1	1	1	1	3	3
(3) Sufficiency of operation and maintenance costs according to the schools	1	1	1	n.a.	1	1	1	1	1	1	1
Overall evaluation	1	2	2	n.a.	2	1	1	1	1	2	2
Remarks	- Block grant has not been distributed. - The amount collected from the community is small.	The amount collected from the community is small.	The amount of public subsidy is small compared to the number of students.	Site survey was not conducted due to road blockage caused by heavy rain.	- The amount of public subsidy is small compared to the number of students. - The amount of annual fee collected by PTA is large.	- The amount of public subsidy is small compared to the number of students. - The source of cash income is scarce and it is difficult to obtain financial support from the community.	- The amount of public subsidy is small compared to the number of students. - At the time of the ex-post evaluation, there was no financial support from the community due to ethnic issues.	- The amount of public subsidy is small compared to The number of students. - The amount collected by PTA is also small.	- Block grant has not been distributed. - The amount collected from the community is small.	- Block grant has not been distributed. - A lot of financial support for the community such as annual fee collection from parents and hay sales income.	Sufficient public subsidy community support.

Source: Developed by the evaluator based on interviews during the field study
Note: The degree of sufficiency of each item is judged to be 3: High, 2: Medium, and 1: Low in three stages. Public subsidy is judged to be 1 if Block Grant was not allocated as of March 2020. Also, when it is less than the specified amount, it is judged to be 1.

The primary schools make up the lack of public subsidies with annual PTA fees and donations and profit gained from income generation activities such as selling livestock and hay for livestock under the initiative of PTA. All of the 10 primary schools visited stated that the operation budget was not sufficiently allocated, even for purchasing consumables to be used at school, and thus the maintenance budget was insufficient. Taking into account public subsidies and community support, the overall financial status is judged to be medium in five out of 10 visited schools and low in five schools.

Table 20: Operation and Maintenance Budget by School (Secondary Schools)

Unit: Ethiopian Birr

School ID		S-1		S-2		S-3		S-4		S-5		S-6		S-7		S-8		S-9		S-10	
Number of classrooms		32		16		16		32		12		32		8		16		8		32	
Enrollment [Note 1]	Grade	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
	G9-10	2,080		1,280	720	1,280	517	2,560	2,007	960	836	2,080	1,138	640	312	1,280	950	640	250	2,080	
	G11-12	480		0	0	0	0	0	0	0	0	480	0	0	0	0	0	0	0	480	
	Total	2,560	1,568	1,280	720	1,280	517	2,560	2,007	960	836	2,560	1,138	640	312	1,280	950	640	250	2,560	775
Source of budget																					
1. Public subsidies																					
(1) Block Grant [Note 2]		41,600	0	25,600	17,000	25,600	0	51,200	32,000	19,200	12,937	41,600	60,000	12,800	6,900	25,600	0	12,800	6,500	41,600	53,595
(2) School Grant [Note 3]		132,800	30,800	64,000	10,000	64,000	9,854	128,000	126,010	48,000	20,866	132,800	230,000	32,000	6,400	64,000	16,321	32,000	4,693	132,800	28,754
(3)Total of public subsidies ((1)+(2))		174,400	30,800	89,600	27,000	89,600	9,854	179,200	158,010	67,200	33,803	174,400	290,000	44,800	13,300	89,600	16,321	44,800	11,193	174,400	82,349
Annual public subsidies per student		68	20	70	38	70	19	70	79	70	40	68	255	70	43	70	17	70	45	68	106
Comparison with the expected amount of public subsidies (%)			29%		54%		27%		112%		58%		374%		61%		25%		64%		156%
2. Community contribution																					
(1) Tuition fee for G11-12		36,000	0	0	0	0	0	0	0	0	0	36,000	0	0	0	0	0	0	0	36,000	0
(2) PTA annual fees and donations		0	86,600	0	0		50,000	0	58,000	0	0	0	455,200	0	62,400	0	0	0	0	0	72,280
(3) Income-generating activity		0	0	0	7,000		25,000	0	0	0	20,000	0	0	0	30,000	0	35,000	0	39,950	0	0
(4)Total of community contribution ((1)+(2)+(3))		36,000	86,600	0	7,000	0	75,000	0	58,000	0	20,000	36,000	455,200	0	92,400	0	35,000	0	39,950	36,000	72,280
Total budget (1+2)		210,400	117,400	89,600	34,000	89,600	84,854	179,200	216,010	67,200	53,803	210,400	745,200	44,800	105,700	89,600	51,321	44,800	51,143	210,400	154,629
Budget per student		82	75	70	47	70	164	70	108	70	64	82	655	70	339	70	54	70	205	82	200
Actual budget compared to plan (%)			91%		67%		234%		154%		92%		797%		484%		77%		292%		243%

Source: Preparatory survey report and developed by the evaluator based on the interviews at the time of ex-post evaluation.
Note 1: The number of students at the time of planning was calculated as the number of planned classrooms ×the number of students per classroom, namely (40 students ×2 (double shift)).
Note 2: The Block Grant at the time of planning was 20 Birr per student for G9–10. The estimation was calculated by multiplying the above enrollment capacity by 20 Birr.
Note 3: School grant was 50 Birr per year for G9–10 and 60 Birr for G11–12 at the time of planning. It is 60 Birr for G9–10 and 70 Birr for G11–12 at the time of ex-post evaluation.

Table 21: Evaluation of Financial Sustainability by School (Secondary Schools)

School ID	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10
(1) Pubic subsidies Note	1	1	1	1	1	3	2	1	1	3
(2) Community contribution	2	1	3	2	1	3	3	2	3	2
(3) Sufficiency of operation and maintenance costs according to the schools	1	1	1	1	1	1	1	1	1	1
Overall evaluation	1	1	2	1	1	2	2	1	2	2
Remarks	- Block Grant has not been distributed. - Water pipes are not connected to the laboratory and the toilets due to lack of budget of the woreda,	No electricity or water connection due to lack of budget of the woreda.	- Block Grant has not been distributed.	Water connection has not been completed and a laboratory technician is not assigned due to lack of budget of the woreda.	- Electricity and water connection, provision of computers and assignment of laboratory technician have not been completed due to lack of budget of the woreda. - The community contribution is small.	Both public subsidies and community contribution are sufficient.	Public subsidies are not sufficient, however, there is sufficient financial contribution from the community (PTA annual fee, income generation from the sale of hay and firewood), which covers a small amount of public subsidies.	- Block Grant allocation delayed. - The woreda cannot secure a budget for electricity connections. - There is a certain financial capacity of the community, such as purchasing a generator by PTA to cope with uncompleted electricity connection and hiring a cleaner.	- Due to lack of budget of the woreda, electricity and water connection, provision of computers have not been completed and a laboratory technician is not assigned. - The community has financial capacity; they contribute the income from the sale of hay and maize for the operation and maintenance of the school.	Public subsidies are sufficiently allocated and the community has a certain financial capacity.

Source: Developed by the evaluator based on interviews during the field study.
Note: The degree of sufficiency of each item is judged to be 3: High, 2: Medium, and 1: Low in three stages. Public subsidy is judged to be 1 if Block Grant was not allocated as of March 2020. Also, when it is less than the specified amount, it is judged to be 1.

Regarding the secondary schools, three schools have not received public subsidies, and other schools have also suffered from delayed and/or decreased public subsidies. The lack of financial resources is covered by the PTA's annual fees and community contribution. The budget for operation and maintenance is not sufficient for all 10 target schools to purchase consumables used in the schools, and then the financial resources that can be used for maintenance, such as equipment repairs, are insufficient. Regarding the financial status of the 10 target schools, it was judged that five schools were medium and five schools were low, considering the sufficiency of public subsidies and community contribution.

Late distribution and reduction in amounts of public subsidies in both primary and secondary schools are due to the federal government's budget deficit. Under these circumstances, it is expected that the budget for the education sector will be further reduced in order to take measures against COVID-19, which has been spreading worldwide since March 2020.[20]

Financial sustainability is judged to be slightly low regarding the primary schools and low regarding the secondary schools. As mentioned earlier, intensifying ethnic conflicts in some parts of the SNNPR since 2016 has given priority to the woreda's budget for internally displaced persons, which has affected the budget for the woreda education bureaus. Therefore, there is no concrete outlook for budget allocation to schools where electricity and water supply are incomplete. Based on the above, it is judged that sustainability of the financial aspect of operation and maintenance is low as a whole.

[20] Source: Interviews with the regional education bureau and the target schools.

3.4.4 Status of Operation and Maintenance

As a result of the visual confirmation of the maintenance status of facilities and equipment, it was confirmed that there was damage to notice boards, desks, chairs in classrooms, electrical switches, lockers, drainage pipes, and water faucets at work tables of laboratories, as well as issues such as water leakages in ceilings. Tables 16 and 17 of 3.4.2 Technical Aspect of Operation and Maintenance indicate the problems as well as the maintenance status according to the school.

There are some problems with the facilities and equipment at the primary schools, but, overall, maintenance is being carried out properly. Regarding facilities and equipment at the secondary schools, there were many problems at several schools. The main causes of these were that (1) the users (mainly students) did not treat school property carefully and (2) schools did not do proper repairs at the proper time, resulting in lingering damage. As mentioned previously, schools have plans to do repairs when schools are closed every half-year, but, in reality, half of the secondary schools had only carried out repairs once or twice as of the time of the ex-post evaluation, which was 3 to 4 years after school operation began. Regarding the looseness of door handles and bolts in desks and chairs, if preventive measures were carried out, such as tightening whenever looseness was noticed instead of every half-year, it seems that most problems would not lead to damage.

Based on the above, although the operation and maintenance status of the primary schools' facilities are good overall, since there are many issues related to the operation and maintenance status of the secondary schools, it was determined that the overall status of the operation and maintenance was low.

Some minor problems have been observed in terms of the financial aspect and current status. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to upgrade eight incomplete primary schools (primary schools targeting G1-4 only instead of all eight grades) into complete ones, and extend/upgrade three primary schools by increasing the number of classrooms in order to mitigate the number of overcrowded classrooms, and increase the number of total classrooms by constructing 10 secondary schools in the SNNPR, thereby contributing to improved access to and educational environment of basic education in the SNNPR.

This project's implementation is highly consistent with Ethiopia's development policy, which emphasizes improved access to basic education and educational environment as well as the target

region's developmental needs for basic education, and with Japan's assistance policy for Ethiopia, which emphasized the education sector. Therefore, the project's relevance is high. Although the project outputs and the project costs were as planned, the project period exceeded the plan. Therefore, the project's efficiency is fair. The implementation of the project contributed to alleviating the overcrowding of existing primary schools, improving access to basic education, and improving the educational environment through constructing new secondary schools. The project generally achieved the initial project effect indicators. In addition, the facilities constructed by the project are fully operational in both primary and secondary schools. Impacts such as enhanced motivation among teachers for teaching, class management, and students' motivation for learning by improving the educational environment were also confirmed. The project's effectiveness and impact were judged to be high. Some minor problems have been observed in terms of the financial aspects and the current status of the operation and maintenance system. Therefore, the sustainability of the project's effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Immediate Completion of Ethiopia's Obligations at All the Secondary Schools

The obligations of the Ethiopian side were planned to be completed prior to the start of school operation, but due to budget shortages and delays with procedures, it was found that water and electricity had not yet been completed at some schools and that computers were not being provided at some secondary schools at the time of ex-post evaluations. Therefore, at some schools, facilities, such as laboratories and ICT centers, are only partially used or are not being used at all. To utilize facilities constructed through this project in accordance with the initial purpose, it is necessary for the Ethiopian side to complete its obligations as soon as possible. To facilitate this, the regional education bureau is recommended to encourage zonal education bureaus, woreda education bureaus, and administrations in target woredas to secure sufficient budgets for infrastructure at target schools in this project. If it seems difficult to secure the budget from the woreda, it is recommended that the zonal education bureau and woreda education bureau discuss how to ensure financial resources and educational equipment available locally, such as the PTAs asking for donations, implementing or strengthening income-generation activities for creating revenue, and receiving computers and laboratory equipment that are no longer used at nearby universities if available. In addition, it is desired that the regional education bureau makes a regular report about the progress of the obligations, such as every month or every quarter, to the JICA Ethiopia office until the obligations are completed.

(2) Immediate Repair to Damaged Equipment and Strengthening Daily Maintenance (Recommendation to the executing agency and the target schools)

First of all, it is desired that schools with damaged equipment and furniture immediately repair the damaged equipment. Although it is appreciated that the schools are carrying out repairs to damaged equipment through teachers, PTAs, and local contractors with limited financial resources, it is found that the main cause of the damage is the users based on physical observation conducted at the time of ex-post evaluation and interviews with related parties. It is suggested that the regional education bureau share photos of school facilities that remain in good conditions (Ex: S-7) with the target woreda education bureau, directors and teachers of other target schools, and PTA members, and then directors of the target schools should take the initiative to raise students' awareness regarding the proper usage of school facilities and equipment.

In addition, periodic inspections have been carried out at all surveyed schools, but most schools do not perform repairs immediately, even when they recognize that the equipment is going to be damaged, and they repair all damaged equipment while the school is closed between semesters. Such "curative maintenance" is important, but from now on, it is desirable to strengthen "preventive maintenance," such as repairing damage while the equipment is still usable, and tightening loose bolts based on inspection results.

4.2.2 Recommendations to JICA

(1) Continuous Monitoring on the Obligations of Ethiopian Side

Regarding the obligations of the Ethiopian side, it is desirable that the JICA Ethiopia office regularly check the progress with the regional education bureau via e-mail or telephone, as it has practiced so far, and encourage the implementation of the obligations frequently.

4.3 Lessons Learned

(1) Communication in Harmony with the Sociocultural Characteristics of the Target Area

Regarding the obligations of the secondary schools among the obligations of the Ethiopian side, it was found that water and electricity connections have not been completed at some schools, fences have not been installed, and computers and distance learning equipment had not been provided at the time of ex-post evaluation. Since these obligations were not completed, at some schools, laboratories and ICT centers are only partially being operated or are not being used. The procurement agency regularly confirmed the progress of obligations on the Ethiopian side during project implementation, and if there were delays, they encouraged the regional education bureau to fulfill their obligations in writing and through meetings. In addition, after project completion,

the JICA Ethiopia office has on several occasions encouraged the regional education bureau to take action in writing. Such an approach by project-related parties was overall appropriate, but the SNNPR, which is the target of this project, consists of zones based on ethnicity, so the zonal and woreda education bureaus play a larger role than in other regions. In actuality, secondary schools that could afford the expenses for electricity and water connections borne by the woreda and PTA had close collaboration among the woreda education bureau, school, and community. Based on characteristics of the target region and such cases, it is believed that it was necessary to have an approach that corresponds to the region in collaboration with the target region; for example, concerned parties of the Japanese side should have encouraged the target zones and woredas to follow the procedure for securing the budget immediately after the project began, and if it was difficult for woredas to secure the budget, they should have involved the community in the early stages to promote activities for donations and income generation.

As for the implementation of future projects, it is desirable to properly encourage related local governments and groups in counterpart governments in order to proceed with matters efficiently according to the target society's administration and sociocultural characteristics.

Lao People's Democratic Republic

FY2019 Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Improving Secondary School Environment in the Southern Provinces"

External Evaluator: Nobuyuki Kobayashi, OPMAC Corporation

0. Summary

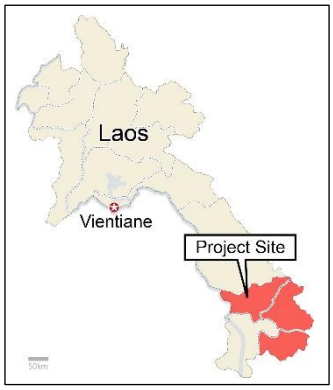
The objective of this project is to improve the access and educational environment of lower secondary education by constructing and refurbishing the facilities and the equipment of the lower secondary schools in three southern provinces of Laos, thereby contributing to the quality improvement of the lower secondary education in the target area. At both the planning phase and the time of ex-post evaluation, the educational policy aimed at wide dissemination of education and increase in the gross enrollment rate of lower secondary education. At the time of the ex-post evaluation, the gross enrollment rates[1] in lower secondary education in Saravan province and Attapeu province showed room for improving the gross enrolment rates in lower secondary education. The scope of this project was consistent with Japanese aid policy. Therefore, its relevance is high. Given that the additional project scope increased the floor area, the actual project cost of the Japanese side was within the plan. In contrast, the project period exceeded the plan and thus efficiency of the project is fair. Concerning the quantitative indicators, "Students who can study in a good environment" increased and "Incomplete lower secondary schools[2]" declined. While both reached the targets, "Newly accepted students" achieved 80% of the target. Concerning the qualitative effects, teachers and parents had the opinion that improving the learning environment raised student motivation for learning. Furthermore, it is presumed that this project contributed to the improvement of both "Number of students per classroom and "Percentage of female students" to a certain degree. Therefore, effectiveness and impacts of the project are high. Concerning the institutional/organizational aspect, the number of new teachers did not meet the requirement estimated during the planning phase, and the majority of the schools that responded to the questionnaire replied that they did not have enough teachers. In terms of the technical aspect, the maintenance of school buildings did not require advanced technology. In terms of the financial aspect, the spending for the lower secondary education sector was on the rise. Concerning operation and maintenance, no serious damage that affected the use of the classrooms was found. For these reasons, sustainability of the project effects is fair.

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

[1] Total number of students at a specific education stage is divided by the school age population applicable to that education stage.

[2] Lower secondary schools which cannot teach all grades (M1-M4) of the lower secondary education.

1. Project Description



Project Location

School buildings constructed by this project

1.1 Background

In the first half of the 2010s when this project was formed, the Lao government was promoting a transition to a market-oriented economy, aimed at leaving the classification of least developed country by 2020. The country faced an increasing demand for human resources development to support industrial development, as well as a strong need to strengthen lower secondary education, which is the stage prior to vocational training, technical education, and higher education. In primary education, the increase in the number of schools improved the educational environment and access. Demand for lower secondary education, the next educational level, increased while existing secondary schools did not have enough classrooms. In addition, the period of lower secondary education was expanded from three to four years in FY 2009-10 but it was difficult to secure classrooms for all grades with existing school buildings. As a result, many lower secondary schools were forced to rent elementary school classrooms and construct temporary school buildings with the cooperation of residents. The schools faced an urgent issue in quality and access to education. In particular, this issue was more severe in the target area of this project, the provinces of Saravan, Sekong, and Attapeu, because the provinces were in mountainous areas and had many poor districts.

JICA had continuously supported primary education in the target area of this project. The grant aid "Project for Improvement of School Environments in Three Southern Provinces" accelerated the refurbishment and construction of elementary school buildings. The technical cooperation "Project for Supporting Community Initiative for Education Development (Phase 2)" worked on improving administrative and management capacity in primary education.

Against this background, the Lao government requested Japan's grant aid for new construction/reconstruction of the buildings for lower secondary schools and provision of equipment in the three southern provinces.

1.2 Project Outline

The objective of this project is to improve the access and educational environment of lower secondary education by constructing and refurbishing the facilities and the equipment of the lower secondary schools in three southern provinces of Laos, thereby contributing to the quality improvement of the lower secondary education in the target area.

Grant Limit / Actual Grant Amount	1,069 million yen / 1,069 million yen
Exchange of Notes Date /Grant Agreement Date	March 2014 / March 2014
Executing Agency	Ministry of Education and Sports (MOES)
Project Completion	April 2017
Target Area	Saravan province, Sekong province, and Attapeu province
Main Contractors	[Construction] Vannavoung Construction Co., Ltd. (Laos), Somphamith Construction Co., Ltd. (Laos), Mitsamphan Construction Co., Ltd. (Laos)、Phosy Construction Co., Ltd. (Laos), ST Construction Co., Ltd. (Laos) [Equipment] Chitchareune Construction Company Ltd. (Laos), Central Sign Trading Co., Ltd. (Laos)
Main Consultant	Mohri, Architect & Associates, Inc.
Procurement Agency	Japan International Cooperation System
Outline Design	June 2013 – May 2014
Related Projects	• Technical Cooperation “Project for Supporting Community Initiative for Education Development (Phase 2)” (2012) • Grant Aid “Project for Improvement of School Environments in Three Southern Provinces” (2009) • Grant Aid “Project for Improving Secondary School Environment in the Central and Southern Provinces” (2017)

2. Outline of the Evaluation Study

2.1 External Evaluator

Nobuyuki Kobayashi, OPMAC Corporation

2.2 Duration of Evaluation Study

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

Duration of the Study: September 2019 – December 2020

Duration of the Field Study: December 4, 2019 – December 24, 2019

2.3 Constraints during the Evaluation Study

In the impact of this ex-post evaluation, the effect of this project was based on a comparison of the project target schools, the number of students per classroom and the percentage of female students in the three southern provinces as well as the entire country of Laos. Other than this project, however, many factors affected the number of students per classroom and the percentage of female students. In this ex-post evaluation, careful attention was given to the accuracy of the above analysis.

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

3.1 Relevance (Rating: ③[4])

3.1.1 Consistency with the Development Plan of Laos

During the planning phase of this project, the national development strategy *the Seventh Five-year National Socio-Economic Development Plan (2011-2015)* (2011) prioritized education and assumed that sustainable economic growth and poverty reduction required dissemination and improvement of basic education. Moreover, the main policies of the plan were poverty reduction, human development, and reduction of disparities (urban/rural, poor/rich, genders) through knowledge and education. *The Education Sector Development Framework* (2009) focused on capacity development of teachers, improvement of educational quality, and improvement of curriculum as the main tasks, and emphasized construction of new educational facilities in rural areas. To reduce the number of imperfect elementary schools and expansion of secondary education, the sector plan adopted a policy to promote construction of educational facilities in areas where school construction was inadequate. *The Education Sector Development Plan 2011-2015* (2011) planned to raise the gross enrollment rate of lower secondary education to 75% in 2015 and to strengthen the expansion of secondary education facilities.

"Outcome 2" of *the 8th National Socio-Economic Development Plan (2016-2020)* (2016), the national development strategy at the time of the ex-post evaluation, included access to education

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ②: Fair, ①: Low

among all ethnic groups and genders. The strategy also planned to increase the total enrollment rate in lower secondary education to 85% during the strategy period. At the ex-post evaluation, the *Educational Sector Development Plan 2016-2020* (2016) stated that primary school graduates should continue to receive education and complete lower secondary education as the goal of lower secondary education. In addition to the increase in the gross enrollment rate of lower secondary education (85% in 2020), the plan set the target on the transition from the final year of primary education to the first year of secondary education (100% in 2020). The plan also mentioned specific activities such as school construction in areas where a school is needed, classroom construction in crowded schools, and improvements in the school environment.

During both the planning phase of this project and the time of ex-post evaluation, the national development strategies emphasized wide dissemination of education. The policy of the sector plans was to increase the gross enrollment rate of lower secondary education. In the plans, construction of school buildings to promote lower secondary education remained the same both before and after of this project. This project targeted the three southern provinces where the dissemination of lower secondary education has lagged. The major project effects were better access to lower secondary education and an improved educational environment. Therefore, it is concluded that this project was consistent with the dissemination of lower secondary education, which the national development strategies and the sector plans had continuously aimed for.

3.1.2 Consistency with the Development Needs of Laos

At the planning phase of this project, the net enrollment rate[5] of primary education in Laos increased from 91.6% in FY2008-09[6] to 96.6% in FY2012-13, and the completion rate of primary education in Laos increased from 64.2% in FY 2008-09 to 70.6% in FY 2012-13[7]. With the dissemination of primary education, it was foreseen that the number of students enrolled in secondary education would rise. Moreover, the period of lower secondary education was changed from three years to four years in FY2009-10. As the number of enrolled students increased, coping with this situation became an urgent issue. The gross enrollment rate of lower secondary education in FY2012-13 was 69.0% nationwide, while the rate was 44.9% for Saravan province, 57.4% for Sekong province, and 52.5% for Attapeu province. Since the project area was a mountainous area with poor access and inadequate facilities, these conditions prevented the dissemination of lower secondary education.

At the time of the ex-post evaluation, the net enrollment rate of primary education in Laos slightly increased from 96.6% in FY2012-13 to 98.8% in FY2017-18, and the same trend was observed in the three target provinces (see Table 1). The completion rate of primary education

[5] At a specific education stage, the total number of students belonging to the age group assumed for that education stage divided by the total population of that age group

[6] For the education system in Laos the fiscal year starts in September and completes in August.

[7] The Preparatory Survey Report, p.1-16

in Laos increased from 70.6% in FY2012-13 to 80.4% in FY2017-18. Although the completion rates of primary education in the three target provinces also increased, they were lower than the entire country of Laos.

Table 1 Net enrollment rate and completion rate of primary education for Laos and three target provinces

	FY2012-13	FY2017-18
Net enrollment rate (Laos)	96.6%	98.8%
Net enrollment rate (Saravan province)	97.2%	98.9%
Net enrollment rate (Sekong province)	95.5%	97.7%
Net enrollment rate (Attapeu province)	95.4%	97.3%
Completion rate of primary education (Laos)	70.6%	80.4%
Completion rate of primary education (Saravan province)	47.5%	68.3%
Completion rate of primary education (Sekong province)	60.6%	70.4%
Completion rate of primary education (Attapeu province)	50.8%	72.3%

Source: MOES

At the time of the ex-post evaluation, the gross enrollment rate of lower secondary education (FY2017-18) was 83.1% nationwide, while 67.1% for Saravan province, 84.7% for Sekong Province and 76.3% for Attapeu Province (see Table 2). The number of lower secondary schools in the three target provinces rose from 140 schools in FY2013-14 to 183 schools in FY2018-19. However, to improve access to lower secondary education in the project area, lower secondary schools with sufficient capacity and easy access were needed. This showed a strong demand for development of classrooms.

Table 2 Gross enrolment rate of lower secondary education for Laos and three target provinces

	FY2012-13	FY2017-18
Gross enrollment rate (Laos)	69.0%	83.1%
Gross enrollment rate (Saravan province)	44.9%	67.1%
Gross enrollment rate (Sekong province)	57.4%	84.7%
Gross enrollment rate (Attapeu province)	52.5%	76.3%

Source: MOES

During both the planning phase of this project and the time of ex-post evaluation, the number of students who were able to advance to lower secondary education increased, and there was a substantial demand for continuous school education for graduates of primary education. During the ex-post evaluation, the net enrollment rate of primary education in the three southern provinces remained nearly 100%, and the completion rate was improving. To provide educational opportunities for the number of students who would be able to advance to lower secondary education, the construction of buildings for lower secondary schools is necessary in the three southern provinces. During the ex-post evaluation, the gross enrollment rates in lower secondary education in Saravan province and Attapeu province, both of which are in the target area, were lower than the national average and showed room for improvement in educational access by developing classrooms.

3.1.3 Consistency with Japan's ODA Policy

During the planning phase of this project, *the Country Assistance Policy for Lao People's Democratic Republic* (2012), which was formulated by the Ministry of Foreign Affairs of Japan, regarded human resources development as the "key for socio-economic development" and prioritized "improvement of educational environment and human resource development." Furthermore, in *the Official Development Assistance (ODA) Country Data Book 2014*, the prioritized area in assistance for the country was "Development of Educational Environment and Human Resource Development." Through the grant aid project, "Project for Improvement of School Environments in Three Southern Provinces" (2009), and technical cooperation project, "Project for Supporting Community Initiative for Education Development (Phase 2)" (2012), JICA contributed to the construction of elementary school facilities and the improvement of school management in the target area of this project.

The scope of this project was the construction and refurbishment of buildings and the provision of equipment for lower secondary schools. The priority area of Japanese ODA, which was "improvement of educational environment and human resource development," and the project scope were consistent with the aid policy. In addition, JICA had promoted basic education with a focus on primary education. This project supported lower secondary education, which is the latter phase of basic education and, thus, it contributed to the enhancement of basic education. Therefore, this project is highly consistent with Japanese aid policy.

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

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

This project constructed and renovated the facilities of the lower secondary schools and provided equipment such as desks and chairs in three southern provinces (Saravan, Sekong, and Attapeu) with support by the Japanese side. In addition, consulting services on detailed design and construction supervision were also provided in project implementation. According to the plan of the detailed design, construction work was to be implemented in 42 schools (total floor area: 20,648.80m^2). The construction work was carried out in 44 schools (total floor area: 23,047.40m^2) (see Table 3 for details). The geographical breakdown of the supported schools was 23 schools in Saravan province, 12 schools in Sekong province, and 9 schools in Attapeu provinces (see

Table 4 for details).

Table 3 School construction supported by this project (Plan and Actual)

Plan (at the Detailed Design)	Actual
Target school: 42 schools	Target school: 44 schools
Classroom: 227 rooms	Classroom: 256 rooms
Teacher's room*: 34 rooms	Teacher's room*: 36 rooms
Latrine building: 34 buildings	Latrine building: 36 buildings
Storage: 34 rooms	Storage: 35 rooms
Student dormitory: 3 locations (6 rooms)	Student dormitory: 3 locations (8 rooms)

Source: documents provided by JICA

Note: *including teacher's room/storage

Table 4 School construction by this project (by province, Actual)

	Saravan province	Sekong province	Attapeu province	Total
Target school	23 schools	12 schools	9 schools	44 schools
Classroom	124 rooms	72 rooms	60 rooms	256 rooms
Teacher's room *	19 rooms	11 rooms	6 rooms	36 rooms
Latrine building	19 buildings	11 buildings	6 buildings	36 buildings
Storage	19 rooms	12 rooms	4 rooms	35 rooms
Student dormitory	2 locations (6 rooms)	—	1 location (2 rooms)	3 locations (8 rooms)

Source: documents provided by JICA

Note: *including teacher's room/storage

Exterior of school building

Classroom

Teacher's room

Student dormitory

The procurement of building construction was divided into the first group, the second group, and the additional group. When the first group's procurement was completed, there were unspent funds. To accept more students, the number of classrooms was increased in the second group. In addition, the additional group was set up to handle an increase in the number of schools covered by the project. As a result, the total floor area increased by approximately 10% from the initial plan.

The tasks of the Lao side were implemented almost as planned. At the time of the detailed design, electrical connection in 30 schools, water pipe connection in 6 schools, and well construction/repair in 15 schools were to be implemented and funded by the Lao side. Based on the information from the Provincial Education and Sports Service (PESS) of each province, electrical connection in 30 schools, water pipe connection in 1 school, and well construction/repair in 20 schools were implemented by the time of the ex-post evaluation,

3.2.2 Project Inputs

3.2.2.1 Project Cost

At the time of the detailed design, the planned project cost was JPY 1,076 million (JPY 1,066 million for the Japanese side and JPY 10 million for the Lao side[8]).

The actual cost of the Japanese side was JPY 1,069 million. Compared with the planned amount of JPY 1,194 million, adjustments due to the increased floor area (112% of the plan), the actual amount was within the plan (90% of the planned amount). According to the construction supervision consultant, there were unspent funds due to very competitive bidding for building construction. This allowed for additional construction work.

Since the project cost on the Lao side was funded by several sources such as PESS and municipal governments, it was difficult to accurately compile the actual amount of the project cost. Therefore, an assessment was made only for the cost of the Japanese side, which accounted for most of the project cost in the plan.

Table 5 Project cost for this project (Plan and Actual)

	Plan	**Plan after adjustment**	**Actual**	**Comparison with the plan**
Cost for the Japanese side	JPY 1,066 million	JPY 1,194 million	JPY 1,069 million	90%
Cost for the Lao side	JPY 10 million	—	—	—
Total project cost	JPY 1,076 million	—	—	—

Source: documents provided by JICA

3.2.2.2 Project Period

The project period at the time of detailed design was planned at 27 months (June 2014 - August 2016) and it covered the period from the commencement of consulting services to project completion. In actuality, it took 34 months (July 2014 - April 2017) from the start of consulting services to project completion. By comparing the actual period with the planned period of 30 months that adjusted for the increase in floor area (112% of the plan), the actual period exceeded the plan (113% of the plan). The delay in the project period was mainly due to the construction of the additional group, which was not expected at the time of the detailed design. This resulted in an increase in the project period beyond the expansion of the project scope.

[8] The amount was based on the ex-ante evaluation sheet because the project cost for the Laos was not recalculated at the time of detailed design.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness and Impacts[9] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects

During the planning phase, this project selected "Students who were able to study in a favorable environment," "Newly accepted students," and "Incomplete lower secondary schools" as indicators on the quantitative effects, and set the target after project completion for each indicator. The effectiveness and impact were evaluated based on the achievement level of the above targets.

Table 6 Quantitative effects of this project

	Baseline	Target	Actual			
	2013	FY2019-20	FY2016-17	FY2017-18	FY2018-19	FY2919-20
		3 Years After Completion	Completion Year	1 Year After Completion	2 Years After Completion	3 Years After Completion
Students who are able to study in a favorable environment	2,800 students	12,848 students*	—	—	—	12,848 Students
Newly accepted students	—	5,143 students	4,065** students	4,299** students	4,214** students	—
Incomplete lower secondary schools***	40 schools	24 schools	19 schools	13 schools	11 schools	—

Source: Documents provided by JICA and the executing agency

Note: * During the planning phase, this project set the target at 12,040 students, but the target was revised to 12,848 students in consideration of the additional project scope.

Note: **Number of students in 44 target schools (actual) - number of students in 2013 (actual)

Note: *** Number of incomplete lower secondary schools in the three target provinces (Salawan, Sekong, and Attapeu)

Based on the number of classrooms available in the target schools, the "students who were able to study in a good environment" reached the target. According to PESS of the three target

[9] Sub-rating for Effectiveness is to be put with consideration of Impacts.

provinces, floods and typhoons damaged some schools after project completion, but these schools were repaired and cleaned promptly after the disaster. All classrooms were available at the time of the ex-post evaluation. (Achievement level: 100%). Secondly, "Newly accepted students" was mostly achieved based on the increase in the number of students at the target schools. In 2013, a year before the project was implemented, the number of students at the target schools was 7,371. In FY2018 -19 (as of December 2018), the number of students at the target schools was 11,585. The increase in the number of students was 4,214, which was 82% of the target (5,143). Finally, "Incomplete lower secondary schools" also achieved the target. The number of incomplete lower secondary schools in the three target provinces was 11 in FY2018-19 (as of December 2018), which was below the target of 24 schools (achievement level: 100%). During the ex-post evaluation, there were no incomplete lower secondary schools among the target schools in this project.

"Students who are able to study in a good environment" and "Incomplete lower secondary schools" reached their targets. The achievement level of "Newly accepted students" was approximately 80% of the target. It is concluded that the quantitative effects of this project reached the expected levels if the above three indicators are given the same weight.

3.3.1.2 Qualitative Effects (Other Effects)

To understand the project effects of the construction and refurbishment of facilities for lower secondary schools, interviews were conducted with the stakeholders in the target schools[10]. The qualitative effects found during the ex-post evaluation were as follows.

(1) Learning environment and students' willingness to learn

During the planning phase of this project, many target schools used temporary school buildings constructed by neighboring residents. In many of these schools, the learning environment was not favorable, such as (1) there were roof leaks during rain, (2) the floor was soiled and covered with mud on rainy days, and (3) it became very hot in the dry season due to poor ventilation and the galvanized iron structure. According to teachers and parents, most interviewees were

Temporary school building
(not constructed by this project)

[10] Interviews with stakeholders were conducted in December 2019 in 10 target schools (4 Saravan province, 5 Sekong province, 4 Attapeu province). The interviewees consisted of 26 teachers (19 men and 7 women), 16 parents (6 men and 10 women), and 21 students (10 men and 11 women).

of the opinion that rehabilitating the buildings in this project improved the learning environment. Some of them had the opinion that the students' motivation to learn was improved and the attendance rate increased.

(2) Blackboard easy to see and write

This project aimed at improving the educational environment and provided blackboards for the classrooms as well as the construction and rehabilitation of school buildings. The legibility of the blackboard contributes to better understanding of the lessons and the students' willingness to learn. The teachers were of the opinion that it was difficult to write clearly because the chalk slipped on the blackboards used before the project. The new blackboards allowed clear writing, and it was easy to write tables and figures because of the scales. The students also commented that they could read the blackboards more easily in the new school buildings. At the schools where the interview was conducted, there was no lighting in the classroom, but large windows were placed to allow in more daylight. Therefore, the students said that they could read the blackboards without lighting in the classroom.

3.3.2 Impacts

3.3.2.1 Intended Impacts

The impact of this project is "the quality improvement in lower secondary education in the target area." As this project did not set quantitative indicators about impact during the planning phase, quantitative indicators were newly selected at the time of the ex-post evaluation. Pre-post comparison of these indicators was used to figure out the improvement created by this project. In addition, out of the qualitative effects expected during the planning phase, the effects relevant with the impact was assessed based on interviews with the stakeholders in the project target schools.

(1) Students per classroom

As this project constructed classrooms, it was expected that the students per classroom would decrease at the target schools. Prior to the pre-project in FY2013-14 to the post-project in FY2018-19, the number of students per classroom decreased in the three southern provinces, throughout the nation and in the target schools (see Table 7). After the implementation of this project (FY2018-19), the number of students per classroom at the target schools was smaller than the classrooms in the three southern provinces and throughout Laos. Therefore, it is presumed that the target schools were able to conduct lessons in a relatively favorable environment.

Table 7 Student per classroom

(unit: persons)

	FY2013-14	FY2016-17	FY2017-18	FY2018-19
Laos	38.5	36.4	35.3	34.3
Saravan province	38.5	36.0	35.3	33.8
Sekong province	36.0	37.3	36.6	35.9
Attapeu province	36.8	37.1	35.9	36.4
Target schools	36.6	35.0	33.3	33.3

Source: MOES

(2) Percentage of female students

From the pre-project in FY2013-14 to the post-project in FY2018-19, the percentage of female students in lower secondary education increased slightly in Laos and in all of the three southern provinces. During this period, the percentage of female students at the target schools rose higher than the three provinces and Laos (see Table 8). This project contributed to better access to lower secondary education in remote areas. In rural areas, female students tend to avoid schools outside the communities in which they live. For this reason, improved access through this project presumably contributed to the increase in the percentage of female students.

Table 8 Percentage of female students

(unit: %)

	FY2013-14	FY2016-17	FY2017-18	FY2018-19
Laos	47.3	47.7	48.0	48.1
Saravan province	46.7	47.6	47.9	47.9
Sekong province	46.9	48.8	48.5	48.4
Attapeu province	47.1	47.5	47.3	47.5
Target schools	47.2	48.9	49.4	49.1

Source: MOES

(3) Parents' participation in school education

Based on the interviews with the stakeholders of the target schools, it was found that this project contributed to the participation of parents in school education. Teachers and parents commented that after the rebuilding of school buildings, the number of parents visiting the schools increased due to their interest in the new buildings. Moreover, teachers took advantage of the opportunities that arose when parents came to the schools, and conducted awareness campaigns for school education, requested funding and labor for repairs of school buildings and school events.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

Based on JICA's *Guidelines for Environmental and Social Considerations* (2010), this project was classified as Category C (projects are likely to have minimal or little adverse impact on the environment and society) during the planning phase. As this project consisted mainly of rebuilding or expansion of existing school buildings and did not require preparation of building sites, its negative impact on the natural environment was very minimal. Moreover, the use of heavy machinery was limited, and there were no problems concerning emissions and noise. According to the construction supervision consultant, the negative impact on the natural environment was minor. Therefore, an environmental impact assessment and initial environmental examination were not required for the construction, and environmental monitoring was not conducted during and after the implementation of this project.

(2) Resettlement and Land Acquisition

During the planning phase, it was assumed that no resettlement would occur for this project. According to the construction supervision consultant, the main scope of this project was rebuilding or expanding existing school buildings, and land acquisition was not required. For this reason, resettlement of residents did not occur in the implementation phase of this project.

(3) Contribution to Upper Secondary Education

The contribution to upper secondary education was an unexpected positive impact during the planning phase. Prior to the implementation of this project (2013), nine out of 44 target schools provided upper secondary education (5th grade in secondary education and above). After the implementation of this project (FY2018-19), 17 of the target schools provided upper secondary education. According to school officials and parents, additional costs such as commuting by motorcycle and boarding is required and the financial burdens of parents are significant if an upper secondary school is not located in the neighborhood. It has been concluded that this project constructed school buildings and contributed to the dissemination of upper secondary education by providing educational opportunities in the neighboring area.

This project has mostly achieved its objectives. Therefore, effectiveness and impacts of the project are high.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional/Organizational Aspect of Operation and Maintenance

At the time of ex-post evaluation, MOES oversaw the supervision of school operations and the budget distribution through PESS and the District Education and Sports Bureau (DESB). While

each school was responsible for its operation and maintenance activities of school facilities, the Village Education and Development Committee (VEDC) supervised and supported these activities. According to the questionnaire response from the executing agency and interviews with school personnel, the major roles in operation and maintenance following school construction are given in the following table.

Table 9 Division of roles in operation and maintenance

Organization	Roles in operation and maintenance
MOES	Supervision on the distribution and use of subsidies, decisions on the number of teachers, budget allocation of teachers' salaries
PESS	Preparation of budget plan for lower secondary schools in the province
DESB	Preparation of operation plan for lower secondary schools in the district (assessment on the numbers of teachers and teaching materials, etc.)
VEDC	Supervision of operation and maintenance, facilitation of residents' supports (funding, labor, etc.)
Each school	Implementation of operation and maintenance (cleaning and minor repairs)

Source: MOES, interview with the project stakeholders

Concerning the assignment of teachers, it was estimated that 214 teachers would need to be additionally assigned to the target schools because of the increase in classrooms during the planning phase of this project. The number of teachers at the target schools increased by 97 from FY2013-14 to FY2018-19, but the increase was smaller than the requirement estimated at the planning phase. Based on a questionnaire survey of the target schools[11], for the question "Is there a sufficient number of teachers in the school?" the answer "Yes" accounted for 23% of the respondents, "Yes to some extent" for 23%, "No to some extent" for 20%, "No" for 34% (see Figure 1). In addition, for the question "Are there subjects which cannot be taught due to lack of teachers?", "Yes" accounted for 38% of the respondents and "No" for 62% (see Figure 2). Many schools mentioned IT, Physical Education, and French as the subject which they could not teach. Based on the interviews with the teachers, the teachers were responsible for not only lessons, but also school administration and repairs of facilities and furniture.

[11] The questionnaire survey was conducted from December 2019 to January 2020, targeting the officials (such as principals, deputy principals) of the target schools. Out of 44 schools supported by this project, 30 schools replied to the questionnaire (response rate: 68%). The breakdown of the responding schools was 11 in Saravan province, 11 in Sekong province, and 8 in Attapeu province.

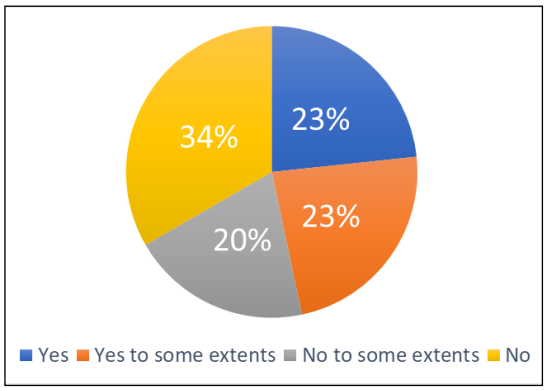


Figure 1 Assignment of enough teachers

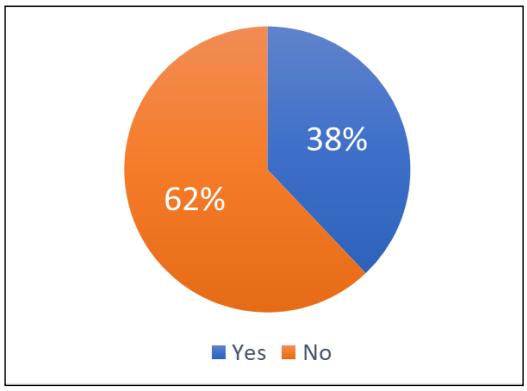


Figure 2 Subject cannot be taught due to the lack of teachers

During the ex-post evaluation, the division of roles for the operation and maintenance of school facilities was clearly defined. Every year, along with the division of roles, the school operation plan was prepared, the budget was allocated in accordance with the plan, and the operation and maintenance activities were carried out. In contrast, the increase in the number of teachers did not reach the requirement estimated during the planning phase, and a majority of the schools replied that the number of teachers was not sufficient. Therefore, it is concluded that the operation and maintenance of this project has a minor problem with the institutional/organizational aspect.

3.4.2 Technical Aspect of Operation and Maintenance

As the construction of this project was based on the technical standards of Lao companies, all contactors in this project were Lao companies (school building: 5 companies, equipment: 2 companies). According to the construction supervision consultant, it was not technically difficult to conduct maintenance as the local contractors constructed the school building. As for electrical equipment, and advanced operation and maintenance activities were not required because only lighting and outlets were used. Due to this point, this project did not prepare a maintenance manual. Based on the questionnaire responses from MOES, the ministry conducted annual training for facility management staff of PESS and explained them on the maintenance manual prepared by the government. According to PESS staff, it was easy to find a contractor with appropriate technical capacity when the school buildings required major repairs.

In terms of the technical aspect, the maintenance of the school buildings did not require advanced technology and the schools can do the repairs to some extent. Therefore, it is concluded that there are no technical problems that affect the sustainability of the project effects.

3.4.3 Financial Aspect of Operation and Maintenance

From FY2014-15 to FY2018-19, the Lao government's spending on education and lower secondary education increased nominally (see Table 10). However, due to the flood in 2018, the spending on education and lower secondary education decreased in FY2018-19. After inflation was adjusted with the GDP deflator, education spending leveled off and lower secondary education increased (see Table 11). During this period, the number of lower secondary education schools increased slightly, but the expenditure for lower secondary education per school increased by almost 10% from FY2014-15. While the number of students remained flat during the same period, the expenditure for lower secondary education per student increased by almost 20% from FY2014-15.

Table 10 Lao government's spending for education and lower secondary education (nominal)

	FY2014-15	**FY2015-16**	**FY2016-17**	**FY2017-18**	**FY2018-19**
Education (spending, million Kip)	3,216,247.47	3,252,890.60	3,409,241.76	3,521,759.90	3,408,432.20
Lower secondary education (spending, million Kip)	434,479.26	497,489.65	474,374.12	559,731.14	558,213.91

Source: MOES

Table 11 Lao government's spending for education and lower secondary education (real)

	FY2014-15	**FY2015-16**	**FY2016-17**	**FY2017-18**	**FY2018-19**
Education (spending, million Kip)	3,216,247.47	3,178,249.54	3,233,293.03	3,279,268.95	3,113,959.85
Lower secondary education (spending, million Kip)	434,479.26	486,074.22	449,891.98	521,190.82	509,986.88
Lower secondary education (spending) / School	282.50	310.39	281.01	321.52	310.02
Lower secondary education (spending) / Student	1.01	1.11	1.03	1.20	1.19
Number of schools*	1,538	1,566	1,601	1,621	1,645
Number of students**	429,559	439,187	438,861	432,961	426,822
GDP deflator (2012=100)	112.57	115.21	118.70	120.90	123.22
GDP deflator (base year 2014=1.00)	1.00	1.02	1.05	1.07	1.09

Source: MOES, World Bank

Note: *total of public lower secondary school and unified lower and upper secondary schools

Note: ** total of students in public lower secondary school and students in complete schools

For routine operation and maintenance expenses of the schools, the central government budget covered teacher salaries and school block grants (70,000 Kip per student in FY2019-20). The school block grant showed a significant increase after the project commenced because the grant was 20,000 Kip per student in FY2012-13.

To supplement the school block grant, parents additionally paid operating expenses in most schools. According to school officials and parents, parents paid 5,000 to 50,000 Kip per student, and the payment amount differed across schools. Some measures such as flexible payment timing of the expense was undertaken for poor households.

The school block grant and the operating expenses from parents were used for minor repairs, school events, teaching materials (such as additional purchase of textbooks, materials used for art, and sporting goods). Based on interviews with school officials and the questionnaire survey of the target schools, there were no schools that were not able to teach due to a budget shortage.

Over the past five years, the spending for lower secondary education was on the rise and the school block grant per student recently showed a significant increase. There were no schools where teaching was on pending due to the lack of a budget. Financially, there were no problems that affected the sustainability of the project effects.

3.4.4 Status of Operation and Maintenance

Out of the 44 target schools, the site survey was conducted in 20 schools[12]. There were 2 schools damaged by floods and typhoons after the project was completed. After the disasters, both schools carried out cleaning and repairs, and resumed schooling.

School buildings: Among the visited schools, this project supported the construction of school buildings in all the schools (20 schools). Minor damages (such as broken doorknobs, unusable window laches, and insect bites in the desks) were found in classrooms and teachers' rooms, but there were no serious damages that made teaching difficult. Teachers and students regularly cleaned the school buildings. Doorknobs, windows, desks and chairs were repaired properly. Some schools had unused classrooms as new schools were established in the neighborhoods. The classrooms were expected to be used in the future when the number of

Broken doorknob

[12] The site survey was conducted from December 2019 to January 2020. Based on the expected number of students at the planning phase, the target schools were divided into 3 categories and, then, 10 schools in the first category (large scale), 4 schools in the second category (medium scale), and 6 schools in the third category (small scale) were visited. The breakdown of schools visited was 11 in Saravan province, 5 in Sekong province, and 4 in Attapeu province.

students increased. Among the visited schools, the flood in 2019 affected the Houaykhon unified lower and upper secondary school and damaged desks and chairs. According to the teachers in the school, they repaired and used the desks and chairs again.

Latrine buildings: Among the visited schools, this project supported the construction of latrine buildings in 15 schools. During the ex-post evaluation, water pipes or wells were installed at the expense of the Lao side, and the latrine buildings had water in most of the visited schools. However, one school had the problem of a water pump that was temporarily out of order and another school had a problem where water would not flow into one toilet bowl. Except for the school where the pump was temporarily out of order, the latrine buildings were in use during the site survey; and teachers and students also cleaned them.

Student dormitories: Among the visited schools, this project supported the construction of student dormitories in two schools. During the site survey, students or teachers used the student dormitories. Since teachers at remote schools sometimes faced difficulty in commuting to school daily, they used the dormitories in the schools. The student dormitory was regularly cleaned by users.

The site survey confirmed minor damage to the school facilities supported by this project but did not find any serious damage affecting the use of the classrooms. Regarding the current status, it is concluded that there was no problem that affected the sustainability of the project effects.

Some minor problems have been observed in terms of the Institutional/Organizational aspect. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to improve the access and educational environment of lower secondary education by constructing and refurbishing the facilities and the equipment of the lower secondary schools in three southern provinces of Laos, thereby contributing to the quality improvement of the lower secondary education in the target area. At both the planning phase and the time of ex-post evaluation, the educational policy aimed at wide dissemination of education and increase in the gross enrollment rate of lower secondary education. At the time of the ex-post evaluation, the gross enrollment rates in lower secondary education in Saravan province and Attapeu province showed room for improving the gross enrolment rates in lower secondary education. The scope of this project was consistent with Japanese aid policy. Therefore, its relevance is high. Given that the additional project scope increased the floor area, the actual

project cost of the Japanese side was within the plan. In contrast, the project period exceeded the plan and thus efficiency of the project is fair. Concerning the quantitative indicators, “Students who can study in a good environment” increased and “Incomplete lower secondary schools” declined. While both reached the targets, “Newly accepted students” achieved 80% of the target. Concerning the qualitative effects, teachers and parents had the opinion that improving the learning environment raised student motivation for learning. Furthermore, it is presumed that this project contributed to the improvement of both “Number of students per classroom” and “Percentage of female students” to a certain degree. Therefore, effectiveness and impacts of the project are high. Concerning the institutional/organizational aspect, the number of new teachers did not meet the requirement estimated during the planning phase, and the majority of the schools that responded to the questionnaire replied that they did not have enough teachers. In terms of the technical aspect, the maintenance of school buildings did not require advanced technology. In terms of the financial aspect, the spending for the lower secondary education sector was on the rise. Concerning operation and maintenance, no serious damage that affected the use of the classrooms was found. For these reasons, sustainability of the project effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Assignment of maintenance staff

In the target schools, teachers were responsible for a wide range of tasks (teaching, school administration, maintenance of facilities and furniture), but some schools were unable to teach some subjects due to the lack of teachers. Although there are budgetary constraints, it is appropriate to reduce the teachers’ burden concerning maintenance activities. It is recommended that MOES and PESS facilitate each school to conduct maintenance by using various resources (such as school subsidies, VEDC, NGOs, domestic and foreign volunteers).

Assignment of teacher by using a school cluster

Although the number of teachers increased at the target schools, it was below the requirement estimated during the planning phase. In the questionnaire survey given to the schools, it was found that some subjects could not be taught due to the lack of teachers. In Laos, primary education introduced a school cluster system, where teachers within the cluster are shared in subjects where there is an insufficient number of teachers. During the ex-post evaluation, the trial use of the school cluster system was planned for lower secondary education. As soon as the trial use of the school cluster in lower secondary education is completed, it is desirable to assess the introduction of the system in the target schools.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

To request parents' support at the completion of new school buildings

In this project, there was a large number of parents who visited the schools after school buildings were rebuilt or expanded. By taking advantage of the opportunity for parents to visit the schools, teachers conducted an education awareness campaign and tried to obtain funds and labor for school building repairs and school events. Immediately after rebuilding or expanding school buildings, parents were interested in the new school buildings and often visited. To create a desirable environment in maintenance after project completion, it is appropriate to take advantage of this opportunity during the project period and to secure funds and labor to repair school buildings in the future. The endeavor such as holding monthly meetings and opening the school to local communities, vocational training (agriculture, traditional textiles, etc.) involving parents raises their interest in education and helps obtain their support for school events.

Careful assessment and monitoring on an increase of teachers

During the planning phase, it was anticipated that the target schools will need more teachers in tandem with an increase in classrooms. The number of teachers in the target schools had increased during the ex-post evaluation, but it did not reach the requirement estimated during the planning phase. If the number of teachers is expected to increase in projects to construct schools, it is desirable to carefully assess the feasibility about such an increase during the planning phase and to monitor whether sufficient teachers are assigned in the project implementation phase.