Ex-Post Project Evaluation 2012:
Package IV-4 (Sri Lanka, Bangladesh)

November 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

Kaihatsu Management Consulting Inc.
Kokusai Kogyo Co. Ltd.

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2010, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2009. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

November 2013

Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Democratic Socialist Republic of Sri Lanka

Ex-Post Evaluation of Japanese Grant Aid Project
"The Project for Construction of New Mannar Bridge and Improvement of Causeway"

External Evaluator:
Tomoko Tamura, Kaihatsu Management Consulting Inc.

0. Summary

This project was implemented with the objective of achieving stable traffic flow and contributing to sustainable regional development in Mannar District in Sri Lanka, by replacing the old Mannar Bridge and improving the causeway.

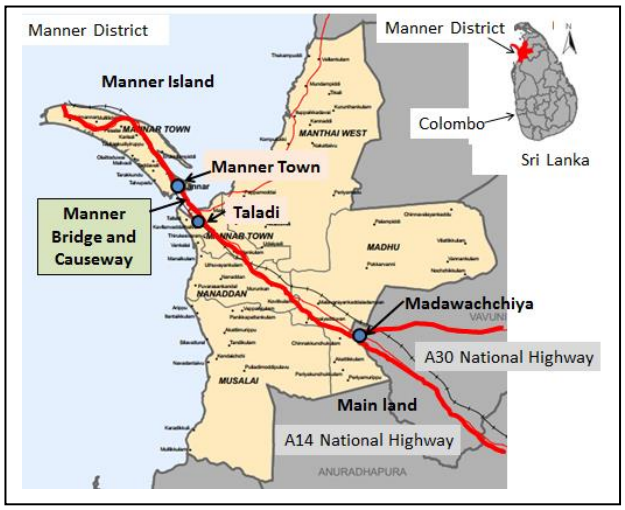
Both at the time of planning and ex-post evaluation of the project, the objective of the project was in line with the medium- and long-term development plan of the country and the road development plan, which were aiming at regional economic development. The need for and urgency of replacing Mannar Bridge and improving the causeway were high at the time of planning of the project. The need for safety and convenience of travel on the bridge and the causeway remained high at the time of the ex-post evaluation of the project. The project has relevance with Japanese assistance policy, as assistance for rehabilitation of the conflict-effected area and regional economic development were some of the priority areas in Japanese assistance policy to Sri Lanka at that time. Therefore relevance of the project is high.

The weight limit for vehicles traveling on the bridge was increased as planned from 10 tons to 30 tons after the project. The traffic volume during daytime increased significantly from 3,000 to 4,000 vehicles per day. There has been no flooding of the causeway after the project. A lot of the beneficiaries mentioned the improvement in traffic safety, and convenience and transport of agriculture and fishery products, as effects of the project. They also mentioned that transportation of heavy machinery and material became possible after the project. Therefore, effectiveness and impact of the project are also high.

Efficiency of the project is high, as the project cost and period were shorter than planned. There were some problems with sustainability, including maintenance of the lighting facility on the bridge and cleaning the surface of the bridge. It is expected that the operational system of maintenance will also be improved. Therefore, sustainability of the project is fair.

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

1. Project Description



Project Location

New Mannar Bridge

1.1 Background

Mannar District is located in the north-west of Sri Lanka. It has a population of 990,000, and an area of around 2,000 km^2. The district consists of five divisional secretariat divisions, one on Mannar Island and four on the mainland. Mannar Bridge and the causeway, which were improved by this project, connect Mannar Island and the mainland.

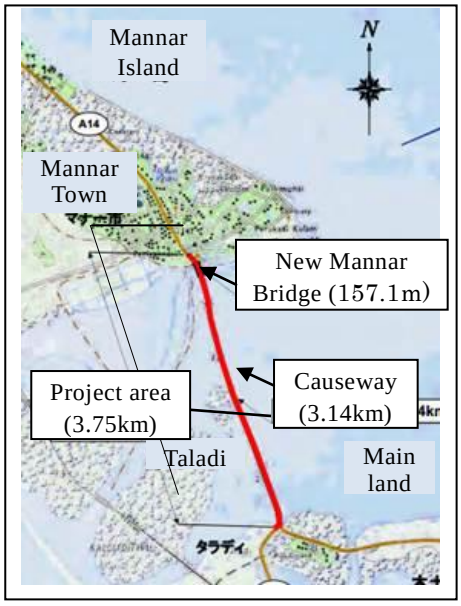


Figure 1 Map of the Project

The District Secretary's office is located in Mannar Town on Mannar Island. Important facilities of the district, such as the district general hospital, district offices of the various government institutions and banks, are also in Mannar Town. Therefore, people living on the mainland of Mannar District have to travel over Mannar Bridge and the causeway when they visit these facilities and offices. It is same when people from other districts of the country visit Mannar Town. Residents of Mannar Island have to travel over Mannar Bridge and the causeway when they visit the mainland. In this way, Mannar Bridge and the causeway form a single travel route connecting Mannar Island and the mainland that residents of, and visitors to, the district cannot travel without it.

Mannar Bridge was constructed in 1930 during the British colonial period. At the time of planning the project it was in a dilapidated condition, and had also been damaged as the result of a blast conducted by the LTTE[1]. There was a risk of vehicles falling off the

[1] The Liberation Tigers of Tamil Eelam.

causeway, which is connecting the mainland and the bridge, as the width of the roadway of the causeway was too narrow and the shoulders of the causeway had almost collapsed. As a result of these problems there was no guarantee of road safety, and large vehicles could not pass each other.

This project was implemented by Japanese Grant Aid, with the aim of solving the above-mentioned problems by constructing a new Mannar Bridge and improving the causeway.

1.2 Project Outline

The objective of this project is to realize stable traffic flow and sustainable regional development in Mannar district of Sri Lanka by replacing the existing Mannar Bridge and improving the causeway.

Grant Limit/Actual Grant Amount	1,836 million yen/1,833 million yen
Exchange of Notes Date	May 2007
Implementing Agency	Road Development Authority
Project Completion Date	March 2010
Main Contractor	Wakachiku Co. Ltd.
Main Consultant	Joint venture of Nippon Koei Co., Ltd. and Oriental Consultants
Basic Design	June 2006
Related Projects	None

2. Outline of the Evaluation Study

2.1 External Evaluator

Tomoko Tamura, Kaihatsu Management Consulting Inc.

2.2 Duration of the Study

Duration of the Study：November 2012 - September 2013

Duration of the Field Study：February 13 - March 9, 2013; June 2 - June 4, 2013

2.3 Constraints during the Evaluation Study

One of the qualitative effects of the project was expected to be a reduction in the number of traffic accidents as a result of improved traffic safety. However, this effect was not analyzed with quantitative information because there was insufficient data on the number of traffic accidents before and after the project.

One of the expected impacts of the project was a reduction in the maintenance cost of the causeway. However, it was difficult to evaluate this impact, as the cost of maintenance of the causeway before and after the project was not available.

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

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance with the Development Plan of Sri Lanka

The national development plan of the government of Sri Lanka at the time of planning of the project, *Mahinda Chintana* (2006-2017), stated that economic development and poverty reduction of rural area of the country was a priority issue because economic activities were intensively conducted in the Western Province,[4] which includes Colombo; 23 per cent of the population were below the poverty line, and most of them were living in rural areas (2004).

The Comprehensive Road Plan (2005), which was developed at the time of planning of the project and based on the above-mentioned national development plan, planned to establish eight economic development centers outside Colombo District, and to develop a road network to connect these centers. The roads to and from Mannar Town were planned to be developed as a priority to facilitate development of the rural economy, as Mannar Town was included as one of the economic development centers in the plan.

Achievement of economic development in a balanced manner was still a priority issue at the time of both implementation and the ex-post evaluation of the project, as *Mahinda Chintana* was still the national development plan of the country. It was a policy of the National Road Master Plan (2007-2017), issued in December 2007, to maintain, improve and expand the road network of the country in order to promote ethnic integration and economic growth. It was also planned to facilitate balanced growth of the rural economy and income equality through the development of roads.

The project aimed at sustainable development of the rural area by constructing a new Mannar Bridge and improving the causeway. The objective of the project was highly in line with the national development plan and road development plan of the country.

3.1.2 Relevance with the Development Needs of Sri Lanka

According to the detailed design report of the project, Mannar Bridge and the causeway had the following problems at the time of planning the project (see pictures on next page):

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[3] ③: High, ② Fair, ① Low
[4] GDP contribution of the Western Province was as high as 51 per cent of total GDP of the nine provinces in the country at the time of development of the plan (2004). The percentage of the contribution was reducing and it was 45.1 per cent in 2011. However, it is still true that the economic activity of the country is concentrated in the Western Province.

Mannar Bridge

- A temporary bridge was constructed and used after the bridge collapsed as a result of its dilapidated condition and damage caused by the blast. The temporary bridge was unstable because it was constructed on piers that were broken and cracked due to the blast.
- The width of the roadway was four meters in some parts of the bridge; therefore large vehicles could not pass each other.
- The maximum weight of vehicles was limited to ten tons, because the bridge did not have adequate load bearing capacity as a result of deterioration of the piers and concrete beams due to salt erosion and dilapidation.

Causeway

- There was a risk that vehicles could fall down from the causeway, as the width of the roadway became narrower where the wall of the causeway was declined and had collapsed and the surface of the roadway had deteriorated and become exposed.
- In terms of safety of travel, it was a problem for pedestrians and vehicles when the causeway was inundated at full tide during the rainy seasons. This happened because the body of the causeway has settled.

According to the questionnaire survey carried out at the time of the ex-post evaluation,[5] 98 per cent of the respondents mentioned that the construction of a new bridge and improvement of the causeway had been "very urgent", and two per cent said "urgent". All the respondents agreed that they had had problems earlier. They stated, for example: "We were worried that the bridge might fall down"; "It took a long time to travel over the bridge and therefore, it was not possible to reach destinations on time"; "Vehicles could not pass by each other"; "We could not bring in heavy vehicles"; and "The bridge and the causeway caused a problem for transport of agriculture and fishery products". From these facts, it was confirmed that there was a strong need and urgency for construction of a new bridge and improvement of the causeway at the time of project planning.

After the end of the civil war in 2009, the internally displaced people who had been in welfare camps returned to various places in Mannar District. Work has started on reconstruction and development of basic infrastructure, such as roads, bridges and facilities for water and electricity supply.[6]

[5] The questionnaire survey was conducted for a randomly selected sample of 100. Fifty were selected from people on the mainland and 50 from the island. The sample included general households (67 per cent), government staff (17 per cent), people working/owning shops and market (15 per cent) and staff of schools and hospitals (1 per cent).

[6] The A14 national highway (Madawachchiya – Talaimannar), which is the main road in Mannar was improved in 2010-11. A bridge was constructed at the end of the A32 national highway (Pooneryn－Karative), which opened access from Mannar District to Jaffna District.

Under these circumstances, it was found that the traffic volume over Mannar Bridge and the causeway at the time of the ex-post evaluation had increased substantially compared to that at the time of project planning, as is mentioned in the section of this report on Effectiveness. The need to transport heavy machinery, such as road rollers and shovel cars, construction materials, electricity poles and fishing boats, had also increased with the implementation of projects for rehabilitation and development of the area. Therefore, the need to maintain the safety and convenience of travel over Mannar Bridge and the causeway remained high at the time of the ex-post evaluation.

		
Available width of the roadway of the bridge was four meters	The pier at the center of the bridge, which was cracked following a bomb blast	The causeway

The old Mannar Bridge and the causeway

		
Width of the roadway of the bridge is 10.4 meters	Mannar Bridge	The causeway

The new Mannar Bridge and the improved causeway

3.1.3 Relevance with Japan's ODA Policy

The country assistance policy of the Ministry of Foreign Affairs of Japan, which was developed in 2004 during the implementation of the ceasefire agreement, stated that the assistance for economic development of the country should aim at sustaining the peace and assisting the process of rehabilitation and balanced development of the regions. This project aimed to assist the process of rehabilitation in the area affected by the civil war,

and facilitate economic development of the rural areas, as mentioned earlier. Therefore, the project has a high relevance with the overseas assistance policy of Japan.

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

3.2 Effectiveness[7] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

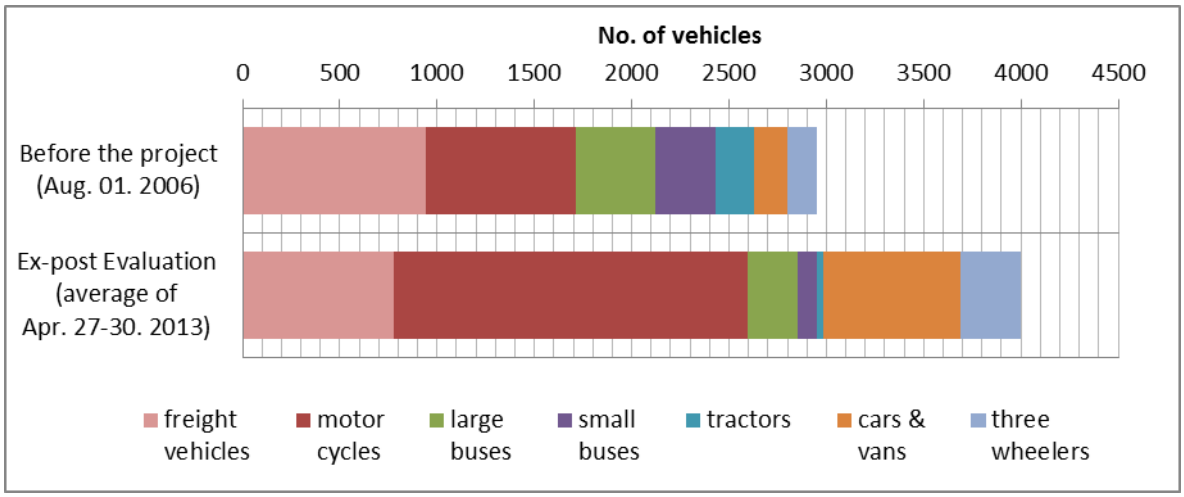
The operation and effect indicators of the project were planned as an increase in the weight limit of vehicles traveling across the bridge, and an increase in traffic volume. The weight limit of vehicles traveling on the bridge was ten tons at the time of the project planning. It was planned to increase this to thirty tons after the completion of the project. The Road Development Authority (RDA) confirmed at the time of the ex-post evaluation that the weight limit of the bridge had been designed as thirty tons, and the present weight limit was also thirty tons as planned.[8] According to the stakeholders of Mannar District, the heaviest vehicle likely to travel over the bridge would be a heavy duty lorry of the Ceylon Electricity Board loaded with electricity poles for high-tension transmission lines. The Mannar office of the Ceylon Electricity Board commented that they do not have any problem with the present weight limit, as the weight of the above-mentioned lorry would not be more than thirty tons.

As Figure 2 shows, when the daytime traffic volume for twelve hours at the time of planning and the ex-post evaluation were studied,[9] it was found to have increased substantially, from around 3,000 to around 4,000.

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

[8] The bridges of the national highways were recently designed to have a weight limit of 30 tons, according to the RDA. The RDA was of the opinion that the weight limit of Mannar Bridge should be regarded as 30 tons, as it was designed in the above-mentioned manner. However, a facility to weigh vehicles traveling on the national highways has only recently been introduced in the country, and Mannar Bridge does not have such a facility yet. Therefore, a signboard for the weight limit has not been arranged, and the weight of vehicles traveling the bridge has not been checked, and, therefore, people using the bridge do not know the weight limit. The RDA had specified the weight limit, arranged signboards and made necessary arrangements to limit the vehicles for the dilapidated bridges.

[9] The result of a traffic volume survey conducted during the detailed design on August 1, 2006 (a weekday) was used as traffic volume at the time of project planning. The average of the results of a traffic survey conducted for four days, from April 27 (Sat) to 30 (Tue), 2013, was used as a traffic volume at the time of the ex-post evaluation. The RDA conducted both surveys at Mannar Bridge for twelve hours, from six o'clock in the morning to six o'clock in the evening. The latter survey was conducted for four days consecutively to have more accuracy. There was no multi-day survey conducted at the time of project planning; therefore, the results of the one-day survey were used.



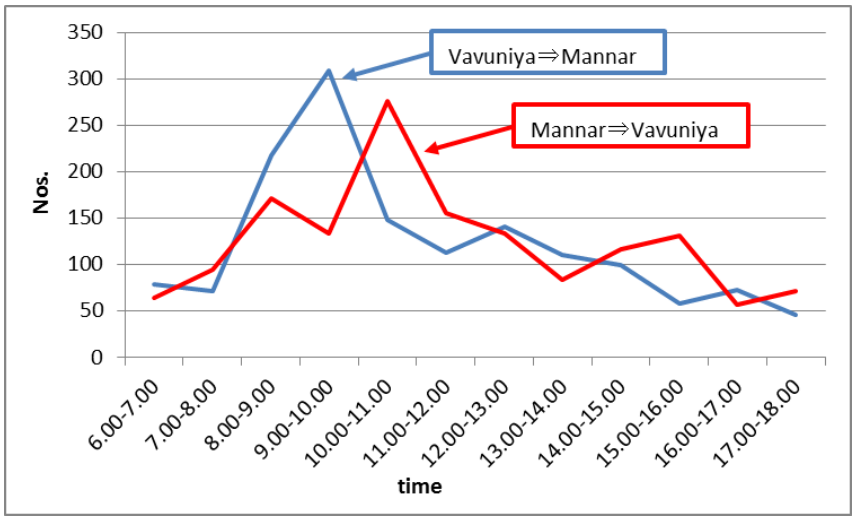
Source：RDA

Figure 2　Traffic volume at the time of planning and ex-post evaluation of the project

Figure 2 also shows that it is particularly the number of motorcycles, cars and vans that have increased. The stakeholders in Mannar District explained that the number of these vehicles had increased as more people in Mannar District purchased motorcycles, cars and vans for personal use as a result of the increased freedom of movement after the end of the conflict, and the area for commuting and schooling expanding accordingly. There are several other reasons that helped the people of Mannar District to purchase the above-mentioned vehicles. For example, they are now able to purchase vehicles with installment payments, as several leasing companies recently opened branch offices in Mannar Town. Senior government officers in the area have been given the opportunity to purchase vehicles with reduced import tax, just like officers in other parts of the country.

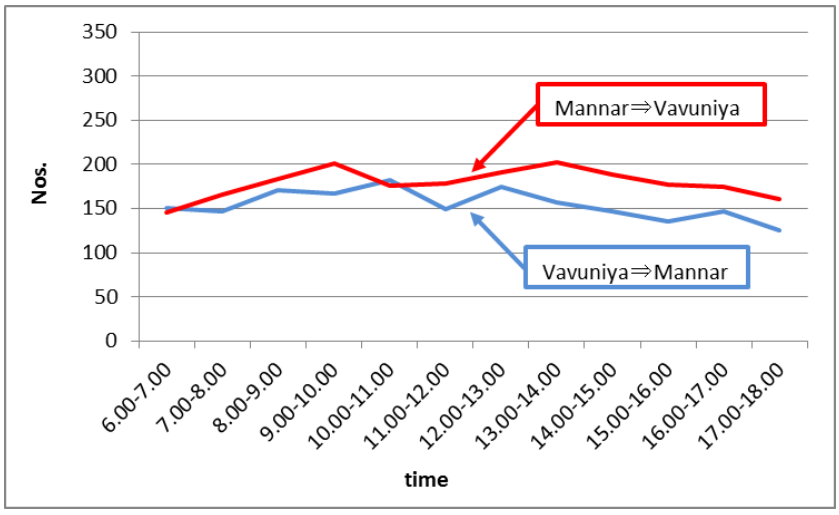
Figures 3 and 4 show the number of vehicles every hour. It was found from these figures that the number of vehicles in the morning and in the evening was very low at the time of planning the project; however, the number of vehicles was almost the same every hour of the day at the time of the ex-post evaluation. The number of vehicles in the morning and in the evening was low at the time of planning the project because people tended to avoid traveling on the bridge and the causeway during these times, because it was difficult for large vehicles to pass each other and the bridge was very old and could collapse. It was also because public security had deteriorated in those days.

After the project the traffic volume became stable during the course of the day, because safety and convenience of travel over the bridge and causeway had improved as a result of the project, and also because the people felt it was safe to travel throughout the day as a result of improvement in public security after the end of the conflict.



Source: RDA

Figure 3 Hourly traffic volume before the project (August 1, 2006)



Source : RDA

Figure 4 Hourly traffic volume after the project (Average from April 27- 30, 2013)

The external evaluator studied the number of buses traveling in the area, although this had not been particularly expected to be an operation and effect indicator of the project at the time of planning. Buses are the main public transport facility in the area.[10]

Table 1 shows data submitted by the Mannar Depot of the Sri Lanka Transport Board on the number of services, buses and passengers on the public buses departing from

[10] There had earlier been a train service from the mainland to Talaimanner, at the end of Mannar Island. The service was suspended in 1990 due to the conflict. Currently, buses are the only public transport. Sri Lanka Railways were carrying out repair work on the railway as at July 2013.

Mannar Town before and after the project. It is clear from the table that all the above-mentioned figures increased substantially.

Table 1 Information about public buses departing from Mannar Town

Year	Number of services per day	Number of buses operated per day	Average number of passengers per day
2008	90	16	3,140
2009	96	18	3,336
2010	108	20	3,769
2011	147	28	4,100
2012	188	32	4,730

Source：Mannar Depot of the Sri Lanka Transport Board

Table 2 shows information on the long-distance buses before and after the project, submitted by the chairman of the Mannar Private Bus Owners' Association. The number of services per day was increasing rapidly, just like the services of public buses. It was also found that a bus service from Mannar to Jaffna had commenced recently.

Table 2 Number of services per day of private long-distance buses departing from Mannar Town

Route/Year	2009	2013
Mannar Town – Vavuniya Town	10	24
Mannar Town - Colombo City	3	18
Mannar Town – Jaffna City	0	14

Source：Mannar Private Bus Owners' Association

Before the project, when public and private buses were fully loaded they were stopped by the police and several passengers had to disembark before the bridge. The passengers who got off the buses had to walk across the bridge and get on the bus again at the other side.

Earlier, the road was closed when a bus broke down on the bridge or the causeway, until either the bus was repaired in situ or towed away. This is no longer a problem, as there are two lanes on the bridge and the causeway.

3.2.2 Qualitative Effects

Expected qualitative effects of the project included that the causeway would not be

inundated, and the number of traffic accidents on the bridge and the causeway would be reduced.

Before the project, the causeway was usually inundated twice a year, and this caused a problem for traveling. The salt water that covered the surface of the road when it was flooded was one of the causes of damage to the road. As expected, the causeway has not been inundated after the project.

According to Mannar District Traffic Police, there were no traffic accidents on Mannar Bridge either before or after the project. Table 3 shows the number of traffic accidents on the causeway. It is difficult to make a conclusion about the change in the number of traffic accidents before and after the project by analyzing the table, because the number of injuries before the project is not available, and the duration of the records before and after the project is different.

Table 3 Number of traffic accidents on the causeway before and after the project

Item/Year	2006-2009 (4 years)	2010-2012 (3 years)
Deaths	03	01
Injuries	Not available	11
Damaged vehicles	09	06
Vehicles falling off the causeway	02	06

Source：Mannar District Traffic Police

However, stakeholders of the project in the RDA Mannar office and District Secretary's Office were of the opinion that the number of traffic accidents might have increased after the project. This was mainly because traffic volume had increased, and vehicles were able to increase speed when traveling on the causeway after the project. Before the project the maximum speed of vehicles was around 30 km per hour. Currently, the speed limit of the causeway is 50 km - 70 km per hour. According to the RDA, the number of traffic accidents often increases after road improvements, such as road widening or resurfacing, as vehicles can comfortably go faster. Therefore, it is often necessary to do something to prevent traffic accidents after road improvements.

The causeway is very dark at night as there are no streetlights and no houses or shops along the causeway at the moment. Most of the traffic accidents happen at night when the vehicles try to avoid donkeys and cows crossing the causeway, according to the RDA and the Mannar District Police. To prevent traffic accidents, the RDA and other stakeholders in the area pointed out the need for streetlights along the causeway, and for nets and

fences to stop animals coming onto the causeway.[11]

3.3 Impact

3.3.1 Intended Impacts

(1) Improvement of safety and convenience of travel, development and activation of regional socio-economic status

In the questionnaire survey for 100 beneficiaries, the external evaluator asked how the new Mannar Bridge and improvement of the causeway contributed to the socio-economic situation of the citizens of the Mannar District. All the respondents selected that "the project had contributed" to all the items in the questionnaire, including improving safety and convenience of travel, transportation of agriculture and fishery products, heavy machinery and material could now be transported, and increased employment and job opportunities.

Key informant interviews,[12] were also conducted in the ex-post evaluation. In the interviews, the respondents stressed impacts of the project were improved safety and convenience of travel, facilitation of resettlement of internally-displaced people, and activation of economic activities.

It was very impressive that respondents to the questionnaire survey talked a lot about the difficulties they had earlier faced when traveling and transporting goods, and the tremendous benefits they enjoy after the project. This shows that the project had a great impact on the socio-economic life of people in Mannar District.

Box 1: Opinion of Mr. A. A. Edward, former Deputy Land Commissioner of Mannar

Mannar Bridge is the only access to Mannar Island and is a lifeline for citizens of Mannar District. Our life and work were disturbed for five years after the bridge was blasted by the LTTE in 1990. We had to travel from the mainland to Mannar Island by boat, as we did not have a bridge.

We used a Bailey bridge after 1995. We did not feel at all safe as the bridge was old and badly damaged. We had to wait for a long time before getting on the bridge when there was

[11] Local authorities are in charge of construction and operation and maintenance of streetlights on national highways in Sri Lanka. Mannar Urban Council agreed it was necessary to put streetlights along the causeway and had looked into this possibility on several occasions. However, the council had not yet implemented it as it would be very expensive - around LKR 4 million (around JPY 3.8 million).

[12] The key informant interviews were conducted in selected public and private sector organizations in Mannar Town, especially those relating to travel and transport businesses. For example, public sector organizations, such as Urban Council, Divisional Secretary's Office, Agriculture Department, Sri Lanka Transport Board, *Pradeshya Sabhawa* (divisional council); and private sector organizations, such as guest house owners and traders of fisheries products. In addition to that, information was collected from citizens of Mannar who had been employed in the project under the contractor for administration, accounting, supervising, etc.

a lot of traffic because large vehicles could not go past each other as the width of the bridge was narrow. We could not bring things needed for infrastructure and economic development, such as large lorries, shovel cars, electricity poles for high tension lines, and manhole covers, due to the limitation on weight.

Since the conflict was ended in 2009, development assistance and infrastructure construction have commenced in Mannar District in an active way after thirty years. If the new Mannar Bridge had not been constructed, there would have been various problems in transporting materials and heavy vehicles, speedy transport and travel, in rehabilitation programmes for internally-displaced people returning to Mannar District, and for housing and basic infrastructure development. The construction of the new Mannar Bridge and improvement of the causeway by JICA was indeed a timely assistance.

Box 2: Opinion of Mr. Devathas Croos, who is engaged in wholesale of fishery products in Pesalai on Mannar Island

I currently sell fishery products wholesale to supermarkets and trading companies in Colombo. I have 14 lorries. I started an ice factory and a crab meat processing factory two years ago.

Earlier it took around 45 minutes from Mannar town to Taladi. It was difficult for us, as we have to keep the fishery products as fresh as possible. Now, I'm glad that I can travel in around 10 minutes. Earlier, large cooler trucks and container trucks could not travel over the bridge. Now, fish traders from outside the district come here in these vehicles to purchase fishery products. I'm expanding the business by taking this opportunity. More than anything, the old bridge was shaking, and too narrow for two vehicles to pass by each other. It was also dangerous.

(2) Reduction of the maintenance cost of the causeway

It was expected that the maintenance cost of the causeway would be reduced as a result of the causeway being more stable, and there being less damage to the protection wall and road surface.

However, it is not known whether the cost was reduced or not, because the amount of expenditure for maintenance of the causeway before and after the project is not available. The RDA Mannar office paid for the cost of maintenance of Mannar Bridge and the causeway out of the total budget for maintenance work allocated to the office as and when necessary.

3.3.2 Other Impacts

(1) Impacts on the natural environment

Negative impacts on the natural environment as a result of the project were not observed or pointed out during or after the project.[13]

(2) Land Acquisition and Resettlement

The two households who had illegally occupied the public land were resettled as a result of the project. The resettlement was conducted in a legal way. One of the households, which had a shop, was provided with an alternative land for building as otherwise they would have lost their livelihood. In addition, Mannar District Secretariat carried out the relocation of a petrol station run by a cooperative society in a legal way. An alternative land and cost for reconstruction were provided to the cooperative society. The RDA acquired a land with a security guardroom of the army. The necessary compensation was paid to the Ministry of Defense. The Ceylon Electricity Board and the Sri Lanka Telecom respectively relocated electricity and telephone poles. The RDA paid necessary costs for the relocation. There have been no complaints or issues about the above-mentioned resettlement, land acquisition and relocation of public facilities, and therefore there is no particular problem in this regard.

(3) Other Indirect Impact

The beneficiaries expressed deep gratitude in the questionnaire survey and the key informant interviews to the Japanese government and the contractor for implementing the project during the conflict when public security was unstable and there were a lot of restrictions on transport and traveling. Many of them were of the opinion that the bridge is designed beautifully, and it contributes to enhancing the image of Mannar District.

In total, 296 citizens of Mannar District were employed by the project, according to the resident of Mannar who worked as a coordinator under the contractor of the project.[14] The results of the questionnaire survey showed that more than 80 per cent of the respondents recognized the impact of employment generated by the project, and expressed gratitude for that.

This project has largely achieved its objectives; therefore its effectiveness and impact is high.

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[13] After the completion of the project, on July 12, 2010, the area south-east from Mannar Bridge was registered as a wetland under the Ramsar International Convention, and came under the management of the Department of Wildlife Conservation.

[14] The population of Mannar District and Mannar Town Divisional Secretariat Division were 990,000 and 510,000 respectively according to the national census of 2012.

3.4 Efficiency (Rating: ③)

3.4.1 Project Outputs

All the expected outputs of the project were produced as planned, except for the minor adjustments and changes mentioned below. These minor changes did not influence the quality or length of the period of construction.

Table 4 Planned and Actual Outputs of the Project

Plan	Actual
(1) Construction of a new bridge - Length: 157.1 m - Width : 10.4 m (two lanes) - Walking paths : 3.0 m in both sides (1.5 m in one side) - Pavement : Asphalt concrete - Piers : Pile-bent system - Abutment : Direct filling slope - Foundation : Cast-in-place reinforced concrete piles	As planned except the following minor changes: - Diameter of the mantle of the piers was changed from 1.2 meters to 1.4 meters to suit the type of cast-in-place piles of the piers. - Size of the cradle of the water supply pipeline changed from 1700x550x528 mm to 700x700x528 mm due to change of the diameter of the pipeline.
(2) Improvement of the causeway - Width : 11.0 m (Two lanes with walking paths in both sides) - Length: 3.14 km - Pavement : Double bituminous surface treatment (DBST) (around 37,000 m^2 including the approach roads)	As planned except the following minor changes: - The size of the chips for DBST was changed from 9.5 mm to 19 mm due to change of the types of vehicles and increase of traffic volume in future. - Height of the causeway in every section was made higher than the existing road to avoid inundation.
(3) Approach roads - Width : 11.0 m (Two lanes with walking paths on both sides) - Length : 0.453 km	As planned.

Source : JICA and the Project Completion Repot

3.4.2 Project Input

3.4.2.1 Project Cost

The cost of the project was planned as JPY 1,897 million and was actually JPY 1,833 million in total, including the contract amount for the consultant of JPY 103 million and the same for the contractor of JPY 1,730 million. The cost of the project was lower than

planned (96% of planned cost).

The government of Sri Lanka contributed LKR 176 million in total, including payment of custom duty for import materials and machinery, taxes, cost of land acquisition and resettlement and other administration expanses. It was JPY 154 million using the exchange rate at the time of project planning.[15] Therefore, the total cost of the project was JPY 1,987 million.

3.4.2.2 Project Period

The project period was planned as 37 months from May 2007 to June 2010. It was actually 34 months: from 23 May 2007 to 1 March 2010. The project period was shorter than planned (92% of the planned period). The project was completed before the planned date as a result of the stakeholders of the project making a determined effort, even though the civil works were suspended from the middle of January to middle of April 2008 due to deterioration of public security of the area.

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

Box 3: Opinion of Mr. S.S. Rajasingam, a supervisor of the civil works of the project

The people in Mannar did not have many employment opportunities at the time construction of the new Mannar Bridge started, as we had unstable public security during the conflict. The contractor of the project, which was a Japanese company, understood this situation and actively employed local companies and persons as subcontractors and direct employees.

I was employed as a supervisor for the civil works of the project, as I had worked as a chairman of farmers' organizations, and my leadership in the area was appreciated. I supervised around thirty laborers. There was strict discipline at the workplace. Everybody in the workplace had to punch timecards and participate in the radio gymnastics every morning. The time for the radio gymnastics was important for group leaders to count the number of group members attending the work. We felt strange at first, as we did not have these customs in Sri Lanka. However, we got used to the system within two or three days. One of the good points of working for the project was that we learnt Japanese management systems and discipline in the workplace from the Japanese staff.

Every working group was given clear responsibilities and targets, so that we could

[15] LKR 1 = JPY 1.1443

complete the given work on time. We worked hard from seven o'clock in the morning to five o'clock in the evening. We sometimes worked overtime and on Sundays. We were very proud of being a part of the "Construction of a new Mannar Bridge". This pride created a sense of unity among the stakeholders and encouraged everyone to make every effort to complete the work as soon as possible.

Construction under the environment of conflict was very difficult. We had to obtain permission from the army for every shipment of construction material and machinery. The army and police both provided us with the fullest cooperation, as they understood the need for the project. The project was completed earlier than planned because of the Japanese management, motivation of the workers and cooperation of the stakeholders.

3.5 Sustainability（Rating：②）

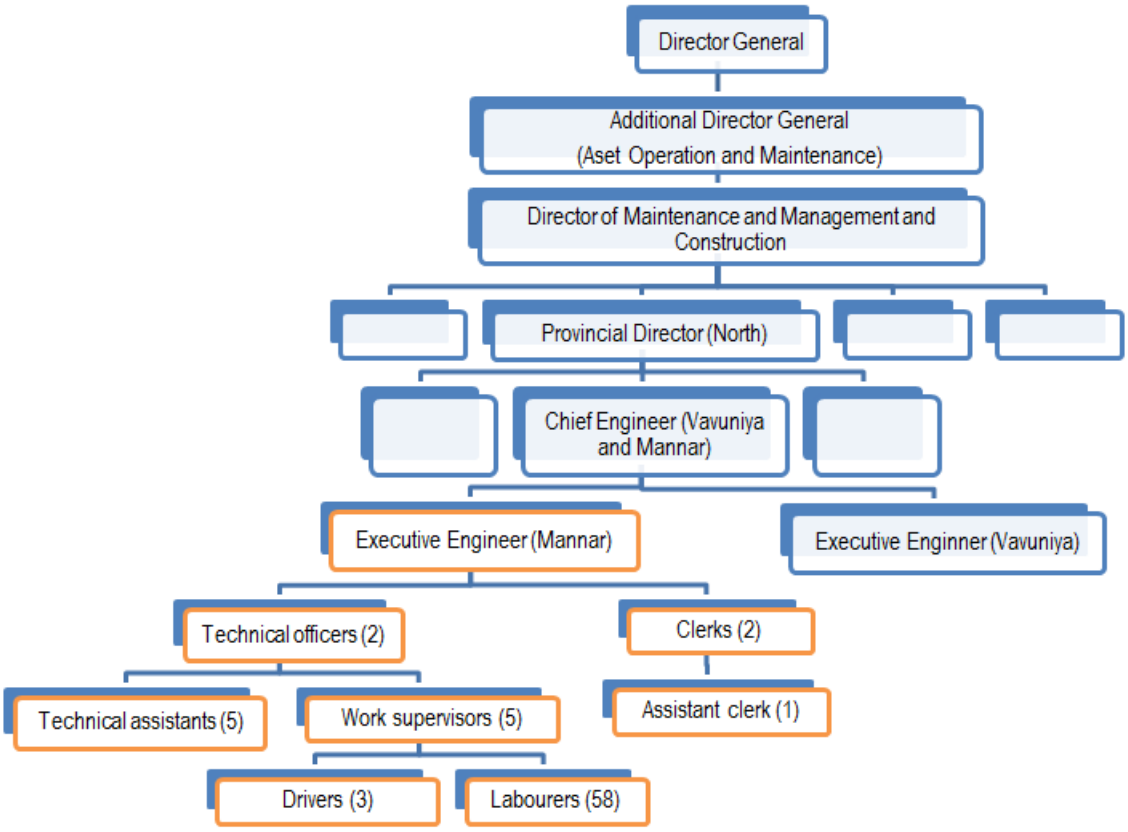
3.5.1 Institutional Aspects of Operation and Maintenance

The Mannar office of the RDA is in charge of maintenance of roads in the district, including Mannar Bridge and the causeway improved under the project. The head of the office is the executive engineer. The chief engineer of the Vavuniya and Mannar office of the RDA is supervising the Mannar office. Figure 5 shows the institutional set-up of the office in the organizational structure of the RDA.

The RDA Mannar office assigns the necessary staff for maintenance of the facility under their responsibility, and there is no vacancy or double duty at the moment. In recent years, the RDA has had a policy of not increasing the cadre of laborers in order to increase management efficiency. Therefore, sometimes when someone retires the vacancy has not been filled. The Mannar office is trying to increase the efficiency of work; available staff carries out work assigned to the office after shifts of the laborers are allocated in the best possible way.

In this way, there is a clear responsibility for maintenance assigned to the organization. However, there is no work plan, checklist or record of inspection with regard to the maintenance of Mannar Bridge and the causeway at the moment.[16] They conduct maintenance work as necessary. The staff members have a general understanding about the necessary intervals for the work, such as whether it should be carried out once a week or once a month.

[16] They used the checklist provided by the contractor once; however they did not use it after that as the format was not convenient for them.



Source：Reply of the RDA to the evaluation questions

Figure 5　Organizational Structure of the RDA for Maintenance Work

3.5.2　Technical Aspects of Operation and Maintenance

According to the RDA Mannar office, there is no problem with the technical level of the technical officers and technical assistants, and they do not have technical issues with regard to the maintenance of the Mannar Bridge and the causeway at the moment except for replacement of bulbs of the lights on the bridge as mentioned later. Training of staff of the Mannar office was not planned or implemented under the project, as the technical level of the staff was considered to be adequate to implement maintenance of Mannar Bridge and the causeway.

3.5.3　Financial Aspects of Operation and Maintenance

As mentioned in the section on Impact in this report, there is no particular budget allocation for maintenance of Mannar Bridge and the causeway. The cost of maintenance of the facility came from the maintenance budget allocated to the RDA Mannar Office when necessary. There are two items in the maintenance budget of the office: routine maintenance and periodic maintenance. Table 5 shows the budget allocation and actual

expenditure on these items in recent years. In addition to these budget allocations, the RDA head office provides an emergency maintenance budget according to necessity, for example, when roads need urgent repairs due to floods.

Table 5 Annual budget of RDA Mannar office for maintenance work

(Unit：Million Rupees)

Item/ Year	2010		2011		2012	
	Budget allocation	Actual expenditure	Budget allocation	Actual expenditure	Budget allocation	Actual expenditure
Routine maintenance	20.0	10.8	14.0	14.0	17.3	17.3
Periodic maintenance	36.0	35.6	42.0	40.4	80.0	48.5
Total	56.0	46.4	56.0	54.4	97.3	65.8

Source：RDA

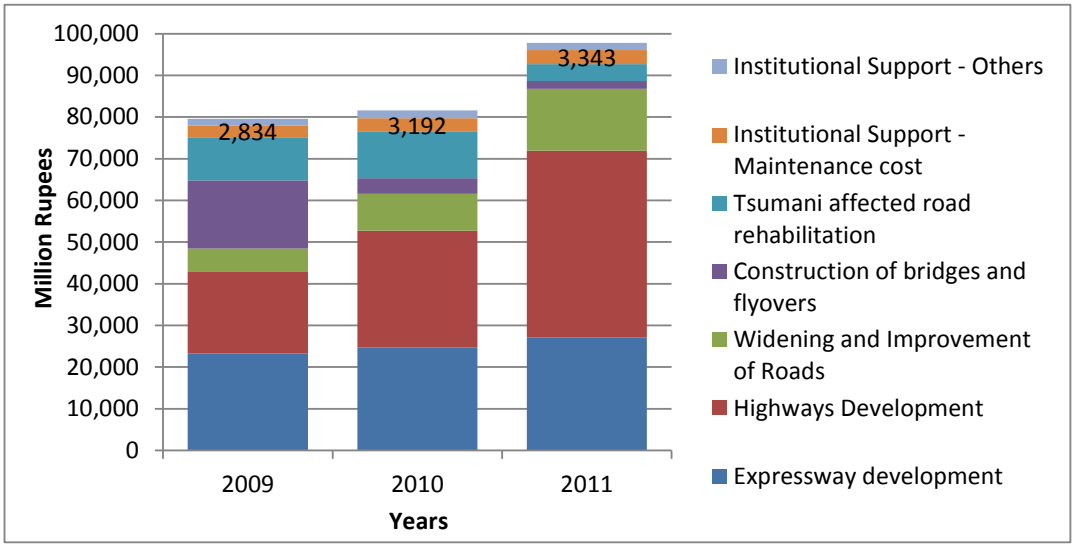
When a road is expanded or improved, responsibility for maintenance of the road under construction will be transferred to the contractors. Then, the cost of maintenance of that particular road will be removed from the annual budget for the RDA offices. Therefore, the annual budget of the RDA offices varies from year to year. The budget for maintenance of the RDA offices was allocated from the Road Maintenance Trust Fund (RMTF). The central government allocates the necessary budget to the fund.

The external evaluator discussed with the staff of the RDA Mannar office whether the budget allocated to the office was sufficient. They stated that it is not excessive but not too low; it is adequate if they manage it properly. As the above table shows, there are some balances remaining some years. In most cases this is because a payment to a contractor was not completed, as the work entrusted to them did not show the expected progress.[17] The RDA Mannar office had estimated the maintenance cost of Mannar Bridge and the causeway as around LKR 910,000 per year based on the cost of the necessary staff and materials; this is within the budget of the office. There seems to be no particular problem with regard to the financial situation of the Mannar office as the annual budget, including the cost of personnel and material, has been revised each year taking account of increasing prices.

Figure 6 and 7 show budget allocation and expenditure of the RDA. Cost of maintenance for the last three years were LKR 2,834 million, LKR 3,192 million and

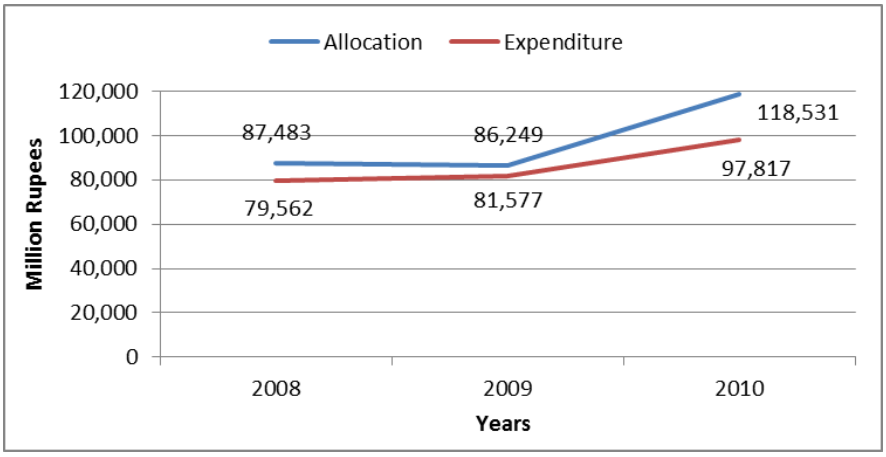
[17]For example, there was a surplus in the budget for 2012, as the office had planned to implement periodic maintenance of small-scale bridges during 2012; however they could not do so within the year because the procurement process for the work took longer than expected.

LKR 3,343 million. There seems to be no particular problem with the budget allocation and expenditure as the RDA increased the amount of the total budget, including the budget for maintenance, year by year considering the price hike and increase of employment cost; and the total amount of expenditure was within the budget.



Source：Annual report of the RDA

Figure 6　Annual Budget Allocation of the RDA



Source：Annual Report of the RDA

Figure 7　Annual Budget Allocation and Actual Expenditure of the RDA

3.5.4　Current Status of Operation and Maintenance

Table 6 shows the main items of maintenance and frequency of the work for Mannar Bridge and the causeway, which were stated in the detailed design report of the project.

Table 6 Maintenance Items (plan)

Category	Frequency	Inspection items	Work items
Maintenance work needing to be carried out every year			
Maintenance of drains	Twice a year	Drains on the bridge surface	Removal of sand
		Drains under the walking path	Removal of sand
Maintenance of the facility for traffic safety	Once a year	Indications of road surface	Repainting and replacement of bulbs in the streetlights
Maintenance of the road	Twice a year	Shoulder and cut slope	Removal of weeds
Maintenance work needing to be carried out once every few years			
Inspection and repairs of the walls and bottom protection work	At the time of cyclone (estimated as once in 2 years)	Protection wall	Repair of damaged parts
Maintenance and repair of the pavement	Once in 5 years	Surface of the pavement	Repair of overlay, cracks, potholes and others
Repainting of iron poles for lights	Once in 10 years	Surface of the metal parts	Painting at site
Replacement of the expansion joints	Once in 10 years		

Source：Detailed design report

At the time of the first field survey of the ex-post evaluation in February 2013, the following problems on the status of maintenance of Mannar Bridge and the causeway required improvement. Following discussions with the RDA Mannar office and the head office, as of June 2013 some of these problems have already been attended to, and it is planned to address some others.

(1) Maintenance and cleaning of the drains was inadequate

It was found at the time of the field survey of the ex-post evaluation that drain holes on both sides of the bridge and drain (service duct) were not cleaned properly. Because of this, drainage pipes under the bridge seemed to be blocked and were not functioning properly. As a result, the rainwater had run into the side of the approach roads and had eroded the cut slopes. The erosion may cause sedimentation on the approach roads in future. The RDA Mannar office mentioned that they had carried out cleaning once a week; however, there was no cleaning schedule, nor any checklist for the inspection or any record that could prove the cleaning had been done. It seemed that the service duct

was not cleaned periodically.

As a result of discussions with the Chief Engineer, who is in charge of Vavuniya and Mannar, and the staff of the RDA head office, RDA Mannar office conducted a cleaning campaign at the end of February 2013, including the following work:

- Removal of sand on the bridge surface
- Removal of sand in the drain holes of the bridge
- Removal of sand and garbage in the drains by opening the concrete lid of the drains.
- Re-planting of grass on the turf of the approach roads to prevent erosion.

Cleaning of drains on the bridge

The Mannar office conducted removal of sand periodically after the campaign, too. There has been no erosion observed on the approach roads so far.

(2) Maintenance of the facility for traffic safety: streetlights on the bridge are not functioning

The streetlights on Mannar Bridge were constructed by the project in order to secure safety of traffic on the road and ships traveling under the bridge. However, all seven bulbs of the lights had burnt out and had not been replaced for more than one year. The Chief Engineer of the RDA Vavuniya and Mannar explained that they had not replaced the bulbs recently due to the following reasons, although they had replaced them several times after completion of the project.[18]

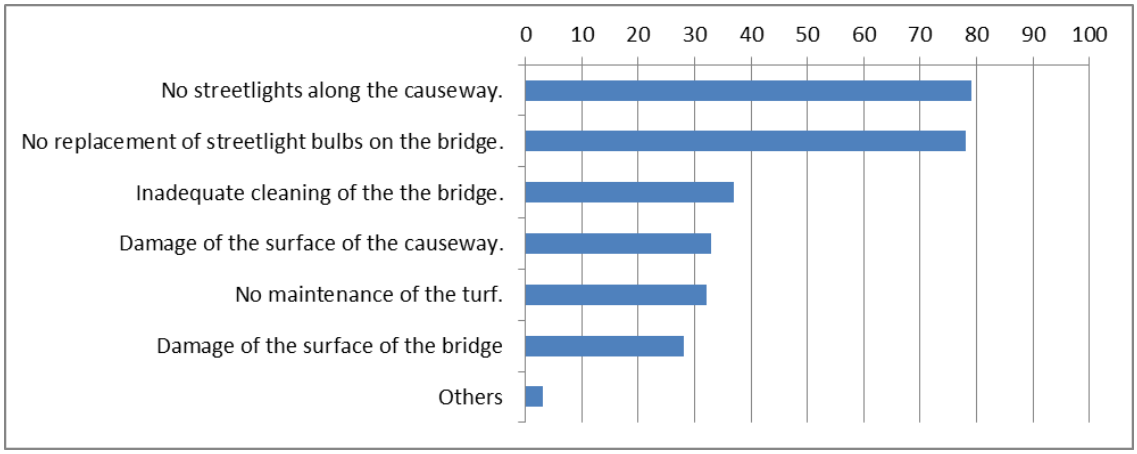
- The bulbs are 12 m up, and they have to use scaffolding to replace them. However, they found it was dangerous for staff as the scaffolding was trembling. It is especially dangerous from April to September, when strong winds blow in the area. They had rented a crane, but found it not realistic to do so often as the rental charge was LKR 10,000 per time.
- The streetlights are not durable against vibration and the bulbs do not last long. The two in the middle of the bridge last only around six months as they vibrate more.

With regard to this problem, the RDA head office instructed the Chief Engineer to replace the bulbs with LED bulbs, which last for 10–15 years. The Chief Engineer was in the process of discussing the details of the technical specifications with a supplier.[19]

[18]Local authorities are in charge of maintenance of the streetlights of the national highways and bridges in general. However, the RDA is undertaking maintenance of the streetlights on the Mannar Bridge as they are high and technically difficult for Mannar Urban Council to maintain.

[19]LED bulbs were hardly available or used in Sri Lanka at the time of planning of the project. Therefore,

Figure 8 shows the results of the questionnaire survey about the current status of maintenance. The beneficiaries expressed concern that there are no streetlights along the causeway, and that the bulbs of the streetlights on the bridge do not function. It is expected that the organizations in charge will provide solutions to these issues urgently.



Source: Questionnaire survey

Figure 8 Are there any problems on maintenance of Mannar Bridge and the causeway?

(3) Maintenance and repair of the pavement: damage to the road surface

Some chips of the asphalt pavement on the bridge had worn off. The pavement of the approach roads had started to be badly damaged, especially on their downward slopes.[20] This was because more friction occurred there, as vehicles had to brake. Maintenance of the pavement was supposed to be conducted once in five years according to the maintenance plan developed at the time of project planning. The RDA should examine the need to repave from a technical viewpoint, so that they can carry out it at an appropriate time.

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there seems to be no problem with the selection of the kind of bulb at that time. The height of the streetlights was in accordance with the standards of the RDA. Also, the lights needed to be high enough to ensure adequate coverage. It was planned to use scaffolding for replacement of bulbs. The impact of vibration and strong winds might not have been studied adequately.

[20] According to the detailed design report and explanation of the RDA, there had been a discussion whether the pavement should be asphalt concrete or DBST (double bituminous surface treatment). DBST was adopted even though asphalt concrete was more durable, because asphalt was not available near the construction site at that time. Asphalt is now readily available - after the project a manufacturing workshop of asphalt concrete has been constructed in Madawachchiya, and this is owned by the RDA.

(4) Insufficient maintenance of the turf on the approach roads

The RDA Mannar office started replanting the grass after the external evaluator pointed out that there was no grass. The office needs to continue the replanting and to water and weed the replanted grass periodically.

There was no problem on the weeding of the shoulder and the cut slopes.

There were several issues with regard to maintenance as mentioned above. These were not because of shortage of budget or laborers, but because there was not sufficient management or incentive for the maintenance work as there was no cleaning schedule, record of inspection or adequate monitoring by senior management.

In this way, some problems have been observed in terms of the institutional aspects and the current status of the maintenance of the bridge and the causeway, therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented with the objective of achieving stable traffic flow and contributing to sustainable regional development in Mannar District in Sri Lanka, by replacing the old Mannar Bridge and improving the causeway.

Both at the time of planning and ex-post evaluation of the project, the objective of the project was in line with the medium- and long-term development plan of the country and the road development plan, which were aiming at regional economic development. The need for and urgency of replacing Mannar Bridge and improving the causeway were high at the time of planning of the project. The need for safety and convenience of travel on the bridge and the causeway remained high at the time of the ex-post evaluation of the project. The project has relevance with Japanese assistance policy, as assistance for rehabilitation of the conflict-effected area and regional economic development were some of the priority areas in Japanese assistance policy to Sri Lanka at that time. Therefore relevance of the project is high.

The weight limit for vehicles traveling on the bridge was increased as planned from 10 tons to 30 tons after the project. The traffic volume during daytime increased significantly from 3,000 to 4,000 vehicles per day. There has been no flooding of the causeway after the project. A lot of the beneficiaries mentioned the improvement in traffic safety, and convenience and transport of agriculture and fishery products, as effects of the project. They also mentioned that transportation of heavy machinery and material became possible after the project. Therefore, effectiveness and impact of the project are also high.

Efficiency of the project is high, as the project cost and period were shorter than planned. There were some problems with sustainability, including maintenance of the lighting facility on the bridge and cleaning the surface of the bridge. It is expected that the operational system of maintenance will also be improved. Therefore, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executive Agency

(1) The RDA is advised to establish a more effective system for maintenance of Mannar Bridge and the causeway by developing and implementing a maintenance schedule, utilizing a checklist for inspection, record keeping and monitoring implementation.

(2) The Urban Council of Mannar and other stakeholders of the project are expected to construct streetlights along the causeway by fundraising and coordinating the relevant institutions.

4.2.2 Recommendations to JICA

It is recommended that improvements in the system of maintenance of Mannar Bridge and the causeway should be monitored in future.

4.3 Lessons Learned

The project was highly appreciated by the local community as it had employed them in the civil works as much as possible, and this contributed to increasing employment opportunities and improving their skills and experience. The sense of ownership of the project was enhanced among the local community as a result of the contractor doing this, and provided maximum benefit and consideration to them. This experience should be shared with other projects.

Democratic Socialist Republic of Sri Lanka

Ex-Post Evaluation of Japanese Technical Cooperation Project
"The Project for Agriculture and Rural Development for Rehabilitation and Reconstruction through Community Approach in Trincomalee District"

External Evaluator: Tomoko Tamura, Kaihatsu Management Consulting, Inc.

0. Summary

This project was implemented with the objective of establishing a development model of rural and agriculture rehabilitation with a participatory approach in Trincomalee District in Sri Lanka.

Assistance for rehabilitation and to the agriculture sector was an important task in the policy of the country at the time of project planning; the need of assistance for the Eastern Province, which lagged behind in development due to the influence of conflict was high; and assistance for rehabilitation was an important area in the strategy of Japanese assistance to Sri Lanka. Therefore, relevance of the project is high.

The project objective, "To establish a model for agricultural and rural development projects for community rehabilitation and reconstruction in Trincomalee District" was largely achieved by the end of the project; therefore effectiveness of the project is high. In terms of the overall objective of the project, sub-models on production technologies in the paddy, other field crops (OFC), dairy farming and other sectors were disseminated by being integrated into the programmes of the provincial government. However, effectiveness and replicability of the TRINCAP[1] total package, which is an integrated development model based on the formulation of CAP[2], had not been tested during the project period and was not disseminated thereafter, either. There are some issues with the continuation and expansion of project activities in the target villages. Therefore, effectiveness and impact is concluded as fair.

Efficiency of the project is high, as the project cost and period were as planned. Some improvement is needed in terms of institutional aspects of the counterpart organizations, and further enhancement is recommended for the technical and financial aspects. Therefore, sustainability of the project is fair.

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

[1] TRINCAP is the acronym used to refer to this project.
[2] Community Action Plan. A planning methodology with community participation aims to develop an action plan by the community for solving their problems. The Ministry of Housing Development introduced this methodology first time in Sri Lanka in 1980s.

1. Project Description

Project Location

Training for farmers at the model farm for paddy technology in a target village (January 2009)

1.1 Background

From the early 1980s, there was a conflict in Sri Lanka between the government and the LTTE[3], the opposition force which sought separation and independence. The north and east of the country was particularly affected due to the conflict. As a result of the conflict and Tsunami catastrophe in 2004, infrastructure of the area was significantly damaged, and productive activity stagnated.

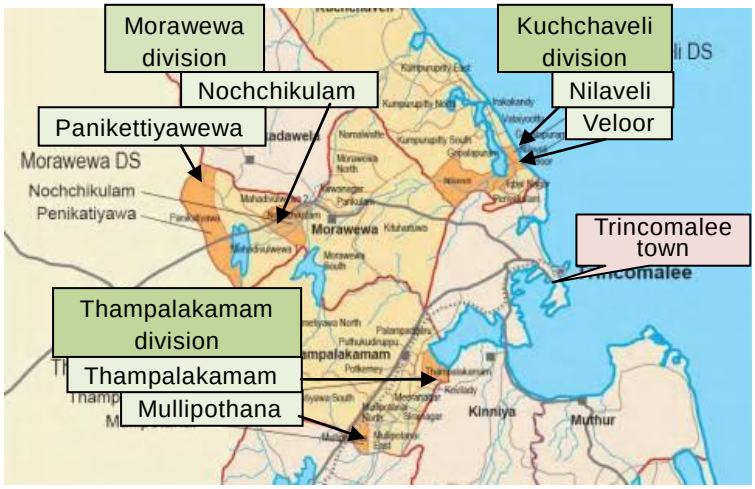


Figure 1 Location of the target villages of the project

A ceasefire agreement was signed between the government and the LTTE in February 2002, and after that there was no fighting for some time. The Sri Lankan government and the international community were actively involved in assistance to the conflict-affected areas, as they considered that providing a peace dividend to the local community would help the peace process.

Sixty per cent of the population of Trincomalee district, the economic center of the Eastern Province,[4] worked in the agriculture, forestry and fishery sectors. However, agricultural production stagnated as rural infrastructure, such as irrigation and internal

[3] The Liberation Tigers of Tamil Eelam.
[4] The Eastern Province consists of three districts, Trincomalee, Batticaloa and Ampara.

roads, was severely damaged as a result of the conflict. In these circumstances, the government of Sri Lanka requested the Japan International Cooperation Agency (JICA) to implement a technical cooperation project to improve the infrastructure and agriculture productivity of the rural areas of the district. This project commenced in October 2005 after JICA had dispatched a study team for project formation. Six *grama niladhari* divisions[5] in three divisional secretary's divisions in the district were selected as the target area of the project.

As soon as the project commenced, clashes between the LTTE and the defense forces of the government occurred around the target area of the project, and the fighting started again. Public security around the target area of the project worsened rapidly after that,[6] and the JICA experts had to leave Trincomalee District for around seven months. Public security improved, and the JICA experts returned to Trincomalee in January 2007. However, the project activities were carried out in very unstable security conditions with a lot of restrictions on travelling and transport.[7]

1.2 Project Outline

Overall Goal		The model developed will be extended in Trincomalee District through which it will contribute to the activation of rural areas in the region.
Project Objective		To establish a model for the agricultural and rural development project for community rehabilitation and reconstruction in Trincomalee District.
Outputs	Output 1	Community-based organizations (CBOs) are strengthened.
	Output 2	Rural infrastructures are improved through Community Managed Rehabilitation (CMR[8]).
	Output 3	Technologies for agriculture and livestock are enhanced.
	Output 4	Technologies for income generation other than agriculture and livestock are enhanced.
	Output 5	Frontline government services on agriculture and rural

[5] *Grama niladhari* division is the smallest administration unit of Sri Lanka. Trincomalee District has 11 Divisional Secretary's divisions and 230 *grama niladhari* divisions.

[6] There are some factors leading to instability in Trincomalee District as all three main communities (Sinhala, Tamil and Muslim) live there, and Trincomalee harbor is a strategic point for the government defense forces.

[7] The government defense forces took control of the LTTE-controlled area by force in May 2009. This was only six months before the end of the cooperation period of the project. Public security in the target area of the project improved rapidly after that.

[8] There is a system in Sri Lanka through which a CBO can undertake public works of a limited size without having to go through a process of tender. This aims to develop the capacity of CBOs. It is called a community contract, and is often called "community managed rehabilitation" for works implemented in conflict-affected areas.

	development are strengthened.
Inputs	【Japanese Side】 1. Experts: 9 persons • Long-term: 6 persons • Short-term: 3 persons 2. Trainees received: 6 persons for counterpart training in Japan 3. Equipment: JPY 20 million 【Sri Lankan Side】 1. Counterparts: 58 in total 2. Land, facilities and project office 3. Local cost and counterpart salary
Total cost	JPY 484 million
Period of Cooperation	October 2005 – October 2009; 4 years
Implementing Agency	Ministry of Economic Development
Cooperation Agency in Japan	Nippon Koei
Related Projects	Major related projects implemented in the target area during the project implementation were as follows: • UNDP: Transition Recovery Programme • World Bank : North East Coastal Community Development Project (NECCDEP) Major projects utilizing outputs of the project are as follows: • Follow-up cooperation for the Project for Agriculture and Rural Development for Rehabilitation and Reconstruction through Community Approach in Trincomalee District of JICA • Dairy farmers, milk factory and livestock societies support project by Peace Winds Japan • Agriculture Rehabilitation Support in the Eastern Province by JEN • USAID：Connecting Regional Economies (CORE) project • UNDP：Early Recovery Programme • Project for Training of Frontline Officers in Community Development in Conflict-Affected Areas in Sri Lanka by JICA

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Overall Goal (including other impacts)

It was evaluated that the overall goal would be achieved because: 1) the stakeholders of the project believed it would be possible to increase their harvest and income by applying the technology introduced by the project; 2) the production technology and other outputs introduce by the project were expected to be disseminated to surrounding villages; 3) the stakeholders recognized that the approach and strategy of the project was appropriate and effective; 4) a development model was established and related documents and technical manuals were being developed; and 5) the district secretary agreed to allocate budget for dissemination of the method of the project.

1.3.2 Achievement of Project Objective

It was evaluated that there was a high prospect that the project would achieve its objective because between three and seven kinds of technology introduced by the project to a village had already expanded to surrounding villages; income of 78 per cent of the core farmers[9] had increased by more than 10 per cent; all the people interviewed in the terminal evaluation, including the members of the joint coordination committee of the project[10] and other stakeholders, had mentioned the effectiveness of the TRINCAP total package, and several textbooks summarizing the experience of the project were being prepared.

1.3.3 Recommendations

(1) Dissemination of the TRINCAP total package[11]

- Establishment of mechanism for dissemination of the model
  Organize divisional level implementation teams and provincial and district level coordination and monitoring team.
- Facilitation for development of CAP
  Development of CAPs at the target villages for dissemination by divisional level implementation teams, including identification of necessary funding, machinery and materials, and personnel for implementation of development projects.

[9] Two hundred and twenty-five farming families, who had a good motivation to introduce new technologies, were identified as "core farmers" in the project after discussions with community and agriculture instructors. The core farmers were prioritized for technical training. They conducted demonstrations of the new cultivation technologies introduced by the project at the model farms, and played a role in transferring the technologies to neighboring farming families.

[10] The Joint Coordination Committee was the meeting hosted by the implementing agency of the project to monitor progress of the project; it had a role in deciding the plan and strategy of the project.

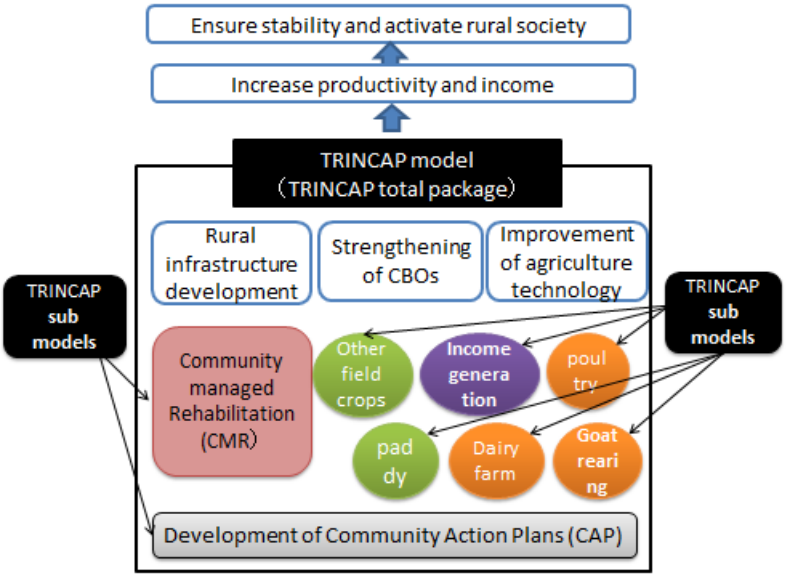
[11] There is no clear definition of the TRINCAP total package in the report of the terminal evaluation. However, from the content of the report it is understood that that the TRINCAP total package should be an integrated development model, which starts with development of CAP and implements activities of several sectors, such as paddy, OFC, animal husbandry and CMR, according to needs (see Figure 2).

- Fund allocation for implementation of CAPs

  Utilization of the budget of *Gama Neguma*[12] and allocation of necessary funds, machinery and materials, and personnel for implementation of the development projects in the CAPs.

(2) Utilization of TRINCAP sub-models (sector-wise models on paddy, OFC, poultry and others)

- Documentation of manuals for TRINCAP sub-models, and utilization of the sub-models by introducing them to the donor agencies and the on-going programmes.



Source: illustration done by the external evaluator for the ex-post evaluation based on the ex-ante evaluation report of the project

Figure 2 TRINCAP model proposed at the terminal evaluation (Total package and sub-models)

1.3.4. Definition of "model" in the project

This project was implemented with the objective of establishing a model for rehabilitation of agricultural rural villages. As a part of the ex post evaluation study, the external evaluator tried to clarify what kind of model the project aimed to establish and disseminate in the project. It was found that the definition of "model" used by the experts and counterparts of the project was not consistent throughout the project period.

[12] *Gama Neguma* is a village development programme implemented by the Ministry of Economic Development all over the country. "*Gama*" means village and "*Neguma*" means improvement or uplifting. Improvement of small-scale rural infrastructure and income generation are the main activities of the programme.

In the ex-ante evaluation of the project, the stakeholders used "establish a model" to mean to achieve outputs that would be a role model for other projects, by rehabilitating infrastructure and providing training for agriculture management through a participatory development approach. There was a discussion about the definition of model at the time of the mid-term evaluation of the project. The phrase "TRINCAP model" was used in the terminal evaluation as mentioned above, and it was recommended that the TRINCAP total package and the TRINCAP sub-models should be disseminated. It was also found that the TRINCAP model was re-defined as "a set of good practices for reference" at the completion of the project, according to the minutes of the meeting at that time. Many of the stakeholders of the project in the counterpart organizations recognized "dissemination of the TRINCAP model" as utilization of the sub-models at the time of the ex-post evaluation of the project.

2. Outline of the Evaluation Study

2.1 External Evaluator

Tomoko Tamura, Kaihatsu Management Consulting Inc.

2.2 Duration of Evaluation Study

Duration of the Study: November 2012 - September 2013

Duration of the Field Study: February 13 - March 9, 2013, May 12 - May 18, 2013

3. Results of the Evaluation (Overall Rating: B[13])

3.1 Relevance (Rating: ③[14])

3.1.1 Relevance with the Development Plan of Sri Lanka

As mentioned earlier, a ceasefire agreement was signed in Sri Lanka in February 2002, and there was no fighting for some time after that. The Sri Lankan government developed the "National Framework for Relief, Rehabilitation and Reconciliation" in June 2002. The Framework considered the most important task to be projects for rehabilitation and reconstruction of the conflict-affected areas, and ethnic reconciliation through these projects. This project was believed to contribute to the above-mentioned task at the time of project planning.

The conflict started again as soon as the project commenced. However, rehabilitation and stabilization of the conflict-affected area - including Trincomalee District, the target area of the project - was still an important task for the government. Redevelopment of the Northern and Eastern Provinces was still an important task in *Mahinda Chintana*

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

(2006-2016), which was formulated in 2006. This was the medium- and long-term national development plan of the country at the time of completion and the ex-post evaluation of the project.

In this way, rehabilitation and reconstruction of the conflict-affected area was an important policy matter at the time of planning, implementation and ex-post evaluation of the project.

Therefore, the objective of the project has high relevance with the development plan of the country.

3.1.2 Relevance with the Development Needs of Sri Lanka

Agricultural production, the main revenue source of the people in the area, had stagnated in the Eastern Province at the time of planning the project, because necessary infrastructure had been damaged, including irrigation facilities and farm roads. Improving agriculture productivity and activating rural villages was a priority need for rehabilitation and reconstruction of the conflict-affected area.

The Eastern Province had fallen further behind the development of the country at the time of the project completion. Before the conflict, the contribution of the province to Gross Domestic Product (GDP) had been 14 per cent; this had reduced to 5.8 per cent at the time of completion of the project in 2009.[15] Primary industries, including agriculture, were an important sector, in which 28–39 per cent of the population of the province was engaged (2009[16]). However, in 2008 the sector's contribution to GDP was only 22 per cent. The low productivity of the sector had led to its percentage contribution to GDP being lower than the percentage of population engaged in the sector. This indicates a need to improve productivity, including through increasing the harvest and reducing costs, which the project aimed to achieve.

As mentioned above, the need for assistance to the Eastern Province was high, as at both the time of planning and completion of the project it was behind the development of the country due to the influence of the conflict. Increasing agricultural productivity was particularly important, as a large percentage of the population was engaged in this sector. Therefore, relevance of the project in terms of development needs is high.

3.1.3 Relevance with Japan's ODA Policy

The Country Assistance Policy of Sri Lanka (2004) of the Ministry of Foreign Affairs of Japan, at the time of project planning, stated that the economic cooperation of Japan to

[15] *Eastern Development Plan, 2012-2016, Volume I*, p.14.
[16] The percentages of population engaged in the primary industry sector were 37.5, 27.5 and 39.2 in Trincomalee, Batticaloa and Ampara Districts respectively, according to the statistics of the Eastern Provincial Council.

the country should aim at the establishment of peace and to implement projects on rehabilitation and assistance based on the medium- and long-term development plan. The Country Assistance Strategy of JICA (2004) also stated that the priority tasks were assistance to the northern and eastern areas of the country and to the agriculture sector.

As mentioned above, the establishment of peace and assistance for rehabilitation in the northern and eastern areas of the country, and to the agriculture sector, were important tasks in Japanese assistance to Sri Lanka. Therefore, the project had high relevance with Japanese cooperation policies.

This project has been highly relevant with Sri Lanka's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Effectiveness and Impact[17] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Outputs

The following five items were identified as the outputs of the project, which are necessary to achieve the project objective. Outputs 4 and 5 were added at the time of the mid-term evaluation.[18]

1) Output 1

Output 1 was "Community-based organizations (CBOs) are strengthened". Indicators for the output were: registered members increased by 5 per cent in 60 per cent of the CBOs participating in the project; more than 30 CAPs implemented; minutes of the meetings prepared for 60 per cent of the meetings conducted by CBOs; and financial books and/or inventory sheets maintained in 80 per cent of the CBOs participating in the project.

The project carried out training programmes, including those on leadership development, finance and accounting, management and administration for implementation of CAPs, for the 17 CBOs in the target area. The CBOs became more active as a result of these training programmes and implementation of CMRs. It was found that all the above-mentioned indicators were fulfilled and Output 1 had been achieved at the end of the project.

2) Output 2

Output 2 was "Rural infrastructure is improved through CMR". The indicators of the

[17] Sub-rating for Effectiveness is to be put with consideration of Impact.
[18] Output 4 was added as the related activities had already started, and Output 5 was added as it was needed to achieve the overall goal of the project.

output were: the project rehabilitated more than 80 per cent of the infrastructure proposed to be rehabilitated by the CAPs; all the infrastructure rehabilitated by the project was utilized by the community; operation and maintenance plan was prepared for all the rehabilitated infrastructure.

Construction of a water supply system by CMR. The community members provided labour free of charge for excavation and backfilling of pipe laying (Veloor village in June 2009)

Nineteen infrastructure activities in the target villages, including internal roads, irrigation facilities and community halls, were proposed for construction or to be rehabilitated in the CAPs. Sixteen infrastructure were constructed or planned to be rehabilitated by the project, and the other three were supposed to be done with funding from other donor organizations. Prior to implementation of the construction and rehabilitation of the infrastructure by the CBOs through the CMR scheme, the project provided training programmes to the community on contract and construction management, and financial and administration management of the construction. All sixteen infrastructure activities were completed and utilized by the community at the end of the project as planned. Operation and maintenance plans were also formulated, and the community members started maintenance work according to the plans. In this manner, all the three indicators were fulfilled and Output 2 was achieved.

3) Output 3

Output 3 was "Technologies for agriculture and livestock are enhanced". The indicators for the output were: 60 per cent of the core farmers increased paddy production by 10 per cent; 60 per cent of the core farmers continued utilizing the technology introduced by the project for more than two cultivation seasons; and 40 per cent of the core farmers had increased access to market information. It was found at the end of the project that 66 per cent of the core farmers had increased their production of paddy by more than 10 per cent; and 62 per cent of the core farmers utilized technology introduced by the project for more than two cultivation seasons. Technology

Field training on row seeding method (Thampalakamam village in November 2008)

introduced included seed paddy production, parachute method,[19] row seeding method,[20] small-scale fruit gardening, home gardening, production of potatoes and pineapples, rearing of improved varieties of cattle, goat rearing and poultry. The core farmers participated in the training programme, including market inspections arranged by the project, and 58 per cent of them gained increased access to market information.[21] In this manner, all the indicators were fulfilled and Output 3 had been achieved.

4）Output 4

Output 4 was "Technologies for income generation other than agriculture and livestock are enhanced". The indicators for the output were: 60 per cent of the core farmers continued the income generating activities introduced and assisted by the project after they received training, in areas other than agriculture and livestock; and 10 per cent of these core farmers sell the products of the income generating activities. It was found that all 71 core farmers who underwent the training programmes on income generating activities continued with these activities, and 52 farmers, 73 per cent of the total, sold the products.[22] Therefore, Output 4 had been achieved.

5）Output 5

Output 5 was "Frontline government services on agriculture and rural development are strengthened". The indicators for the output were: the number of farmers who utilized the Agriculture Service Centers and services of veterinary surgeons was increased by 10%; 40 per cent of field extension officers utilized the agriculture and livestock technologies introduced by the project into their activities; and meetings initiated by frontline officers[23] were conducted regularly. The number of farmers who utilized the Agriculture Service Center in Nilaveli and veterinary surgeon's office in Morawera, for which buildings were constructed by the project, increased by more than 10 per cent at the end of the project. The number of training sessions conducted at the veterinary surgeon's office increased substantially from eight in 2007 to thirty-three in 2008. Excluding the newly-recruited officers, twenty of the twenty-two frontline officers (91 per cent) who worked in the target area of the project were utilizing the technologies on agriculture and

[19] A method of cultivating paddy seedlings on plastic trays and transplanting them by throwing. It is called parachute method because the paddy seedlings fall down to the paddy field like parachutes when they are thrown.
[20] Cultivation method of planting seed paddy in rows using a hand push machine (see picture).
[21] Farmers engaged in cultivation of OFC and goat rearing were not yet in a position to sell the products in markets as they were still at an early stage of production.
[22] Groups engaged in dressmaking were not yet in a position to sell the products in markets but only satisfied the needs of their family members.
[23] The government officers working in the field to provide advice for farmers, including agriculture instructors, livestock development officers and divisional officers of the Agrarian Service Development were called "frontline officers" in the project.

livestock introduced by the project.

It was proposed in the mid-term evaluation of the project that the meetings initiated by frontline officers should be held around once every two months with participation of frontline officers, project staff and senior management to review the process and methodology of the project, problems and best practice of the project. The meetings were held six times but were not continued after that. The main reason for discontinuation was because the frontline officers were busy as they were in charge of a large area; some of them had to cover several areas due to vacancies in some officer positions at that time. From this, it can be considered that Output 5 was partly attained.

3.2.1.2 Achievement of Project Objective

Project Objective was "To establish a model for the agricultural and rural development project for community rehabilitation and reconstruction in Trincomalee district". The results of the study on the level of achievement of the project objective in accordance with the indicators is given below.

1) Indicator 1

The first indicator for the project objective was "Five technologies were transferred from the core farmers to five surrounding farmers in each target g*rama niladhari d*ivision (150 households). It was expected that any five out of the seven technologies introduced by the project - CAP, CMR, paddy, OFC, dairy farming, poultry and income generating activities – would be disseminated. It was found that the technologies introduced by the project had spread to 311 households at the end of the project. This was more than expected. However, the number of technologies that had spread was different from village to village, and each of these households did not practice all five technologies due to geographical and climatic conditions and availability of land and other resources. The technologies that spread most were those on paddy, OFC, home gardening, small-scale fruit gardening, dairy farming, cane craft and dressmaking.

2) Indicator 2

The second indicator was "Income of 60 per cent of the core farmers (250 households) were increased by 10 per cent". It was found that the income of seventy core farmers out of ninety randomly selected core farmers (78 per cent) had increased by more than 10 per cent at the end of the project. This means that the indicator had been satisfied. There were some core farmers whose income had not increased. This was because their yield had not increased mainly due to natural disaster, such as flooding.

3）Indicator 3

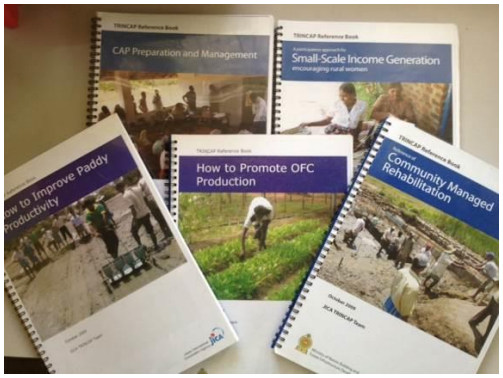
The third indicator was "60 per cent of the members of the Joint Coordination Committee at four levels appreciated the approach and methodologies of the project to activate communities in Trincomalee District". The members in four levels meant those working for province, district, divisional secretary's divisions and *grama niladhari* divisions. It was found at the interview conducted in the terminal evaluation of the project that more than 60 per cent of the members of the Joint Coordination Committee and all the other stakeholders mentioned the effectiveness of the TRINCAP model. Development partners in the World Bank and Asian Development Bank also recognized the effectiveness of the TRINCAP models. From these facts, it can be said that the third indicator had been achieved.

However, as mentioned later, replicability and effectiveness of the TRINCAP total package was not tested in the field at the time of the terminal evaluation. It seems that the stakeholders of the project stated in interviews that "the model was effective" just to appreciate the good outcome of the project.

Replicability and effectiveness of the TRINCAP total package was to be tested at the time of dissemination after the project. The result of this test is explained in the section on Impact of this report.

4）Indicator 4

The fourth indicator was "Reference materials on the approach and methodologies established by the project were documented". The experience of the project was summarized and documented in eight books by the JICA experts. These books were called "TRINCAP textbooks" and distributed among the relevant government institutions, the World Bank, the Asian Development Bank, United Nations Development Programme (UNDP) and non-government organizations (NGOs). They were introduced in the seminar held by the project just before the project ended.[24]



TRINCAP textbooks:
Summary of experience of the project

In this way, this project has largely achieved its objectives and five outputs; therefore its effectiveness is high.

[24] The seminar was held for government stakeholders in the Ministry of Economic Development, Northern and Eastern Provincial Councils and other institutions, staff of JICA office, donor agencies and NGOs to share the experience of the project. There were a total of eighty participants.

3.2.2 Impact

3.2.2.1. Result of dissemination of the models

The Overall Goal of the project was "The development model will be extended in Trincomalee District through which it will contribute to the activation of rural areas in the region". As mentioned above, in the terminal evaluation the experience of the project was called the "TRINCAP model", and it was proposed to disseminate the model to other areas. The activities in the following table were carried out by mainly on the initiative of the Eastern Provincial Council with the assistance of JICA.

Table 1 Status of dissemination of the TRINCAP models after the completion of the project

Phases	Main activities	Input from JICA	Note
Phase 1 Conducted in nine villages in the Divisional Secretary's Divisions of the project's target area in Trincomalee District (November 2009 – October 2010)	Frontline officers, including agriculture instructors working in the project target area, demonstrated models in the non-target villages. They did validation and modification of the models. The TRINCAP textbooks were translated into local languages and distributed to stakeholders.	Two people were employed for model dissemination by utilizing administration costs of a JICA individual expert, who was working in the area as an advisor for the rehabilitation and development programme. The budget for coordination allocated to the expert was utilized in the distribution of the textbooks.	Models were modified or adjusted for dissemination.
Phase 2 Conducted in seven villages in four Divisional Secretary's Divisions outside of the project's target area (November 2010 – July 2011)	Dissemination of the sub-models* was conducted out of the project's target area by government officers and agriculture instructors	Same as above	Activities for human resource development had to be conducted intensively as it was the first dissemination out of the project's target area.
Phase 3 Conducted in Batticaloa and Ampara Districts in the Eastern Province (August 2011- March 2012)	Several sub-models were introduced to the target areas for dissemination in Batticaloa District, which were selected after field visits and training programmes were conducted.	Two local consultants were dispatched by utilizing a Follow-up Cooperation scheme of JICA. The machinery necessary for implementation of the paddy sub-model was provided to the Batticaloa branch of the Ministry of Agriculture of the Eastern Provincial Council.	Dissemination of sub-models was not conducted in Ampara District within the period of the Follow-up Cooperation.

Note: Models for specific sectors, such as paddy, OFC and dairy farm, are called "TRINCAP sub-models", to differentiate them from the integrated model as a package.

Source: JICA

Generally, in the process of developing a model, it is necessary: first, to summarize the methodology adopted or experience gained in the activities carried out in a particular area; second, to test the replicability and effectiveness of the methodology, or the summary of experience, by adopting the same in a different area or environment; and then to identify any issues arising from this test and thereafter make any necessary modifications to the methodology or the summary of experience.

It does not seem that the stakeholders of the terminal evaluation had recognized the need for testing and improvement. However, the effectiveness and replicability of the TRINCAP total package was tested in the activities in Phase 1 of the dissemination, mentioned in the above table.

Through the process of this test, it was found that implementation of the TRINCAP total package was difficult given the existing administrative structure and budget allocation of the Sri Lankan government (this will be discussed in detail later). Therefore, after Phase 1, it was encouraged to utilize available local resources as much as possible, and it was understood that it was not always necessary to disseminate the total package, but sub-models or a part of sub-models could be disseminated with modifications or adjustment. This change of direction was facilitated by the JICA individual expert supervising Phase 1, as a result of discussions with staff of the Eastern Provincial Council and frontline officers.

Phase 2 was the first dissemination of the models in non-project areas. It was planned that the dissemination would be conducted by frontline officers who had not been involved in the project much. Therefore, several study tours to target villages of the project were organized for them, so that they would have an opportunity to share the experience and achievements of the project. The sub-models on paddy, OFC, dairy farming and others were disseminated. Phase 3 was dissemination to different districts. Human resource development was conducted intensively at first. JICA only assisted the activities of Phase 3 for 3 months. There was no visible outcome of Phase 3 within that period. The Ministry of Agriculture of the Eastern Provincial Council continued the activities.[25]

3.2.2.2. Factors that affected the dissemination of the TRINCAP total package

The replicability and effectiveness of the TRINCAP total package, which is an integrated development model, was not tested during the project period. It was found to be difficult to disseminate, as mentioned above, as there were several factors that affected

[25] It was confirmed with the Ministry of Agriculture of the Eastern Provincial Council at the time of the ex-post evaluation, that agriculture instructors of the districts had followed up the agriculture technologies introduced in Phase 3. It seems that the sub-models on paddy and OFC were utilized in Batticaloa and Ampara Districts respectively, and the sub-model on dairy farming was utilized in both districts.

its dissemination, including availability of budget, time constraints (because one officer is in-charge of around 1,500 families), shortage of equipment and lack of coordination among the various government institutions. The following are details of these factors.

Firstly, the fact that the budget of the implementation agencies was very small compared with the input of the project caused a problem. The project spent a total of JPY 128 million in four years for the implementation of development activities in the six target villages, including training, purchasing of materials and machinery, and implementation of CMRs. This excludes the personnel and travelling costs of the Japanese experts, salaries of local project staff and the cost of training in Japan. It was found that around JPY 5 million was invested in a target village per year.[26]

The budget allocated for the Eastern Provincial Council for implementation of development programmes in the villages of the province on agriculture and livestock sectors was LKR 77 million in 2010. If we simply divide the budget by the number of villages in the province, this means that only around LKR 110,000 was invested in a village for that year. This is around JPY 70,000, using the exchange rate in 2010. From these figures, we can understand that the project made an extremely intensive investment, and that it was difficult for government organizations to implement a similar amount of investment for dissemination. It was also difficult for government institutions, such as ministries and departments, to allocate the necessary budget in a flexible way for activities identified as necessary by the community members as a result of CAPs. Government institutions have to propose the budget required in the previous year, and spend their allocation according to an annual plan that has been approved by their higher authority. These issues on budget allocation were some of the problems with dissemination of the total package.

The TRINCAP total package starts with implementation of a CAP workshop. The CAP workshop conducted in the project was a comprehensive one, in which government officers and residents got together and had discussions for three to five days in a village. There was active participation and discussions among them at that time. This was partly because the residents and government officers firmly expected that the activities they proposed in the workshop would be implemented in due course, as the project had a budget for activities in the village. The project provided lunch for the participants to facilitate the participation. However, after the project it was found that implementation of such a comprehensive CAP workshop was difficult: farmers and the government officers did not have adequate incentive to hold and participate in a three to five day workshop in a village when they were occupied with other routine work, and when they did not have

[26] The figure was calculated by the external evaluator based on the figures in the terminal evaluation report of the project.

firm expectations and facilitation as mentioned above.

Another factor that affected planning of CAPs was lack of coordination among the various government institution due to the segmentarized and vertical government administrative structure. The process of planning a comprehensive CAP needs the government officers who are in charge of agriculture, animal husbandry, irrigation, agrarian service, rural development, and village administration to participate in a CAP workshop in a village, to discuss the current situation and problems with the villagers, and thereafter analyze the problem from a professional viewpoint, propose solutions and develop action plans with the participation of and discussion with the villagers.

However, the government administration structure of Sri Lanka is segmented, and there is sometimes little horizontal communication between the different institutions.[27] The project staff coordinated communication between the government institutions and invited them to CAP workshops during the project. However, it was found that there was no suitable government institution to take a leadership role in holding a CAP workshop and to coordinate between the relevant government institutions. The terminal evaluation recommended that the Divisional Secretary's offices should take a leadership role in holding a CAP workshop; however this did not work well, because the offices had neither a clear mandate to coordinate these segmented government institutions nor the experience to do it.[28]

It seems that there were some problems with the experience and ability on participatory approaches of frontline officers. According to staff and others in JICA involved in Phases 1 and 2 of dissemination, frontline officers in the sectors of agriculture, animal husbandry, agrarian development service, and others, are all technical officers and have specialized knowledge and experience of the technology of the sector they are in charge of. However, they do not have much experience in participatory approaches and facilitation and have limited ability to carry out effective facilitation work in a CAP workshop, generating opinions of villagers, analyzing problems and proposing solutions, while appreciating the sense of ownership of the villagers.

[27] For example, there are several government organizations in the sector of agriculture, such as agriculture, animal production and health, irrigation and agrarian services. Out of these, agriculture and animal production and health belong to the provincial council, and irrigation and agrarian services belong to both the central government and provincial council.

[28] The "divisional level implementation team" and "monitoring team", comprising officers working for government organizations belonging to the province and district, were formed and had meetings periodically in accordance with the recommendation in the terminal evaluation of the project. However, the divisional level implementation team was not able to function as it was recommended and expected in the Terminal Evaluation due to the above-mentioned reasons, and it became unworkable. The monitoring team had the same members as the existing periodic progress review meetings conducted by province and district. Some felt that it was inefficient to hold a meeting just to monitor the dissemination of the models; therefore, the monitoring of dissemination was conducted as one of the items for discussion in the periodic meetings of the province and district. This was continued until Phase 3 of the dissemination.

3.2.2.3. Dissemination of the TRINCAP sub-models

It was found in the ex-post evaluation that the TRINCAP sub-models were utilized actively in various ways as follows:

(1) Dissemination of TRINCAP sub-models by integrating with on-going programmes of the Eastern Provincial Council

The senior management of the Ministry of Agriculture of the Eastern Provincial Council was actively engaged in dissemination of the TRINCAP sub-models as a part of agriculture technology dissemination conducted by agriculture instructors, who are the frontline officers of the ministry. The ministry conducted practical training on the TRINCAP sub-models in various training programmes for agriculture instructors. They planned to purchase and distribute necessary materials and equipment for implementation of the sub-models in 2013, and the necessary cost for that has been added to the annual budget.

The Department of Animal Production and Health of the ministry had been conducting a programme called "Dairy Farm Village" since 2011.[29] As a result of getting ideas from the TRINCAP sub-model on dairy farming the Department was conducting the programme in the Eastern Province, introducing improved varieties of cows, providing training on intensive cattle rearing in a cattle shed, encouraging formation of production societies and collection and sales of milk by the societies. Thirty production societies have been formed, which are now collecting and selling milk in Trincomalee District.

However, the progress of dissemination of other sub-models was slow due to various reasons. CMR has only been conducted once - for rehabilitation of irrigation canals in Thampalakamam village, a target village of the project, using funds from UNDP. The Irrigation Department stated that they are willing to adopt the CMR system in donor-funded projects in future; however, it is difficult for them to adopt the system in routine work as it needs more funding and time, and a system to support farmer organizations (FOs). The farming families who conducted poultry or goat rearing during the project now feel it is difficult to continue with them, due to changes in the market and production environment after the end of the conflict, as mentioned later. The Department of Animal Production and Health has not conducted a large-scale programme for dissemination of these sub-models.

[29] The Dairy Development Project, conducted by the Ministry of Animal Husbandry and Rural Development, is encouraging dairy farming all over the country with the aim tripling the production of milk and milk products between 2009 and 2015 in order to achieve self-sufficiency in milk products by 2016. The Dairy Farm Village is part of the above-mentioned project.

(2) Utilization of TRINCAP textbooks

During the project the JICA expert team compiled the TRINCAP textbooks, which are the reference books on sub-models. After the project, they were translated into local languages (Tamil and Sinhala) by the Ministry of Agriculture of the Eastern Provincial Council, and distributed to each sub-office. According to the ministry, officers refer to the textbooks during their routine work, and they are also utilized during training programmes. The ministry reprinted the textbooks using funding from the USAID/CORE agriculture programme, which was implemented in the Eastern Province with financial assistance of USAID.

(3) Utilization of TRINCAP formats in training in accounting for FOs

According to a frontline officer of the Department of Agrarian Service Development, accounting formats for FOs, which were developed and introduced by the project, have been utilized. The formats are the necessary documents for FOs to keep their accounts. They mentioned that the formats are easy to use, and they did not have such convenient formats earlier. The officers of the department are encouraging FOs to use the formats developed by the project, by introducing them at the time of financial training for FOs and during monitoring visits to the organizations.

(4) Utilization of the outcomes of the project in the training programme for frontline officers

The "Project for Training of Frontline Officers in Community Development in Conflict Affected Areas in Sri Lanka" is being implemented by JICA Sri Lanka office for a period of three years from April 2013. The Ministry of Economic Development is the counterpart organization of the project. The participants in the training courses of the project will visit the target villages of the TRINCAP project. Preparation work is being carried out at the moment. The objective of the visits is for participants to learn participatory approaches and the outcome of the introduction of agricultural technologies through the experience and achievement of the villages.

(5) Utilization by international organizations and NGOs working in Trincomalee District

During the project, international organizations and NGOs working in the district were provided with an opportunity to share the experience and achievements of the project by visiting the target villages and participating in seminars held by the project. As a result, international organizations, such as USAID, and Japanese NGOs, such as Peace Winds and JEN, utilized project sub-models after the project.[30]

[30] UNDP conducted rehabilitation of irrigation canals and promotion of OFC cultivation with construction

(6) Change of awareness of the government officers about participatory approaches

It was found that officers of the Eastern Provincial Council had learned about participatory approaches from the project, and changed their attitude. The senior management of the council often mentioned during interviews that, "we never know their needs until we ask farmers", and "top-down planning does not work". The Agriculture Department mentioned that they used to adopt a top-down approach to choose the kind of technologies to be introduced and the model farmers for field demonstrations; however they now select the kind of technologies to be introduced in accordance with the needs of the farmers following discussions with them, and select model farmers together with them. The Director of the Department of Animal Husbandry earlier used to propose a plan and targets to the staff members; now, staff members propose the plan and targets. The Director mentioned that he understood from the project that staff members have a greater sense of responsibility for achieving targets when they have proposed them themselves.

It was found through the process of dissemination that there were several issues with regard to the dissemination of the sub-models. These included: there was not enough incentive for the farmers to adopt the new technologies due to the low price of paddy; there was not enough agriculture machinery and tools to introduce the new technologies; there were not enough water sources for the farmers to implement cultivation of OFC in an integrated way; there was a limited budget in the department to introduce the improved variety of cattle; and the newly appointed government officers did not know much about the sub-models. The Ministry of Agriculture of the Eastern Province plans to promote dissemination of the sub-models in future, while dealing with these issues.

3.2.2.4. Current status of the outputs and the activities in the target area of the project

The current status of the outputs and the activities in the target area of the project was studied in the ex-post evaluation. As Table 2 shows, the status varies. In summary, out of the forty activities, sixteen were expanded or developed, nine stayed the same, and fifteen were scaled down or had disappeared.

With paddy cultivation, the technologies, such as application of organic manure, production of seed paddy and post-harvest technologies, were continuously utilized in many villages. The parachute method was not practiced in any of the target villages, and the row seeding method was only practiced in one village. The villagers explained that, "we stopped practicing the method as we could not increase the yield due toas a result of

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of agro-wells in the target villages of the project. USAID and Peace Winds Japan utilized the sub-model on dairy farming, and JEN utilized sub-models on OFC.

flooding, even though we used it taking much time and effort", and "We are using the traditional method again even though we learned the new methods are effective, as the present agriculture inspector does not visit our village". It seems that more conscientious instruction and incentive are needed for the farmers to change the traditional methodology of throwing seed paddy, which has been practiced for generations.[31]

The technology on OFC cultivation had spread from the core farmers to the surrounding farmers in some villages. There were some families whose income had increased, and they were now able to produce OFC throughout the year systematically. There are some farmers who had won district or provincial awards, or had been entrusted to supply coconut plants to the Department of Agriculture. Production of a new variety of papaw, which had been introduced by the project, was expanded to a commercial scale. The neighboring farmers are getting advice from the core farmers who were successfully practicing what they had learned from the project. It was found that some core farmers, whose production was good, were facing new challenges of post-harvesting or marketing.

Dairy farming has expanded through being integrated into the "Dairy Farm Village" programme of the Department of Animal Production and Health, as mentioned earlier. Some of the women engaged in dairy farming mentioned that the sale of milk helps the family economy a lot as it gives them daily income, while paddy cultivation only gives them income twice a year.

Most of the farming families had given up poultry for broiler production. During the conflict, there was limited marketing and distribution of chicken in the district. Therefore, the farming families were able to sell their product to nearby markets or shops. However after the end of the war large-scale private companies selling broiler chicken expanded their business to the district, and the farming families found it difficult to sell their products, because they could not offer their product at a fixed price and cheaper than the products of these large-scale companies.

Changes in the living environment also affected poultry production. After the end of the war, people who had been displaced to India and other places came back to the villages and the population of the villages increased. The people who had earlier settled in the villages had started agricultural production on a large scale. Many of those who were engaged in goat rearing and poultry had to stop these activities, because there was a possibility of goats eating agricultural products in nearby houses, and the smell from poultry might affect neighboring houses.

Some of the families who were engaged in income-generating activities, such as cane

[31] According to the Ministry of Agriculture of the Eastern Provincial Council, these technologies are labour intensive; farming families with more than four acres of paddy land do not have much incentive to introduce the technologies, as the technologies are not cost effective for them.

craft and dressmaking, continued with production and sales. It seems that these activities expanded to some extent as some of them visited other villages and gave training. In some villages, the villagers are only engaged in these activities for their home consumption and do not sell or obtain income.

Table 2 Status of implementation and continuation of the main activities introduced by the project

(as of March 2013)

Divisional Secretary's Divisions	Grama Niladhari Divisions	Villages	Paddy	OFC	Dairy farming	Poultry (broiler)	Goat rearing	Income generation (cane craft/ dress making)
Morawewa	Panikettiyawewa	Ethabandiwewa	→	↗	↗	→		↗
	Nochchikulam	Mylakudawewa	→	↗	↗			↘
		Miriswewa/ Rothawewa		↘	↗		↘	↘
		Nochchikulam	→	→	↗		→	
Thampala kamam	Mullipothana	Mullipothana	↘	↗	↗	→	↘	
		Saliyapura	↗	↗	↗	↘	↘	↗
	Thampalakamam south	Thampalakamam	↗	↘	→	↘	↘	↘
Kuchchaveli	Nilaveli	Nilaveli		↗	↗	→	↘	↘
	Veloor	Veloor						↘

↗ : Expanded or developed, → : As it was, ↘ : Scaled down or disappeared

Source: Documented by the external evaluator based on interviews with beneficiaries, discussions with CBOs and reports of the projects.

As Table 3 shows, the status of utilization of the major infrastructure constructed by CMR was good in most of the villages. The villagers carried out cleaning and repairs periodically. However, the community halls of Mylakudawewa and Miriswewa could not be used for meetings, as they had been used by the Department of Agrarian Service Development as grain stores and had not been cleaned up yet.

Table 3 Status of utilization and maintenance of the major infrastructure constructed or rehabilitated by CMR

(as of March 2013)

Divisional Secretary's Divisions	Grama Niladhari Divisions	Villages	Infrustructure constructed or rehabilitated by CMR	Status of utilization			Status of maintenance		
				Utilized well	Utilized	Not utilized much	Very good	Good	Poor
Morawewa	Paniketiyawewa	Ethabandiwewa	Community hall	✓				✓	
			Storage of agriculture machineries		✓			✓	
	Nochchikulam	Mylakudawewa	Community hall			✓			✓
			Storage of agriculture machineries			✓			✓
		Miriswewa	Community hall			✓			✓
		Nochchikulam	Agriculture road	✓				✓	
Thampalakamam	Mullipothana	Mullipothana	Irrigation channels	✓				✓	
			Internal road	✓				✓	
		Saliyapura	Community hall	✓			✓		
			Internal road	✓			✓		
			Storage of agriculture machineries		✓			✓	
	Thampalakamam South	Thampalakamam	Office of the Farmer Organization with rooms for paddy storage and shop	✓			✓		
			Agriculture road	✓				✓	
			Storage of agriculture machineries		✓			✓	
Kuchchaveli	Nilaveli	Nilaveli	Drainage system	✓				✓	
	Veloor	Adambodai	Internal road	✓				✓	
			Water supply system		✓			✓	
Total				10	4	3	3	11	3

Source: Documented by the external evaluator based on interviews with the beneficiaries, discussions with CBOs and reports of the projects.

Table 4 shows the results of the study conducted for the eleven CBOs that undertook CMRs, in terms of status of activities, holding of meetings, collection of membership fees and, maintenance of accounting books. There was one CBO that was good in all four criteria. There were two that were poor in all four criteria. Others had a mixed result, which can be considered as moderate. It can be assumed that the CBOs became inactive mainly because they had less funds and assistance for their activities once the activities of the project had finished.

Table 4 Status of CBOs undertaking CMR

(as of March 2013)

Divisional Secretary's Divisions	Grama Niladhari Divisions	Villages	CBOs implemented CMR	Status of the CBOs			
				Status of activity	Holding of meetings	members hip fee collection	Book keeping
Morawewa	Paniketiyawewa	Ethabandiwewa	WRDS	A	A	A	B
			FO	B	C	B	B
	Nochchi kulam	Mylakudawewa	FO	C	C	A	B
		Miriswewa	WRDS	C	C	C	C
		Nochchikulam	FO	A	C	A	A
Thampala kamam	Mullipothana	Mullipothana	FO	A	B	B	B
			RDS	C	C	C	C
		Saliyapura	RDS	A	B	A	A
	Thampala kamam South	Thampalakamam	FO	A	A	A	A
Kuchcha veli	Nilaveli	Nilaveli	RDS	A	B	B	B
	Valoor	Adambodai	RDS	C	C	C	B

Notes：Status of activity: A: Active B: Moderate C: Inactive
Holding of meetings: A: Often B: Sometimes C: Almost no meetings
Membership fee collection: A：Collected from almost all the members
B：Collected from a part of the members C: Not collected
WRDS: Women's Rural Development Society, FO: Farmer Organization, RDS: Rural Development Society
Source: Documented by the external evaluator based on interviews with the beneficiaries, discussions with CBOs and reports of the projects.

As Table 5 shows, the agricultural machinery provided to the CBOs of the target villages was not utilized well as a result of a change in the market environment and inadequate maintenance. The FOs utilized the tractors for around two years. However after that they did not use them because they could not afford the cost of repairs, which become more necessary as the machinery got older; or only utilized them for the activities of their organizations, without renting them out to farmers, because they found the process of renting them out was too troublesome. It was expected that the farmers in the villages would be able to reduce their production cost by obtaining the tractors at a low rental rate from the FOs. However, the rental business by FOs did not last long effectively, as they did not have enough experience in complicated business management, such as collecting fees from farmers after renting out the machinery to them.

Table 5 Status of utilization of the agricultural machinery provided to the CBOs

(as of March 2013)

CBOs responsible for maintenance	Machinery	Status of utilization	Notes
Mylakudawewa FO	Four wheel tractor and a trailer	C	Shortage of funds for repairs
	Tsunami harvesting machine*	C	Became unpopular
Ethabandiwewa FO	Two wheel tractor	B	Utilized for activities of the FO only
	Paddy cleaning set	C	Lost interest
Miriswewa FO	Two wheel tractor	B	Utilized for activities of the FO only
Nochchikulam FO	Paddy cleaning set	C	Lost interest
Thampalakamam FO	Four wheel tractor and a trailer	B	Utilized for activities of the FO only
	Tsunami harvesting machine*	C	Became unpopular
Saliyapura RDA	Combine harvester	C	Too many breakdowns. Shortage of fund for repairs. Cheaper to hire from private agents.
	Two wheel tractor	B	Utilized for activities of the FO only
	Paddy cleaning set	A	Utilized and sometimes rent out to other villages.

Notes：A: Utilized well B: Utilized sometimes C: Almost not utilized

- The harvester called "Tsunami harvesting machine" was introduced just after the earthquake in the Indian Ocean off Sumatra. It was popular at that time but became less popular when the combine harvester was introduced to the area after the end of the conflict. Farmers have to cut the paddy by hand and then put it into the Tsunami harvesting machine, while the combine harvester cuts and threshes paddy automatically.

Source: Documented by the external evaluator based on interviews with the beneficiaries, discussion with CBOs and reports of the projects.

3.2.2.5 Achievement of Overall Goal

There were two indicators for the overall goal of the project. One was "Number of communities which formulated CAPs", and the other was, "Economic statistics of Trincomalee District, such as agriculture production and household income".

1) Indicator 1

The first indicator was "Number of communities which formulated CAPs". A total of eight CAP workshops were conducted in villages other than the project target villages. The workshops were conducted in three villages during the project period and CAPs were formulated as a result. The project team conducted these workshops so that dissemination of the model would be promoted after the project. After that, CAPs were formulated in five villages during the dissemination process. CAPs were not formulated in any of the villages thereafter due to the various problems as mentioned earlier.

2) Indicator 2

The second indicator was, "Economic statistics of Trincomalee District, such as agricultural production and household income". According to statistics on agricultural production in recent years, production in the area has increased. The yield increased a lot in 2011; however it reduced in 2010 and 2012 due to flooding and drought.

Until 2008, both areas of production and yield were increasing for OFC, such as maize, red onions, cowpeas, groundnuts, green gram, black gram, chilies, and vegetables. However, there is no further increase after that. The Ministry of Agriculture explained that the yields were not stable because of large-scale flooding in 2010, a change in market needs and the availability of seeds and plants. There is a possibility that the statistics might not be kept properly.

The latest Household Income and Expenditure Survey (2009/2010),[32] which is conducted periodically by the Department of Census and Statistics, was used to study socio-economic statistics. It was found that the average income of a household in Trincomalee District was LKR 24,291, which was the fourth lowest among the 22 districts in the country.[33] The Poverty Headcount Index of the district was 11.7 per cent, which was ranked sixth highest. It is not known whether these figures on income and poverty were improving, as the district was not studied in the survey before 2009 due to the lack of public security.

In summary, it was found that the sub-models were disseminated and the textbooks were utilized; however the total package was not disseminated and there are several issues with regard to the continuation and expansion of project activities in the target villages of the project. There were a limited number of CAPs formulated, and agricultural production in the district did not continue to increase. From the above-mentioned factors, with regard to the achievement of the overall goal and dissemination of the models, it can be concluded that the overall goal was not achieved at this moment.

3.2.2.6 Other Impacts

At the time of discussion with farmers in the ex-post evaluation, they mentioned that "It was very encouraging for us to have a great assistance by the project, which was implemented during the period that public security of the area had deteriorated and we had limited assistance from external organizations. It is something we will never forget throughout our lifetime. We were motivated by the project and appreciated it very much". It seems that the fact that the project area had unstable public security and did not have much access to external assistance, and that the project was continued even in such an unstable environment, also helped the beneficiaries psychologically.

The project selected the target villages and allocated project staff with due consideration of a balance among the three ethnic groups. There was no negative impact

[32] Household Income and Expenditure Survey, 2009/2010, Department of Census and Statistics, Sri Lanka.
[33] There are 25 districts in Sri Lanka; however, Kilinochchi, Mannar and Mullativu Districts were not included in the 2009 survey due to the status of public security.

during or after the project in terms of ethnic relations.

The project objective was achieved by the end of the project, and the effectiveness is high. As for the overall goal of the project, dissemination and expansion of the sub-models is appreciated; however, dissemination of the total package was not realized, and there are some issues with regard to the continuation of project activities in the target villages.

This project has somewhat achieved its objectives, therefore its effectiveness and impact is fair.

3.3 Efficiency（Rating：③）

3.3.1 Inputs

The following table shows the planned and actual inputs of the project. There is no particular problem in this regard, as the actual inputs were almost as planned.

Table 6 Plan and actual input of the project

Inputs	Plan	Actual
(1) Experts	・Long-term: Five areas: chief advisor, community development, agriculture, agriculture infrastructure development, coordinator ・Short-term: 2-3 persons	As planned
(2) Trainees received	One to two per year on agriculture extension, agriculture technology, agriculture infrastructure development and others.	Almost as planned (6 in total)
(3) Third-country Training Programs	None	As planned (none)
(4) Equipment	Vehicles, agriculture machinery, seeds, fertilizer, office equipment and others	As planned
Total Project Cost	JPY 490 million	JPY 484 million
Total Local Cost	JPY 80 million	LKR 23 million (around JPY 18 million with the exchange rate at the time of project completion) excluding salary of the counterparts.

3.3.1.1 Elements of Inputs

Six long-term JICA experts with five specializations - chief advisor, rural development, agriculture, agriculture infrastructure development and project coordination - were engaged in the project for a total of 150 man-months. Three short-term JICA experts with three specializations - project planning, project evaluation and farm household economy - were engaged in the project for a total of six man-months. Six Sri Lankan counterpart officers participated in the training in Japan on Japanese agriculture, animal husbandry technology dissemination policy and irrigation system administration. Provision of materials and machinery, such as vehicles, agriculture machinery, seeds, fertilizers and office equipment, were made as planned.

3.3.1.2 Project Cost

The project cost on the Japanese side was planned as around JPY 490 million. It was actually JPY 484 million and lower than planned (98 per cent).

3.3.1.3 Period of Cooperation

The period of cooperation was planned as four years from October 2005 to October 2009 and was actually four years as planned (100 per cent).

3.3.1.4. Important Assumptions of the project

In the English version of the Project Design Matrix (PDM) of the project, one of the pre-conditions was “The ceasefire agreement is continued and security is kept”, and one of the important assumptions to achieve outputs of the project was “The project area is secure and government staff and experts can continue the technologies extension work”. This pre-condition and important assumption were kept in the PDM even after the mid-term evaluation of the project, which was conducted after the ceasefire agreement was abandoned, public security became much worse and the Japanese experts temporary evacuated from the project area. The framework of the project should have been reconsidered to meet the current situation if the pre-conditions and the important assumptions were apparently not applicable. However, there was no such attempt for this project in the mid-term evaluation or in the terminal evaluation. According to the staff of JICA involved in the project during project implementation, the project was continued without modifying the initially set objective, as the Japanese Embassy in Sri Lanka had encouraged the project to be continued by appreciating it as one of Japanese assistance in the conflict-affected area, there were high expectations among the stakeholders in Sri Lanka towards the project, and the motivation of the JICA project team was high.

As mentioned above, both project cost and period of cooperation were as planned; therefore efficiency of the project is high.

3.4 Sustainability (Rating：②)

3.4.1 Related Policy towards the Project

The project adopted participatory approaches to activate rural villages. The current development policy of the Eastern Provincial Council, *Eastern Development Plan 2006-2016,* was developed with the aim of realizing reconstruction of infrastructure and community development. One of its objectives is to implement an appropriate model of community development. The central government and the provincial council are implementing projects that give a weight to community participation.[34] In an interview, the additional secretary of the Ministry of Economic Development expressed his opinion that community participation is inevitable, especially in the agriculture sector. In this way, development with a community participation approach is considered as important in the policies of the Sri Lankan government, and it is a positive factor to disseminate the approach of the project.

3.4.2 Institutional and Operational Aspects of the Implementing Agency

As mentioned earlier, the "divisional level monitoring team", which was recommended in the terminal evaluation, was formed for dissemination of the TRINCAP total package; however this did not function. The "coordination and monitoring team" was integrated into the existing regular meetings of the province and the department, and continued until Phase 3 of the dissemination, which was supported by JICA. At present, monitoring of the TRINCAP sub-models are conducted in progress meetings of the province and department, as the implementation of the sub-models was integrated into the existing programmes of the organizations.

As mentioned earlier, the effects of the project are planned to continue to be expanded in the future, also, by integrating the sub-models into existing programmes of the ministries and the departments. Therefore, the external evaluator studied the allocation of frontline officers of the target villages, especially those who are in charge of agricultural extension. It was found that the cadre of frontline officers was getting filled after the end of the war; however there were still several vacancies and double duties.

Officers of the Agrarian Service Development explained that Trincomalee and Batticaloa districts do not have agriculture production research assistants, which have been allocated to every Agrarian Service Center in other districts, and that is one of the reasons for insufficient follow-up to the farmers on technical extension. The additional

[34] *Gama Neguma, Devi Naguma,* Dairy Farm Village, for example.

secretary of the Ministry of Economic Development explained that they plan to recruit the above-mentioned assistants for the Northern and Eastern Provinces, and will complete the allocation of assistants by the end of 2013.

It was observed during the field visits of the ex-post evaluation that the agriculture instructors were providing advice to the villagers with sympathetic attitude. It was also observed that a trustworthy relationship had been built up between the two parties. On the other hand, some farmers mentioned that they are practicing the same old method of cultivation as the agriculture instructor rarely visits their village.

As mentioned earlier, there are several administrative issues for participatory planning and implementation of programmes. These include: there are various government institutions in the agriculture sector that are segmented and vertical, and find it difficult to collaborate with each other; there is no appropriate institution to take a leadership role in participatory planning, such as a CAP workshop: and the budget system is not flexible enough to allocate funds for proposals from the villagers.

3.4.3 Technical Aspects of the Implementing Agency

The technologies introduced by the project are the ones that the government of Sri Lanka is also promoting. Therefore they are not difficult for the frontline officers to learn.[35] Senior management of the Ministry of Agriculture of the Eastern Province mentioned that there is no major problem with the technical level of the officers at present. However, the ministry is implementing in-service training for the officers, as there are some newly-appointed officers and there needs to be continuous effort for them to learn agriculture technologies, including the sub-models, and improve skills on agricultural extension (see the following tables). There is some training with relation to the dissemination of technologies introduced by the project. In-service training programmes for the officers were conducted in the donor-funded programme earlier. However, the provincial government has obtained its own budget for the training in recent years. The external evaluator studied the training programme from 2012, and found that almost all the frontline officers had had an opportunity to participate in a training programme during the year.

[35] For example, the Ministry of Agriculture in the Eastern Province and the central government have been promoting both the parachute method and the row seeding method in recent years. The project also introduced these technologies, which had been promoted by the government but shown little progress as the extension of technologies and demonstration of the outcomes had not been conducted effectively.

Table 7 Training conducted for the staff of Department of Agriculture of Trincomalee, Eastern Province in 2012

Title of the training programme	Participants (numbers)	Period
OFC expansion programme	Agriculture instructors (3)	3 days
Paddy yield increasing package	Agriculture instructors (32), subject-matter officers（1）	5 days x 3 times
Integrated pest control in vegetables	Agriculture instructors (32)	3 months
Cultivation under net house	Agriculture instructors (5)	3 days x 2 times
Micro irrigation system (organized by a private sector organization)	Agriculture instructors (32), subject-matter officers (5), agriculture officers (3)	1 day

Source: Ministry of Agriculture, Eastern Provincial Council

Table 8 Training conducted for the staff of Department of Animal Production of Trincomalee, Eastern Province in 2012

Title of the training	Participants (numbers)	Period
Seminar on information technology	Provincial director (1), veterinary surgeons (22)	1 day
Artificial insemination training programme for newly recruited veterinary surgeons	Veterinary surgeons (20)	4 days
Production programme	Veterinary surgeons (15)	2 days
Promotional day for grass growing	Senior management of the Ministry of Agriculture of the province, provincial director, veterinary surgeons (100 in total)	1 day
Meeting of veterinary surgeons and livestock development officers	Provincial director, veterinary surgeons、livestock development officers (50 in total)	1 day

Source: Ministry of Agriculture, Eastern Provincial Council

3.4.4 Financial Aspects of the Implementing Agency

Table 9 shows the programme budget of the Ministry of Agriculture of the Eastern Province for training programmes and purchasing of equipment and materials for

demonstration to farmers. It is appreciated that the budget has been increased year by year, with consideration of increasing prices and expansion of the programme. However, the budget for 2013 was LKR 17.9 million; it was found that only LKR 190 was allocated for each household when the total amount was simply divided by the number of agriculture households in the province in 2009, i.e. 94,000.

The ministry used to provide agriculture machinery and tools or cattle to the farmers free or charge. However, the ministry changed this principle in recent years, and now asks farmers to share the cost in order to generate a sense of ownership of the farmers for what had been provided. It is important to utilize the budget effectively by adopting the above-mentioned cost-sharing method, and also to strengthen partnership with private companies in future.

As mentioned earlier, it is planned to use funding from other donor-assisted programmes to implement CMR. The external evaluator observed an example of this during the ex-post evaluation.[36]

Table 9 Budget allocation of the Eastern Provincial Council for training and purchasing of materials and machinery for farmers

（Unit：LKR million）

Items / years	2010	2011	2012	2013
Agriculture				
Training	0.8	0	4.0	1.7
Purchasing of materials and machinery	9.1	1.5	5.1	8.2
Sub total	9.9	1.5	9.1	9.9
Animal husbandry				
Training	0	0.5	3.0	4.0
Purchasing of materials and machinery	0	0.5	1.0	4.0
Sub total	0	1.0	4.0	8.0
Total	9.9	2.5	13.1	17.9

Source: Ministry of Agriculture, Eastern Provincial Council

Some problems have been observed in the institutional aspects of the counterpart agencies, and there needs to be further improvement in technical and financial aspects; therefore, sustainability of the project effects is fair.

[36] It is a common practice in Sri Lanka to implement development of medium- and large-scale infrastructure projects using funds of donor agencies, and conducting operation and maintenance of the infrastructure using funds of the government. Some government officers mentioned that it may not be efficient to utilize CMR in government-funded projects on small-scale infrastructure and operation and maintenance, given the need for government institutions to implement training of the farmers and to conduct supervision and monitoring for implementation of the civil works.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented with the objective of establishing a development model of rural and agriculture rehabilitation with a participatory approach in Trincomalee District in Sri Lanka.

Assistance for rehabilitation and to the agriculture sector was an important task in the policy of the country at the time of project planning; the need of assistance for the Eastern Province, which lagged behind in development due to the influence of conflict was high; and assistance for rehabilitation was an important area in the strategy of Japanese assistance to Sri Lanka. Therefore, relevance of the project is high.

The project objective, "To establish a model for agricultural and rural development projects for community rehabilitation and reconstruction in Trincomalee District" was largely achieved by the end of the project; therefore effectiveness of the project is high. In terms of the overall objective of the project, sub-models on production technologies in the paddy, OFC, dairy farming and other sectors were disseminated by being integrated into the programmes of the provincial government. However, effectiveness and replicability of the TRINCAP total package, which is an integrated development model based on the formulation of CAP, had not been tested during the project period and was not disseminated thereafter, either. There are some issues with the continuation and expansion of project activities in the target villages. Therefore, effectiveness and impact is concluded as fair.

Efficiency of the project is high, as the project cost and period were as planned. Some improvement is needed in terms of institutional aspects of the counterpart organizations, and further enhancement is recommended for the technical and financial aspects. Therefore, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Participatory planning, which was an important approach of the project, is not promoted systematically at present as a result of limited dissemination of the TRINCAP total package - although understanding of participatory planning among senior management officers has been enhanced. It may be difficult to conduct the three-day CAP workshops that were implemented in the project. However, there is a good possibility of implementing participatory planning through modifying present practices. For example, it is worth seriously considering enhancing the participation of the community in planning and implementation process of formulation of various plans presently

conducted, such as seasonal plans formulated by the agriculture instructors. This could be done by keeping records of needs assessment, sharing formulated plans with the community, and getting the community to monitor progress of the plan. It may be a good idea to monitor the progress of the community participatory approach as mentioned above in existing meetings, such as the divisional agriculture coordination committees and seasonal meetings conducted in villages.

(2) The possibility of disseminating TRINCAP sub-models was tested, and issues were identified in the follow-up assistance of JICA for dissemination of the models of the project. At present, the Eastern Provincial Council and other related organizations disseminate the sub-models by integrating them into existing programmes. It is recommended that they review the results of the above-mentioned testing, set clear targets and establish a more effective system for dissemination of the sub-models.

(3) It was found that the some farmers of the target villages did not continue new production technologies introduced by the project even though they recognized their effectiveness. The frontline officers need to motivate farmers by conducting periodic visits to them, and to implement continuous monitoring and follow-up in order to further disseminate and establish the technologies introduced by the project.

(4) Several agricultural machines that were provided to CBOs by the project are not utilized at present. It is necessary for the relevant organizations, such as the Department of Agriculture Service Development, to conduct appropriate follow-up on this. For example, they can discuss with the relevant CBOs and assist them in solving issues on maintenance and finance. The department may undertake to utilize the machinery for training programmes if the CBOs do not intend to utilize them in future.

4.2.2 Recommendations to JICA

It is recommended that the topics of the importance of participatory planning and continuous monitoring and follow-up for farmers by the frontline officers, mentioned in the above (1) and (3), are taken up in JICA's Project for Training of Frontline Officers in Community Development in Conflict Affected Areas in Sri Lanka, which is currently being implemented by the JICA Sri Lanka office. It is also recommended to monitor counterpart organizations' efforts to solve the institutional and administrative issues on implementation of participatory planning and continuous monitoring and follow-up by the officers, for example, by utilization of existing meetings and plans, because capacity building alone will not succeed.

4.3 Lessons Learned

(1) The following factors should be considered at the time of planning technical

cooperation projects with the objective of establishing models and dissemination of pilot activities:

- A process of testing the effectiveness and replicability of the models and improvement of the models is needed when developing the models. This should be conducted after summarizing the methodologies and approach implemented in a particular area, by introducing the same methodologies and approach in a different area or environment. It is not realistic to conclude that the outcome of project activities is an "effective model", and to develop a plan for its dissemination, without going through the above-mentioned process of testing. In Phase 1 of the dissemination of the model implemented after the project, a lot of technical work was necessary, including testing, modification and improvement of the models, coordinating the related government organizations, setting up a suitable environment for dissemination and human resource development. The assistance of JICA played an important role in this technical work as the Eastern Province did not have experience of dissemination programmes. It should be duly noted at the time of planning that the process of testing, modification and improvement of the models should be included in the project period, when a project which has an objective of establishing and disseminating the outcome of the project as a model.
- It is important, in a project aiming at establishing and dissemination of a model, to decide project design and the size of input with due consideration of the kind of model and by whom it should be disseminated. For example, if the model is intended to be disseminated by counterpart government organizations, a model with high replicability should be established, with due consideration of the administration system, organization, human resources, technical level and budget of the organizations. If the model is intended to be disseminated with the assistance of donor agencies and NGOs, a suitable model should be established by analyzing the future direction of their assistance.

(2) The project was implemented in an area where there were various restrictions on activities and movement as a result of deterioration in public security and in the environment. This meant that the pre-condition and important assumptions of the project, such as "The ceasefire agreement is continued and security is kept" and "The project area is secure and government staff and experts can continue the technologies extension work" were not applicable. The outcomes and objective of the project were largely achieved as a result of enormous efforts by stakeholders of the project. However, there were some issues in terms of continuing the effect of the project and achievement of the overall goal of the project after the completion of the project, partly because the size of the input of the project had to be large due to the

above-mentioned unstable environment. It was fortunate that no one related to the project was affected by bomb blasts or armed conflict. However, such an incident could have occurred in the critical situation during that period. In a project implemented in a conflict-affected area, the framework of the project should be reviewed and modified flexibly after making appropriate analysis and taking decisions in time. This should take due consideration of changes in public security, and any collapse of pre-conditions and important assumptions.

Bangladesh

Ex-Post Evaluation of Japanese Technical Cooperation Project

"Project for Strengthening Primary Teacher Training on Science and Mathematics"

External Evaluator: Yuko Aoki, Kokusai Kogyo

0. Summary

The Project had an objective of improving the teachers' teaching method of science and mathematics and the instructors for teacher training in Field Testing Schools (FTS) in Mymensingh province. The Project targeted the National Academy of Primary Education (NAPE) and related institutions of primary education in the province, and developed science and mathematics teaching materials, and promoted cooperation and collaboration among teachers and education related personnel. The Project was implemented under the sub-sector wide program[1], PEDPII.

Quality improvement of primary education has been an important issue for the national development policy in Bangladesh. The needs to improve the teaching capacity of teachers to implement the comprehensible classes for pupils have also been high. The primary education support has been one of the focus fields of Japan's ODA plan for Bangladesh. Consequently, the relevance of the Project is high.

As for the Project Objective, the science and mathematics instruction has improved through the utilization of Teaching Packages, which are collections of good practices on science and mathematics teaching methodologies and which were introduced in target institutions. Consequently, the desired quality of teaching in science and mathematics was almost achieved at target institutions. As for the overall goal, not only the Project but also various activities of PEDP II such as increasing the number of teachers, distribution of teaching materials and equipping classrooms contributed to the trend of improving the scores in science and mathematics. The impact was observed, for example, distribution of Teaching Packages in the entire country by the fund of PEDPII, therefore improvement of teaching using the Teaching Packages of the Project was highly evaluated. As above, effectiveness and impact are judged as high.

As for efficiency, the cooperation period was extended for one and a half years because of delays in the approval of Teaching Packages, extending cooperation coordination supporting works due to the extension of PEDPII period and so on. This resulted in the cooperation amount much higher than planned due to the increase of the cost of dispatching experts, thus efficiency is evaluated to be low. Sustainability is high because there are no issues from institutional, technical and financial aspects of sustainability when conducting training with

[1] Sub-sector wide program is a measure to plan and implement a development program which ensures relevance between recipient country's policies and implementing support by "sector" such as education or other individual fields, by collaborating donor agencies/institutions and recipient country.

the Teaching Packages.

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

1. Project Description

（Project Locations） （NAPE）

1.1 Background

The People's Republic of Bangladesh has been working actively toward achieving universal implementation of primary education since the signing of "Education for All (EFA)" declaration in 1990. From 1998 for 5 years, the Primary Education Development Programme I (PEDP I), which is a sub-sector wide program, was put into effect to implement the construction of primary schools and resource centers, the training of teachers and administrative officers, and the development of educational materials and the establishment of information management systems. As a result, it succeeded in raising the net enrollment ratio of primary education to 87.2%. However, the completion rate of primary schooling, which is compulsory, remained at 59.2%, and the problems of withdrawal from schooling and the quality of education were recognized as important challenges.

The Government of Bangladesh (GOB) started the Second Primary Education Development Program (PEDP II) from 2004 as the second phase of the PEDP I under the cooperation of eleven donor organizations. PEDP II aims to improve the quality of education, and includes four major components, namely 1) organizational reform, 2) improvement of educational quality in schools and in classrooms, 3) improvement of infrastructure and 4) improvement of access. Among them, regarding component 2) “improvement of educational quality in schools and in classrooms,” the GoB requested technical assistance to the Government of Japan on the improvement of educational quality at the classroom level.

Aiming to improve the quality of training for science and mathematics teachers at primary

schools and that of education given in the classroom, with the National Academy for Primary Education (NAPE) serving as the major counterpart (C/P) organization, the project promotes cooperation and collaboration between teachers and others involved in education, and implements activities conducive to the improvement of educational quality through the development of science and mathematics teaching materials.

1.2 Project Outline

Overall Goal		Attainment in science and mathematics in primary education is improved in the target institutions.
Project Objective		The quality of teaching in science & mathematics is improved in the target institutions. The target institutions are: National Academy of Primary and Mass Education (NAPE), Primary Teacher Institute (PTI), Field Testing Schools (FTS)[2], and selected Upazila Resource Centers (URC) and Upazila Education Offices (UEO).
Output(s)	Output 1	New teaching and learning methodologies are introduced through the development of Teaching Packages
	Output 2	The lessons of science and mathematics are improved in the target institutions through the use of Teaching Packages.
	Output 3	The capacity of NAPE for training and research in science & mathematics is enhanced.
	Output 4	The progress of activities is reported regularly in DPE and PEDP II.
Inputs		Japanese Side: 1. Experts 0 for Long-Term、19 for Short-Term（Leader (1), Sub-leader(1), Training Planning (3), Mathematics (2), Science (5), Database development (2), Education evaluation/Curriculum (1) , Project coordinator (3)） 2. Trainees received（Twice, 11 for Japan） 3. Trainees for Third-Country Training Programs in Philippines (9) 4. Equipment 11,623,000 yen

[2] FTSs are the target primary schools of the Project. There are a total of five schools in Mymensingh: Gavishmul, Shakariputti, Tatkra, Vashani and PTI Experimental School. PTI Experimental School is a primary school that belongs to PTI and PTI trainees conduct practice teaching there.

	5. Local Cost 9,610,000 yen 6. Others (incl. dispatch of related missions) Bangladesh Side: 1. Counterparts 2. Project Office (in Dhaka and Mymensingh), Utilities
Total cost	654 million yen
Period of Cooperation	October 2004 – September 2008 (Extended: until March 2010)
Implementing Agency	Ministry of Primary and Mass Education, NAPE
Cooperation Agency in Japan	PADECO Co. Ltd.; Faculty of International Cooperation Hiroshima University
Related Projects	-Dispatch of Japan International Cooperation Agency (JICA) experts (Adviser of primary education) -Dispatch of JICA volunteers (Math/Science teachers, Primary education) - Multi assistance grant (Support to PEDPII through UNICEF) - JICA Regional Training (Science experimental education at primary schools by JICA)

In the Project, the Teaching Package which is teaching methodology of science and mathematics for Grade 1 to 5 of primary schools was developed mainly by NAPE which is in charge of development of primary education training and implementing trainer's training. The Teaching Package was expected to be utilized at PTIs, which conduct C-in-Ed (Certification for primary school teachers) training, URCs, which conduct the subject based training at Upazila level, and UEOs, which give instruction on school management, general pedagogy and other subject related issues through sub-cluster training. The teaching package was expected to improve science and mathematics education of PTI instructors, their trainees who are future teachers and present teachers. The target area of the Project was the Mymensingh province. A total of five FTS [3]were elected, two each from Shodor Upazila and Gouripur Upazila[4], and one PTI experimental school. There is generally one PTI located in each province, and only Mymensingh PTI is the target of the Project. It was expected that the training utilizing the Teaching Package would be expanded to all PTIs in Bangladesh.

[3] Four FTS were chosen from the Government Primary Schools and Registered Non-Government Primary Schools.
[4] Shodor Upazila is located in an urban area and Gouripur Upazila in a rural area.

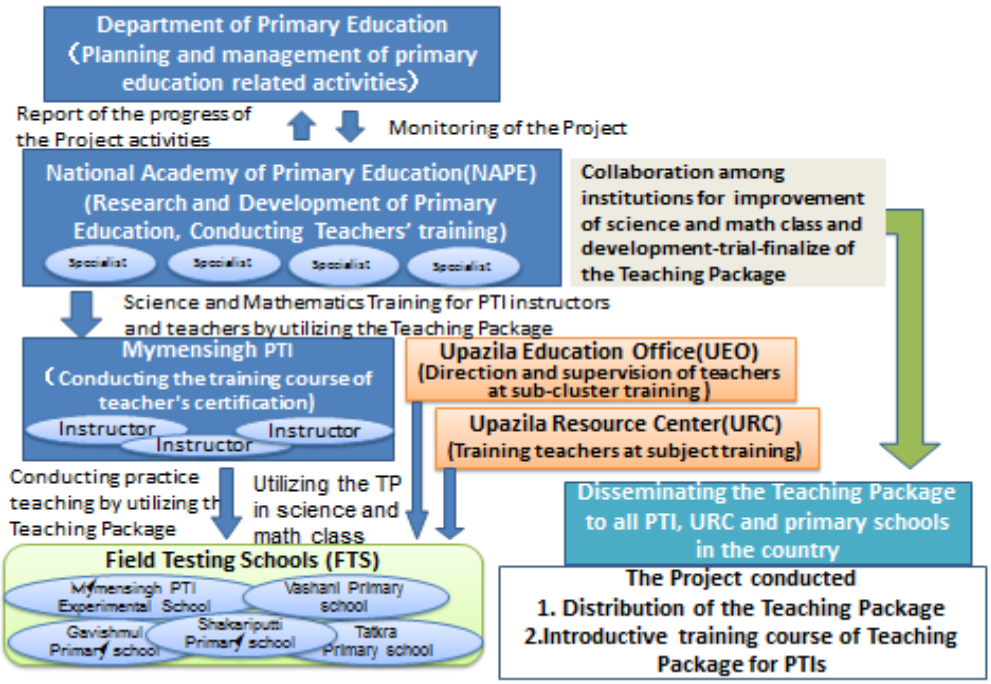

Fig. 1 The target flow of the Project

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Overall Goal

At the time of Terminal Evaluation, improvement of the attendance rate, the promotion rate and the completion rate in FTS was observed, which contributed to the Overall Goal "Attainment in science and mathematics in primary education is improved in the target institutions." Thus, it was judged that there was the prospect of achievement of Overall Goal.

1.3.2 Achievement of Project Objective

The prospect of achieving the Project Objective is high. By working closely with JICA experts toward the development of the teaching packages, NAPE Specialists obtained the knowledge and skills that represent the fundamentals of high-quality science and mathematics education. PTI instructors improved their basic skills on the cycle of "planning classes, giving classes and reviewing" (plan-do-see). However, as of the Terminal Evaluation it had yet to be confirmed whether the instructors who participated in the training program were able to utilize and make the teaching packages a regular fixture in their lessons when they returned to each of their PTIs, or if they were able to improve

the quality of Certification in Education (C-in-Ed) training[5].

1.3.3 Recommendations

(1) It is desirable to take appropriate steps to ensure early approval of the teaching package for 5th grade.
(2) It was agreed in the operational plan of the Mid-term Review (MTR) of the PEDP II to pay expenses to print and distribute the teaching packages for all primary schools in the country from the pool fund of the PEDP II. Appropriate administrative procedures to print and distribute the teaching packages should be taken promptly.
(3) Directorate of Primary Education (DPE) and NAPE should encourage the extensive use of the teaching packages in PTIs, URCs, UEOs and all other related institutions.
(4) NAPE should continuously serve an important role in monitoring/mentoring of PTIs and in giving instructions and advice on the use of the teaching packages in the future.
(5) In order to extend the teaching packages in PTIs and primary schools, it is essential to include the teaching packages into the revised C-in-Ed curriculum. It is expected that DPE and NAPE will be proactively engaged in this work.
(6) In order to implement activities given in recommendations above, the period of the JICA Project should be extended until March 2010.

2. Outline of the Evaluation Study

2.1 External Evaluator

Yuko Aoki, Kokusai Kogyo Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: November, 2012 – September, 2013
Duration of the Field Study: January 26, 2013 – February 13, 2013
June 29, 2013 – July 5, 2013

2.3 Constraints during the Evaluation Study

In this Ex-post evaluation, outputs and indicators in the Project Design Matrix (PDM) were reviewed and comprehended based on the Project's activities and their expected effect, and on analysis of the information collected, because the PDM and its indicators of the Project were unclear. Also, most of the indicators do not have numerical goals, therefore the numerical information was not collected at the time of the Terminal Evaluation. Due to the time constraints on collecting numerical information in this Ex-post evaluation, narrative

[5] C-in-Ed is issued by NAPE after the 1 year of training and passing a certification exam.

information was mainly collected to assess the achievements of the Project.

As the Project was conducted as a part of PEDP II, this Ex-post evaluation attempted to verify not only the Project itself but effectiveness of the Project as a part of the program and its contribution to the program as a whole.

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

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance to the Development Plan of Bangladesh

Improvement of primary education quality was given as one of the important items in the Interim Poverty Reduction Strategy Paper (I-PRSP) 2003-2006 which was the National Development Plan of Bangladesh, at the time of Ex-ante evaluation. I-PRSP was finalized into PRSP in December 2005; PRSP is also taking importance on improvement of primary education quality as well as I-PRSP, and was the Development Plan of Bangladesh at the time of completion of the Project. Education for All: National Plan of Action (2003-2015) was made in 2007, in the middle of the Project's period. The quality of primary education is also a priority issue under this plan of action. As mentioned above, PEDP II was implemented as a component of the National Plan of Action, and the Project was integrated into Component 2 of the PEDP II for realization.

Accordingly, the objective of the Project had been consistent with the development policies of the country, and the improvement of primary education has been a priority issue of the development policies of the country at the time of Ex-ante evaluation, implementing and completion of the Project.

3.1.2 Relevance to the Development Needs of Bangladesh

At the time of Ex-ante evaluation, the method of science and mathematics education in Bangladesh was by memorizing and copying from the blackboard in classrooms, consequently there was a problem with children losing interest in classes and with the low level of understanding. To solve the problem, the objective of PEDPII's component 2 was "improvement of educational quality in schools and in classrooms" using a child-centered approach.

NAPE is playing the leading role of primary school teacher training and improvement of educational contents, however it had not contributed enough to improving quality in the field of education due to a lack of cooperation with PTIs and training institutions for present teachers (URC and UEO). There was a strong need to establish the practical fostering and training of primary school teachers for child-centered and comprehensive classes by

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

[7] ③: High, ② Fair, ① Low

strengthening cooperation amongst NAPE－PTI－URC/UEO－primary schools. There was also a strong need in subject-wide issues and pedagogy such as the teachers' guides corresponding to text books, achievement of methods of study that focus on discovery/exploration, and interactive child-centered class room management. The need for improvement of educational quality remained strong at the time of the Project's completion, and there had been activities for them through PEDP II.

Consequently, improvement of quality of education had been an important development need of the county at the time of Ex-ante evaluation and completion of the Project, therefore there was a high consistency between the Project's objective and the development need of the county.

3.1.3 Relevance to Japan's ODA Policy

In Japan's ODA Policy, Country Assistance Program for the People's Republic of Bangladesh (2000) and JICA's Country Assistant Program (2000), assistance to primary education was a prioritized area. The project has been highly relevant with the Japan's ODA Policy.

This project has been highly relevant to Bangladesh's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Effectiveness and Impact[8] (Rating: ③)

3.2.1 Project Outputs

3.2.1.1 Project Output

The Project has 5 Outputs shown below to achieve the Project Purpose.

1) Output 1

Output 1 is: "New teaching and learning methodologies are introduced through the development of Teaching Packages, "Number of authorized Teaching Packages" is set as an indicator.

NAPE acted as a leader, and the Teaching Packages were developed as Project activities. The Teaching Packages are collections of good practices on teaching methodologies including ideas for use in the classroom, materials and evaluation sheets for selected topics which are difficult to teach. As mentioned above, there is no numerical goal for the "Number of authorized Teaching Packages", an indicator of Output 1. However, a total of 8 Teaching Packages for grade 1 to 5 were developed by the Project and were officially approved by

[8] Sub-rating for Effectiveness is to be made in consideration of Impact

the DPE. Thus, Output 1 is considered as achieved.

2) Output 2

Output 2 is: the lessons of science and mathematics are improved in the target institutions through the use of Teaching Packages. ①Frequency of activities of Study Group Activities (SGAs) and Study Workshops (SWs)[9], ②Degree of improvement of the teaching ability in science and mathematics at FTS and a selected PTI, ③Number of training programs implemented, ④Degree of improvement of the teaching ability in science and mathematics at PTIs, ⑤Number of adopted materials, are set as indicators.

Since Output 2 means the same as Project Purpose, in the Ex-post evaluation it was interpreted as the approved Teaching Packages are utilized at the target institutions (NAPE, PTIs, target URC and UEO, and FTS).

① During the Project period, SGAs were held 5-10 times per month; SWs were held every 3 months. SGAs had provided opportunity to exchange opinions among teachers about improvement of science and mathematics classes by utilizing the Teaching Packages. SWs were the place to develop trial and revise Teaching Packages and also had provided opportunities to strengthen the relationships among people in related target institutions including teachers.

③To promote utilization of the Teaching Packages, the training course for superintendents of all PTIs in the country was conducted 4 times, the training course for PTI instructors was conducted for 4 times in science and mathematics, and Teaching Package instruction training was conducted once for URC instructors.

⑤The material which adopted the contents of Teaching Packages is the instructor fostering training (ToT) guideline of URC (approved in April 2008). This is the teaching aid for URC's subject training manuals. It was confirmed that a leaflet which is used at UEO's sub-cluster training included the concept of class management methodology on Teaching Packages, yet the leaflet is not an educational material.

②Mymensingh PTI has been implementing Quality Teaching Cycle[10] which is proposed in the Teaching Packages. As a result, one way lecture style of training changed to an interactive style that includes conversations with trainees. At FTS, teachers had started planning the classes as recommended in the Teaching Packages, and implementing interactive class and group activities in class to let students think by themselves.

④According to the Survey Report on the status of Teaching Package implementation at PTIs,

[9] Study Group Activities were conducted at each target institution. Study Group Workshop was a cooperative workshop which related persons of different institutions participated in from NAPE, PTIs, URC, UEO and FTS.

[10] Quality Teaching Cycle is a type of plan-do-check-act (PDCA) cycle composed of planning classes, implementation, thinking back and feedback.

conducted by NAPE's specialists in November 2009, it was confirmed that all 18 sample PTIs were utilizing the Teaching Packages for lesson planning, teaching practices and C-in-Ed classes[11].

Consequently, the Teaching Packages are utilized at target institutions, and Output 2 is considered to be achieved.

3) Output 3

Output 3 is: "the capacity of NAPE for training and research in science and mathematics is enhanced." ①Frequency of activities of SGAs and SWs, ②Degree of improvement of the teaching ability in science and mathematics at NAPE, ③Reports for all grades of science and mathematics, ④Report on C-in-Ed development and utilization of science and mathematics database, ⑤Frequency of using the educational database for the activities conducted by NAPE, ⑥Number of overseas/in-country trainees, are the indicators. As these indicators do not have numerical goals, expected outputs were read from the Project's reports and the minutes of meetings, and achievement of the expected outputs are evaluated through the interview to target institutions at the Ex-post evaluation.

① As showed in the indicator① of Output 2, SGAs and SWs had been conducted constantly during the Project period. SGAs and SW helped NAPE specialists to improve their capacity of training and researching of science and mathematics, and also promoted the opinion exchange among personnel in different institutions.

② Since this indicator means the same as Project purpose, it was interpreted as "NAPE's improvement of training implementation capacity". The interviews were conducted to 4 NAPE specialists/assistant specialists who were C/P at the time of Project period. All of them answered "We could improve our capacity of training implementation" and "We have now confidence to conduct Quality Teaching Cycle", through the development and trial of Teaching Packages, and through the monitoring of training utilizing Teaching Packages at PTIs. Thus, it was judged that the objective of the indicator was achieved.

③ "Study on Bangladesh Primary Mathematics and Science Curriculum and Textbooks (Grade 1 to 5 Math & Grade 3 to 5 Science)" is a report of issues and recommendations of the curriculum and textbook which NAPE's specialists/assistant specialist have found during process of development and trial of Teaching Packages. The report was made during the Project's period. In the interview to NAPE's specialists/assistant specialists at the time of Ex-post evaluation, all of them answered that through the making of the report, they could deepen their knowledge of each subject, and this helped them recognized the issues of the curriculum and text books. Making the report was useful for

[11] Source: JICA documents.

them, and the objective of the indicator was judged as achieved.

④ A report about C-in-Ed curriculum (a training course to get certification of teachers) is a report of issues and recommendations to be improved of C-in-Ed curriculum and study assessment methodology which NAPE's specialists/assistant specialists analyzed. The report was made during the Project's period. In the interview to NAPE's specialists/assistant specialists at the time of Ex-post evaluation, all of them answered that they obtained the opportunity to improve the way they implement training through making the report. The objective of the indicator was judged as achieved.

⑤ Training for Educational database[12] were conducted in a total 4 times to NAPE C/Ps in how to encourage its utilization and to database managers. C/Ps were able to use the database and refer to it for their work, however they were not able to improve their research capacity by newly utilizing it. The database manager(C/P) was not specialized in ICT and C/Ps were not used to using computers in their work. Because of that, the database had not been used after the Terminal Evaluation.

⑥ The indicator "Number of overseas/in-country trainees" does not show the type of training and numerical goals in the PDM. In the report of Terminal Evaluation, number of SGAs and SWs (143 and 11), the training for PTI superintendents and instructors (6) and Japan/third country training (total 3 times) were shown. A follow-up training for PTI superintendents and instructors was conducted after the Terminal Evaluation.

Accordingly, indicators of Output 3 were almost achieved. As it is considered that a capacity for research and training of NAPE was improved, Output 3 was achieved.

4) Output 4

Ouput 4 is: "The progress of activities is reported regularly in DPE and PEDP II". "The number of progress reports approved" and "Annual Operation Plan" are set as its indicators. These indicators also do not have numerical goals. During the Project period, the activity plan and its progress were regularly submitted to the Training Division of DPE and approved. Output 4 is considered as achieved.

3.2.1.2 Achievement of Project Objectives

Project Objective is: "The quality of teaching in science and mathematics is improved in the target institutions" and the target institutions are NAPE, PTIs, FTSs, selected URCs and UEOs. The indicators are: "The degree of improvement of teacher's class teaching, class management and attitude towards science and mathematics (he degree of improvement of

[12] Its contents are Pre-Activity/Post-Activity Study Report, electronic data of Teaching Packages, English translated text books, teachers' guides and curriculum, and various meeting minutes.

consciousness in terms of understanding and interest of trainees and pupils)", and shown examples in the PDM as ①Students' Perception about class②Teacher's strategy in classroom teaching③Teacher's handling of topics④The numbers and types of expressions of both teachers and students.

The indicators do not have numerical goals to evaluate the achievements, as there were only collected opinions and comments of relate persons in the Terminal Evaluation Report and Project completion report, therefore it was difficult to judge the achievement of Project Objective at the time of Project termination. The Project Objective can be interpreted targeting improvement of only FTS teacher's capacity among other target institutions, as "teachers" are targeted in the indicators. Only FTS teachers are called "teachers," while other institutions have NAPE specialist, PTI/URC instructors, UEO officers). Also, the Terminal Evaluation report mainly described the changes of FTS teachers' class.

In the Ex-post evaluation, analysis was conducted based on JICA documents and results of questionnaire/interview surveys[13] about each indicator to the related institutions at the time of Ex-post evaluation. The table below shows the change of mainly FTSs at the time of Project completion in terms of examples ①～④ of the indicator above.

Table 1: Situation of FTSs along with the examples of indicator at the time of Project completion

Examples of indicator	Situation at the time of Project completion
① Students' Perception about class	• As a result of introduction of Teaching Packages to science and mathematics classes by FTS teachers, pupils were gaining an interest in the classes as they could understand the links between their daily life and what they had learnt in class.
② Teacher's strategy in classroom teaching	• FTS Teachers gained an understanding about the concept of Teaching Packages and making lesson plans before the classes. • Teachers started making lesson plans in line with the Quality Teaching Cycle, whereas in the past they used to do the classes totally depending on teaching guidelines. • URC's instructors joined in the development of Teaching Packages, and understood the necessity of lesson planning. They also recommended conducting Quality Teaching Cycle in their own classes according to the developed Teaching Packages. They evaluated "Quality of education has improved at FTSs" and "the

[13] A questionnaire telephone survey was conducted to all 57 PTI superintendents in the country and answers were received from 55.

	classes became effective and practical" from this experience.
③ Teacher's handling of topics	• Group activities and observations were introduced to the classes to let pupils think by themselves. For example, at the class of "sound", teachers let pupils vocalize and discuss the sound around them. The classes became more practical and experimental in Shakariputti primary school. • Teachers started handling the materials familiar with their daily life, for example, teachers got a hint from Teaching Packages to make the teaching aids utilizing the materials familiar to them and used these materials in classes in Gavishmul primary school. • Teachers started spending more time on each question in mathematics class than before, and became more conscious about linkage between the subject and daily life in science class.
④ The numbers and types of expressions of both teachers and students	• Teachers started using words comprehensible for pupils. • Teachers became able to widen their expressions such as showing realistic examples, whereas before their classes consisted mostly of letting pupils memorize or copy from the black board. Pupils started giving reasons for their answers rather than just replying only "Yes or No".

Source: Terminal Evaluation report, JICA documents and answers of interviews at the time of Ex-post evaluation survey

In addition, there were changes observed in PTI instructors who conduct the training for primary school teachers including FTS teachers by utilizing Teaching Packages. According to the answers interviewed to Mymensingh PTI superintendent, as a result of PTI instructors' understanding that Teaching Packages encourage learners' creativity and support further comprehension of the content of classes, the Packages became proactively utilized; and as the topics included in Teaching Packages can be practically applied to other topics, trainees highly evaluated about the contents of trainings.

Changes to the classes for FTS teachers were observed during the Project period and the contents of the classes became comprehensible for pupils. At the PTIs, the place of training for teacher fostering, the lessons taught by instructors took into consideration the level of learners' understanding by utilizing Teaching Packages. Accordingly, the Project Objective is almost achieved.

During the Project period, the target institutions including FTSs improved the quality of their classes through development and trial of Teaching Packages. In particular, through SGAs and SWs, equal discussions and collaborative activities were conducted among related

institutions which had not been interacting before, and reviewing the training and classes at each institution was conducted for improvement. Those actions ended up making the Teaching Packages more practical. It can be said that the Project contributed to strengthen the relationships among related institutions as the Project provided them with a place to discuss the improvement of classes and to share their experiences.

This project has largely achieved its objectives; therefore its effectiveness is high.

3.2.2 Impact

As mentioned in 2.3 above, results of overall activities on PEDP II and PEDP 3 were verified to evaluate their impact. There were several activities conducted from 2004 to 2009 as part of PEDP II in addition to the Project, such as various types of training for improvement of teacher's quality, increasing the number of primary school teachers, distribution of teaching materials, upgrading school facilities, scholarships for improvement of enrollment rate and school provided lunches[14]. In PEDP 3, JICA's technical cooperation project "Strengthening the capacity of teacher training in Primary Teacher Training Institutes （PTIs） to improve classroom teaching" has been conducted following on from the Project, and through this project activities were implemented to improve science and mathematics classes of PTIs and primary schools in Bangladesh by utilizing the Teaching Packages.

3.2.2.1 Achievement of Overall Goal

Overall Goal of the Project is "Attainment in science and mathematics in primary education is improved in the target institutions". The indicator is "Number and rate of successful learners in science and mathematics in the target institutions".

The score of mathematics and science of the FTSs (2004-2012) are shown below in figures 2 to 6. The data of 2004 and 2007 are from the Final Evaluation Report of the Project, the data from 2008 to 2012 were obtained at the time of Ex-post evaluation from each FTS. All data is the average score[15] of science and mathematics of grade 4 at each FTS. And the vertical axis is the score out of 100 points and the horizontal axis is year.

[14] From the interview with the Director General (who is also Program Director of PEDPIII), DPE. In PEDPII, not only increasing the number of primary school teachers, but various activities were conducted such as distribution of teaching materials and text books, scholarships and school provided lunches etc…especially for improvement of enrollment rate in rural areas and deprived areas. Consequently, the national averages of number of teachers and students have increased. Comparing the number of students in 2004 and 2012, Gavishmul and Tatkra primary school, 2 FTS in rural area, increased in 1.8 times and 1.5 times, while other 2 schools of FTS in urban area remained almost the same or slightly decreased. This is considered as a effectiveness of PEDPII though, the rate on number of students per a teacher has not improved.

[15] Overall Goal of the Project is "Attainment in science and mathematics in primary education is improved in the target institutions" though, there was no data correspond to it. In the Ex-post evaluation, the average scores of final exams on science and mathematics in grade 4, which are the same as Terminal Evaluation, were obtained and analyzed.

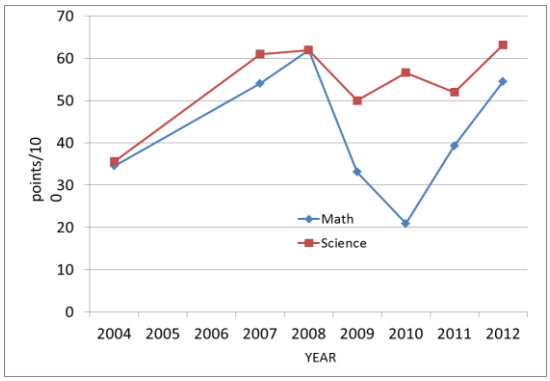

Fig.2　Tatkra primary school

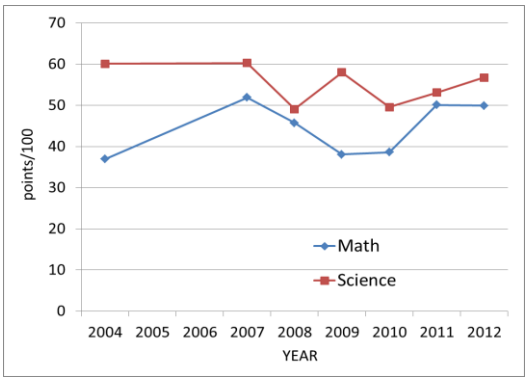

Fig3.　Vashani primary school

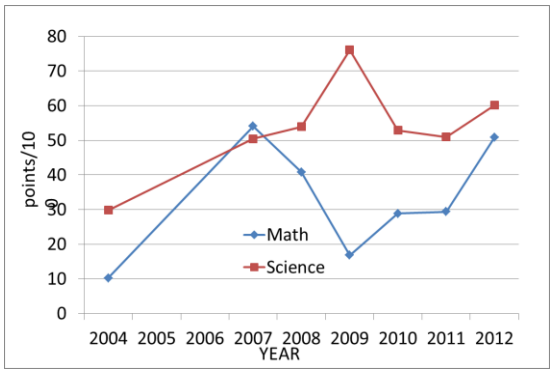

Fig.4　Gavishmul primary school

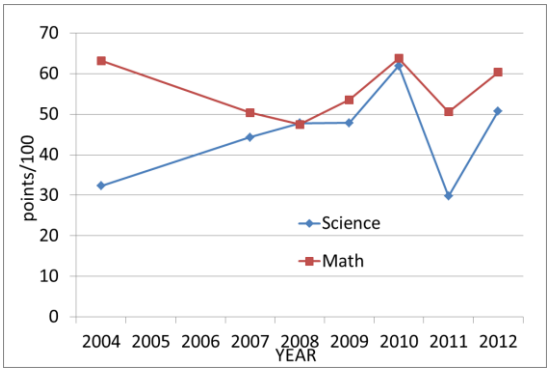

Fig.5　Shakariputti primary school

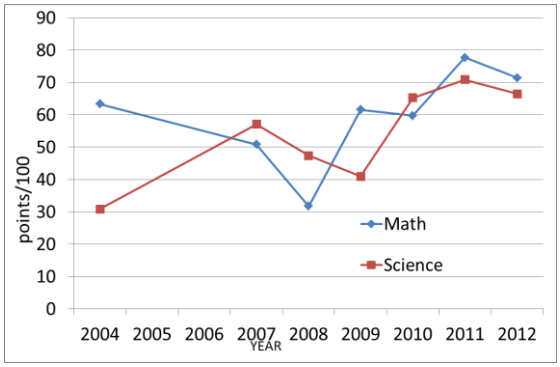

Fig.6　PTI experimental school

Sources of Fig.2～6：Terminal Evaluation report and FTSs

It is difficult to figure out the overall trend as the scores of each school showed large fluctuations. However, by comparing the scores of 2004 (before implementation of the Project) and 2012 (at the time of Ex-post evaluation), the scores are improving except the science scores of 2 schools.　Even though the scores of each school fluctuated every year and are not stable, according to the interview to DPE, overall trend is improving. Consequently, it is evaluated that improvement of scores can be observed after implementation of the Project. As mentioned above, because various measures were taken during the Project period, access to education has rapidly improved and there are more opportunities for learning by pupils in

rural areas where the learning environment is relatively more severe than in urban areas. It is noteworthy that the overall learning achievement is on an increasing trend.

3.2.2.2 Continuity of training utilizing Teaching Packages after completion of the Project

The teacher training utilizing Teaching Packages have been conducted continuously at all PTIs in the country. The telephone interview survey to all PTIs in the country at the time of the Ex-post Evaluation, of the 55 PTIs superintendents who answered, 89% answered that Teaching Packages were useful in conducting training. PTI has continued conducting training utilizing Teaching Packages for PTI instructors as well as monitoring activities of the training. Specially, the developed SW and PTI cluster workshops (details are shown later in the Sustainability) promote information sharing of Teaching Packages utilization among NAPE, PTI and primary school teachers. As for URC and UEO, utilization of Teaching Packages is planned, at subject based training of all URCs in the country and at sub-cluster training of 2 UEOs which are target institutions of the Project. The contents of Teaching Packages will be planned to be included in the successor to C-in-Ed (details shown in the Other Impacts), and the phase 2 of the Project has been supporting it.

As for current situation of the classes utilizing Teaching Packages at primary schools, the interview survey to the FTSs was conducted. It was found that all 5 FTSs have been utilizing the Teaching Packages. As mentioned above, teachers are making handmade materials using the common items and implementing experience-type classes. All the curriculums and text books were revised in January 2013 and numerical order of topics and contents were changed. Despite this, the interviewed teachers said that because the Teaching Packages are arranged by topic, they were able to pick the topics as needed and apply to new curriculum and text books.

Phase 2 of the Project started in November 2010, and involves activities supporting improvement of overall teacher training system (supporting TED plan implementation, details later) and fixing Teaching Packages at PTIs and primary schools in the country. FTSs are not the target schools of the phase 2; however, FTS's science and mathematics classes will receive positive influences continuously from training for present teachers and PTI cluster workshops (described later).

3.2.2.3 Other Impacts

1) Impact on passing grades and graduation

As for trends in the graduation rate from 2004 to 2008, while national average remained 50%, the rate of FTS improved from 66% in 2004 to 83% in 2008 (JICA report). Moreover, the Ex-post evaluation survey reveals that the number of students graduating from FTS is increasing.

Table 3　Trend in the number of pupils graduating from FTS

	2008	2009	2010	2011	2012
Shakariputti	15	15	15	23	23
Gavishmul	12	8	15	36	16
Vashani	10	11	16	9	10
Tatkra	17	23	24	30	35
PTI experimental school	16	24	36	50	44

Source：FTS

Also, Passing/graduation rate in FTS from 2004 to 2012 (average of passing rate from grade 1 to 4 and graduation rate of grade 5) is shown below. An increasing trend is observed. As national average of passing/graduation rate is not available, national average of graduation rate of grade 5[16] is shown below for reference. The figure shows also increasing trend to a large extent.

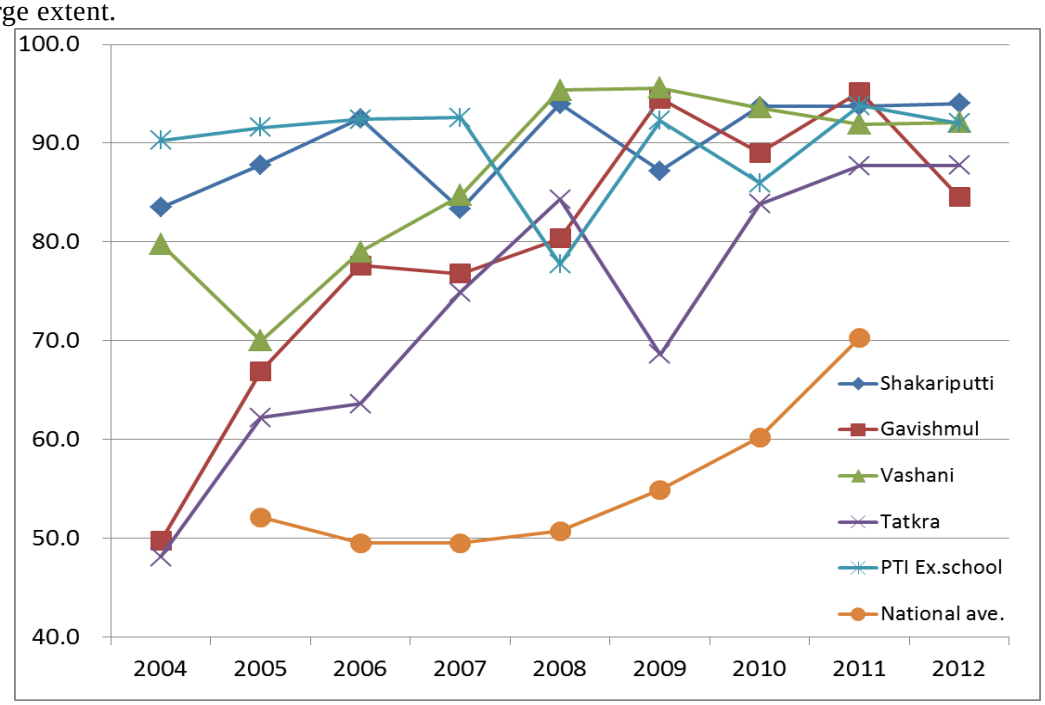

Fig 7　Passing/graduation rate of primary schools（%）

Source: JICA documents (2004-08) and FTS (2008-12)

Passing/graduation rate is calculated by making denominator the number of participants in passing/graduation examinations, not by the number of pupils, and the number of pupils are decreasing along with grade (probably due to drop-out and non-attendance)[17]. Taking the

[16] Graduation rate of grade 5 are from Key Performance Indicator (2005-2011) of PEDPII.

[17] It was unable to trace trends in the actual number of pupils who completed the entire five years of primary education, however it is likely that those who could pass grade 5 was only 1/3 to 1/2 of the total who entered grade 1 in FTS, except PTI experimental school. Also, comparing the number of pupils of grade 1 and 5, in most cases, the numbers of grade 5 were far below of those in grade 1. At the comparison of

above into consideration, the passing/graduation rate is not a sufficient measure of the quality improvement of education. It is preferable to set the indicators as reduction of drop-out rate instead of passing rate and increase of graduates instead of graduation rate for measuring comprehensively the improvement of educational quality.

As seen above, passing rate, graduation rate and number of graduates show the trend of improvement.

2) Printing and distribution of Teaching Packages in the country by PEDP II's pool fund[18]

DPE highly evaluated the fact that classes utilizing Teaching Packages introduced by the Project were much improved, therefore it decided to distribute Teaching Packages to all primary schools and PTIs in the country through the budget of PEDP II, and these were distributed from 2009 to 2011. The number of Teaching Packages distributed and amount of contribution on the pool fund are shown below. DPE was strongly recommending utilizing Teaching Packages at the time of Ex-post evaluation. The telephone interview survey to all PTIs in the country found that 53 out of 55 were utilizing the Teaching Packages and considered them to be effective, showing that the packages are still being utilized.

Table 5 Number of times Teaching Packages have been printed and amount of contribution by PEDP II pool fund

	Times printed	Amount（BDT）	Grade
2008/09	255,300	15,000,000	1-4
2009/10	153,724	12,000,000	5
2010/11	152,070	n.a.	1-5
Total	561,094		

Note: Teaching Packages are for grade 1 to 5. Each package contains 8 volumes (5 for mathematics, 3 for science). Most of them were distributed to teachers of mathematics and science in primary schools.

3) Impact to the science and mathematics curriculums of primary education and revision of text books

During the implementation of the Project, NAPE made a presentation of the report on analysis of the science and mathematics curriculums of primary education and text books at the "seminar of the science and mathematics curriculums of primary education and analysis of text books" (Output 3). Policy decision makers of primary education in Bangladesh participated in the seminar including the Minister of primary education, Secretary General of primary education, Director General of department of primary education and its section chief. As a result of sharing issues of the curriculums and text books at the seminar, the secretary general

grade 1 in 2008 and grade 5 (those who could graduate) in 2012, numbers of grade 5 were 48% of grade 1.

[18] In PEDPII, under the agreement of 11 donors, the money is deposited in a fund, PEDPII pool fund, to conduct common activities.

commanded to revise the text books to the national curriculums and text books committee and DPE. As a part of activities for PEDP II, the curriculums and text books were going to be revised. Following the decision, the curriculum and text books technical committee was established and the revision was conducted.

4) Impact to revision of the C-in-Ed training

As a result of discussions at the PEDP II meeting on the report "Study on Bangladesh Primary Mathematics & Science Curriculum and Textbooks (Grade 1 to 5 Math & Grade 3 to 5 Science)", which was held mainly by NAPE, the vice minister of primary education commanded to revise the curriculum of C-in-Ed. Subsequently, Diploma in Education (DPEd) was going to be established instead of C-in-Ed. The diploma course to obtain DPEd was in trial stage at the time of Ex-post evaluation. Curriculums and text books of mathematics and sciences for the diploma course are including the components of Teaching Packages (Quality Teaching Cycle and so on) which were introduced to the Project.

5) Impact on policy coordination

JICA long-term experts have been continuously supporting primary education in Bangladesh since December 1999, the year of commencement of PEDP I, and this is ongoing. The long-term experts together with JICA office of Bangladesh have conducted coordination among PEDP I/II and the government of Bangladesh. In addition, JICA volunteers (science and mathematics teachers, primary school teachers) have been dispatched all over the country since the Project was conducted and they have advised related personnel of primary education policy how to implement policy coordination. It was found in the interview survey of the Ex-post evaluation that the government officials of the country and other donor agencies highly evaluated their contribution.

It was confirmed that the science and mathematics training of target institutions, teachers' classes at FTS, class management and attitudes were all improved by the Project at the time of the Ex-post evaluation; consequently the Project Objective "The quality of teaching in science and mathematics is improved in the target institutions" was almost achieved. As for the Overall goal, the improvement of the scores on science and mathematics in FTS was confirmed, and the expected effects were observed. In addition, the trend of increasing number of graduated pupils at FTS, distribution of Teaching Packages at all PTIs and primary schools in the country, and the impacts to the revisions of curriculums and text books for primary schools and PTIs as a result of the analysis reports on science and mathematics education and C-in-Ed curriculum, were observed. This project has largely achieved its objectives; therefore its effectiveness and impact is high.

3.3 Efficiency (Rating: ①)

3.3.1 Inputs

Inputs of the Project, plan and actual performance are shown in the table below. Due to increase of personnel cost and the number of experts due to extension of Project period, actual performance exceeds the plan.

Inputs	Plan	Actual Performance
(1) Experts	● unknown for Long-Term ● unknown for Short-Term (Chief Adviser, Mathematics education, Science education, Project coordinator, Education evaluation, Database development, etc.)	● 0 for Long-Term ● 19 for Short-Term (Chief Adviser (1), Sub-chief Adviser (2), Training planning (3), Mathematics (2), Science (5), Database development (2), Education evaluation/Curriculum (1), Project coordinator (3))
(2)Trainees received	Field(s) of training: Approx. 5/year	Field(s) of training: Training in Japan, Twice total 11 trainees
(3)Technical Exchange Training Programs	Field(s) of training: Unknown	Field(s) of training: Technical Exchange in Philippines, Once 9 trainees
(4) Equipment	Unknown (Equipment to make teaching materials, experiments materials, audio visual machines, cars etc.)	11.62 million yen (Equipment to make teaching materials, experiments materials)
Total Project Cost	Total 350 million yen	Total 654 million yen
Total Local Cost	Unknown	Unknown

Source: JICA

3.3.1.1 Elements of Inputs

Dispatch of experts cannot be compared as the number planned at the time of Ex-ante evaluation of the Project is unknown. Acceptance of trainees and provision of equipment were conducted as planned. At the time of Ex-post evaluation, NAPE was not utilizing some of the provided equipment (experimental tools for science such as microscopes)[19] and the educational database.

[19] The experimental equipment was provided to conduct researches of profession in science and mathematics, at the same time to research of methodologies of teaching by using that equipment. The NAPE specialist were supposed to be assigned as C/P before implementation of the Project though, the personnel actually assigned were not professional in science and mathematics. Also, there was less needs of training improvement by using the equipment and deepen the subject knowledge. As a result, the provided equipment has not been used.

3.3.1.2 Project Cost

Input from Japanese side was planned as 350 million yen, however the actual cost was 654 million yen, which is significantly higher than planned (187% of the planned).

The reasons for the actual figure being higher than planned are due to the one and half year extension of the project period and increase of personnel costs. The plan at the time of Ex-ante evaluation assumed that the Project office would be established in Mymensingh without any Japanese experts based in Dhaka. It was planned for the experts to make trips to Dhaka to visit MOPME for the official approval of Teaching Packages, regular reporting about the progress of the Project to DPE and National Curriculum and Textbook Board, and other coordinating works such as attending the donor agencies. However, there were more workloads of coordination with DPE and PEDP II than expected, thus two Project offices were maintained in Dhaka and Mymensingh for the duration of the Project. This required an increase in the number of experts and an increase in the total assignment period.

The Project is a component of the sub-sector approach which requires cost and works of coordination, and the distance was far between NAPE in Mymensingh and the base of PEDP II in Dhaka. All conditions and requirement above should have been considered, and based on this a more accurate project cost should have been able to be estimated at the time of Ex-ante evaluation.

3.3.1.3 Period of Cooperation

Period of cooperation was planned for 4 years from October 2005 until October 2008, however, the actual period was 5 years and 6 months, and longer than planned (138%).

The Project period was extended because, mainly due to the general election in Bangladesh, several activities were delayed such as ①finalization and DPE approval of Teaching Packages for grade 5, ② follow up training and monitoring of the packages to PTI superintendents and instructors in the country, ③ cooperation and supporting works for PEDP II.

Both project cost and period of cooperation significantly exceeded the plan, therefore efficiency of the project is low.

3.4 Sustainability (Rating: ③)

3.4.1 Related Policy towards the Project

”Education for All: National Plan of Action 2003-2015” which was finalized in 2007 was the policy for improving the quality of primary education at the time of Ex-post evaluation. Under the national plan, PEDP II was established as an implementation program. Consequently, there was no change of the policy since the time of Ex-ante evaluation.

In PEDP 3 after PEDP II, National Plan and Strategy for Primary Teacher Education and

Development (TED Plan) was made in September 2011 and approved by MOPME. Summary is as follows.

1) Implementation of teacher training and training courses

2) Implementation of supervision and advice to teachers and establishment of supporting networks

3) Establishment of the occupational competence and implementation of training to teachers, superintendents and AUEOs

4) Establishment of the occupational competence of NAPE, PTI and URC instructors and implementation of training

As above, it was observed that policy and system for quality improvement of education have continued at the time of Ex-post evaluation.

3.4.2 Institutional and Operational Aspects of the Implementing Agency

To make the Project effectiveness sustainable, the science and mathematics teaching training for PTI instructors and teachers at each school by utilizing Teaching Packages have to be conducted and monitored at each training institution. Implementation of training and monitoring at each institution at the time of Ex-post evaluation are shown below.

Table7 Implementation of training and monitoring at each institution

Related institutions and personnel	Implementation of training・Monitoring
［DPE Training division］ Director(1), Sub-director(1), Assistant head(1), Education Officer(1), Sub-officer(1)	DPE Training division is in charge of training for primary school teachers, and it is expected to monitor continuously the overall Project outputs. There is no vacancy in the division, and monitoring to the implementation of the class utilized Teaching Packages at PTIs and primary schools has been continuously conducted. In addition, the division has been monitoring the phase 2 of the Project under PEDP III.
［NAPE Faculty of science and mathematics］ Senior Specialist(1, Vacant), Specialist Science and Mathematics(1 each), Assistant Specialist science and mathematics (2 each), Total 7	NAPE is conducting training for PTI instructors, and through the training and DPEd trial works, is monitoring the implementation of classes utilizing Teaching Packages. There is a vacancy of senior specialist though, therefore the works of it has been combined with the works of specialist and assistant specialist, and there is no problem in conducting training and PTI monitoring. Also, as an activity of PEDP III (the phase 2 of the Project), the faculty has been participating in the study workshops organized at PTIs, and sharing the information about the utilized Teaching Packages at PTIs in Bangladesh.
［Mymensingh PTI］ Instructors［Total 16, of them, science(2), mathematics (2), no vacant］, Number of trainees (approx. 200), Number of class room (5)	Mymensinch PTI is one of the pilot schools which implementing the trial of DPEd course. There is no vacancy at the moment; the trainings are conducted based on the curriculum of DPEd course.

<table>
<tr>
<td>［All PTIs in the country］
Each PTI has on ave. 10 instructors. Average of trainees are 141 at each PTI, 16 trainees for each instructor. However it is difficult to calculate average as vacancy at each PTI varies from zero to over half[20].</td>
<td>All PTIs are continuously conducting the teacher training utilizing Teaching Packages, and going to be introduced DPEd course sequentially.
As seen the left column, there are vacancies of instructors, however there is a plan to cover these vacancies with recruitment in the PEDP III[21].</td>
</tr>
<tr>
<td>［URC］
Both URC Gauripur (rural area) and URC Shodor (urban area) have one instructor each, and there is no vacancy.</td>
<td>URC instructors are conducting the monitoring for the quality of the class on primary school teachers and subject based training utilizing Teaching Packages.
URC instructors had received the training courses of the Project for utilization of Teaching Packages, and there is no problem observed at the monitoring system for primary schools' utilization of the packages.</td>
</tr>
<tr>
<td>［UEO］
UEO Shodor, there is one UE Officer and 9 AUEOs were enrolled, and no vacancy.
UEO Gauripur, there is one UE officer and 7 AUEO supposed to be assigned though, there were 4 vacancy of AUEO.</td>
<td>AUEO are conducting not only the sub-cluster training but surveys on operation of primary schools, through the survey monitoring of Teaching Packages utilization is implemented.
UEO Gauripur has vacancy, however it will be filled by PEDP III.</td>
</tr>
<tr>
<td>［FTS］
Number of teachers, pupils and pupil/teacher at each FTS are shown below. All FTS operate 2 shifts system (35 min/class, morning and afternoon shift)

Table 7 Number of teachers, pupils and pupil/teacher
<table>
<tr><th></th><th>Teacher</th><th>Pupil</th><th>Pupil /Teacher</th></tr>
<tr><td>PTI Experimental school</td><td>5</td><td>210</td><td>42</td></tr>
<tr><td>Gavishmul</td><td>4</td><td>300</td><td>75</td></tr>
<tr><td>Shakariputti</td><td>5</td><td>168</td><td>34</td></tr>
<tr><td>Tatkra</td><td>7</td><td>460</td><td>66</td></tr>
<tr><td>Vashani</td><td>4</td><td>210</td><td>53</td></tr>
</table>
</td>
<td>The curriculum and text books were revised in January 2013, however the Teaching Packages which are the output of the Project have been continuously utilized at each school.
Number of students per teacher (excluding superintendent) is 42-100. Number of students are decreasing along with grades, it seems that lower grades' classes are overcrowded.
PEDP III has been increasing the number of teachers, developing educational infrastructure, and implementing various training courses for better quality of teachers. The situation of FTSs will be expected to be improved.</td>
</tr>
</table>

Source: Results of interview to each institution at the time of Ex-post evaluation

As seen above, operation of each institution is clear, and there are plans to fill the vacancies or have certain staff take on two roles, therefore there is no problem observed regarding implementation of training and monitoring system. Consequently, it is judged that there is no problem in the organizational aspects to sustain the Project effect.

3.4.3 Technical Aspects of the Implementing Agency

Activities to maintain and improve technical skills of teaching utilizing Teaching Packages by each institution are shown as follows.

[20] Source: Telephone interview survey at the time of Ex-post evaluation (55PTIs answered out of all 57)

[21] "Vacancies will be filled at PTI, UEOs and URCs and local capacity in planning and monitoring functions will be strengthened." Sub-Component 3.1.1 Field-Level Offices Strengthened, ***3.1*** *Decentralization, Component 3 Decentralization and Effectiveness, PEDP3 Main document, 2011*

[DPE]

In the phase 2 of Project, the expert team supported DPE training division making the action plan to practically implement the TED plan. The TED plan is the national plan on capacity development of primary school teachers. TED Plan includes pivotal activities such as the lesson study, SGA and SW supported by the Project to promote the teaching method utilizing Teaching Packages. DPE has been proactively working for technical improvement of primary school teachers and trainers/lecturers of each institution.

[NAPE]

NAPE makes annual work plan and training calendar every year, and conducts training. The teaching method utilizing Teaching Packages for PTI instructor training is included in the training works of NAPE, and training courses are conducted every year following the plan. In DPEd course trial mentioned above and PEDP III/the phase 2 of Project activities, there are opportunities to maintain the techniques obtained in the Project.

[PTI]

SGA and SW introduced by the Project are the places to exchange opinions aiming to strengthen the capacity of PTI instructor training implementation, and have been continuing and developing in the phase 2. For example, "PTI cluster study workshop" is a developed form of SW, and these workshops have been held since June 2011 as an activity of the phase 2. The PTI cluster study workshops are held as follows: the country is divided into 10 cluster areas, and the PTI instructors of each cluster holds workshops three times a year at the cluster representative PTI to discuss and share the issues of training and solutions for improvement. Mymensingh PTI is a cluster representative PTI. The manual of the study workshop activity is prepared by the JICA expert team of the phase 2[22]. Also, among those primary schools in each province, one from urban area and another one from rural area join the study workshops. PTI cluster study workshops have changed its name to Teacher Support Network through Lesson Study (TSN) since January 2013. The workshops have been implemented and funded as an activity of PEDP3 annual operating plan at all 57 PTIs in the country. As seen above, SW and SGA have developed and continuously conducted to maintain and improve the training ability of PTI instructors, and no problems were observed.

[URC/UEO]

The Project implemented activities to promote utilization of Teaching Packages for URC's subject based training and UEO's sub-cluster training. Activities for improvement of training techniques have been conducted by TED action plan mentioned above for staff of both institutions. It is expected that sustainability and development of the Project outputs in both training courses through the phase 2 of the Project.

[22] Materials of the study workshops are the Teaching Packages already distributed to all PTIs in the country.

[FTS]

According to the interviews with FTS teachers at the time of Ex-post evaluation, while the curriculum and text books have been revised, they are using Teaching Packages by picking up topics and applying to the new curriculum and text books. There is no technical problem observed in utilization of Teaching Packages.

Consequently, technique of related personnel in each target institution is maintained.

3.4.4 Financial Aspects of the Implementing Agency

Budget and financial situation of each target institution is as follows, financial sources are regular budget and budget from PEDP3. PEDP3 will be conducted until 2016, therefore no budget or financial problems are envisaged until then. However from 2017 it is still unclear what the financial situation will be like. It is hoped to discuss and prepare about the budget from 2017 as soon as possible.

[DPE]

DPE is allocating the budget which is necessary for teacher training (such as salary of instructors, daily allowances of trainees, rental space, text books and other materials) to PTIs and URC/UEO. According to the interview to DPE staff, DPE had enough budget allocated from regular budget and PEDP3 to distribute necessary amount to each institutions.

[NAPE]

Budget for the training for primary school teachers and PTI instructors by NAPE are allocated from DPE's regular budget, PEDP3 and donor agencies. Regular budget from DPE to NAPE since 2007 to 2012 (Fiscal year of Bangladesh starts from July) is shown in the table below. Necessary amount of budget is allocated every year to conduct the training as planned, there is no financial problem.

Table 8　NAPE budget

unit：BDT

2007	2008	2009	2010	2011	2012
2,052,000	2,750,000	4,700,000	7,044,000	9,103,300	6,002,975

Source: Annual Work Plan &Training Calendar, NAPE
Note: Excluding the training budget of PEDP II/3

[PTI]

Budget for the training activity at each PTI is allocated by PEDP3[23]. Since January 2013, TSN by PTI (Former "PTI cluster study workshop", name has changed due to the change of financial source, TSN is funded by PEDP3. See section 3.4.3) has been conducted, and necessary budget is securely allocated. The phase 2 of the Project only conducts technical support.

[URC/UEO]

Budget for the subject based training of URC is supposed to be allocated by PEDP3 on actual implementation each time; there is no shortage for implementation. Training at URC is a target of TED plan though. However, no training was conducted since PEDP3 has started. As for UEO, budget for the sub-cluster training which has to be conducted every 3 months is allocated by DPE. There is no problem in allocation of the budget and the training courses are smoothly conducted.

[FTS]

Teaching Packages are already distributed to FTSs, there is no budget needed for utilization, and thus there is no financial problem conducting the classes using the packages[24]. According to the interview at the time of Ex-post evaluation, there was an opinion about lack of equipment such as computers and other equipment of the schools. However, educational infrastructure has been strengthened by PEDP3, and the situation in FTSs is expected to be improved.

No major problems have been observed in the policy background, the structural, technical, financial aspects of the executing agency, therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project had an objective of improving the teachers' teaching method of science and mathematics and the instructors for teacher training in FTS in Mymensingh province. The Project targeted the NAPE and related institutions of primary education in the province, and developed science and mathematics teaching materials, and promoted cooperation and collaboration among teachers and education related personnel. The Project was implemented under the sub-sector wide program, PEDPII.

[23] Interview to DPE Training Division, July 2013.
[24] Interview to the experts of phase 2 and FTS.

Quality improvement of primary education has been an important issue for the national development policy in Bangladesh. The need to improve the teaching capacity of teachers to implement the comprehensible classes for pupils has also been high. The primary education support has been one of the focus fields of Japan's ODA plan for Bangladesh. Consequently, the relevance of the Project is high.

As for the Project Objective, the science and mathematics instruction has improved through the utilization of Teaching Packages, which are collections of good practices on science and mathematics teaching methodologies and which were introduced in target institutions. Consequently, the desired quality of teaching in science and mathematics was almost achieved at target institutions. As for the overall goal, not only the Project but also various activities of PEDP II such as increasing the number of teachers, distribution of teaching materials and equipping classrooms contributed to the trend of improving the scores in science and mathematics. The impact was observed, for example, distribution of Teaching Packages in the entire country by the fund of PEDPII, therefore improvement of teaching using the Teaching Packages of the Project was highly evaluated. As above, effectiveness and impact are judged as high.

As for efficiency, the cooperation period was extended for one and a half years because of delays in the approval of Teaching Packages, extending cooperation coordination supporting works due to the extension of PEDPII period and so on. This resulted in the cooperation amount much higher than planned due to the increase of the cost of dispatching experts, thus efficiency is evaluated low. Sustainability is evaluated to be high because there are no issues from institutional, technical and financial aspects of sustainability when conducting training with the Teaching Packages.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

①Utilization of experimental equipment by NAPE

As mentioned above, experimental equipment and education database provided to NAPE are not utilized. The reason is that allocation of personnel and time places too much importance on training, and there is no system to encourage the lesson study utilizing the experimental equipment. As for the educational database, there is no custom to use the personal computer among NAPE specialists, also there is no personnel who has knowledge of ICT and can handle the database.

Experimental equipment was provided to deepen the subject knowledge of science and mathematics, to improve the teaching methods, and to improve the training contents of science and mathematics education conducted by NAPE. While the educational database was

provided to establish the database of basic data and information of primary education and of trainings and their actual achievement for efficient understanding of training works and obtaining the related statistical information of pedagogy study.

It is preferable that NAPE utilizes the equipment and database to seek more improvement of training and research.

②Securement of budget after PEDP3

Each activity is funded by regular budget and PEDP3 at the moment. Since the future prospect of funding from donors is not clear after PEDP3, it is preferable to discuss and prepare about the budget as soon as possible.

4.2.2 Recommendations to JICA

4.3 Lessons Learned

①Descriptions in the PDM should be clear and set measurable indicators

As mentioned at the column 2.3, expression of PDM outputs and indicators of the Project are unclear, and some outputs are the same as the Project objective. Most of indicators are not numerical goals such as "Number of XX," "Frequency of XX" or "Report of XX" which are not able to measure the achievement. Neither at the Mid-term Review[25] nor at Terminal Evaluation, there was no discussion about setting numerical goals or revision of indicators. Because there is no setting of clear expression of the goal and practical target value, it is supposed that it was difficult to manage and to know the extent of achievement of the Project goal which was planned at the time of Ex-ante evaluation during the implementation of Project. Even at the time of Ex-post evaluation, it was not easy to understand what the Project intended to achieve. There is a risk that the intended effectiveness was not evaluated appropriately, and the Ex-post evaluation was unable to show quantitative outputs. To avoid this, appropriate expression of objective, outputs and indicators in PDM should be made, and practical, measureable indicators to evaluate the expected change by Project implementation should be carefully designed.

②Project in Sub-sector wide program needs to consider the coordination cost

The Project is a part of activity on PEDP II, and was required to trip between Mymensingh where NAPE located and Dhaka for daily coordination works. Therefore, project cost and period of cooperation significantly exceeded the plan. To implement the Project under the sub-sector wide program, it is necessary to conduct coordinating works to keep in line with

[25] PDM was revised following the advice of Mid-term Review Evaluation though; there are not "date of revision" and the "version" written in the revised PDM.

the program as a whole, and the coordination cost should have been included in Input or Project Cost at the designing of the Project.

② On a parallel with project technical support, implementing the policy coordination by JICA long-term expert is essential

At the beginning of the Project, the Project was not under the PEDP II. Since it was not allowed to conduct activity outside of PEDP II for primary education in Bangladesh, the expert team of the Project started coordinating with the secretary of PEDP II. As a result, the Project was included in annual operational plan of PEDP II from the second year. Then, the activities of the Project and its outputs of the teaching method using Teaching Packages were highly evaluated by the government, members of the expert team were appointed for revision of text books on primary education of science and mathematics. At the time of Ex-post Evaluation, according to the interview to the Japanese experts of phase 2 of the Project, JICA has a good reputation for its support for primary education on science and mathematics in Bangladesh, and indeed DPE has frequently asked JICA experts for consulting in this field.

As a background to this, the expert team, JICA Bangladesh office staff and the long-term experts have been supporting and conducting coordination works with PEDP II secretariat and Bangladesh government. Being involved in the donor coordination along with the sub-sector wide program and decision making process of the government was an important factor in the above success. In PEDP II/3, there are coordination meetings of donors to operate the pool fund, and JICA long-term experts (primary education adviser) has been assigned for the meetings to coordinate the activities of phase 2 of the Project. According to the interview to other donor personnel at the time of Ex-post evaluation, they were highly evaluated about the JICA long-term expert and it was observed that the overall presence of JICA in the program activity was high.

③ For continuing activity after Project completion, the budget after completion of the donors' funding needs to be secured and prepared

The Project is utilizing the donor fund of PEDP II/3, which Japan has also contributed to, for the budget of activities after completion of the Project. In this kind of scheme, it has to be considered how to obtain the budget after completion of donors' financial support. To continue the activities after completion of the Project, preparations need to be made as early as possible to secure the budget after completion of the donors' funding.