

**Ex-Post Project Evaluation 2021:
Package II-5 (India)
Evaluation Reports**

January 2023

JAPAN INTERNATIONAL COOPERATION AGENCY

OPMAC CORPORATION

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India

FY2021 Ex-Post Evaluation Report of
Japanese ODA Loan “Bangalore Distribution Upgradation Project”

External Evaluator: Junko Fujiwara, OPMAC Corporation

0. Summary

The objective of this project was to improve the reliability of the electricity supply by the development of a distribution automation system in the Bengaluru metropolitan area, which includes the capital city of the State of Karnataka, in southern India, thereby contributing to local economic development and the improvement of living standards for residents in the areas concerned. The project addresses all three of these perspectives: consistency with national and state-level sector development plans and programs, the development needs at the time of appraisal and ex-post evaluation, and the appropriateness of the project plan and approach. The upgrading of telecommunication facilities, distribution automation, and control center development were considered and planned in a pioneering manner within Karnataka and in relation to other states, and were implemented with a coordinated design to optimize the development plan. Although no specific linkage or coordination with other JICA projects was confirmed, the project was sufficiently consistent with Japan's assistance policy at the time of appraisal, and specific results, such as linkage and coordination with assistance provided by the Asian Development Bank, could be confirmed. Therefore, the appropriateness and consistency of the project are high. Although the project cost was within the plan, the project period was significantly longer than planned, resulting in moderately low efficiency. The reasons for the prolonged project period include technical examinations for output changes, delays in re-tendering and the procurement of materials and equipment, redesign of the communication network, delays in frequency allocation, and prolonged period spent for a series of acceptance test and system integration. The operation and effect indicators generally reached the target values, and the qualitative effect of the project, stabilization of the power supply, was also achieved. Effects on business efficiency, such as the promotion of restoration in areas where the distribution automation system has not yet been introduced and the use of data in related departments, were also confirmed. These have led to improvements in customer service and customer satisfaction. In terms of impact, stabilization of the electricity supply did not have an effect on regional GDP or the amount of foreign investment, but it was confirmed that the project improved the living environment and contributed to regional economic development. The project had no impact on the natural environment, and no land acquisition or resettlement occurred. Therefore, the effectiveness and impact of the project are high. The operation and maintenance of the project has no problems in terms of policy and system, nor in the organizational / institutional, technical, financial aspects, or current conditions, and sustainability is ensured. In addition, preventive measures have been taken in terms of

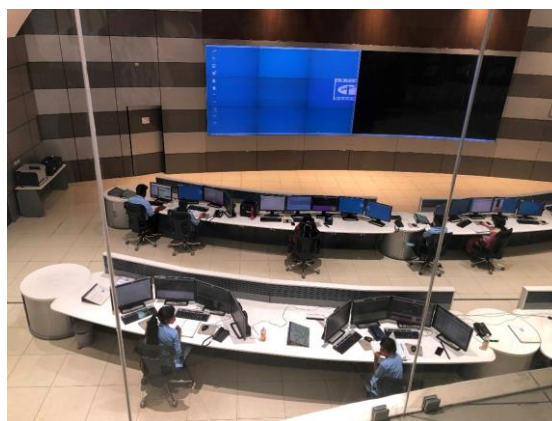
environmental and social considerations and risks. Therefore, the sustainability of the effects of this project is very high.

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

1. Project Description



Project Location (Source: Evaluator)



Control Center constructed by the Project (Source: Evaluator)

1.1 Background

Bengaluru, the capital city of the State of Karnataka in southern India, had been quoted as “Silicon Valley of India”, rapidly growing as the hub of the Indian IT industry and was emerging as one of the most popular industrial clusters in India with numerous major global firms, including Japanese firms. As economic activity increased through industrial concentration, Bengaluru's population grew from 3 million in 1981 to 5.7 million in 2001, and electricity demand increased at an average annual rate of about 10%. However, the annual average duration of outage per consumer per annum in Bengaluru was 86.2 hours (in FY2003), much higher than in other metropolitan cities in India like Delhi, Mumbai or Chennai¹. This had diminished the efficiency of firms due to the shutdown of factory lines, lighting and computers, and meant the inefficient use of captive power, which had a negative impact on local economic activities. Blackouts in city streets that threatened people's safety and breakdown of electric appliances at home. had become a bottleneck in improving the living standards of citizens.

To solve the above issues, the replacement of deteriorated facilities and the installation of insulated wires were promoted under “Accelerated Power Development & Reform Programme” (APDRP)². In addition to such measures, the introduction of a distribution automation system was regarded as effective to reduce the duration and extended area of each outage. However, it was

¹ Delhi: 31.5 hours, Mumbai: 3.5 hours, and Chennai: 21 hours.

² Under the APDRP each state was given support for new development and the reinforcement of power distribution facilities with the condition that they implement reforms based on a memorandum of understanding signed with the Ministry of Power of the Government of India.

not among the targets of the assistance schemes of the central and state governments, so budget availability was limited.

Therefore, it can be said that there was a pressing need to implement this project to produce a stable electricity supply in the Bengaluru metropolitan area.

1.2 Project Outline

The objective of this project was to improve the reliability of the electricity supply through the reduction of outage duration by the development of a Distribution Automation System (DAS) and related facilities in Bangalore, the capital city of the State of Karnataka, in southern India, thereby contributing to local economic development and the improvement of living standards for residents in the areas concerned.

Loan Approved Amount / Disbursed Amount	10,643 million yen / 6,975 million yen
Exchange of Notes Date / Loan Agreement Signing Date	March 2007 / March 2007
Terms and Conditions	Interest Rate 0.75% Repayment Period 15 years (Grace Period 5 years) Conditions for Procurement General untied
Borrower / Executing Agency(ies)	The President of India / Bangalore Electricity Supply Company Limited, BESCO
Project Completion	June 2019
Target Area	Bengaluru metropolitan area
Main Contractor(s) (Over 1 billion yen)	SATEL Oy (Finland) / Efacec Engenharia e Sistemas, S.A. (Portugal)
Main Consultant(s) (Over 100 million yen)	Central Power Research Institute (India) / KEMA INCORPORATED (USA)
Related Studies (Feasibility Studies, etc.)	Special Assistance for Project Formation for Distribution Upgradation Project for Bangalore City (Japan Bank for International Cooperation, 2005)
Related Projects	None

2. Outline of the Evaluation Study

2.1 External Evaluator

Junko Fujiwara, OPMAC Corporation

2.2 Duration of Evaluation Study

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

Duration of the Study: October 2021 – January 2023

Duration of the Field Study: March 9 - 23, June 21 - 25, 2022

3. Results of the Evaluation (Overall Rating: A³)

3.1 Relevance / Coherence (Rating: ③⁴)

3.1.1 Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of India

At the time of the appraisal, the Government of India had placed emphasis on rural electrification as one of the critical tasks for rural development and intended to reduce transmission and distribution losses from over 30% to 15% through the improvement of transmission and the distribution network in *the 10th Five-Year Plan* (April 2002 - March 2007). Along with the Plan, the “*Accelerated Power Development & Reform Program*” (APDRP) was started in 2002 to improve the high rate of transmission and distribution losses (at 31.3% in 2004) and to improve efficiency in terms of facilities and finance for the power distribution sector. The program was subsequently restructured to promote IT in the distribution sector and to strengthen its network.

At the time of the ex-post evaluation, the Government of India had implemented the *National Electricity Plan* (NEP) since 2018 in which the promotion of, and conversion to, renewable energy, the development and strengthening of the power transmission and distribution system, the introduction of electric vehicles, etc. were being facilitated⁵. Also, the “*Revamped Distribution Sector Scheme*” (RDSS) is under way from FY2021 to FY2025. This is designed to improve the business efficiency and financial sustainability of the distribution companies of each state, to strengthen the electricity supply infrastructure, promote the installation of smart meters, reduce transmission and distribution losses, and improve the balance of revenue and expenditure. Among these, the upgrade of power distribution facilities and the automation of power distribution are priorities for the promotion of photovoltaic power generation and the introduction of electric vehicles.

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

⁴ ④: Very High, ③: High, ②: Moderately Low, ①: Low

⁵ NEP was under revision as of 2021.

Therefore, the introduction of a distribution automation system in the Bengaluru metropolitan area was relevant at the time of the appraisal as well as the ex-post evaluation.

3.1.1.2 Consistency with the Development Needs of India

At the time of project appraisal, with the rapid industrial development in Bengaluru and its suburbs, the electricity demand in Karnataka State had been increasing at an annual average rate of about 15% for the last four years. The state government had been working on power sector reform since early on, and through the aggressive development of power generation facilities and electricity purchase from neighboring states, the supply and demand of electricity was almost balanced on an annual basis in FY2005. The need to reduce the annual power outage hours per consumer in Bengaluru city is described in “1.1 Project Background.” The introduction of a distribution automation system was regarded as effective to reduce the duration and extended area of each outage in addition to the replacement of deteriorated facilities and the installation of insulated electric wires.

At the time of the ex-post evaluation, the development of transmission and substation facilities was underway throughout the Karnataka State, and transmission and distribution losses were improving. As shown in “3.3.1 Effectiveness” below, there had been a reduction in the duration of power outages and an improvement in power supply in the project area, ensuring fairness as a public utility service for all citizens, including socially vulnerable groups. However, as the population of central Bengaluru continued to grow, and industrial activity increased in line with economic development, the need to reinforce power distribution facilities, further utilize the data collected through distribution automation system, and improve the distribution network considering each consumer’s characteristics and their wide variety of demands continued to be a pressing issue. Meanwhile, distribution automation had not yet been introduced outside of the project area (i.e., outside Bengaluru city) although it has been promoted within the city, and reduction of power outage duration and frequency and stabilization of power supply voltage was still necessary in industrial parks in the suburban areas.

From the above, it can be seen that the project is consistent with the development needs at the time of the appraisal as well as the ex-post evaluation.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan’s ODA Policy

At the time of project appraisal, Japan’s *Country Assistance Program for India* (May 2006) listed three priority targets: i) the promotion of economic growth; ii) improvement of poverty and environmental issues; and iii) assistance for human resources development and exchange

program enhancement. Among these, “i) the promotion of economic growth” included assistance for the development of infrastructure in the power and transportation sectors.

3.1.2.2 Internal Coherence

In the *Medium-Term Strategy for Overseas Economic Cooperation Operations* by JICA, assistance for poverty reduction and infrastructure development for sustainable growth were set as overall priority areas, and the development of economic infrastructure was prioritized as an area for assistance to India. In particular, as “improvement of the distribution network and rural electrification for economic revitalization and poverty reduction by providing a stable power supply” was a priority assistance area, as the power sector was regarded as a major sector for yen-loan assistance to India and shared 40% of the approved amount. No specific synergies or interconnections with other JICA projects were identified at the time of the appraisal or ex-post evaluation, and no collaboration or coordination with other projects in Karnataka was confirmed.

3.1.2.3 External Coherence

At the time of the appraisal, the project was seeking to collaborate with a U.S. Agency for International Development (USAID) project, but this did not materialize. Meanwhile, the Asian Development Bank's Bengaluru Smart Energy Efficient Power Distribution Project has been under implementation in Bengaluru since December 2020. The project covers six districts in the Bengaluru metropolitan area⁶. This includes the conversion of overhead distribution lines to underground cables with optical fiber cables, and the installation of automated ring main units adapted with the distribution automation system. The project was planned during the implementation of this project based on the development plan and design of the power distribution network and the distribution automation system which had been developed under this project. External consistency is also ensured in the implementation of the project through coordination and collaboration between the two projects.

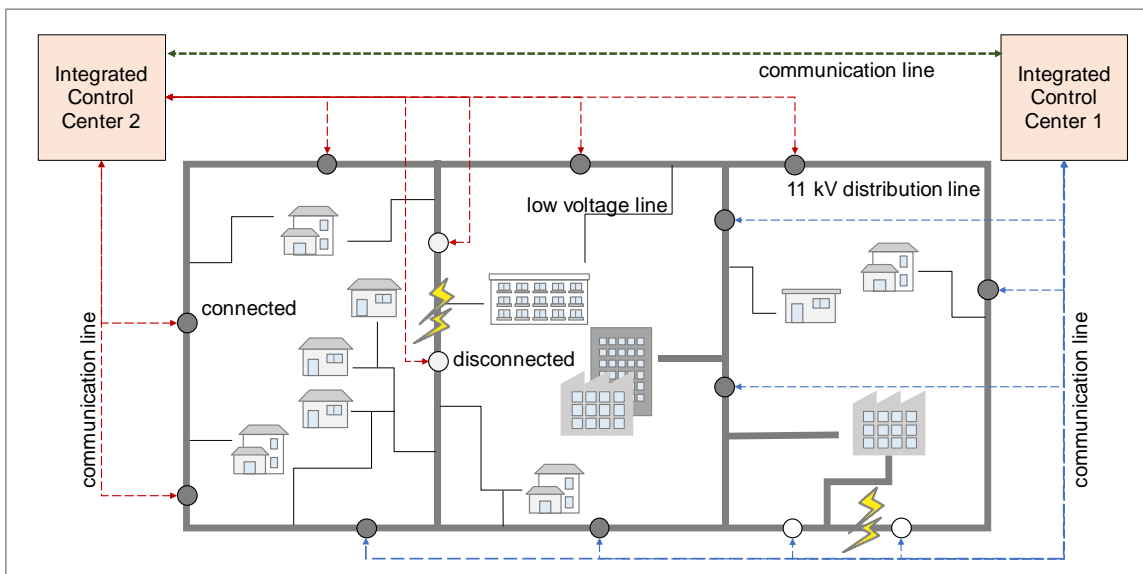
In light of the above, this project has been highly relevant to India's development plan and development needs, as well as to Japan's ODA Policy. No specific collaboration or coordination with other JICA projects was confirmed, but linkage / coordination has been made with support provided by the Asian Development Bank. The distribution automation system introduced by the project was one of the pre-conditions for the executing agency to replace existing power distribution lines with new ones in Bengaluru, together with the undergrounding of overhead lines, and the planning and implementation of smart metering. Therefore, its relevance and coherence are high.

⁶ The project covered all 14 districts in the Bengaluru metropolitan area, including six ADB projects.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The components of the project are broadly classified into (1) new facilities and equipment related to the power distribution automation system (two control centers, ring main units (RMUs) including communication lines, sectionalizers and etc.), (2) improvement and replacement of existing RMUs, and (3) replacement and new installation of 11 kV distribution lines. (See “Comparison of the Original and Actual Scope of the Project” at the end of this report for details.) The “distribution automation system” refers to a system that monitors and controls the power distribution system via a communications network. Distribution automation system was introduced primarily to minimize the spread of outages per incident and reduce the duration of outages by remotely identifying the section of an outage occurring in the 11 kV distribution network within the Bengaluru metropolitan area from the control centers via the communication network, and operating the RMUs (See Figure 1).



Source: Prepared by the evaluator referring to JICA internal documents and project outputs, as well as publicly available materials from the Electric Technology Research Association of Japan.

Note: The Control Center No. 1 serves the East and South Circles of the Bengaluru metropolitan area, while the Control Center No. 2 serves the North and West Circles.

Figure 1: Project Diagram



Ring Main Unit

Switchgear that integrates the equipment needed to open / close, protect and isolate the power distribution network in an integrated unit that communicates between the 11 kV distribution network and the Control Center.



Sectionalizer

Containing line reclosers and load break switch for 11 kV distribution network including telecommunication interface transmitting system's isolation status to the BESCO Integrated Control Centers

Source: Photos taken by evaluator (March 2022).



Changes and quantity variances between the planned and actual were identified. Rapid population growth, land development for housing, and urban expansion in the Bengaluru metropolitan area have resulted in the repeated expansion of the 11 kV power distribution network, and the need to update the information from the project formation stage in 2004 on the total length, number, and locations of 11 kV lines. Along with this, the development progress of the entire power transmission and distribution network was also confirmed, and as a result of a comprehensive technical study, the project scope was reviewed during the project implementation.

Specifically, the planned lengths of underground cables and overhead distribution lines were 450 km and 675 km, respectively, but as a result of the review, these were changed to 230.5 km and 949.6 km. It was planned to have three different types of retrofitting works of breakers on the existing RMUs, two of which were self-financed by the executing agency due to the urgency and the rest one they decided to replace RMU itself as they found it was difficult to keep using them. Furthermore, in order to improve response to power outages and speed up restoration work, the location of the telecommunication system was changed from the substations⁷ in the original plan to the Division Offices and Sub-Division Offices of the executing agency. In addition, a comprehensive IT system update was underway for the entire BESCO, and in response to this update, the Business Process IT Application planned for this project was cancelled from the perspective of future system integration.

⁷ All substations in the project target area belong to the Karnataka Power Transmission Corporation Limited (KPTCL).

The above change in scope was in line with the project objectives, as it responded to the need to expand the power distribution network due to the rapid population growth and urban expansion of Bengaluru city. In addition, the decision to establish telecommunication facilities within the own area directly controlled and under the jurisdiction of the executing agency, independent and complete from other agencies, was made with a view to speeding up the response to power outages and other incidents. This change was deemed appropriate and necessary. Although there were some changes in the volume and terms of reference of consulting services (see “Comparison of the Original and Actual Scope of the Project” at the end of this report), these changes were deemed reasonable, as they were due to the need to respond to changes in the project design and to avoid duplication with the routine work of the executing agency.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost at the time of planning was 14,205 million yen⁸, of which the ODA Loan accounted for 10,643 million yen, while the actual project cost was 8,793.6 million yen (including the ODA Loan portion of 6,976 million yen), which was within the plan (61.9% of the plan) (see Table 1).

Table 1: Planned and Actual Project Cost

Unit: Million yen

Item	Plan (2007)			Actual		
	Foreign currency	Local currency	Total	Foreign currency	Local currency	Total
Equipment procurement and installation	5,075	3,359	8,434	2,314.49	5,728.48	8,042.97
Price escalation	373	215	488	-	-	-
Physical contingency	545	357	902	-	-	-
Consulting services	413	163	576	558.81	70.04	628.85
Land acquisition and resettlement	0	0	0	0	0	0
Tax	0	2,721	2,721	0	-	-
General administration	0	841	841	0	-	-
Interest during construction	143	0	143	102.23	0	102.23
Extension charge				19.56	0	19.56
Total	6,549	7,656	14,205	2,995.09	5,798.52	8,793.61

Source: Documents provided by JICA.

Note 1: Exchange rate: Planned: 1 rupee = 2.52 yen (Sep 2006); Actual: 1 rupee = 1.74 yen (average of 2008 - 2020)

Note 2: Actual cost of price escalation, physical contingency, tax and general administration is included in the actual cost of equipment procurement and installation, and consulting services.

⁸ The project identified changes and quantity variances between the planned and actual outputs. If there is a change in the planned outputs assumed at the time of ex-post evaluation, the planned project cost will need to be revised again to match the change in the planned outputs and compared to the actual project cost. However, as shown in “3.2.1 Outputs,” the direction of the original plan was generally maintained, the changes were commensurate with the project plan, and as a result of careful attention to the budget plan, changes were examined to remain within the budget range that would fit into the planned project cost. As a result, a review of the planned project cost was not necessary for this ex-post evaluation.

By item, consulting service expenses increased from 576 million yen in the plan to 628.85 million yen in the actual, due to changes in the volume and content of work (see “Comparison of the Original and Actual Scope of the Project” at the end), as well as changes in the unit price of remuneration due to the extended period of work (See “3.2.2.2 Project Period” below). Meanwhile, the actual total project cost is significantly lower than the planned project cost. One reason for this is that the facilities and equipment related to the distribution automation system were initially expected to be procured in foreign currency, but were procured in local currency, resulting in an increase in the share of local currency in the project cost. In addition, the yen appreciated over 40% during the project period compared to the foreign currency exchange rate as it had been at the time of the plan. Therefore, comparing the project cost in yen, the project cost decreased by about 40% compared to the plan as shown above.

Comparing the project cost in rupees, the actual project cost was 5,731.85 million rupees compared to the planned project cost of 5,637 million rupees, which is almost in line with the plan and shows no negative impact on the quality of outputs.

The actual amount of the disbursement of yen loan was significantly reduced to 6,976 million yen, compared to the planned 10,643 million yen. This is because, although the loan disbursement period was extended from July 2015 to March 2017, the project period was also further extended, resulting in difficulties in disbursing the planned amount before the amended loan agreement period was expired. The executing agency responded to the resulting funding shortfall by borrowing from the Government of Karnataka, among other sources.

3.2.2.2 Project Period

The planned project period was 59 months (March 2007 to January 2012), while the actual project period was 148 months (March 2007 to June 2019), which significantly exceeded the plan (250% of the plan). (See Table 2).

Table 2: Planned and Actual Project Period

Item	Planned	Actual
L/A signing	March 2007	March 2007
Consulting services (including selection period)	April 2007 - January 2012	December 2007 - June 2019
Bidding / Contract	May 2008 - July 2009	June 2008 - January 2011
Construction work	August 2009 - January 2012	March 2011 - June 2019

Source: Documents provided by JICA and responses to the questionnaires by the executing agency.

Note 1: The “project completion” was defined, at the time of project appraisal, as the “completion of the commissioning of all components and the completion of capacity building activities.”

Note 2: With regard to the actual implementation, both the executing agency and the Consultant confirmed that the consulting service contract period was from May 2008 to April 2020, but that all work had been completed as of June 2019. In addition, “construction work” includes the period of acceptance tests and system integration work.

The main reason for the delay was the prolonged period spent for a series of acceptance tests and system integration after equipment installation. The equipment procured for the project was installed between March 2011 and May 2017, and the equipment had been in operation since September 2013, after which the acceptance tests for all facilities and system integration took approximately three and a half years. This is because not only was the performance of the delivered system verified to meet the specifications, but also it was based on internal and external system integration and linkage, which included the checking and adjusting of compatibility between the equipment purchased under different procurement packages, integration with GIS⁹ and the customer information systems and distribution SCADA¹⁰ within the executing agency, and data acquisition in conjunction with SCADA on the KPTCL side. Along with technical examination of the changes in project outputs mentioned above, these measures were the basics required for the project implementation and would improve the quality and the operational convenience of the project after its completion. The executing agency therefore had to give priority to these even at the cost of delaying the project.

Other reasons for delays include delays in contractor selection due to unsuccessful bids and the resulting delays in construction work and the procurement of materials and equipment. Reasons for the delay which were beyond the control of the executing agency, were the height limit imposed on communication towers due to aviation control, which forced the redesign of the communication network, and the delay in frequency allocation by the Government of India.

3.2.3 Results of Calculation for Internal Rates of Return (Reference only)

(1) Financial Internal Rate of Return

Since the Financial Internal Rate of Return (FIRR) had not been calculated at the time of the appraisal, it was not recalculated in the ex-post evaluation either.

(2) Economic Internal Rate of Return

The Economic Internal Rate of Return (EIRR) of this project was 14.9% at the time of the project appraisal, with the assumption that the starting point of project life would be the year following project completion. Meanwhile, the starting point of project life was redefined as the year of the signing of the loan agreement at the time of the ex-post evaluation, and the results were the same at 14.7%.

The EIRR recalculated at the time of the ex-post evaluation was 11.5%, which was lower than the EIRR at the time of appraisal. This arose from the fact that the project period had been assumed to be 5 years at the time of the project appraisal, and the benefits, i.e., consumer surplus, were accounted for from the middle of project implementation. The cost savings in

⁹ Geographic Information System

¹⁰ Supervisory Control and Data Acquisition

construction of distribution lines and substations were accounted for from the year following the year of project completion. The recalculation was made to account for benefits in line with the actual project period (extended to 12 years) and to reflect actual expenses that saw a significant increase in power purchase costs from the Karnataka Power Corporation Limited.

The assumptions used in the EIRR calculations at the time of the appraisal and at the time of the ex-post evaluation are shown in Table 3.

Table 3: Pre-conditions of EIRR Calculation for the Project

Item	At the time of appraisal	At the time of the ex-post evaluation
Cost	Project cost (excluding tax), Spare parts cost, Power purchase cost, O&M cost	Same as at the time of appraisal
Benefit	Increase in consumer surplus, cost savings in construction of distribution lines and substations	Same as at the time of appraisal
Project life	30 years after project completion	30 years after the loan agreement
EIRR	14.9%	11.5%

Source: Documents provided by JICA.

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

3.3 Effectiveness and Impacts¹¹ (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

The baseline and target values for the operation and effect indicators set at the time of the project appraisal and the actual values collected during the ex-post evaluation are shown in Table 4.

Table 4: Operation and Effect Indicators

Indicators	Unit	Baseline value	Target value	Actual value		
		2006	2014 2 Years After Completion	2019 Completion Year	2020 1 Year After Completion	2021 2 Years After Completion
Accidental power outage duration	Hour per annum / household	86.2	31.4	16.2	22.8	32.9
Peak load	MW	1,437	2,630	3,081	2,832	2,882
Distribution loss	%	10.62	9	-	-	7.33
Electricity consumption (excluding loss)	GWh	6,067	12,326	18,787	16,545	12,233
No. of staffs dispatched for restoration work	No. / hour per day	702	0	-	-	40
Feeder capacity utilization Index	%	48	75	-	-	69

¹¹ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Source: Prepared by the Evaluator based on documents provided by JICA and responses to the questionnaire from the executing agency.

Note: Actual values for 2019 and 2020 were not available for the distribution loss, the number of staff dispatched for restoration work, and the feeder capacity utilization index.

Accidental outage duration per customer was 16.16 hours in the year of project completion (FY2019), 22.76 hours one year after completion (FY2020), and 32.93 hours two years after project completion (FY2021), compared to a target of 31.4 hours. Peak load was 3,081 MW in the year of project completion, 2,832 MW one year after, and 2,882 MW two years after project completion, exceeding the target of 2,630 MW. Distribution loss was 7.33% in FY2021, which exceeded the target. Electricity consumption was 18,786.6 GWh in the year of project completion, 16,545.3 GWh one year later, and 12,232.6 GWh two years after project completion, compared to the target value of 12,326 GWh. The number of staff dispatched for restoration work in the event of a power outage was 40 persons / hour per day in FY2021, compared to the base value (702 persons / hour per day). The feeder capacity utilization index was 68.5% in 2021, 90% of the target value of 75%.

Based on the above, it is judged that the target values for each indicator two years after completion of the project have been achieved or nearly achieved.

Note that the accidental power outage hours per customer decreased to 16.16 hours per household in FY2019, which was far well above the target, but increased to 22.76 hours per household in FY2020 and 32.93 hours per household in FY2021. This is due to (i) occurrence of overhead line equipment failures and wire breakage accidents caused by the unprecedented storms that hit Karnataka in FY2020 and FY2021, and (ii) accidents during the on-soak test of distribution lines replaced from overhead to underground in Bengaluru city¹² which has been largely implemented since 2020. The main reason for the drop in electricity consumption from 18,786.6 GWh in FY2019, the year of project completion, to 16,545.3 GWh in FY2020 and 12,232.6 GWh in FY2021 was the strict lockdown due to the spread of Covid-19, the resulting restrictions on commuting to workplaces and schools in Bengaluru metropolitan area, and the lower electricity consumption by industrial and commercial consumers. Similarly, the peak load also decreased from 3,081 MW in FY2019 to 2,832 MW in FY2020, but the impact of the spread of Covid-19 is judged to have been limited and temporary, given the consistent upward trend from FY2014 to FY2019¹³ and the increase in FY2021.

¹² This is part of an ADB funded project. Bengaluru city has many roadside trees, and most of them are large ones. When trees fall due to heavy rains, etc., overhead power lines break, wooden poles collapse, and even in normal times, there is serious damage to power lines due to contact with trees and wild birds, while at the same time there has been high level of unauthorized connections. For this reason, the executing agency has been working for several years to replace bare overhead conductors with covered conductors as well as to convert them to underground cables. It is planned that this work will be completed within the next few years.

¹³ 2,479 MW in FY2014, 2,579 MW in FY2015, 2,795 MW in FY2016, 2,835 MW in FY2017, and 3,014 MW in FY2018.

Factors other than the implementation of this project that contributed to the achievement of the target values include significant population growth, economic development and the promotion of industry in the Bengaluru metropolitan area, the replacement of deteriorated facilities, and the promotion of the replacement, insulation, and undergrounding of power distribution lines in the metropolitan area through Asian Development Bank support.

3.3.1.2 Qualitative Effects (Other Effects)

(1) Stabilization of the electricity supply

“Stability of electricity supply” in the power distribution sector largely depends on the state of development of its upstream (power generation and transmission sectors). In parallel with the implementation of the project, the generation capacity became sufficient for the entire Karnataka's electricity demand as new generation sources were secured and other factors. Meanwhile, the KPTCL has also been upgrading, expanding, and strengthening its transmission and substation facilities throughout Karnataka State, including Bengaluru city, which has resulted in improved transmission and voltage stability in the transmission sector.

Under the above circumstance, to evaluate the qualitative effect of the “stabilization of the electricity supply,” the average period per accidental interruption per consumer for the three years following the project completion was estimated based on the “accidental power outage duration per consumer (hour per annum / household)”, which is one of the operation and effect indicators as well as the immediate effect of introduction of DAS, and the “accidental power outage frequency per consumer (frequency per annum / household)” which was collected separately (Table 5).

As can be seen from the above, the restoration time from accidental power outages per consumer has been getting shorter every year: 34.1 minutes / time in FY2019, 27.3 minutes/time in FY2020, and 24.3 minutes / time in FY2021. Thus, it can be confirmed that the introduction of distribution automation has enabled the rapid identification of the locations of accidents / failure as well as the rapid restoration of power supply to consumers outside of those locations.

Table 5: Trends in outage duration and frequency

Indicators	Unit	2019	2020	2021
		Completion Year	1 Year After Completion	2 Years After Completion
(a) Accidental power outage duration	hours per annum / household	16.2	22.8	32.9
(b) Accidental power outage frequency	frequency per annum / household	28.5	50.0	81.5
(c) Average outage duration (=a / b)	minutes / time	34.1	27.3	24.3

Source: Responses to the questionnaire from the executing agency.

According to key informant interviews with five industrial / commercial consumers (firms)¹⁴ in the Bengaluru metropolitan area where the distribution automation system was introduced under the project, three of the five companies who described the power supply as “unstable” before the installation and operation of the equipment procured by the project (before 10 years ago), at the time of the ex-post evaluation, said that the power supply had improved significantly, turning to “very stable” (three companies) or “stable” (two companies). Asked what improvements led them to answer “stable”, they replied that the average duration of power outages was “30 minutes” or “half a day” before 10 years ago, but at the time of the ex-post evaluation, this was generally less than one hour (“negligible, a few minutes, ” “20 minutes, ” or “45 minutes”), and the frequency of outages, which used to occur once every two to three days before 10 years ago, has decreased (“none,” “two to three times a month,” or “once every four to five days”). In addition, while voltage fluctuations varied according to the responses from before 10 years ago (“rarely occurs,” “sometimes occurs,” and “frequently occurs”), they are now reported to be improving overall (“never occurs” and “seldom occurs”).

The same trend can be observed among domestic consumers¹⁵. Key informant interviews conducted with four households in areas where the distribution automation system has been installed showed that the electricity supply, which had been “unstable” (four households) before 10 years ago, is now generally stable (three “very stable” and one “stable”). Improvement is also evident in the specific responses. The duration of power outages ranged from 30 minutes to 2 hours before 10 years ago (“30 to 60 minutes” and “1 to 2 hours”), but at the time of the ex-post evaluation, duration was within 20 minutes (“none, negligible, within 5 minutes” and “15 to 20 minutes”). The frequency of power outages was most frequently described as “5 to 6 times a day” before 10 years ago, but these have now been almost eliminated (“none” and “negligible”). Voltage fluctuations were marked as “sometimes” or “frequently” before 10 years ago, but now three of the households respond that they “never” take place.

As a side effect of the project, the contribution of the project to voltage stabilization efforts and reduction in the number of power outages by the executing agency was confirmed in

¹⁴ In selecting the companies to be surveyed, we requested through the executing agency that they (1) have been continuously active at the same address for the past 10 to 15 years, (2) receive power distribution from the executing agency, and (3) would provide an interviewee who would be able to answer specific questions and who would have been in a position to keep data related to the power supply, etc. Interviews were conducted with two manufacturing companies (spring processing, vehicle parts), one garment factory, two IT companies, and one metal parts processing company. Of these, the two IT companies and the metalworking factory were located in an industrial park in Bengaluru City.

¹⁵ Domestic consumers were selected from both the areas where the distribution automation system had been installed and the areas where the system had not been installed (areas with a large number of people not connected to the grid or areas with low electricity consumption). Key informant interviews were conducted with two households and two resident representatives (from housing complexes and local communities) in the installed areas, and with one household and one resident representative in the uninstalled areas.

interviews with them¹⁶. In general, it can be said that in the areas where the distribution automation system was introduced, the power supply, which was unstable not only in terms of outage duration but also frequency and voltage before the project effects were realized, turned stable and improved at the time of the ex-post evaluation.

For the purpose of comparison, interviews were also conducted with two domestic consumers in an area where the distribution automation system had not yet been installed¹⁷. These showed that the electricity supply had been “very poor” before 10 years ago, but was now “stable” and “stable with occasional power outages,” indicating a certain degree of improvement. In particular, the duration of power outages, which were “6 hours” and “4 to 5 hours” before 10 years ago, was “not a major problem” or “30 minutes to 1 hour” at the time of the ex-post evaluation, and have been drastically reduced. Power outages that occur in areas where distribution automation systems have not yet been installed cannot be restored remotely, but the remote monitoring of the control centers established in this project can identify the approximate area where power outages occur. This shortens the time required for field staff to reach the site of a power outage, and as a result, the time required to complete disconnection and restoration at the point of an accident has been reduced.

The above indicates that in the project area, the electricity supply has been stabilized compared to the level before the project was implemented.

(2) Improvement of the operational efficiency of the executing agency

In addition to the stabilization of the electricity supply, the following effects on the operational efficiency of the executing agency were confirmed.

Promotion of effects of electricity restoration in areas where distribution automation has not yet been achieved

The development of the control centers has enabled real-time remote monitoring of power distribution network in the entire Bengaluru metropolitan area. The data obtained from the monitoring system is also mutually shared and updated with GIS data and customer information

¹⁶ According to the executing agency, current information was collected through the installation of the distribution automation system, which made it possible to monitor the electric power flow. This has led to concrete improvements in customer service, such as the installation of individual voltage stabilization devices, especially for large customers in industrial parks. In addition, based on the information on which sections of the network are with frequent power outages, it is now possible to avoid them by sectionalizers through alternative routes, leading to a reduction in the number of power outages.

¹⁷ The installation of the distribution automation system under the project was carried out with priority given to areas with large populations and industrial areas in Bengaluru City. As the project period was prolonged, the length of power distribution lines in Bengaluru City was rapidly extended, and some areas in the project area remain where power distribution automation has not yet been installed.

held by the executing agency. This has led to the early identification of accidents and breakdowns and shortened staff arrival times, not only in areas where the distribution automation system has been installed, but also in areas in Bengaluru city where the system has not yet been installed.

Data Utilization in Related Departments

With the introduction of distribution automation through this project, data such as outage information, power outage indices, peak load, information on overcurrent and ground fault incidents on each distribution line, the availability of power supply, distribution network operation models, and geographic information on the 11 kV distribution line network is now obtained and accurately quantified. These data are widely shared within the executing agency and is systematically and extensively used for system capacity planning, distribution network configuration studies and expansion, preventive maintenance operations of the distribution network, and day-to-day customer service.

(3) Improvement of executing agency's customer services

The executing agency shares the data obtained from the distribution automation system internally and promptly provides accurate outage information through their websites, smartphone applications for customers, and telephone operators for customer relations. In addition, sales representatives and field staff from the executing agency visit customers from time to time to listen to their complaints and requests to help improve operations.

Regarding the electricity supply by the executing agency, the results of the key informant interviews indicate that both domestic and commercial / industrial customers were at least “satisfied”. In addition to the substantial improvements such as the reduction in the frequency of power outages during the rainy season, reduction of the duration of power outages, and improvements in voltage fluctuation, the respondents also mentioned that the sales staff and field staff are very responsive. They reported that if any problem arises, field staff immediately rush to the scene and respond to customers with abundant and reliable knowledge and skills. This is largely due to smooth communication with the staff of the executing agency and trust in the high level of their technical capabilities.

3.3.2 Impacts

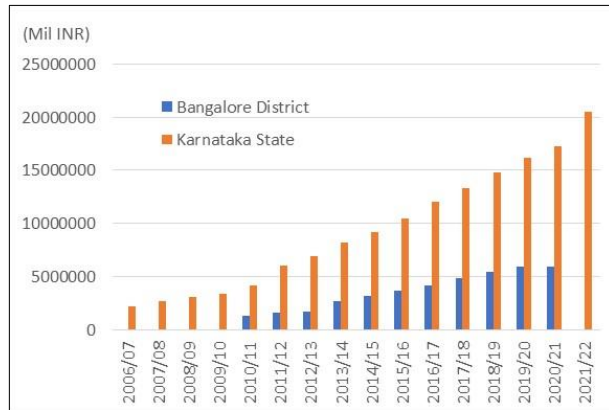
3.3.2.1 Intended Impacts

(1) Quantitative Effects

The “quantitative effects” established at the planning stage of this project are regional GDP and foreign direct investment. The status of these indicators over time is as follows.

i) Growth of Regional GDP

The regional GDP of the entire Karnataka State during the project period is shown in Figure 2. It jumped from approximately 2.1 trillion rupees in FY2006 to approximately 20 trillion rupees in FY2021, a tenfold increase. The GDP of Bengaluru District¹⁸ increased from approximately 1.2 trillion rupees in FY2010 to 5.9 trillion rupees in FY2020, a five-fold increase in 10 years. The GDP of Bengaluru District accounts for 30-40% of that of State and is increasing every year.

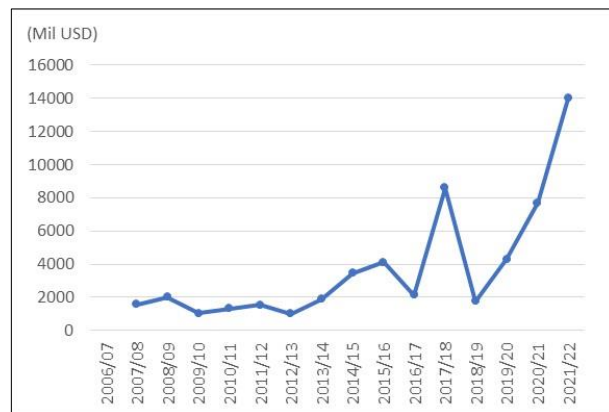


Source: Economic Survey of Karnataka 2021-22, March 2022, Planning, Program Monitoring and Statistics Department of Karnataka State

Figure 2: Trend of GDP of Karnataka State and Bengaluru District

ii) Promotion of Foreign Direct Investment

Figure 3 shows the evolution of foreign direct investment in Karnataka State during the project period¹⁹. The amount of foreign direct investment has varied from year to year, but according to the “Economic Survey of Karnataka 2021-22”, investment in the biotechnology sector increased significantly, even during pandemic that began early 2020. Even considering the external factor of the Covid-19 outbreak, the overall trend over the years shows solid growth.



Source: Economic Survey of Karnataka 2021-22, March 2022, Planning, Program Monitoring and Statistics Department of Karnataka State

Figure 3: Trend of Foreign Direct Investment in Karnataka State

It was difficult to confirm whether and to what extent the project contributed to these “quantitative effects.” On the other hand, the contribution of the project to the following “qualitative effects” has been verified.

¹⁸ Karnataka State publishes data on state GDP and district GDP, but not data specific to Bengaluru City. Therefore, we used Bengaluru District GDP as an alternative data set.

¹⁹ Data on the number of foreign investments and data on Bengaluru City or Bengaluru District were not available.

(2) Qualitative Effects

i) Regional Economic Development

In key informant interviews with industrial and commercial consumers, “expansion of employment” and “growth of production activities” were cited as examples of the contribution that the stabilization of the electricity supply has made to the local economy. Specifically, “The reduction in the duration and frequency of power outages has made it possible to operate machinery 24 hours a day,” and “Staff members are essentially free from overtime work as shift-based system is introduced, but production activities became expanded because of the fact that the number of power outages has been reduced during regular work hours.”

Moreover, in interviews with domestic customers, the following were reported as examples of the contribution that the stabilization of the electricity supply has made to the local economy: “The stabilization of the electricity supply made it possible for people to work at home for long periods of time during the pandemic, which sustained economic activity.” “After the lockdown was lifted, companies that made telecommuting an option were able to maintain a variety of work styles, contributing to the revitalization of economic activity.”

In addition, the Bengaluru Chamber of Industry and Commerce²⁰ also recognized and praised at certain extent that “accidental power outages have been significantly reduced,” and that “the customer information services have improved.”

ii) Investment Promotion in the Bengaluru Metropolitan Area

Interviews with industrial and commercial consumers and the Bengaluru Chamber of Industry and Commerce were conducted to gather examples of the impact of electricity supply stabilization on the investment and living environment and its contribution to the local economy. However, it was difficult to confirm the manifestation of effects related to these impacts.

iii) Improvement in the Living Environment

Key informant interviews with domestic consumers confirmed the following improvements in living conditions:

Various activities at home

While a severe lockdown was imposed during the pandemic, respondents said that they were able to enjoy TV and internet access at home without any problems because there were few power outages in Bengaluru city and the recovery time was short. They also unanimously confirmed that there were no problems with telecommuting or studying at home.

²⁰ Membership includes more than 1,000 companies (manufacturing, IT, etc.) operating in and around the Bengaluru metropolitan area. The key informant interviews brought together two member companies of the Bengaluru Chamber of Industry and Commerce, three secretariat members, and one civil society organization.

Improvement in public security

They commented that the reduction in the duration and frequency of power outages has resulted in streetlights being on at all times during the night, making the community safer for women in the evenings and at night, and reducing burglaries.

Improvement in electrical appliance breakdowns

Before ten years ago, 3 out of 6 households reported that they experienced appliance breakdowns “sometimes” or “frequently”, but after the project, all 6 households reported that they “never” experienced appliance breakdowns, indicating a change over time.

In general, there were no problems with the amount of contracted electricity, and satisfaction levels were very high, confirming the project's effectiveness and impact.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

In the *Japan Bank for International Cooperation (JBIC) Guidelines for Confirmation of Environmental and Social Considerations* (2002), this project was classified as Category C as it was not included in sensitive sectors or was located in sensitive areas, and was therefore likely to have a minimal adverse environmental impact. The executing agency stated that no environmental impact of the project was anticipated and that no environmental clearance, etc., would be required, and that any environmental impact or pollution that did occur would be minimized by the distribution automation and the improvement of power distribution lines of the project.

As confirmed at the time of the ex-post evaluation, there were no discrepancies between what was anticipated at the time of project appraisal and the actual results, nor was there any environmental impacts during project implementation. The executing agency launched an environmental and social management system in 2021, and an institutional environmental monitoring system has been ensured.

(2) Resettlement and Land Acquisition

As described in (1) above, the project was considered to fall under Category C. Since the distribution automation system and distribution lines of the project were to be installed incidentally to the existing facilities, no resettlement was assumed at the time of planning, and no resettlement or acquisition of land was required for the project implementation.

(3) Gender Equality

At the time of project appraisal, this item was not established and had not been considered. The project is a public utility service by nature and improves the quality of the electricity supply as a universal service, such as by reducing the duration of power outages, which benefits all consumers in the target area.

(4) Marginalized People

As in (3) above, all consumers in the target area were benefited.

(5) Social Systems and Norms, Human Well-being and Human Rights

As with (3) above, the project was a universal service and brought benefits to all consumers in the target area.

(6) Unintended Positive / Negative Impacts

None in particular.

In summary, the operation and effect indicators have generally achieved their target values, mainly in the three main indicators (accidental power outage duration, number of staff dispatched for restoration work, and feeder capacity utilization index).

The qualitative effect of the project, namely, stabilization of the electricity supply, has been achieved as the quality of electricity supplied by the KPTCL has been improved and the reduction of the duration of accidental outages in the distribution area has been confirmed by the executing agency. In addition, the effects of project implementation on the business efficiency of the executing agency have also been confirmed, in areas such as the promotion of restoration in places where distribution automation has not yet been introduced and the use of data in related departments. Stabilization of the electricity supply and business efficiency have led to improved customer service and customer satisfaction.

In terms of impact, the stabilization of the electricity supply had no confirmed effect on regional GDP or on the amount of foreign investment, but it did improve the living environment and contribute to the economic development of the region. There was no impact on the natural environment, and no land acquisition or resettlement occurred. No specific impacts were identified on gender equality, marginalized people and human rights, social systems and norms, or people's well-being. There were also no other positive or negative impacts.

In light of the above, this project has mostly achieved its objectives. Therefore, effectiveness and impacts of the project are high.

3.4 Sustainability (Rating: ④)

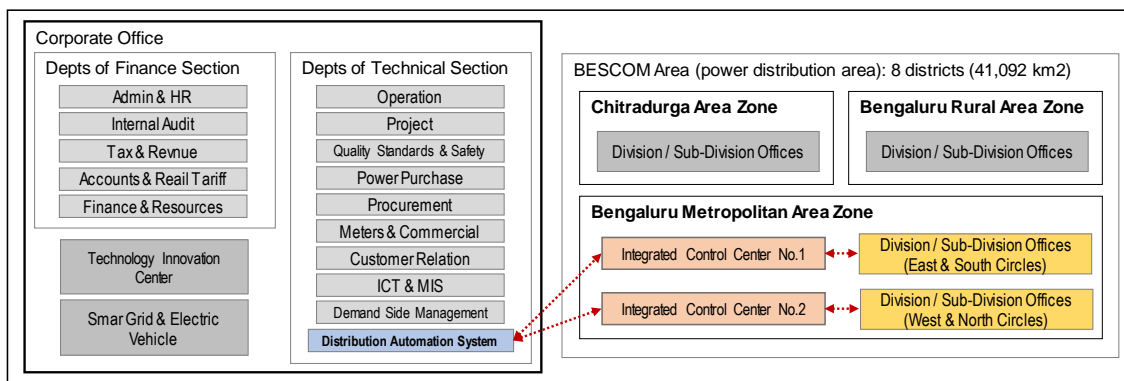
3.4.1 Policy and System

As stated in “3.1.1 Relevance” above, the national and state level sector development plans support and guarantee the project objectives and contents, and are highly consistent with the project and development policies. The upgrade of telecommunication facilities, distribution automation, and the development of control centers were specifically considered and planned in the project prior to their inclusion in the sector development plans and programs at the national and state levels. In addition, overlaps with sector development plans and programs were coordinated and avoided, and the project was designed in a collaborated manner. Moreover, the project laid the groundwork for the introduction of photovoltaic power generation and electric vehicles, which have been promoted in India in recent years.

3.4.2 Institutional / Organizational Aspect

Figure 4 shows an overview of the organization of the entire executing agency. The main organization for the operation and maintenance of the project facilities is the Distribution Automation System Department at the Corporate Office of the executing agency. In addition, operation and maintenance staff are assigned to two control centers and to Division and Sub-Division Offices in the Bengaluru metropolitan area, respectively.

The various data and reports collected by the project facilities are shared among the executives and managers at the Corporate Office, Operation Department, Customer Relation Department, ICT & MIS Department²¹, etc., and are widely used in the operation and maintenance of the distribution network (for planning of system capacity and study and expansion of the distribution network configuration), in preventive maintenance operations, and in day-to-day customer service (see above 3.3.1.2 (3) and 3.4.3 below).



Source: Prepared by the evaluator based on information obtained from the executing agency website (<https://bescom.karnataka.gov.in/english>) and consultations with them.

Figure 4: Organization Diagram of Executing Agency

²¹ ICT and MIS are abbreviations of Information and Communications Technology and Management Information Systems, respectively.

Table 6 shows the staffing situation for the operation and maintenance of the project facilities and equipment. Although the number of vacancies is approximately 20% of the total number of staff, they are supplemented by outsourced and deputed personnel. Operators of each control center are dispatched from the contracted professional company. The operation and maintenance management is carried out in cooperation with the Division and Sub-Division Offices on site. In light of the above, the executing agency concludes that there are no operational problems. In addition, since the equipment procured for this project is subject to periodic inspections and replacement of parts under annual maintenance contracts with the vendors, no maintenance problems have arisen.

Table 6: Status of staffing for O&M of the project facilities and equipment

Unit: number of person

No	Designation	Sanctioned Post (no.s)	Actual Workforce			Vacancies
			Working Strength	Outsourcing Employees (no.s)	Working Strength (total)	
1	General Manager	1	1	0	1	0
2	Deputy General Manager	4	5	0	5	0
3	Asst. General Manager	21	17	0	17	4
4	Managers (Elect. & Civil)	57	32	15	47	10
5	Account Officer	1	1	0	1	0
6	Asst. Account Officer	2	2	0	2	0
7	Junior Engineer	50	4	39	43	7
8	Assistant	4	2	0	2	2
9	Mechanic Grade-II	2	0	0	0	2
10	Lineman	8	0	0	0	8
11	Asst. Lineman	20	19	0	19	1
12	Daftari (office assistant)	4	0	0	0	4
13	Senr. Personal Assistant	1	0	0	0	1
Total		175	83	54	137	39

Source: Responses to the questionnaire by the executing agency

Note: "Lineman" indicates those who operate and maintain electric lines, poles and other facilities on site.

3.4.3 Technical Aspect

The implementation of this project has made it possible not only to identify information such as where power outages are occurring, but also to accurately determine peak load, the occurrence of overcurrent and ground fault incidents on each distribution line, the availability of power supply, the status of distribution network connection and operation, and geographic information for the 11 kV distribution line network. The executing agency is working to maximize the use and operation of this data collected by the project facilities, and classifying the skills required for O&M as shown in Table 7.

Table 7: Skills required for O&M

Required skill	Contents	Present capacity
Engineering Fundamentals	Network Planning, relay coordination, drafting of technical specifications.	Good
Computer literacy	IT system for operations and maintenance	Good
Skill for data analysis	Reports and recommendation on data generated	Good
DAS maintenance management skill	BESCOM has maintained DAS (IT System, CS and RTU) without OEM support	Good

Source: Responses to the questionnaire by the executing agency

Note: "Present capacity" is the executing agency's self-evaluation to open question.

In addition, some operation and maintenance management services are outsourced. The contractors are specialists in the IT and communications fields, such as vendors and engineering firms. The executing agency not only has knowledge and experience in the communications field but also has a comprehensive understanding of the contents of system maintenance and management to be performed by the vendors, so the selection of these contractors is appropriate and proactive supervision is ensured.

Training opportunities for staff are provided as in Table 8. The executing agency is keenly aware of the need to keep up with advances in electricity and communication technology, and technical guidance is provided diligently within the organization. Regarding the operation and maintenance of the distribution automation system, manuals and guidelines on how to operate each piece of equipment have also been prepared.

Table 8: Training Programs

Name of Training Program	Contents	No. of trainees	Frequency
Control Center Operations Training	Training on Control Room Operations, SCADA and DMS Applications (basic level)	217	Half-Yearly
Advanced SCADA-DMS Application Training	Training on effective utilization of advanced SCADA-DMS Applications	148	Quarterly
SCADA-DMS Refresher Training	Refresher Training for working DAS personnel on utilization of SCADA-DMS applications, System Reports and SCADA-Event Management from the System.	101	Half-Yearly
Workshop on DAS for O&M Personnel	Providing guidelines for Operations and Maintenance of DAS Enablers (O&M Personnel and Division / Sub-division Office Technical Staff)	2,188	Half-Yearly
Cyber Security Training	Training pertaining to vulnerability assessment tools and protection of critical infrastructures from threats (DAS System Engineers and IT Engineers)	20	Quarterly
Advanced DAS system training	Training on tools and software that can be utilized for developing additional functions and features (DAS System Engineers and IT Engineers)	41	On Need basis

Source: Responses to the questionnaire by the executing agency

Note: Figures are actual of FY2021.

3.4.4 Financial Aspect

Table 9 shows the executing agency's profit / loss and key financial indicators for the six-year period from FY2015 to FY2020.

Table 9: Profit and Loss and Key Financial Indicators of the Executing Agency

Unit: Million Rupees

No.	Year	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
1	Income	143,154.4	160,721.1	183,589.8	201,233.9	216,509.2	201,162.8
	Revenue from operations	141,482.3	158,611.7	180,420.5	195,387.4	211,706.9	196,808.4
	Other income	1,672.1	2,109.4	3,169.3	5,846.5	4,802.3	4,354.4
2	Power purchase cost	126,010.1	137,008.3	151,232.1	187,146.0	193,453.5	173,212.0
3	Employees benefits and O&M expenses	9,580.8	9,601.8	12,010.5	14,937.0	16,272.4	16,842.9
	O&M expenses	833.7	882.5	904.2	1,288.7	1,138.3	1,835.8
	Employee's benefits expenses	8,747.1	8,719.3	11,106.3	13,648.3	15,134.1	15,007.1
4	Operating profit before amortization, interest & taxes	9,284.6	11,309.7	11,291.8	13,280.4	18,287.7	23,805.1
5	Depreciation	4,195.6	5,287.5	5,979.2	7,329.8	9,947.4	10,654.8
6	Interest expenses, etc.	3,648.0	5,452.3	3,773.4	2,798.8	6,816.9	9,866.1
7	Net profit before tax	1,441.0	569.9	1,539.2	3,151.8	1,523.4	3,284.2
8	Total assets	166,314.9	193,781.9	199,662.8	228,714.1	254,193.1	283,076
9	Sales profit ratio (profit / Income x100)	6.49%	7.04%	6.15%	6.60%	8.45%	11.83%
10	capital adequacy ratio (equity / total assets x100)	2.51%	3.72%	5.05%	5.23%	6.36%	6.99%

Source: Annual Reports of the executing agency

Note: The new Indian accounting standard has been applied since FY2015.

Almost all of the executing agency's revenues come from the collection of electricity charges. According to the executing agency, the implementation of the project increased electricity consumption by a total of 211.35 GWh (FY2012 to FY2022), contributing to an increase in revenues worth Rs. 902 million.

Although sales revenues decreased in FY2020, this was largely due to the pandemic, and are generally steady. In addition, according to the executing agency, there has been an increase in the supply of electricity from dispersed power sources, such as the purchase of solar and other renewable energy sources, which has also affected revenue from electricity sales.

Since the adoption of the new Indian accounting standard (FY2015), the capital adequacy ratio has grown steadily from 2.51% (FY2015) to 6.99% (FY2020). The sales profit ratio was 6.49% in FY2015 and increased rapidly in FY2019 and FY2020 to 8.45% and 11.83%, respectively. According to the executing agency, Rs. 658.4 million was disbursed annually from FY2011 through FY2020 for operation and maintenance of the project facilities (including such cost as staff remuneration and outsourced maintenance contract expenses). In FY2021 and FY2022, a budget of 348.1 million rupees was allocated for each year, and the executing agency indicated that the budgeted amount would be sufficient to maintain the project facilities and equipment.

The above confirms the high financial soundness and profitability of the executing agency as a whole.

3.4.5 Environmental and Social Aspect

As stated in 3.3.2.2 above, no problems were foreseen in advance, nor have they occurred. Since the organization has established an environmental and social management system, it is judged that there will be no particular problem to be addressed in the future.

3.4.6 Preventive Measures to Risks

No differences were identified in the expression of effects among beneficiaries for effectiveness and impact. The project is a public utility service and, as indicated in the impact above, is based on the assumption that consideration is given to gender and people who are inhibited from equitable participation in society. There were no risks identified in the impact that were not anticipated at the planning stage. In particular, no factors that could affect the sustainability of the results in the future were identified at the time of the ex-post evaluation.

3.4.7 Status of Operation and Maintenance

The evaluator confirmed on site that there were no problems with the operational status of the distribution automation system or facility operation, and data rewriting and server updating were done properly in response to changes in power distribution equipment. Maintenance and management plans and databases for the project facilities were also in place. The maintenance status of the facilities in the two control centers and the outdoor facilities (sectionalizers, remote terminal units, RMUs, underground and overhead distribution lines) was also confirmed to have been problem-free and accident-free up to the time of the ex-post evaluation.

In preparing for the future commercialization (privatization) of the power distribution works and in monitoring the ever-expanding 11 kV power distribution network in Bengaluru city, the executing agency is keenly aware that it is essential not only to simply maintain the distribution automation system equipment, but to update it with an eye to future demand. To this end, they have already taken measures such as updating the equipment in accordance with technological advances and model changes, strengthening cyber security, reflecting information on electric vehicle charging stations and dispersed power sources, and linking the system to the optical fiber network.

No issues have been observed in the policy / system, institutional / organizational, technical, financial, and environmental and social aspects, including the current status of operation and maintenance. (Future) risks have been well mitigated. Therefore, sustainability of the project effects is very high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project was to improve the reliability of the electricity supply by the development of a distribution automation system in the Bengaluru metropolitan area, which includes the capital city of the State of Karnataka, in southern India, thereby contributing to local economic development and the improvement of living standards for residents in the areas concerned. The project addresses all three of these perspectives: consistency with national and state-level sector development plans and programs, the development needs at the time of appraisal and ex-post evaluation, and the appropriateness of the project plan and approach. The upgrading of telecommunication facilities, distribution automation, and control center development were considered and planned in a pioneering manner within Karnataka and in relation to other states, and were implemented with a coordinated design to optimize the development plan. Although no specific linkage or coordination with other JICA projects was confirmed, the project was sufficiently consistent with Japan's assistance policy at the time of appraisal, and specific results, such as linkage and coordination with assistance provided by the Asian Development Bank, could be confirmed. Therefore, the appropriateness and consistency of the project are high. Although the project cost was within the plan, the project period was significantly longer than planned, resulting in moderately low efficiency. The reasons for the prolonged project period include technical examinations for output changes, delays in re-tendering and the procurement of materials and equipment, redesign of the communication network, delays in frequency allocation, and prolonged period spent for a series of acceptance test and system integration. The operation and effect indicators generally reached the target values, and the qualitative effect of the project, stabilization of the power supply, was also achieved. Effects on business efficiency, such as the promotion of restoration in areas where the distribution automation system has not yet been introduced and the use of data in related departments, were also confirmed. These have led to improvements in customer service and customer satisfaction. In terms of impact, stabilization of the electricity supply did not have an effect on regional GDP or the amount of foreign investment, but it was confirmed that the project improved the living environment and contributed to regional economic development. The project had no impact on the natural environment, and no land acquisition or resettlement occurred. Therefore, the effectiveness and impact of the project are high. The operation and maintenance of the project has no problems in terms of policy and system, nor in the organizational / institutional, technical, financial aspects, or current conditions, and sustainability is ensured. In addition, preventive measures have been taken in terms of environmental and social considerations and risks. Therefore, the sustainability of the effects of this project is very high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

(1) Project formulation and approach that meet current trends in the relevant field (good practice)

The distribution automation introduced in this project was planned and initiated in advance of the trend to promote the upgrading of telecommunication facilities, distribution automation, and control centers in national and state-level sector development plans across the country. The executing agency played a pioneering role in the introduction of today's smart grid and digitalization, and laid the foundation for the full-scale introduction of renewable energy in the future.

In addition, the executing agency revised the project plan flexibly and accurately by reviewing the 11 kV distribution network development plan to accommodate the needs of the rapidly increasing population while maintaining harmony with the sector development plan. Furthermore, when the current Asian Development Bank-supported distribution line replacement, undergrounding of overhead lines, and smart metering installation was formed, their project components were examined to ensure that their planning should reflect this project.

These approaches at the time of project planning and in early stages of project implementation were proactively adopted by the executing agency, and can be used as good practices and as a reference for similar projects.

(2) Cross-organizational coordination and sector-wide initiatives (good practice)

In implementing the project, the executing agency integrated the distribution automation system installed under the project with other in-house systems and the systems of transmission and substation facilities owned by the KPTCL. Although this was one of the factors that prolonged the project implementation period, a systematic power transmission and distribution network was established in Karnataka, which not only ensured compatibility in data collection, analysis, and sharing, but also made it possible to study the state of the electricity supply by integrating the power transmission and distribution networks.

The project's effect was not limited to this single project, but extended to playing an important role in the electricity supply of the region concerned. The knowledge and experience gained by the executing agency from this successful project will serve as a useful lesson for similar projects in the future.

5. Non-Score Criteria

5.1 Performance

5.1.1 Objective Perspective

The project was continued with the executing agency's own funds after the extended loan disbursement period had expired. JICA India Office understood the executing agency's situation and supported it well, not only during the project implementation period, but also by supervising the progress from the end of the extended loan period (March 2017) to the completion of the project (June 2019). Even under the pandemic from the beginning of 2020, the JICA Office maintained good communications with the executing agency and built a relationship of trust with them. In addition, in conducting this ex-post evaluation, the JICA Office appropriately guided the executing agency in the direction of fulfilling their responsibilities by encouraging them to submit the project completion report.

5.2 Additionality

The executing agency was one of the first in India to make an organizational decision to introduce a distribution automation system. Taking into account the role that distribution automation plays in electricity supply services and the content and direction of the Government of India's development plans and schemes since the time of the project appraisal, the executing agency took the opportunity to review the plan at the start of the project with an eye on the future roles and functions required of a distribution company, and then the project was implemented.

The distribution automation system introduced in this project was completed as a result of individual negotiations with a total of 13 companies that received orders from within India and overseas and there was complicated mutual coordination for communication equipment procured by each company. At the same time, there was also mutual coordination and complementation with other systems within the executing agency. Similar coordination can be seen with the Asian Development Bank-supported project currently underway. Furthermore, there was coordination with transmission and substation equipment systems built by different manufacturers, which had been thought to be extremely difficult for different organizations to achieve together. These are still unprecedented in other states in India. The executing agency hopes to use the knowledge and experience gained through this project to provide consulting and advisory services to distribution companies in other states. In addition, the executing agency is considering the further development of control functions utilizing distribution automation system, as these functions will be indispensable for the introduction of renewable energy, the spread and expansion of dispersed power sources, electric vehicles, and charging stations, which have been promoted in India in recent years.

(End.)

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs		
a) Installation of ring main units (RMUs)	950 Nos.	790 Nos.
b) Installation of line reclosers and sectionalizers	965 Nos.	1,540 Nos.
c) Installation of remote terminal unit (RTU) for RMU	1,976 Nos.	1,590 Nos.
d) Installation of facilities at substations	56 Nos.	- (note)
e) Construction of main control centers	2 Nos.	2 Nos.
f) Retrofitting of existing RMU Operation Devices (ODs) with Vacuum Circuit Breaker (VCB) & Mechanism-two ODs	852 Nos.	Nil
g) Retrofitting of operation mechanism of existing RMUs with Gas Circuit Breaker (GCB)	324 Nos.	Nil
h) Retrofitting of existing RMUs with VCB with automatic operation	2,650 Nos.	Nil
i) Replacement of existing RMU by 3WAY new RMU with two ODs and one VCB	-	200 Nos.
j) Replacement of existing RMU by 5WAY new RMU with two ODs and three VCBs	-	600 Nos.
k) Improvement of underground distribution cable	450 km	230.5 km
l) Improvement of overhead distribution lines	675 km	949.6 km
m) Introduction of BESCO Business Process IT Application	1 Set	Nil
n) Consulting Services	Work volume: 186 man-months in total <Terms of Reference> i) Review of detailed design, tender assistance, construction supervision ii) Technical transfer for O&M iii) Capacity Development	Work volume: 206.75 man-months in total <Terms of Reference> i) As planned ii) As planned iii) 11 kV Distribution Network Survey
2. Project Period	March 2007 – January 2012 (59 months)	March 2007 – June 2019 (148 months)
3. Project Cost		
Amount Paid in Foreign Currency	6,549 million yen	2,995 million yen
Amount Paid in Local Currency	7,656 million yen (3,038 million rupee)	5,798.5 million yen (3,605 million rupee)
Total	14,205 million yen	8,793.6 million yen
ODA Loan Portion	10,643 million yen	6,976 million yen
Exchange Rate	1 rupee = 2.52 yen (As of September 2006)	1 rupee = 1.74 yen (Average between 2008 and 2020)
4. Final Disbursement	March 2017	

Note: It was planned to install at the substations all of which belong to the KPTCL. It however was decided to use the telecommunication system of the executing agency's Division Offices and Sub-Division Offices (See 3.2.1).

India

FY2021 Ex-Post Evaluation Report of Japanese ODA Loan Project
“Tamil Nadu Investment Promotion Program (Phase 2)”

External Evaluators: Keishi Miyazaki and
Kazuhiro Nakagawa, OPMAC Corporation

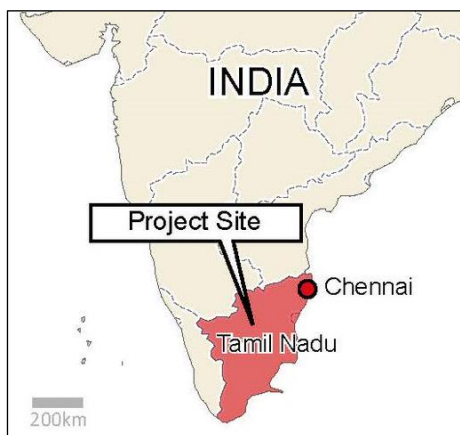
0. Summary

The Tamil Nadu Investment Promotion Program (Phase 2) (the Program) was implemented to enhance the investment climate in the southeastern Indian state of Tamil Nadu by facilitating the improvement of policies and systems related to private sector investment and industrial growth in the state as well as promoting early implementation of the development and improvement of urban infrastructure in the state, especially roads, power, waterworks, sewerage, and other infrastructure facilities, thereby contributing to more foreign direct investment (FDI) into the state. The Program is consistent with the development policies, the financial needs and the development needs of India, as well as with Japan’s ODA policy. The Program is internally coherent with JICA’s other projects and externally coherent with other donors and Japan External Trade Organization (JETRO)’s projects. Therefore, its relevance and coherence are very high.

The operation and effect indicators had fully achieved the targets set at the time of appraisal, except for the number of trainers of government training institutes trained under the private-sector company participation program, the number of days required to issue an investment clearance following receipt of the application through the single window clearance mechanism in Tamil Nadu Industrial Guidance & Export Promotion Bureau (Guidance Bureau), and the number of page views of the Single Window Portal, at the time of the Program completion. Regarding qualitative effects, all policy actions were also achieved. Regarding the impact, as the result of the development of infrastructure in Tamil Nadu under the small-scale infrastructure projects of the Program, improvement of the quality of the workforce through training provided by the Tamil Nadu Skill Development Cooperation (TNSDC), and the simplification by the Guidance Bureau of the investment licensing process through the online single window system, the amount of FDI in Tamil Nadu has been increasing year by year. The construction of new factories and the start of operations at industrial parks for Micro, Small and Medium Enterprises (MSMEs) established through the Program have created new employment opportunities for workers. No negative impact of the Program on the natural environment was observed, and land acquisition and resettlement are underway in accordance with Indian domestic laws. The Program has also had a positive impact on women and marginalized people by providing job training, employment opportunities and developing housing. Therefore, the effectiveness and impacts of the project are high.

Regarding the sustainability of the Program, no problem has been observed in terms of the policy and system and institutional/organizational aspects and, therefore, the sustainability has been ensured. Preventive measures/countermeasures to risks have been conducted.

1. Project Description



Project Location (Source: Evaluator)



Small-scale infrastructure project under the Program (Construction of a bypass road)
(Source: Evaluator)

1.1 Background

The Indian economy, which had been exclusive with foreign currency restrictions and import-substitution industrialization policy, began to grow at a higher rate after 1991, when deregulation and liberalization policies were introduced, and was booming at an average annual growth rate of over 7% after 2000, when the real results of the policies began to be seen. The annual amount of FDI hovered around US\$25 billion from FY2007 to FY2013, peaking at US\$35.1 billion in FY2011, but exceeded US\$40 billion in FY2015, and further expansion was expected. However, Japanese companies were facing challenges in making investment decisions, such as weak infrastructure, unclear legislation, and a complicated tax collection system. These needed to be addressed in order to further attract FDI.

Tami Nadu, a southeast state of India, is located along the shipping lane between India and Southeast Asia. Its abundant labor, consistent policy to lure foreign capital, and other measures attracted Japanese companies to the state, particularly those in the car and motorcycle industries. In fact, the number of Japanese companies that have their bases in the state was on the increase from 77 companies in January 2008 to 344 companies in October 2012, and 577 companies in October 2015. Moreover, being part of the Chennai-Bengaluru Industrial Corridor (CBIC), for which the Japanese and Indian Governments adopted the *Comprehensive Regional Perspective Planning and Master Planning* in July 2015, the state is recognized as an important region for industrial development. The Japanese Government was considering financial cooperation for priority infrastructure projects which would contribute to an improvement of the investment

environment for the CBIC. As the state of Tamil Nadu was ranked 12th among the 36 states and Union territories of India in terms of business environment in 2015 and 18th in 2016, while the capital of the state Chennai was placed 15th among the 17 major cities of India in a 2016 assessment by the World Bank, the region's investment environment needed to be further improved in terms of both systems and infrastructure.

1.2 Project Outline

The objective of the Program was to facilitate the improvement of policies and systems related to private sector investment and industrial growth in the southeastern Indian state of Tamil Nadu, while at the same time promoting early implementation of the development and improvement of urban infrastructure in the state, mainly of roads, power, waterworks, sewerage, and other infrastructure facilities, thereby attempting to increase FDIs in the state by enhancing its investment climate.

Loan Approved Amount/ Disbursed Amount	22,145 million yen / 22,122 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2017 / March 2017
Terms and Conditions	Interest Rate 1.4% Repayment Period 30 years (Grace Period 10 years) Conditions for Procurement General Untied
Borrower / Executing Agency	The President of India / Finance Department, Government of Tamil Nadu
Project Completion	February 2020
Target Area	Tamil Nadu
Main Contractor (Over 1 billion yen)	None
Main Consultant (Over 100 million yen)	None
Related Study (Feasibility Study, etc.)	None
Related Project	“Tamil Nadu Investment Promotion Program” (Phase 1) in India

2. Outline of the Evaluation Study

2.1 External Evaluators

Keishi Miyazaki, OPMAC Corporation

Kazuhiro Nakagawa, OPMAC Corporation

2.2 Duration of Evaluation Study

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

Duration of the Study: October 2021 – January 2023

Duration of the Field Study: March 20, 2022 – April 2, 2022

2.3 Constraints during the Evaluation Study

The Program is a program loan project (Development Policy Lending), which encourages to implement reforms through policy dialogue and provided it with funds once the reforms are accomplished. The funds provided are not earmarked for specific purposes and go into the general revenue. As a result, it is difficult to quantitatively compare inputs (expenses) and outputs (achievements), which is why efficiency is excluded from the analysis and evaluation. Sustainability is included in the analysis, but it is not subject to evaluation scope, and no sub-rating is conferred. Since no sub-rating is conferred on efficiency and sustainability, an overall rating has not been conferred either.

3. Results of the Evaluation (Overall Rating: A¹)

3.1 Relevance/Coherence (Rating: ④²)

3.1.1. Relevance (Rating: ④)

3.1.1.1 Consistency with the Development Plan of India

At the time of appraisal, the “*Make In India*” initiative announced by the Government of India was planned to promote economic growth and job creation by stimulating investment from private sector companies both inside and outside the country, and to increase the manufacturing sector share of GDP to 25% by 2022. The “*Skill India*” campaign also aimed to provide vocational skill training for 400 million young people by 2022. The development plan of the state “*Vision Tamil Nadu 2023*” (March 2012) aimed to deliver significant improvements in economic indicators through various ways, such as by setting an annual GDP growth target of 11% over the following 11 years as well as an annual per-capita income target of 450,000 rupees, six-fold compared to 2012, by 2023.

The “*Make In India*” initiative has remained an effective policy as information and

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

² ④: Very High, ③: High, ②: Moderately Low, ①: Low

opportunities for investment by foreign companies were provided on the policy website at the time of the ex-post evaluation, while the policy continuously contributed to economic growth and job creation through the promotion of investment. Under the “*Skill India*” campaign, the Ministry of Skill Development and Entrepreneurship has provided various vocational training schemes. The “*Vision Tamil Nadu 2023*” has remained in place without any changes in its basic course and contents as the basic principles of the state's policies. In addition, various policies have also been announced after the appraisal such as “*Tamil Nadu Industrial Policy 2021*,” which is designed to provide incentives for companies investing in Tamil Nadu with the aim of creating 2 million job opportunities by 2025 with the manufacturing sector contributing 30% of total state value added by 2030, “*Tamil Nadu Investment Promotion Policy 2021*,” which is designed to increase the exports from Tamil Nadu to US\$100 billion by 2030, and “*Micro, Small and Medium Enterprises Policy 2021*,” which supports the development of MSMEs.

It has been recognized that the Program was consistent with the development policies at the time of the appraisal and at the time of the ex-post evaluation. At the time of the ex-post evaluation, there also still existed strategies and policies related to and consistent with the development policies at the time of the appraisal. The Program was implemented based on these strategies and policies, and it has been recognized that the Program was consistent with the development policies.

3.1.1.2 Consistency with the Development Needs of India

Table 1 shows the differences between the state budget of the Government of Tamil Nadu from the time of appraisal to the time of the ex-post evaluation. From the time of the appraisal to the time of the ex-post evaluation, expenditures constantly exceeded revenues, with the gap between revenues and expenditures mainly being covered by the issue of state bonds. However, the interest burden was not small, meaning that there was also a need for other funding sources. As the Program provided amount of 22,122 million yen (approximately Rs. 13,988 million) through the Program in financial support, contributing as much as 3% of the revenue and expenditure gap during the project period (FY2017-FY2019), there has been a need for other funding sources.

Table 1: State Budget of the Government of Tamil Nadu

Unit: million rupees

Item	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021
Revenue	1,296,917	1,593,630	1,762,510	1,977,212	2,193,751	2,189,920
Expenditure	1,623,192	1,752,930	1,937,420	2,120,359	2,409,928	2,466,947
Balance	△326,274	△159,300	△174,910	△143,148	△216,176	△277,027

Source: Finance Department, the Government of Tamil Nadu

In terms of development needs, at the time of appraisal, India was ranked first in the category “Promising Countries/Regions for Overseas Business Operations over the Medium Term (next 3 years or so)” of “FY2014 (26th) Survey Report on Overseas Business Operations by Japanese Manufacturing Companies” by the Japan Bank for International Cooperation (JBIC) for the first time, surpassing Indonesia, due to the scale and growth potential of the local market and inexpensive labor force, which was highly recognized. The same result was achieved in FY2015 and FY2016 (India has been ranked first as a “the promising countries/regions for overseas business operations over the long term (next ten years or so)” since the FY2010 survey). However, in the same survey, the weak infrastructure, opaque legal system, and complicated tax collection system were cited as challenges for Japanese companies when making investment decisions, and these issues needed to be addressed in order to attract more FDI in the future. As the state of Tamil Nadu was ranked 18th nationally in the 2016 Survey of the Investment Climate in Indian States, and Chennai was ranked 15th out of 17 major cities in a survey conducted by World Bank survey in 2016, further improvement of the investment climate, both in terms of institutions and infrastructure, was an issue.

At the time of the ex-post evaluation, small-scale infrastructure developed through the 30 sub-projects supported by the Program contributed to the promotion of investment in Tamil Nadu. On the other hand, as interviews with private companies have indicated that infrastructure in Tamil Nadu is still insufficient in terms of road networks and water supply and drainage networks, it has been recognized that there is the need for further infrastructure development. The training provided by the TNSDC for the development of industrial human resources has been provided in areas that will be needed in the future based on the results of the skills gap analysis conducted by the Program, contributing to the promotion of investment in Tamil Nadu. On the other hand, the need for industrial human resource development in the state has been continuously recognized, along with an expansion of employment opportunities. The number of types of permits and licenses for which online applications are available in the single-window system provided by Guidance Bureau has increased, and the system itself has been continuously updated, shortening the time required to obtain permits and licenses, which have contributed to the promotion of investment in Tamil Nadu. The amount of FDI in Tamil Nadu has been increasing year by year, and the need to strengthen the investment reception bureaus has been recognized. The launch of a single-window portal site for investment applications for micro, small and medium enterprises (MSMEs) has made it easier for MSMEs to collect information and apply for permits and licenses. Tamil Nadu aims to create and maintain multiple clusters of MSMEs in the state in the future, and the need to further strengthen its investment contact point and information provision for MSMEs has been recognized.

Thus, all four policy items have been recognized as meeting the development needs of Tamil Nadu at the time of the ex-post evaluation.

3.1.1.3 Appropriateness of the Project Plan and Approach

The Program is a program loan project (Development Policy Lending) and a scheme in which, based on the policy matrix agreed upon by both the Japanese and Indian governments (a table summarizing policy items to be improved, targets to be achieved for each item, and policy actions to be achieved each fiscal year), the executing agency and relevant organizations implement policy actions for each policy and field and to promote the achievement of the goals of each policy item and the achievement of the project objectives through periodic monitoring and evaluation of the results of the actions.

The policy matrix was drafted by the Finance Department based on the results of interviews with the relevant departments (Industries Department, Micro, Small and Medium Enterprises Department, Labor and Employment Department, etc.), and JICA then held individual consultations with the relevant departments during the appraisal, and considered the proposed revisions to the policy matrix. The final decision on the policy matrix was made on behalf of the state government at a meeting under the Additional Chief Secretary and attended by all the departments concerned, including the Finance Department. In the process, JICA also consulted with the JETRO Chennai Office and Japanese companies operating in Tamil Nadu to make clear their issues and requests in investing and doing business in the state, and then discussed with the Indian side to select policies with high potential for implementation for the policy matrix. As a specific example, the initial policy matrix proposal included “housing development projects,” but as a result of discussions with the Indian side, this component was deleted from the policy matrix because the Japanese side had a relatively low interest in the component and it was categorized as environmental category B. With regard to the policy item “Acceleration of Infrastructure Development,” the goal was set not to achieve the completion of the small-scale infrastructure projects themselves, but rather to ensure that budgets appropriately allocated and projects promoted. As a result, disbursements from JICA were made without delay and utilized as the budget for each small-scale infrastructure project. In addition, it was agreed between JICA and the implementing agencies that a Program Monitoring Committee (PMC) meeting would be held on a regular basis (once a quarter) to allow for timely input from the Japanese side in order to ensure steady and rapid implementation of the policy matrix.

Based on the above, it is evaluated that the project plan and approach were appropriate.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan’s ODA Policy

At the time of appraisal, according to *Japan’s Country Assistance Policy for India* (March 2016), the Program was positioned as a “regional economic development initiatives” with cooperative programs under the “enhancing connectivity” as a priority area for providing

assistance to eliminate impediments to investment and growth. In addition, it was noted as other considerations that “assistance based on a programmatic approach, in which policy matrices are mutually agreed through close and continuous policy dialogue; monitoring and review are conducted; and projects are guided by its progress” should be promoted gradually.

The JICA Country Analysis Paper for India (March 2012) also saw the “Development of Industrial and Urban Infrastructure” as a priority area and recognized as a key issue institutional improvements contributing to the following: “infrastructure development for the development of industrial infrastructure based on the needs of Japanese companies in India, especially infrastructure development that supports not only Japanese companies but also local industries as a whole (roads, railways, electricity, water, etc.) such as those related to the Delhi-Mumbai industrial corridor and Chennai-Bengaluru industrial corridor” and “an improved investment environment”. Therefore, the Program was consistent with this policy and analysis.

3.1.2.2 Internal Coherence

At the time of appraisal, based on the results of the “Tamil Nadu Investment Promotion Program” as the previous phase of the Program, the improvement of both its institutions and infrastructure in Tamil Nadu was continuously expected through this program. In addition, JICA implemented the “study for preparation of Comprehensive Integrated Master Plan for the Chennai Bengaluru Industrial Corridor” from October 2013 to July 2015 in order to support CBIC.

At the time of the ex-post evaluation, it was recognized that “dialogue with the private sector” and “bilateral policy dialogue based on JICA independent financing,” lessons learned from the “Tamil Nadu Investment Promotion Program,” were being utilized in the PMC in the Program.

The “Project for Construction of Chennai Seawater Desalination Plant” and the “Project for Installation of Chennai Metropolitan Area Intelligent Transport Systems,” which aimed at improving infrastructure in the Chennai metropolitan area of Tamil Nadu, are expected to contribute to improving the investment environment in the state.

3.1.2.3 External Coherence

(1) World Bank

At the time of appraisal, the World Bank (WB) identified “Integration, Transformation, and Inclusion” as its support policy in the *Country Partnership Strategy (CPS) for India* (2013-2017), and in the area of “Integration” the need to strengthen market mechanisms and improve the environment for emerging manufacturing industries was indicated. In addition, WB provided technical cooperation to the Ministry of Commerce and Industry (investment climate survey in each state in September 2015).

At the time of the ex-post evaluation, the “Chennai City Partnership: Sustainable Urban

Services Program” was approved by WB during September 2021 and being implemented by Tamil Nadu. The project aims to improve the quality and sustainability of services in the areas of water supply, wastewater, mobility, and waste management in the Chennai metropolitan area through organizational and financial strengthening, with financing contingent on the achievement of policy goals.

From the above, it can be seen that WB was supporting the improvement of the business environment in India at the time of appraisal. WB is also implementing a project to improve the quality and sustainability of administrative services in the Chennai metropolitan area at the time of the ex-post evaluation. The quality and sustainability of administrative services are closely related to the investment environment that the Program aims to create.

(2) Asian Development Bank

At the time of appraisal, the Asian Development Bank (ADB) identified “Inclusive Growth” as one of the axes of its support strategy in the CPS and identified job creation and support for the development of industrial corridors in the eastern coastal region as target areas. Under this strategy, the project supported the formulation of an industrial corridor between Visakhapatnam City, in Andhra Pradesh, and Chennai City. In addition, ADB was considering technical assistance to the Tamil Nadu Infrastructure Fund Management Corporation (TNIFMC), supported by the Program, for identifying and screening public-private partnership infrastructure projects.

At the time of the ex-post evaluation, the “Chennai-Kanyakumari Industrial Corridor: Power Sector Investment Project” was approved during November 2019, and the “Tamil Nadu Industrial Connectivity Project” was approved during April 2021, with Tamil Nadu Transmission Corporation Limited and Highways Department-Tamil Nadu as the respective implementing agencies and these projects were under implantation. Under the Chennai-Kanyakumari Industrial Corridor: Power Sector Investment Project, the construction of power grids and substations and capacity building for Tamil Nadu Transmission Corporation Limited are being implemented. Under the Tamil Nadu Industrial Connectivity Project, 16 state highways (total length 590 km) in the state are being upgraded and maintained. Through these projects, the infrastructure of the state's power sector and transportation sector is being developed. In addition, ADB implemented a technical assistance “Tamil Nadu Infrastructure Fund Management Company” (2017-2018) to TNIFMC to help improve TNIFMC's capacity to identify and screen public-private partnership infrastructure projects.

From the above, it can be seen that ADB was supporting the planning of the industrial corridor between Visakhapatnam City in Andhra Pradesh and Chennai City at the time of appraisal, and was implementing infrastructure development in the Chennai metropolitan area at the time of the ex-post evaluation, in addition to the Program. ADB also provided technical

assistance to TNIFMC, one of the implementing agencies of the Program, and contributed to improving its capacity for identifying and screening projects. The knowledge and know-how gained by TNIFMC through the technical assistance were utilized in the selection and screening of small-scale infrastructure projects under the Program.

(3) JETRO

Since 2014, JETRO has been dispatching investment promotion advisors to Japan Plus in Invest India under the National Investment Promotion and Facilitation Agency of India, Ministry of Commerce and Industry, to provide Japanese companies considering investment in India with comprehensive information on investment and with advice on licensing procedures. In addition, the advisors hold regular meetings with each state, including Tamil Nadu, to exchange information and approach to each state.

These investment promotion advisors provided comprehensive information and advice on investment and licensing procedures to Japanese companies considering investment in India, including Tamil Nadu, from the time of appraisal to the time of the post-evaluation, thereby contributing to the promotion of investment in Tamil Nadu.

Regarding the consistency with development policies, consistency with the Program has been confirmed as the policies at the time of appraisal were still in effect at the time of the ex-post evaluation. Meanwhile, the policies announced after the time of appraisal were also ones that contribute to the promotion of investment in the Tamil Nadu region.

The expenditures in Tamil Nadu consistently exceeded revenues from the time of appraisal up to the time of the ex-post evaluation, and there has been the need for funds to make up the difference between revenues and expenditures. The 30 subprojects as small-scale infrastructure projects supported by the Program were selected after listening to the development needs of the private sector, including Japanese companies. The small-scale infrastructure developed by the subprojects contributed to the promotion of investment in Tamil Nadu and met the development needs of the state. The above needs were still recognized at the time of the ex-post evaluation. In particular, the fact that JICA interviewed the industrial sector, including JETRO and the private sector, and developed a mutually complementary policy matrix based on their development needs is suggestive for other projects.

The Program was consistent with Japan's aid policy at the time of appraisal, as it was also consistent with the priority areas of Japan's Country Assistance Policy for India (March 2016) and JICA Country Analysis Paper for India (March 2012).

Regarding internal coherence, lessons learned from the previous phase of the Program have been applied, and other JICA-related projects are also related to infrastructure development, which is essential for improving the investment environment in Tamil Nadu. Thus, the internal

coherence has been observed. As for external coherence, other donors' projects in Tamil Nadu, such as those of WB and ADB, have been related to the improvement of administrative services and infrastructure development, and ADB has also provided technical cooperation to improve the screening capacity of TNIFMC, one of the implementing agencies of the Program. JETRO has also dispatched investment promotion advisors to Japan Plus in Invest India to support Japanese companies considering investment in India, including Tamil Nadu. Therefore, external coherence has also been observed.

Thus, its relevance and coherence are very high.

3.2 Effectiveness and Impacts³ (Rating:③)

3.2.1 Effectiveness

3.2.1.1 Quantitative Effects (Operation and Effect Indicators)

The operation and effect indicators of the Program are shown in Table 2.

Table 2: Operation and Effect Indicators

Operation and Effect Indicators	Baseline value	Target value	Actual value	
	2015	2019 Completion Year	2019 Completion Year	2021 2 Years After Completion
1. Number of projects facilitated by Tamil Nadu Infrastructure Fund Management Corporation (cumulative total)	0	4	25 (625%)	43
2. Number of projects facilitated by the Small-scale Infrastructure Project Empowered Committee (cumulative total)	0	25	30 (120%)	30
3. Number of trainees trained by the state's Tamil Nadu Skill Development Corporation scheme and PPP mode institutions (persons/year)	150,000	250,000	210,000 (84%)	42,000
4. Number of trainers of government training institutes trained (persons/year)	0	100	0 (0%)	0
5. Number of days required to gain Single Window Clearances through the Guidance Bureau and the online system (at most)	-	≤ 30	45-60 (50-67%)	10.54
6. Number of page views of the Single Window Portal (monthly)	0	500	No Data (N/A)	No Data
7. Number of MSMEs utilizing the Single Window Portal for applications (yearly)	0	40	1,626 (4,065%)	6,100

Source: Documents provided by JICA, executing agencies and related organizations in Tamil Nadu.

Regarding 1. the number of projects facilitated by TNIFMC, the target was achieved as the actual number at the time of completion was 25 against the target of 4.

Regarding 2. The number of projects facilitated by the Small-scale Infrastructure Project Empowered Committee (SIPEC), the target was achieved as the actual number at the time of

³ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

completion was 30 against the original target of 25. Thirty small-scale infrastructure projects were approved by SIPEC. The list of the small-scale infrastructure projects is shown in Table 3.

Regarding 3. the number of trainees trained by the state's Tamil Nadu Skill Development Corporation scheme and PPP mode institutions, the target was mostly achieved as the actual number at the time of completion was 210,000 against the original target of 250,000. However, since hands-on trainings could not be conducted due to the COVID-19, the actual number for 2021 decreased drastically compared to the value for 2019.

Regarding 4. the number of trainers of government training institutes trained, the target was not achieved with the actual number at the time of completion being nil against the original target of 100. This was because the training program for trainers to be developed under the private sector participation program had not been completed by the time of the Program completion. The development of the program has taken time since then due to the COVID-19. However, the training program for trainers is scheduled to be implemented from 2022.

Regarding 5. the number of days required to gain Single Window Clearances through the Guidance Bureau and the online system, the number of types of investment permits and licenses that can be applied for through the single-window system was larger as of 2019 than that estimated at the time of appraisal. The number of days required to issue these permits and licenses varies depended on the type of permit or license. The actual response time in 2019 ranged from 45 to 60 days, and the target of 30 days or less was not achieved. On the other hand, for environmental-related investment permits and licenses that can be applied for through the system, the approval process should be completed within 60 days according to the regulations. Therefore, it is not appropriate to judge the status of achievement based on the target value (within 30 days) set at the time of appraisal, as this does not reflect the actual situation. Note that with the introduction of the new service of the single-window system in FY2020, the actual number in 2021 improved over the actual figures for 2019, with approximately 6,300 applications processed in an average of 10.54 days.

Regarding 6. the number of page views of the Single Window Portal, actual numbers cannot be obtained. However, the next indicator, "the number of MSME investors utilizing the Single Window Portal for applications", had an actual number of 6,100 in 2021, which is an average of 508 views per month. From this, the actual number in 2021 for "the number of page views of the Single Window Portal" is likely to exceed the target value of 500 views/month at the time of the Program completion.

Regarding 7. the number of MSME investors utilizing the Single Window Portal for applications, the target was achieved as the actual number at the time of completion was 1,626 against the original target of 40. This was because the types of permits and licenses available through the single-window portal had increased.

Table 3: List of the Small-scale Infrastructure Projects

No.	Project	Progress
1	Upgrading of existing Avadi 110 KV SS to 230 /110 KV SS with associated lines - Thiruvallur district	Tenders awarded, project under progress
2	Establishment of 230/110 KV SS at BHEL Thuvakudi - Trichy district	Sub-station commissioned
3	Erection of 230 KV & 110 KV transmission lines associated with BHEL Thuvakudi - Trichy district	Work under progress
4	Establishment of Sojitz Motherson 110 KV SS with associated 110 KV lines - Kancheepuram district	Sub-station commissioned
5	Establishment of Mahindra World City II 110 KV SS with associated 110 KV lines - Kancheepuram district	Sub-station energised
6	Establishment of Thirumani 110/11 KV SS with associated 110 KV lines - Kancheepuram district	Line works under progress
7	Upgrading of existing Maduravoyal 33/11 KV SS into 110/33/11 KV SS with associated 110 KV Lines - Thiruvallur district	Re-tendering works under progress
8	Upgrading of existing Denkanikottai 33/11 KV SS into 110/33/11 KV SS with associated 110 KV Lines - Krishnagiri district	Sub-Station test charged, Line energised, Second Power Transformer test charged
9	Establishment of Pappambakkam 110 /33 -11 KV SS with associated 110 KV lines - Thiruvallur District	Sub-Station works completed. Other works are under progress
10	Establishment of Kunjallam 110 / 33-11 KV SS with associated 110 KV lines - Thiruvallur District	Works nearing completion
11	Establishment of Mangadu indoor110/11 KV SS with associated 110 KV lines - Kancheepuram District	Sub-station commissioned
12	Upgrading of the existing Pulianthope 33/11 KV SS into 110/33/11 KV GIS SS with associated 110 KV lines - Chennai district	Sub-station commissioned
13	Establishment of 110/33-11 KV indoor SS at Pallikaranai with associated 110 KV lines - Kancheepuram district	Sub-station commissioned
14	Establishment of 230/33 KV GIS SS at Thiruvanmiyur with associated lines - Chennai district	Retendering works under progress
15	Establishment of 230 KV Substation in Durainallur for Mahindra Industrial Park Chennai Ltd.	Tendering works under progress
16	Rehabilitation & Improvement work (including biogas generation) for the existing Zone - I & II (each 80 MLD) capacity Sewage Treatment Plant at Kodungaiyur	Modification works in existing STPs are under progress
17	Upgrading work for the existing 110 MLD capacity Sewage Treatment Plant at Kodungaiyur	Works under progress
18	Rehabilitation & Improvement work (including biogas generation) for the existing 34 MLD capacity Sewage Treatment Plant at Koyambedu	Modification Works under progress
19	Upgrading work for the existing 120 & 60 MLD capacity Sewage Treatment Plant at Koyambedu	Works under progress
20	Rehabilitation & Improvement work (including biogas generation) for the existing 23 MLD capacity Sewage Treatment Plant at Nesapakkam	Works under progress
21	Upgrading work for the existing 54 & 40 MLD capacity Sewage Treatment Plant at Nesapakkam	Works under progress
22	Upgrading work for the existing 12, 54 & 60 MLD capacity Sewage Treatment Plant at Perungudi	Works under progress
23	Eco Restoration of Peerkankaranai lake at Peerkankaranai T.P.	Works under progress
24	Improvement of Rajiv Gandhi Salai under Phase II proposed Construction of Bypass at Kelambakkam and Tiruporur	Land acquisition process is under progress
25	Phase-II-Widening from Intermediate Lane to Four lane and Strengthening at Km 2/0-6/2 of Pudukkottai-Pulicat Road (MDR 379)	Land acquisition process is under progress

No.	Project	Progress
	Including Land Acquisition (widening the approach to Mahindra Industrial Park Chennai Ltd.)	
26	Two-tier Skill Development Centers	Works under progress
27	Integrated Technical Textiles Park at Thandarai, Kancheepuram District	Works under progress
28	Integrated Textiles/Apparels Park at Punjaikalakurichi, Karur District	Works under progress
29	Integrated Food Park at Eachambadi, Dharmapuri District	Works under progress
30	Integrated Sea Foods Park at Sakkarakottai, Ramanathapuram District	Works under progress

Source: TNIFMC

3.2.1.2 Qualitative Effects (Other Effects)

(1) Achievement of Policy Actions

The policy matrix of the Program included four policy items, with corresponding achievement goals and policy actions, and regular monitoring and evaluation of the achievement of the policy actions were conducted by the PMC. The Program period was 35 months from March 2017, the time of signing of the loan agreement, to January 2020, the time of the final joint evaluation. The level of achievement of each policy item at the time of Program completion and its continuation at the time of the ex-post evaluation are described below.

Regarding “Policy Item 1: Acceleration of Infrastructure Development”, the Tamil Nadu Infrastructure Fund (TNIF) had been established and was being considered for investment in low-income housing development projects at the time of the Program completion. At the time of the ex-post evaluation, in addition to the TNIF being funded, the Tamil Nadu Shelter Fund (TNSF) and the Alternative Investment Fund (AIF) have been established by the TNIFMC. Moreover, investments in housing development projects for low-income people have been initiated. In addition, small-scale infrastructure projects have been under construction even at the time of the ex-post evaluation.

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
1. Acceleration of Infrastructure Development	TNIF is established by TNIFMC to mobilize public and private funds for the implementation of large and social infrastructure projects, and funding for high priority large and social infrastructure projects is secured.	<p><Policy Actions> At least one fund-raising with the new financial instrument is to take place for the pipeline projects of TNIFMC</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> The TNIF declared its first close on October 2018 with commitments of USD 320 million including the First Loss Capital from the Tamil Nadu Infrastructure Development Board (TNIDB). <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> An investment of Rs.360 million was made in the TNIF, of which Rs.300 million in TNIDB and Rs.60 million in life insurance companies, of investment has been made to the TNIF. In addition to TNIF, TNIFMC has established a Tamil Nadu shelter fund and an alternative investment fund. For the Tamil Nadu Shelter Fund, Rs.6.58 billion has been committed, of which Rs.1.5 billion is from the State Government of Tamil Nadu, Rs.2.49 billion from WB, and Rs.2.59 billion from ADB. Of the Rs.6.58 billion of commitment, Rs. 830 million of investment has

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
		<p>been realized.</p> <p><Policy Actions> At least one project is selected and facilitated by Government of Tamil Nadu and TNIFMC, to which the new funding model for social infrastructure development shall be applied</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> Affordable Housing Project at Manali was selected as a social infrastructure development project. Consultant has been appointed to study the development model, including the funding model. A new model for funding social infrastructure is being established for the Industrial Housing project in collaboration with State Industries Promotion Corporation of Tamil Nadu (SIPCOT). The new “Rent to Aggregator” model is being implemented, where the housing units are rented in bulk to the industrial houses, thereby reducing the risk of rent collection. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> TNIFMC has agreed the investment of Rs. 940 million to a private housing developer for the construction of up to 2700 affordable houses. An amount of Rs. 240 million was invested in the FY 2021-22. SIPCOT has approved the establishment of a Special Purpose Vehicle (SPV) for undertaking the development of the proposed industrial housing projects. Under this SPV, two industrial housing projects are being evaluated at two SIPCOT industrial parks. TNIFMC is finalizing investment terms with TATA Electronics Pvt. Ltd. (TEPL) for the development of a 14,300 bed accommodation facility for the use of female workers at TEPL. TNIFMC is also facilitating the development of hostels for female workers. The SPV for the development of these projects has been established and 16 hostels are being evaluated for investment.
	SIPEC selects the priority projects and allocates the budget properly. The administrative departments and implementing agencies will appropriately monitor and facilitate the priority projects.	<p><Policy Actions> Implementation of the priority small-scale infrastructure projects is facilitated in accordance with the established Project Monitoring Matrix.</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> 30 sub-projects are being facilitated using the Project Monitoring Matrix. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> 30 sub-projects have been under construction.

Source: Documents provided by JICA, Responses to questionnaires to executing agencies and related organizations in Tamil Nadu

Regarding “Policy Item 2: Skills Development for Employment”, a skill gap study was completed, and the priority sectors had been identified at the time of the Program completion. Skills training was continuously being conducted by the TNSDC and the TNSDC portal site was running. The above activities continued to be conducted at the time of the ex-post evaluation. Especially regarding skills training, more than half the candidates have been women, with transgender and differently abled workers also joining the training. Regarding the Apex Skill Development Centers (ASDC), although the decision to establish the ASDC was made only at the time of the Program completion, ASDCs have been established in 4 out of 5 priority sectors and have provided skills training.

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)										
2. Skills Development for Employment	The development of training courses that enable students to acquire the skills required by industry will improve the employment rate of graduates from polytechnics, engineering colleges and industrial training institutes.	<p><Policy Actions> The new sectors of skills training to be expanded are identified based on skill gap analysis.</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> A skill gap study had been completed by August 20, 2019, and was released on November 30, 2019 with an announcement by the Honorable Chief Minister. The following Priority sectors were identified. Apparel and Textile Manufacturing, Automotive and Metals, Agro & Food Processing, Healthcare, Chemical and Petrochemical, Traditional Industries, Building and Infrastructure, Tourism and Hospitality and IT/ITES. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> Skill gap studies have been conducted continuously beyond 2019. 										
		<p><Policy Actions> Skills registry database under the Skills Development Interactive Portal is strengthened.</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> The database was strengthened continuously. The number of total candidates registered was 5,761,465 (increased by 70,534 from 5,690,931 as of March 2019). The number of total skilled youths in the skills registry was 169,330 (increased by 10,470 from 158,860 as of March 2019). The number of training providers offering courses in 2018-19 was 757 (increased by 37 from 720 as of March 2019). <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> The status of training in January to December 2021 is shown below. <table border="1"> <thead> <tr> <th>Status</th> <th>Number of People</th> </tr> </thead> <tbody> <tr> <td>Registered Candidates</td> <td>59,685</td> </tr> <tr> <td>Enrolled Trainees</td> <td>29,911</td> </tr> <tr> <td>Training On-going</td> <td>17,588</td> </tr> <tr> <td>Training Completed</td> <td>11,382</td> </tr> <tr> <td>Certified Trainees</td> <td>8,596</td> </tr> </tbody> </table> <ul style="list-style-type: none"> More than half of candidates have been women. Transgender and differently abled workers have also joined the training. 	Status	Number of People	Registered Candidates	59,685	Enrolled Trainees	29,911	Training On-going	17,588	Training Completed	11,382
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Registered Candidates	59,685											
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The quality of training institutions in the whole		<p><Policy Actions> An action plan to improve placement services for trainees onto Multi-National Companies and MSMEs is implemented.</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> The action plan was improved continuously. The TNSDC Portal was upgraded and all the activities including placement went online soon. Records of the unified skills registry will be made available to all employers to recruit candidates from the Skills Registry. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> TNSDC Portal has been running. 										
		<p><Policy Actions> Pilot schools for vocational training through TNSDC empaneled training partners are rolled out in select districts.</p> <p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> 67 Schools were selected as pilot schools. The project was implemented and started in 67 schools and the scheme was running successfully. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> The pilot project has been completed. 										
		<p><Policy Actions> At least one Apex training institution in PPP mode is established.</p>										

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
	state is enhanced, by creation of an Apex level training institution which acts as a training institution for trainers.	<p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> The MoU between TNSDC and Lead Implementation Partner (LIP) in selected industries for the establishment of ASDC in the three sectors (“Auto, Auto Components and machine Tools”, “Hospital and Healthcare” and “Logistics and Transportation”) was signed on November 30, 2019 in the presence of the Honorable Chief Minister. A detailed schedule was expected to be decided in April, 2020, and ASDCs were expected to start training from July, 2020. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> TNSDC identified the following priority sectors: “Auto, Auto Components and Machine Tools”, “Hospital and Healthcare”, “Logistics and Transportation”, “Building and Infrastructure”, and “Banking Securities Finance and Insurance”. The training has been provided in 4 sectors, “Hospital and Healthcare”, “Logistics and Transportation”, “Building and Infrastructure”, and “Banking Securities Finance and Insurance”. ASDC for “Auto, Auto Components and machine Tools” has not been established, while the LIP was selected.

Source: Documents provided by JICA, executing agencies and related organizations in Tamil Nadu

Regarding “Policy Item 3: Strengthening of the Guidance Bureau”, the improvement of the online single window clearance system, the increased staffing and the establishment of country desks had been achieved at the time of the Program completion. Further updating of the system and increasing the number of staff had been achieved at the time of the ex-post evaluation.

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
3. Strengthening of the Guidance Bureau	<ul style="list-style-type: none"> Investment application process is streamlined by development of a fully functional Online Single Window Clearance System with the empowered responsible agency. More foreign investments are invited by the new Industrial Policy and incentives. 	<p><Policy Actions> The fully functional Online Single Window Clearance System is regularly reviewed for improvement</p>
		<p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> Review was completed. Works under progress for adding 30 functions. The upgraded portal was expected to be launched in July 2020. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> The system is being reviewed regularly and the latest version was released in July 2021. In this version, more than 100 online applications under more than 24 public organizations are available. Within the next few months, further services are planned to be added and it will be possible to apply for more than 200 services through this system. Application for smartphones was launched in November 2021.
		<p><Policy Actions> The action plan of upgrading the Guidance Bureau is implemented.</p>
		<p><Program Completion (2019)> (Achieved)</p> <ul style="list-style-type: none"> Staffing: The number of staff in the Guidance Bureau was 10 in FY2017-18. Out of them, only 2 officials were handling Investment promotion activities. The Guidance Bureau conducted two rounds of recruitment drive and increased the number of staff to 27, including contract and outsourcing, with 2 or more officials expected to join shortly. Including the two officials yet to join, the officials in the core activity of investment promotion was 14 (12+2).

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
		<ul style="list-style-type: none"> Funding: State Government agreed to the proposal of the Guidance Bureau to retain the excess amount for the strengthening and restructuring of the Guidance Bureau. <Ex-post Evaluation (2021)> <ul style="list-style-type: none"> The number of staff in the Guidance Bureau reached more than 60 as of March 2022 and out of them 40 – 45 staff are full-time. In addition, consultants from PWC, Deloitte, Tata Consultancy Services have been employed.
		<Policy Actions> At least two specific country or regional investor desks are established.
		<Program Completion (2019)> (Achieved) <ul style="list-style-type: none"> 9 country/regional offices in Japan, Korea, UK, EU, USA, France, Germany, China, Taiwan were established. In addition, 2 overseas desks were established in Taiwan and USA. <Ex-post Evaluation (2021)> <ul style="list-style-type: none"> In addition to the above desks, another desk was established in Delhi in 2020.

Source: Documents provided by JICA, executing agencies and related organizations in Tamil Nadu

Regarding “Policy Item 4: Strengthening of a Single Window for MSMEs”, the Single Window Portal for MSMEs investors was running and the comprehensive investment guidebook had been updated at the time of Program completion. The services of the Single Window Portal have been expanded and utilized well, and the comprehensive investment guidebook had also been updated at the time of the ex-post evaluation.

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
4. Strengthening of a Single Window for MSME	The Single Window Portal and comprehensive investment guidebook and/or website for improving access to investment information and simplifying application procedures are developed.	<Policy Actions> Guidance Bureau for MSMEs improves the Single Window Portal.
		<Program Completion (2019)> (Achieved) <ul style="list-style-type: none"> The MSME Single Window Portal was launched on May 04, 2018 and was functioning. 729 applications had been approved against 775 applications received in the portal so far. MSME Trade & Investment Promotion Bureau (MTIPB) was established on January 24, 2019. <Ex-post Evaluation (2021)> <ul style="list-style-type: none"> The number of services that could be applied for through the Single Window Portal has expanded to 190 up to March 2022. 4,677 applications have been approved against 6,250 applications received in the portal up to March 2022.
	Investment application procedures are streamlined so as to achieve a shorter period toward the statutory clearances	<Policy Actions> Comprehensive investment guide is updated.
		<Program Completion (2019)> (Achieved) <ul style="list-style-type: none"> The comprehensive investment guide for MSME investors was updated. The Tamil Nadu Electric Vehicles policy in the guide for MSME investors was expected to be updated. <Ex-post Evaluation (2021)> <ul style="list-style-type: none"> The Tamil Nadu Electric Vehicles policy in the guide has been updated. Micro, Small and Medium Enterprises Policy 2021 has also been released.
		<Policy Actions> DIC information aggregation system is developed.
		<Program Completion (2019)> (Achieved)

Policy Item	Goal	Progress of Policy Actions (2018 – 2019)
		<ul style="list-style-type: none"> The MSME Single Window Portal provided information about applications filed for getting clearances from various departments, applications under process with the competent authorities, and applications disposed. In all 32 districts in the state, these could be viewed and downloaded department wise and district wise. <p><Ex-post Evaluation (2021)></p> <ul style="list-style-type: none"> The MSME Single Window Portal has been providing information as of March 2022.

Source: Documents provided by JICA, executing agencies and related organizations in Tamil Nadu



Construction of Bypass Road



Skills Training
(Truck-Driving Simulator)



Industrial Park for SMEs

Source: Photos taken by evaluator (March 2022).

(2) Program Implementation Framework

The progress of policy actions was reviewed once a quarter in principle by the PMC, which is chaired by the Additional Chief Secretary of the Finance Department of Tamil Nadu and includes secretary-level officials of relevant departments of the state government. Based on the discussions at each PMC, Tamil Nadu prepared a joint evaluation sheet including a self-assessment sheet of the status of the achievement of each policy action, documents for evidence, and measures to implement the policy actions as scheduled. The loans disbursement process for each tranche was then carried out based on the joint evaluation sheet as expected. From the Japanese side, not only JICA, but also the Embassy of Japan and JETRO officials attended the PMC. Regarding the issues raised by the Japanese side at the PMC, the Additional Chief Secretary of the Finance Department of Tamil Nadu, as chairperson of the PMC, instructed each person in charge to respond to the issues. In addition, since many implementing agencies related to the Program were participating in the PMC, information was also shared among the implementing agencies. For an example, the Guidance Bureau shared information on companies and industries that were considering entering Tamil Nadu with the TNSDC, and the TNSDC identified the skills needed by these companies and provided training programs for workers to acquire these skills.

The Program Implementation Unit (PIU), established by the Finance Department of Tamil Nadu, was in charge of organizing the PMC and supervising and facilitating the implementation of policy actions. The PIU also coordinated with JICA. The PIU was led by the Secretary of Expenditure of the Finance Department, and consisted of an undersecretary,

a section officer and an assistant section officer in the same department.

The Finance Department was generally satisfied with the implementation and monitoring framework of the Program. However, according to the Finance Department, the Program monitoring consultant was expected to assist the implementing agencies in facilitating implementation and organizing the PMC, but did not provide as much support as expected, leading the Finance Department to have doubts about the need for the consultant.

3.2.2 Impacts

3.2.2.1 Intended Impacts

(1) Quantitative Effects

(i) Increase in FDI to Tamil Nadu and Puducherry Union Territory

The amount of FDI in Tamil Nadu and Puducherry union territory has increased rapidly since the completion of the Program in 2019, as shown in Table 4. Note that the amount of FDI until September 2019 was published for Tamil Nadu and Puducherry union territory as one segment. However, a comparison of the amounts of FDI in Tamil Nadu and Puducherry union territory, which were published separately after October 2019, shows that the amount invested in Puducherry union territory was less than 1% of the amount invested in Tamil Nadu. Therefore, most of the amount invested before September 2019 is surmised to have gone to Tamil Nadu.

Table 4: FDI to Tamil Nadu and Puducherry Union Territory

	2017	2018	2019	2020	2021 (January-September)
Foreign Direct Investment (FDI)	3,869.25	2,765.80	4,299.96	8,333.09	15,253.94

Unit: Million USD

Source: Department for Promotion of Industry and Internal Trade

(ii) Number of offices of Japanese companies in Tamil Nadu

The number of offices of Japanese companies in Tamil Nadu has decreased as shown in Table 5. The reasons for this were COVID-19 and a decrease in car sales which was due to the fact that, although 70% of Japanese companies in Tamil Nadu were automobile-related companies, it became difficult for consumers to apply for car loans due to new banking regulation. The number of Japanese companies in Tamil Nadu has increased with the entry of large anchor companies, but there have been no anchor companies entered in the state since 2018.

Table 5: Number of offices of Japanese companies in Tamil Nadu

	2016	2017	2018	2019	2020
Number of Offices	582	582	620	600	589

Source: JETRO

(2) Qualitative Effects

(i) Increase in FDI in Tamil Nadu

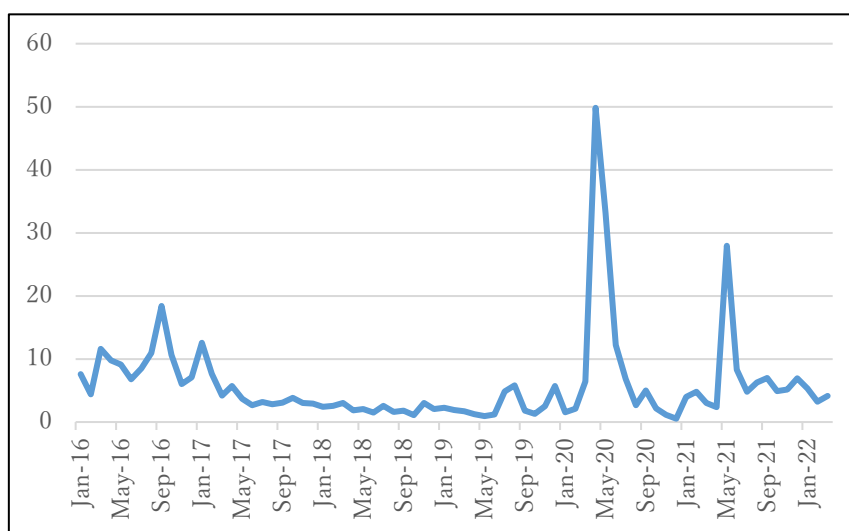
FDI in Tamil Nadu has been increasing year after year. Even after 2020, when COVID-19 spread, the request for consultations with the Guidance Bureau regarding FDI did not decrease, and the amount of investment increased rather than decreased. One of the reasons why FDI did not decrease even during the COVID-19 seems to be the fact that investors can obtain investment permits and licenses online, thanks to the strengthening and expansion of the single window system of the Guidance Bureau with the support of the Program.

On the other hand, the number of requests for consultations regarding FDI from Japanese companies to JETRO and operators of industrial parks in Tamil Nadu has declined significantly since 2020, when COVID-19 spread. It is surmised that this is partly because Japanese companies, which generally making investment decisions after conducting on-site surveys of a potential investment area, cannot travel to India due to COVID-19.

(ii) Job Creation

The unemployment rate in Tamil Nadu is shown in Figure 1. The unemployment rate was on a downward trend during the implementation of the Program. But after spiking to nearly 50% in April 2020 because of the lockdown in Tamil Nadu from March 2020 due to the COVID 19, the unemployment rate continues to fluctuate significantly. Therefore, a direct correlation between the Program and job creation cannot be verified from the macro data.

On the other hand, as there were development projects of some industrial parks for SMEs as small-scale infrastructure projects, factories were constructed by SMEs due to the development of such industrial parks and the jobs for workers were created.



Source: Centre for Monitoring Indian Economy.

Figure 1: Unemployment Rate in Tamil Nadu State

(iii) Satisfaction in Doing Business for Foreign Companies, Including Japanese Companies, by Improving the Investment Environment

In the Indian state-wise Ease for Doing Business (EODB) ranking published by the Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Tamil Nadu rose from 15th place in 2017 to 14th place in 2019. (No ranking has not been published since 2019. It is presumed that this has been due to COVID-19.)

In the State Investment Potential Index published by the National Council of Applied Economic Research (NCAER), Tamil Nadu ranked 3rd in 2016, 6th in 2017, and 2nd in 2018. By sector, the quality of the workforce and the stability of the state government ranked 1st in all regions of India, contributing to the increase in ranking. (The rankings after 2019 have not been published. It is presumed that this has been due to COVID-19.)

The JETRO Chennai office has commented that the permission and approval procedures in Tamil Nadu have improved with the establishment of the Single Window System and its expansion. In addition, although it is taking some time, infrastructure development is being undertaken, taking into account the voices of the private sector. As an example, a Japanese company that was planning to start up business in an industrial park in Chennai was able to establish a factory as originally planned because it was able to obtain permits and licenses smoothly through online application under the Single Window System.

Some Japanese companies also have commented that, although there is still room for improvement in infrastructure such as port facilities, roads, and electricity supply, the quality of the workforce is high.

As a result of these improvements in the investment environment, satisfaction in doing business for foreign companies, including Japanese companies has improved.

3.2.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

The Program was classified as Category C, likely to have minimal or little adverse impact on the environment and society, based on the JICA Guidelines for Environmental and Social Considerations (April 2010). No negative impacts on the natural environment were observed due to the construction work of the small-scale infrastructure projects implemented under the Program.

(2) Resettlement and Land Acquisition

Among the 30 small-scale infrastructure projects, land acquisition is required for a bypass road construction project and a road expansion subproject, which are under the process in accordance with Indian domestic laws at the time of ex-post evaluation. In addition, the

resettlement of informal dwellers is required for the Eco Restoration of the Peerkankaranai lake Subproject, which, as mentioned above, is under the process in accordance with Indian domestic law at the time of the ex-post evaluation.

(3) Gender Equality

At the time of the ex-post evaluation, more than half of those registered and participating in training programs offered by the TNSDC were women. In addition, the TNSDC provided skills training to sexual minorities.

In addition, with the development of an industrial park for MSMEs as a small-scale infrastructure project, female managers employed female workers in the industrial park, thereby improving employment opportunities for women.

Furthermore, TNIFMC has invested in a housing development project for female workers at TEPL and is also facilitating the development of hostels for female workers to improve their conditions.

(4) Marginalized People and Human Rights

Although housing development for low-income workers was not included in the small-scale infrastructure projects, TNIFMC, which was supported by the Program, invested in housing development for low-income workers, and indirectly, loans from the Program were used for housing development projects for low-income workers.

In addition, the differently abled have registered and participated in the training programs provided by TNSDC. There were 156 differently abled persons out of approximately 60,000 persons in total registered in the training programs in 2021. Skill training opportunities were also provided to the differently abled.

Furthermore, with the development of an industrial park for MSMEs as a small-scale infrastructure project, the differently abled were employed in factories established in the industrial park.

From the above, it can be seen that the employment opportunities for the differently abled have improved.

(5) Other Positive/Negative Impacts

Information sharing and collaboration with other departments of the State Government of Tamil Nadu was facilitated through the PMC and by other means under the Program. As an example, the TNSDC obtained information from the Guidance Bureau on the industries of companies considering investing in Tamil Nadu, so that it could develop and provide training programs on the skills required in those industries.

In summary, the operation and effect indicators have fully achieved the target values, set at the time of appraisal, except for the number of trainers of government training institutes trained, the number of days required to gain Single Window Clearances through the Guidance Bureau and the online system, and the number of page views of the Single Window Portal, as of the time of the Program completion. Qualitative effects were also achieved for all policy actions.

Regarding “Increase in FDI in Tamil Nadu” as an impact, as the result of the development of infrastructure in Tamil Nadu by the small-scale infrastructure projects under the Program, the improvement of the quality of the workforce by providing job training to workers through TNSDC, and the simplification of the investment licensing process through the online single window system of the Guidance Bureau., the amount of FDI in Tamil Nadu has been increasing year by year. Regarding “job creation”, new factory construction and the start of operations at industrial parks for MSMEs established through the Program have created new employment opportunities for workers. Regarding “satisfaction in doing business for foreign companies, including Japanese companies, by improving the investment environment,” interviews with Japanese companies have indicated that they are satisfied with the quality of workers to a certain degree. It is thought that the support provided by the Program could be one of the key factors in this.

No negative impact on the natural environment was observed due to the Program, and land acquisition and resettlement are underway in accordance with Indian domestic laws. The Program has also had a certain impact on women and marginalized people by providing job training, employment opportunities and developing housing.

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

3.3 Sustainability (Rating: N/A)

3.3.1 Policy and System

As described in “3.1.1.1 Consistency with the Development Plan of India”, the “Make In India” initiative and “Skill India” campaign by the Government of India at the time of the ex-post evaluation have been effective in promoting private investment and improving the investment environment. In addition, “Vision Tamil Nadu 2023”, which expresses the basic principles of the policies of the state government of Tamil Nadu, the “Tamil Nadu Industrial Policy 2021”, “Tamil Nadu Export Promotion Strategy 2021”, and “Micro, Small and Medium Enterprises Policy 2021” have been also effective for promoting investment in the state, and there has been no change in their priority and positioning.

Therefore, the policies and the political involvement necessary to sustain their effectiveness has been ensured.

3.3.2 Institutional/Organizational Aspect

The following agencies are responsible for the sustainability of each policy action under the Program after completion.

(1) Acceleration of Infrastructure Development

At the time of the appraisal, TNIDB was coordinating and prioritizing infrastructure projects in Tamil Nadu, and TNIFMC was implementing infrastructure fund formation, financing, project evaluation, and project monitoring. TNIDB has continued to exist and function as the coordinating agency after the completion of the Program. TNIFMC is responsible for the establishment of infrastructure funds, financing, project evaluation, and project monitoring, and also monitors the progress of the small-scale infrastructure projects currently underway. Both institutions neither changed their organizations, systems, nor rules from the time of the Program completion to the time of ex-post evaluation.

(2) Skills Development for Employment

Regarding skills development for employment, TNSDC was the only institution providing skills training for industrial human resource development at the time of the appraisal, but at the time of the post-evaluation, in addition to TNSDC, ASDCs in the priority sectors identified by TNSDC in its skills gap study “Hospital and Healthcare”, “Logistics and Transportation”, “Building and Infrastructure”, and “Banking Securities Finance and Insurance”) had been established through the Program, and further promotion of industrial human resource development is expected in the future. (Preparations are being made for the establishment of ASDC for “Auto, Auto Components and Machine Tools”, as the other priority sector). In particular, regarding the Auto, Auto Components and machine Tools sector, 70% of Japanese companies in Tamil Nadu are automotive-related companies, and it is expected that workers trained at the ASDC will be active in the Japanese companies. The 5 ASDCs are expected to become financially independent within five years by receiving income from the companies and educational institutions that send trainees to the ASDCs.

(3) Strengthening of the Guidance Bureau

Regarding strengthening of the Guidance Bureau, the Guidance Bureau, as the implementing agency for this policy action, was continuing to play its role at the time of the ex-post evaluation. As FDI in Tamil Nadu has been increasing year by year, the number of staff has been increased from 10 at the time of completion of the Program to more than 60 at the time of the ex-post evaluation, and, therefore the Guidance Bureau has the capability to continue providing information and services to companies considering investment in Tamil Nadu in the future.

(4) Strengthening of the Single Window for MSME

Regarding strengthening of the Single Window for MSME, the implementing agency for this policy action has been Tamil Nadu Small Industries Development Corporation Limited (TANSIDCO), which has been playing its role with its line department the Micro, Small, and Medium Enterprises Department (MSMED). At the time of Program completion, the Industries Commissionerate and Director of Industries and Commerce under the MSMED were managing and operating the Single Window for MSME, and the MTIPB, which was newly established in 2019, provided a consultation service for MSMEs. At the time of the ex-post evaluation, those organizations were still in existence and functioning, and it is expected that they will continue to provide information as an investment window for MSMEs.

Therefore, the institutions and organizations have been ensured to sustain the effectiveness.

3.3.3 Preventative Measures to Risks

(1) COVID-19

A lockdown was implemented in Tamil Nadu from March to August 2020, forcing all workers from outside the state to return home, resulting in a shortage of workers and halting construction on small-scale infrastructure projects. In addition, hands-on training for workers was not allowed to take place in order to avoid density.

On the other hand, even under the impact of COVID-19, inquiries from foreign companies for FDI in Tamil Nadu and the amount of investment did not decrease, but rather increased. One factor may be that help desks and applications for permits and licenses were available online, allowing consultation and procedures to be carried out even from overseas.

(2) Heavy Rain in 2021

In Tamil Nadu, as heavy rains in November 2021 caused flood damage to the project sites of small-scale infrastructure projects, wastewater treatment was implemented by the respective implementing agencies supervising the construction.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Program was implemented to facilitate the improvement of policies and systems related to private sector investment and industrial growth in the southeastern Indian state of Tamil Nadu, while at the same time promoting early implementation of the development and improvement of urban infrastructure in the state, mainly of roads, power, waterworks, sewerage, and other infrastructure facilities, thereby attempting to increase FDI in the state by enhancing its investment climate. The Program is consistent with the development policies, the financial needs

and the development needs of India, as well as with Japan's ODA policy. The Program is internally coherent with JICA's other projects and externally coherent with other donors and JETRO's projects. Therefore, its relevance and coherence are very high.

The operation and effect indicators have fully achieved the target values set at the time of appraisal, except for the number of trainers of government training institutes trained, the number of days required to gain Single Window Clearances through the Guidance Bureau and the online system, and the number of page views of the Single Window Portal, at the time of the Program completion. Qualitative effects were also achieved for all policy actions. Regarding the impact, as the result of the development of infrastructure in Tamil Nadu by the small-scale infrastructure projects under the Program, improvement of the quality of the workforce by providing job training to workers through the TNSDC, and the simplification by the Guidance Bureau of the investment licensing process through the online single window system, the amount of FDI in Tamil Nadu has been increasing year by year. The construction of new factories and the start of operations at industrial parks for MSMEs established through the Program have created new employment opportunities for workers. No negative impact on the natural environment due to the Program was observed, and land acquisition and resettlement are underway in accordance with Indian domestic laws. The Program has also had a certain impact on women and marginalized people by providing job training, employment opportunities and developing housing. Therefore, the effectiveness and impacts of the project are high.

Regarding the sustainability of the Program, no problem has been observed in terms of the policy and institutional/organizational aspects and, therefore, the sustainability has been ensured. The countermeasures have been conducted to the risks.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

The Program has contributed to infrastructure improvement in Tamil Nadu through small-scale infrastructure projects, but there is still room for infrastructure improvement in the state as a whole. The private sector has mentioned the need to improve port access roads, particularly as road access to ports is still time consuming. Therefore, it is recommended that TNIDB and TNIFMC should continue to promote infrastructure improvement projects in the state.

With the support of the Program, the Guidance Bureau has increased the number of staff and expanded the services of the single window clearance system. On the other hand, some private companies have not fully been aware of the existence of those services and the functionality of the system. The Guidance Bureau should continue to hold such seminars as held in Japan in 2019, to introduce these services, and should actively promote the single window clearance system, in addition to the incentives available when investing in Tamil Nadu, to foreign companies considering investing in Tamil Nadu.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

(1) Development of Mutually Complementary Policy Matrix

As JICA interviewed those involved in industries, including JETRO and private companies, and had discussions with the implementing agencies that were based on their development needs, the policy matrix developed in the Program was a well-designed policy matrix that works in a mutually complementary manner to achieve the objective of promoting investment in Tamil Nadu. In order to attract foreign investment, stable infrastructure such as roads, electricity, and water, quality workers, and a transparent legal system are essential, and the policy matrix was designed covering these elements so that each policy action functions in a mutually complementary manner. Therefore, FDI in the state did not decrease even during the COVID-19. In future similar projects, the possibility of achieving the project objectives could be increased by designing a policy matrix in which each of the elements necessary to solve the issues can interact in a mutually complementary manner, taking into account the needs of the industry when creating the policy matrix.

(2) Reasonable Policy Actions and Target Setting under Develop Policy Lending

When incorporating the development of small-scale infrastructure into the policy matrix, the goal should not be the completion of the small-scale infrastructure projects themselves, but rather the appropriate allocation of the budget and the promotion of the small-scale infrastructure project, so that the budget will also be allocated to each small-scale infrastructure project without delay.

(3) Utilization of PMC

Although the Program was related to multiple implementing agencies and their competent authorities, information sharing and collaboration with other departments were facilitated by holding PMC on a regular basis to check the implementation status of other policy matrixes and the progress of small-scale infrastructure projects among the organizations concerned. Not only JICA, but also the Japanese Embassy and JETRO participated from the Japanese side, which enabled the voices of Japanese companies to be shared with the Indian side. When problems arose, the Additional Chief Secretary of the Finance Department, as a chairperson the PMC, promptly instructed the agency responsible to deal with the problem. It is surmised that this was due to the strong leadership of the Additional Chief Secretary of the Finance Department, who could have a great influence on other state government agencies. In similar projects in the future, as in the Program, the project could be facilitated by appointing a PMC chairperson who can systematically

give instructions to subordinate organizations and regularly share the current status with the chairperson.

(4) All-Japan Approach, including both Public and Private Sectors, to the Program

As a result of the all-Japan approach, including both public and private effort, which continued from the Program formulation to the monitoring of implementation, the Program has generated effects and impacts that have benefited Japanese companies. JICA, through dialogue with the JETRO Chennai Office, the Japanese Chamber of Commerce and Industry, Chennai (JCCIC), and Japanese private companies in Tamil Nadu, identified the development needs of the state and proposed some projects as candidates for small-scale infrastructure projects in the Program at the time of the Program formation. During Program implementation, JICA was able to share with the state government the issues that had arisen during construction and to request improvements. As the result, the investment environment in Tamil Nadu improved, making it easier for private companies, including Japanese companies, to enter the state and do business there. Based on the above, in future similar projects, JICA could formulate and implement projects that will benefit not only the target country but also Japanese companies by closely exchanging information with government agencies and private companies and utilizing the results of these interviews.

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

JICA also shared the policy matrix with the JETRO Chennai office at the time of project planning and identified the needs of Japanese companies and the JCCIC. JETRO commented on the necessity of strengthening the authority and personnel of the investment promotion office and of carrying out human resource development projects such as the improvement of training at skills training schools, and these points were included in the policy matrix. In addition, JICA interviewed Japanese companies, especially developers and operators of industrial parks, about infrastructure impediments in Tamil Nadu, and proposed to the state government of Tamil Nadu some projects as small-scale infrastructure projects, based on the requests from these companies. As a result, some (but not all) of these projects were adopted as small-scale infrastructure projects. In addition, an ASDC is going to be established for the Auto, Auto Components and Machine Tools sector, as one of the priority sectors, and this is expected to be beneficial to automotive-related companies (70% of the Japanese companies in Tamil Nadu).

During Program implementation, in order to monitor the progress of the Program, the PMC meeting was held regularly (quarterly) and, from the Japanese side, not only JICA, but also the Embassy of Japan and JETRO officials attended the PMC meeting on a timely basis. The developers of industrial parks relating to small-scale infrastructure projects could convey the

progress and challenges to the implementing agencies through JICA, Embassy of Japan and JETRO.

As mentioned above, in the process of developing the policy matrix and selecting the small-scale infrastructure projects, JICA exchanged information with the Embassy of Japan, JETRO and Japanese stakeholders in India such as Japanese companies in India and a Japanese association, absorbed their requests, and through the process of a plenty of discussion and consensus-building with the state government of Tamil Nadu, the policy matrix was developed and the small-scale infrastructure projects which were highly beneficial to Japanese companies were adopted in the Program. During Program implementation, coordinating with JETRO, JICA checked the progress of the policy actions and facilitated the sharing progress and coordination of the Program by disseminating information to private sector.

(End.)

India

FY2021 Ex-Post Evaluation Report of
Japanese ODA Loan “Gujarat Investment Promotion Program”

External Evaluator: Keishi Miyazaki, OPMAC Corporation

0. Summary

This project aimed to encourage policy and institutional improvement in Gujarat State in West Central India through financial support with regard to private investment including foreign direct investment, industrial advancement and skill development, as well as to improve the investment climate for the development of infrastructure in the state, including roads, electric power, and water, thereby contributing to increased private investment such as foreign direct investment (FDI). The project was consistent with the development plan and development needs at the appraisal and the ex-post evaluation. The project plan and approach were appropriate. The project also included collaboration with donors such as the World Bank and the German Agency for International Cooperation (GIZ¹). Therefore, its relevance and coherence are high.

Five of the eight operation and effect indicators were generally achieved, and all planned policy actions had been accomplished by project completion, with those achievements maintained at the time of the ex-post evaluation. The project seems to have made a certain contribution to improving the state government’s capacity to implement infrastructure projects and increasing FDI in Gujarat. The project may have also contributed to enhancing the satisfaction of foreign companies doing business in the state, including Japanese companies, by improving the investment environment. No negative impact of the project on the natural environment was observed. Although there was some land acquisition for small-scale infrastructure projects, this was implemented in compliance with Indian domestic laws and the regulations by the Gujarat government. Project implementation has mostly achieved the expected outcomes, and the effectiveness and impacts of the project are high. No issues were observed in the policy/system or institutional/organizational aspects of operation and maintenance, and risks have been well mitigated.

¹ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

1. Project Description



Project Location (Source: Evaluator)



Small infrastructure project implemented as a part of Gujarat Investment Promotion Program (Internal roads in the Bhagapur Industrial Estate) (Source: Evaluator)

1.1 Background

The state of Gujarat in West Central India is situated at a key junction between India and the Middle East, and has played a leading role in India's economic development. In FY2015 it was responsible for 19% of India's export value and 41% of its total maritime cargo. Gujarat is the one of the target states of the *Delhi-Mumbai Industrial Corridor (DMIC) Initiative*, a regional development project agreed to by the governments of Japan and India in 2006, as Japanese companies, mainly in the automotive industry, had established operations in the state. In 2016, Gujarat ranked third among India's 36 states and territories under the direct control of the central government in the Ease of Doing Business Report 2016, conducted by the World Bank and the Ministry of Commerce and Industry, indicating that the state was becoming a superior business environment compared to other states. However, foreign companies operating in Gujarat expressed a strong desire that the state's investment environment be improved, with particular concerns about the poor quality of education related to industrial skill development, lack of infrastructure, and delays in processing applications for various investment procedures.

1.2 Project Outline

The objective of this project is to encourage policy and institutional improvement in Gujarat State in West Central India through financial support with regard to private investment promotion including FDI, industrial advancement and skill development, as well as to improve the investment climate for the development of infrastructure in the state, including roads, electric power, and water, thereby contributing to increased private investment such as FDI in the state.

Loan Approved Amount/ Disbursed Amount	16,825 million yen / 16,808 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	September 2017 / September 2017
Terms and Conditions	Interest Rate 0.6 % Repayment Period 15 years (Grace Period 5 years) Conditions for Procurement General untied
Borrower / Executing Agency	The President of India / Finance Department, Government of Gujarat State
Project Completion	February 2020
Target Area	Entire Gujarat State
Main Contractor(s) (Over 1 billion yen)	N.A.
Main Consultant(s) (Over 100 million yen)	N.A.
Related Studies (Feasibility Studies, etc.)	N.A.
Related Projects	[Technical Cooperation] Support for Project Implementation on Gujarat Investment Promotion Program

2. Outline of the Evaluation Study

2.1 External Evaluator

Keishi Miyazaki, OPMAC Corporation

2.2 Duration of Evaluation Study

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

Duration of the Study: October 2021 – January 2023

Duration of the Field Study: March 20 – April 7, 2022

2.3 Constraints during the Evaluation Study

As this project was a Program Loans project (Development Policy Loan), and a quantitative comparison of inputs and outputs is difficult, so efficiency has not been evaluated. In terms of

sustainability, since it is difficult to identify the technical and financial aspects of operation and maintenance, the analysis will be limited to the policy/system, institutional/organizational aspects, and preventive measures against risks related to operation and maintenance. For the above reasons, sub-rating will be given for relevance/consistency and effectiveness/impacts, but no overall ratings will be determined.

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

3.1 Relevance/Coherence (Rating: ③³)

3.1.1. Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of India

At the time of the appraisal, Prime Minister Modi of India announced *the Make in India Policy* (formulated in September 2014), which aimed to create 100 million jobs through manufacturing development, and *the Skill India Policy* (formulated in July 2015), which aimed to provide job training and improve employment rates. The policies were stimulating to further economic growth and job creation by promoting investment by domestic and foreign private companies. To realize these policies, the Ministry of Commerce and Industry made revisions to the 98-point Business Reform Action Plan established in December 2014 and, in October 2015, recommended a 340-point Business Reform Action Plan to local governments in each state and territory directly under the government. As a result of these efforts, India improved from 142nd out of 189 countries in 2015 to 130th in 2016 in the World Bank Ease of Doing Business rank. However, India's complex investment approval procedures, tax systems, and weak industrial infrastructure have been obstacles to business expansion.

In Gujarat's state development plan, *Blue Print for Infrastructure in Gujarat (BIG 2020)* (formulated in August 2009), the state set the goal of tripling real state GDP from 2.10 trillion rupees to 6.46 trillion rupees and quadrupling state's per capita income (based on purchasing power parity per capita) from US\$3,019 to US\$12,615 by 2020, with the plan to invest a total of 119.2 billion rupees (from 2008 to 2020) in urban development. As a result of this initiative, in 2016, the state was positioned third among 36 states and direct government territories in the Ease of Doing Business Report, indicating that it was becoming an ideal business environment compared to other states.

At the time of the ex-post evaluation, *the Make in India Policy* and *Skill India Policy* remained effective, and the improvement of economic growth and job creation through the promotion of investment by domestic and foreign private companies is a high priority. The Ministry of Commerce and Industry provides information to foreign companies to promote investment, and the Ministry of Skill Development and Entrepreneurship offers various

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory.

³ ④: Very High, ③: High, ②: Moderately Low, ①: Low

vocational training schemes. Gujarat has formulated *the Sustainable Vision 2030 for Gujarat (Vision 2030)*, which follows the state development plan *BIG 2020*. With the promotion of private investment and the improvement of the investment climate as priority areas, *Vision 2030* aims to (i) identify targets that should be focused on or utilized to gain global competitiveness, (ii) develop an appropriate framework and action plan for implementation, (iii) make Gujarat among the 2 best states in India to achieve the Sustainable Development Goals in key socio-economic indicators and indices by 2022, and (iv) make Gujarat a leading state in key socio-economic indicators, rural and urban life satisfaction indices as well as the most livable state in the country by 2030, and in this context, the promotion of private investment and the improvement of the investment environment are positioned as priority areas. Gujarat has also announced in its *Gujarat Industrial Policy 2020* (formulated in August 2020) that it will invest 400 billion rupees over the next five years to encourage further investment in the state and make it a global business hub for sustainable manufacturing and service industries.

3.1.1.2 Consistency with the Development Needs of India

The state of Gujarat, West Central India, is situated at a key junction between India and the Middle East, and has played a leading role in India's economic development. In FY2015 it was responsible for 19% of India's export value and 41% of its total maritime cargo. Gujarat was the target state of *the Delhi-Mumbai Industrial Corridor (DMIC) Initiative*, a regional development project agreed to by the governments of Japan and India in 2006, and was considered key in the industrial development in India. Gujarat was being considered for funding by the Japanese government for priority infrastructure projects that contribute to the development of the investment environment in this industrial corridor. In addition, as of February 2016, 63 Japanese manufacturing companies were operating in the state. However, foreign companies operating in the state continued to strongly request that the state's investment environment be improved. In particular, the low quality of education related to industrial human resource development, the lack of mid to long-term infrastructure, and delays in processing applications for various investment procedures were major issues.

At the time of the ex-post evaluation, Gujarat had designated the Mandal Industrial Estate⁴, an industrial park exclusively for Japanese companies, and the area where major Japanese automobile companies and automobile-related industries were concentrated, as the Mandal Becharaji Special Investment Region (MBSIR) (102 square kilometers in area). Development of the industrial park and the surrounding infrastructure for this new industrial hub in the suburbs of Ahmedabad is underway. Gujarat provides stable services in terms of infrastructure,

⁴ Mandal Industrial Estate is an industrial park where the Ministry of Economy, Trade and Industry (METI), Japan and the Japan External Trade Organization (JETRO) are working together with the Gujarat state government to attract companies.

such as electricity and water supply. Meanwhile, to promote investment by foreign companies, there is still a strong need for infrastructure development including improved roads and transportation networks, such as improved connectivity to industrial parks, special economic zones, airports, and ports. In addition, the state has analyzed the gap between the contents of the training provided by the state's Industrial Training Institutes (ITIs) and the skills and human resource needs of industry, and making efforts on reforming these ITIs in order to develop human resources that meet the needs of industry. For example, the Gujarat government established the Kaushalya Skills University in October 2021 to provide young people with skills education and entrepreneurship training. However, securing quality human resources remains a major challenge for foreign companies, so the development of industrial human resources that meet the needs of the industry continues to be a requirement.

3.1.1.3 Appropriateness of the Project Plan and Approach

This project was a Program Loans project (Development Policy Loan), a scheme in which the executing agency and related organizations were to implement policy actions for each policy and field based on a policy matrix agreed upon by both the Japanese and Indian sides (a table summarizing policy items to be improved, targets to be achieved for each item, and policy actions to be achieved each fiscal year). In this scheme, the achievement of the goals of each policy item and the project's objectives were promoted through periodic monitoring and evaluation of results by the executing agency and related organizations. The Finance Department of Gujarat State was the executing agency for this project, but other related agencies such as the Industrial Extension Bureau (iNDEXTb), the Labor and Employment Department, the Industries and Mines Department, the Gujarat Infrastructure Development Board (GIDB), and the Gujarat Industrial Development Corporation (GIDC) were also in charge of implementing each policy action.

In the project formulation, JICA developed a policy matrix based on the issues and requirements for investment and business development in Gujarat, which had been identified by the Japan External Trade Organization (JETRO) New Delhi Office⁵, Japanese companies operating in Gujarat, and local Japanese associations. JICA also drafted, revised, and finalized the policy matrix while holding discussions and dialogues with the executing agencies and related organizations of Gujarat to identify policy items and areas needing improvement, and to set policy actions and operation and effect indicators. In this way, the policy matrix was developed based on the requests and issues raised by JETRO, which supports the promotion of investment by Japanese companies in India, and local Japanese companies, and through a process of consultation and consensus building with the Gujarat state government, contributing

⁵ The JETRO Ahmedabad office opened in 2018. In 2017, when the formation of this project took place, the JETRO New Delhi office was in charge of supporting Japanese companies in Gujarat.

to increase the beneficial effect on Japanese companies.

JICA's approach in the process of developing the above policy matrix was recognized to be consultative and inclusive by the executing agencies and related organizations, and the iNDEXTb evaluation was that it took the perspectives of all stakeholders into account. According to iNDEXTb, as Gujarat is an industrial state, addressing issues faced by investors should be a high priority for the state government. So they recognized that the policy matrix was instrumental in improving and streamlining the systems and processes necessary to identify investor needs, to facilitate investor acceptance, and to support investors throughout their lifecycles.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

At the time of appraisal, *Japan's Country Assistance Policy for India* (March 2016) stipulated that Japan would provide assistance to eliminate obstacles to investment and growth. This project was positioned as a cooperation program, "Regional Corridor Development Approach," in the priority area of "Strengthening Connectivity." Furthermore, it was noted in "Other consideration" in the policy that the project would promote a novel "programmatic approach to mutually agree on the policy matrix through close and continuous policy dialogue, monitoring and review," with support based on the progress made.

JICA Country Analysis Paper on India (March 2012) listed "Development of Industrial and Urban Infrastructure" as one priority area. The key issues identified in the report were (i) infrastructure development (roads, railroads, electricity, water, etc.) based on the needs of Japanese companies operating in India, supporting not only Japanese companies but also regional industries as a whole, particularly *the Delhi-Mumbai Industrial Corridor (DMIC) Initiative* and *the Chennai-Bengaluru Industrial Corridor Initiative*, and (ii) institutional improvements to contribute to an improved investment environment.

3.1.2.2 Internal Coherence

At the time of the appraisal, the Tamil Nadu Investment Promotion Program (Phase 2) (2017-2019), similar in scheme and project content to this project, was scheduled to be implemented at the same time as this project. It was assumed that JICA would conduct monitoring in cooperation with the Tamil Nadu Promotion Program (Phase 2) and policy dialogues with the governments of the target states, but the cooperation between the two projects did not happen.

3.1.2.3 External Coherence

(1) World Bank

In relation to policy item “7 Strengthening of Gujarat Skill Development Mission & Skill Gap Study,” the SANKALP (Skills Acquisition and Knowledge Awareness for Livelihood Promotion)⁶ scheme (2018-2023), a short-term skills training program implemented by the Ministry of Skills Development and Entrepreneurship with financial support from the World Bank, was launched. Policy actions such as the organisation of district skills committees and skills gap analysis were implemented with the use of SANKALP.

(2) German Agency for International Cooperation (GIZ)

Regarding the policy action under the policy item “1. Enabling GIDC’s capacity to develop world-class industrial estates,” the Industrial Development Corporation prepared *the Strategic Plan for the Recycling and Reducing of Existing Water* in cooperation with GIZ. In addition, it was planned by the Labor and Employment Department that policy action under the policy item “6. Apex Training Institute and Training of Trainers (ToT) for Skill Development,” would be implemented with the cooperation and support of GIZ. Although the plan was delayed due to COVID-19, a technical cooperation project agreement with GIZ was signed in February 2022, after project completion. In the future, with the support of this technical cooperation project, the Labor and Employment Department will establish a state apex training institute, develop a new vocational education training program, conduct the training of training instructors of state vocational training institutions, and improve training facilities.

(3) JETRO

Project formulation was conducted in collaboration and cooperation with JETRO’s local offices, the Ministry of Economy, Trade, and Industry (METI), and local Japanese companies. JETRO also participated in the Program Monitoring Committee (PMC) meetings, held quarterly in principle, to grasp the progress of each policy action and share information with local Japanese companies. In addition, during the Gujarat state government’s consideration of small-scale infrastructure projects, JETRO, in cooperation with JICA, took advantage of various opportunities for dialogue, including the PMC, to encourage the state government to include road development around industrial parks, which local Japanese companies often request. As a result, infrastructure development, including road construction around the industrial parks where local Japanese companies were located,

⁶ SANKALP targets three areas for support: (1) institutional/organizational enhancement at the central, state, and district government levels; (2) quality assurance of skills development programs; and (3) inclusion in skills development programs of people who are inhibited from equal participation in society.

were promoted, which resulted in benefiting the local Japanese companies. These collaborations with JETRO were anticipated at the time of the appraisal and were implemented as expected.

The consistency with the development plan and development needs was recognized at the time of the appraisal and at the ex-post evaluation. The project was also consistent with Japan's development cooperation policy at the time of the appraisal. JICA's approach to preparing the policy matrix was consultative and comprehensive for the both Government of Gujarat and the Japanese side, and the project planning and approach provided suggestions for other similar projects. Meanwhile, the Tamil Nadu Investment Promotion Program (Phase 2), which had been assumed to be a similar project, was not linked to the project, and no internal consistency was found. For policy actions related to industrial human resource development, however, external consistency was found, as the project was linked to the SANKALP scheme supported by the World Bank, supported by GIZ's technical cooperation project, and linked to JETRO in project formation and implementation monitoring.

Therefore, its relevance and coherence are high.

3.2 Effectiveness and Impacts⁷ (Rating: ③)

3.2.1 Effectiveness

3.2.1.1 Quantitative Effects (Operation and Effect Indicators)

The operation and effect indicators of the project are shown in Table 1.

Table 1 Operation and Effect Indicators

Operation and Effect Indicators	Baseline value	Target value	Actual value		
	2015	2019	2019	2020	2021
		At Project completion	At Project completion	1 year after project completion	2 years after project completion
1) Application process on a single window portal within the target period (% per year)	N.A.	85% of total applications are processed.	93.65	95.07	88.87
2) Numbers of dispatch of information to investors by iNDEXTb such as proposals for new projects, project briefs etc.	N.A.	30	21	56	21
3) Numbers of support for the grounding of industrial projects by iNDEXTb (cumulative total)	0	2	51	92	79
4) Numbers of PPP project monitoring matrixes developed (cumulative total)	0	5	5		
5) Numbers of trainees who participated in the training program for instructors and students by Apex Training Institute (cumulative total)	0 (Apex Institute was not established)	Trainer: 200 Student: 500	Trainer: 160 Student: 0	Trainer: 0 Student: 0	Trainer: 0 Student: 0

⁷ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Operation and Effect Indicators	Baseline value	Target value	Actual value		
	2015	2019	2019	2020	2021
		At Project completion	At Project completion	1 year after project completion	2 years after project completion
6) Growth rate of the number of applicants to the skills development program provided by Gujarat state government (%)	N.A.	10% (2017-2018)	N.A.	N.A.	N.A.
7) Employment rate of graduates of state training institutes (% per year)	N.A.	Employee: 50% Self-employee: 20%	N.A.	N.A.	N.A.
8) Number of priority small-scale infrastructure projects such as roads, electricity, water, etc. (cumulative total)	0	5	6		

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

1) Regarding application process on a single window portal within the target period, at the time of project completion (2019), the actual processing rate was 93.6% per year, compared to the target of “85% of all applications processed per year”. Two years after completion (2021), the actual value was 88.87% per year, almost achieving the target.

2) Regarding numbers of dispatch of information to investors by iNDEXTb such as proposals for new projects, project briefs etc., it was 21 compared to the target of 30 at the time of project completion (2019). One year after completion (2020), the actual number was 56, achieving the target in that year. However, with many applications which remained pending due to COVID-19, the actual value after two years of completion (2021) decreased to 21.

3) Regarding numbers of support for the grounding of industrial projects by iNDEXTb, the actual number of cases at the time of project completion (2019) was 51, well above the target of 2. The actual number one year after completion (2020) increased to 92. The actual number of projects two years after completion (2021) decreased slightly to 79 due to COVID-19, but remained high. The reasons for this high level of achievement as well as the rationale for setting the target value and its relevance were asked to iNDEXTb, however, but a clear answer could not be obtained.

4) Regarding numbers of PPP project monitoring matrixes developed, the target of 5 projects at the time of project completion (2019) was achieved, with five actual projects at the time of project completion (2019). A PPP project monitoring matrix was created for five PPP projects: (i) dams, (ii) roads and bridges, (iii) ports, (iv) roll-on/roll-off ferries, and (v) floating, storage, and regasification equipment. The preparation of the PPP project monitoring matrixes was supported by the Support for Project Implementation on the Gujarat Investment Promotion Program.

5) As for numbers of trainees who participated in the training program for instructors and

students by Apex Training Institute, the actual numbers of instructors and students at the time of project completion (2019) were 160 and 0 respectively against the target of 200 instructors and 500 students at project completion (2019). Therefore, the target was not achieved. This project established the state's Apex Training Institute by reforming the existing Industrial Training Institutes (ITIs), created training programs for instructors based on the new standards, which were launched in November 2019 for the instructors of ITIs. However, this training program had been suspended up to the ex-post evaluation due to COVID-19.

It was difficult to confirm the level of achievement with regard to 6) growth rate of the number of applicants to the skills development program provided by Gujarat state government and 7) employment rate of graduates of state training institutes, because the Ministry of Labor and Employment does not measure data related to the above indicators. In Gujarat, training activities provided by state vocational training institutions have been suspended since 2020 due to COVID-19.

8) Number of priority small-scale infrastructure projects such as roads, electricity, water, etc., the target was achieved, with an actual number of 6 projects compared to the target of 6 at the time of project completion (2019). Since project completion, 6 small-scale infrastructure projects which were adopted have been under implementation.

3.2.1.2 Qualitative Effects (Other Effects)

1) Achievement of Policy Actions

The policy matrix of the project included eight policy items with corresponding achievement targets and policy actions, which were regularly monitored by the PMC and evaluated for achievement. The project period was 28 months, from September 2017 (signing of the loan agreement) to December 2019 (the time of the final joint evaluation). The level of achievement of each policy item at the time of project completion and its continuation at the time of the ex-post evaluation are described below.

“Policy Item 1. Enabling GIDC’s capacity to develop world-class industrial estates” was handled by GIDC, and the related policy actions had been accomplished at the time of project completion and the achievements were continuing at the time of the ex-post evaluation.

Policy Item	Achievement Target	Policy Action	Status of Policy Action (Summary)
1. Enabling GIDC’s capacity to develop world class industrial estates	<ul style="list-style-type: none"> Acquire the capacity to develop industrial parks that meet the needs of global companies Focus on sustainability and greening of industrial park development 	[FY2017-18] <ul style="list-style-type: none"> Formulate a five-year business plan for GIDC Establishment of Task Force Establishment of a GIDC representative office in the industrial estate 	[At the Mid-Term Evaluation (2018)] <ul style="list-style-type: none"> A project plan was developed, including the development of 22 new industrial parks. In November 2018, a set of regulations (circular) was posted, defining the Task Force’s activities, members, etc. A representative (regional manager) for Sanand Industrial Estate and Mandal

Policy Item	Achievement Target	Policy Action	Status of Policy Action (Summary)
	<ul style="list-style-type: none"> • Improve the business environment through infrastructure improvements • Promptly respond to the needs of companies in the industrial park 	[FY2018-19] <ul style="list-style-type: none"> • Promote sustainable industrial park measures to reduce water use, and power intensity in Industrial estates. 	Industrial Estate was appointed. [At the Final Evaluation (December 2019)] <ul style="list-style-type: none"> • In collaboration with GIDC and GIZ's, a "Strategic Plan for the Recycling and Reduction of Existing Water" was prepared between 2018 and 2019. • Based on the above plan, a desalination plant in Dahej Industrial Park and a shared wastewater treatment plant in Saykha Industrial Park were developed. [At the Ex-Post Evaluation] <ul style="list-style-type: none"> • The desalination plant (capacity: 40 million liters per day) at Dahej Industrial Park was completed in June 2021. • The wastewater treatment plant (capacity: 100 million liters per day) at Saykha Industrial Park is scheduled for completion in April 2022.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

"Policy Item 2. Single window system for GIDC industrial estates" was handled by GIDC. The related policy actions had been accomplished at the time of project completion and the achievements were continuing at the time of the ex-post evaluation.

Policy Item	Achievement Target	Policy Action	Status of Policy Action (Summary)
2. Single window system for GIDC industrial estates	<ul style="list-style-type: none"> • Full online approval process for new investments, operations, and expansions within the jurisdiction of GIDC 	[FY2017-18] <ul style="list-style-type: none"> • Integrate application submission and payment functions into the online system • Online transfer of procedural documents between departments [FY2018-19] <ul style="list-style-type: none"> • Adopt an online process for the disposal of files and other correspondence. 	[At the Mid-Term Evaluation (2018)] <ul style="list-style-type: none"> • Three levels of approval reports were submitted by GIDC: new approval, business plan approval, and change approval. • An online payment portal for land-related fees and utility payments was developed. [At the Final Evaluation (December 2019)] <ul style="list-style-type: none"> • Online investment screening within the jurisdiction of GIDC was made possible. • Several processes including time extensions for unused assets/facilities and document management systems were tested. [At the Ex-Post Evaluation] <ul style="list-style-type: none"> • Applications subject to online procedures by GIDC are operating, including the extended time limit application.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

"Policy Item 3. Capacity building of the PPP cell" was handled by the GIDB, and the related policy actions had been accomplished at the time of project completion and were continuing at the time of the ex-post evaluation. Due to the retirement of the person in charge of the implementation of this project at GIDB, it was not possible to confirm whether the PPP project

progress monitoring chart prepared for the project was still being used at the time of the ex-post evaluation.

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
3. Capacity building of the PPP cell	<ul style="list-style-type: none"> Promote private sector participation in infrastructure projects in the state by strengthening the capacity to implement PPP projects. 	<p>[FY2017-18]</p> <ul style="list-style-type: none"> Appointment of dedicated PPP team members from five key departments Organize two training sessions for nominated individuals to develop skills for understanding and implementing PPP projects <p>[FY2018-19]</p> <ul style="list-style-type: none"> Organize two training sessions for nominated individuals to develop skills for understanding and implementing PPP projects Develop a project monitoring matrix for the monitoring of five selected projects Monitoring the five selected projects in accordance with the project monitoring matrix 	<p>[At the Mid-Term Evaluation (2018)]</p> <ul style="list-style-type: none"> Five PPP expert team members were appointed to cover the areas of ports, roads, water supply, urban development, and energy. <p>[At the Final Evaluation (December 2019)]</p> <ul style="list-style-type: none"> The training and capacity building trainers (consultants) for the PPP were hired and four training sessions for the staff of GIDB were conducted from May 2018 to March 2019. Training summary reports and attendance sheets were submitted for three of the training sessions. With the assistance of JICA experts from the Support for Project Implementation of the Gujarat Investment Promotion Program, a project monitoring matrix for five PPP projects was prepared. <p>[At the Ex-Post Evaluation]</p> <ul style="list-style-type: none"> Four capacity building training sessions were conducted from March 2019 to March 2022. Of these, the March 2022 session was in collaboration with the World Bank. It was unclear whether the PPP project monitoring matrix prepared under the project was still being utilized.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

“Policy Item 4. Strengthening the Single Window for new investments in Gujarat (excluding industrial estates under the jurisdiction of the GIDC)” was handled by iNDEXTb. The related policy actions had been accomplished at the time of project completion, and the system is being expanded since completion by adding the applications of the Roads and Buildings Department, the Information and Broadcasting Department, the Tourism Corporation of Gujarat, and the Housing Department to the single window portal.

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
4. Strengthening the Single Window for new investments in Gujarat (excluding industrial estates under the jurisdiction of the GIDC)	<ul style="list-style-type: none"> Establishment and operation of a centralized online investment window Establish a framework for monitoring the progress of investment procedures Become the number one investment promotion agency in 	<p>[FY2017-18]</p> <ul style="list-style-type: none"> Consolidation of 51 application procedures in a newly developed single window portal Enhancement of the single window portal application system by creating a common application form Build security and online payment capabilities 	<p>[At the Mid-Term Evaluation (2018)]</p> <ul style="list-style-type: none"> A single window portal was developed, integrating 90 applications related to 16 departments. A common application form was developed for use via the single window portal, covering the information necessary to establish a company. A security system (digital locker system) and an online payment system have been established to support the online submission of required documents.

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
	India	<ul style="list-style-type: none"> Drafting and finalizing a single window portal investment procedure law <p>[FY2018-19]</p> <ul style="list-style-type: none"> Develop an online investor support/grievance redressal system. Conduct investor surveys and prepare reports on action plans to address investor concerns. Integrate at least two additional departments as part of the single window portal Establish a framework for monitoring the time required from application to approval 	<ul style="list-style-type: none"> In August 2017, the Gujarat Single Window Clearance Act was passed by the Gujarat government. Under this act, three committees - the District Level Facilitation Committee, the State Level Facilitation Committee, and the Single Window Investment Facilitation Committee - and an Investor Facilitation Agency (IFA) were established. <p>[At the Final Evaluation (December 2019)]</p> <ul style="list-style-type: none"> A grievance redressal system was developed by the Investor Facilitation Agency (IFA) in April 2018. An investor survey was conducted to provide supporting data for the Ease of Doing Business rankings. An application for Food and Civil Supplies and Panchayats from the Rural Housing and Rural Development Department was added to the single window portal. A timeline (filing history) of 90 applications related to 16 departments was displayed in the single window portal, allowing all users to view the processing status of their applications through the system. All applications are appraised within 90 days, and if they exceed this time frame, penalties are imposed on the responsible department, but as of 2019, no cases have exceeded the above timeline. <p>[At the Ex-Post Evaluation]</p> <ul style="list-style-type: none"> Since 2019, applications from the Roads and Buildings Department, the Information and Broadcasting Department, the Tourism Corporation of Gujarat, and the Housing Department have been added to the single window portal. The single window portal was fully functional at the time of ex-post evaluation.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

“Policy Item 5. Strengthening of Industrial Extension Bureau (iNDEXTb)” was handled by iNDEXTb, and the related policy actions had been accomplished at the time of project completion. The iNDEXTb has proactively provided information to investors after the project completion, including updated sector profiles for ten priority sectors and 13 new project profiles.

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
5. Strengthening of Industrial Extension Bureau (iNDEXTb)	<ul style="list-style-type: none"> Establishment of a comprehensive database with business overviews, industry information, country reports, etc. Assist investors after 	<p>[FY2017-18]</p> <ul style="list-style-type: none"> Establish a Policy Research Cell Provide policy/incentives inputs and conduct impact analysis on the policies of the 3 sectors 	<p>[At the Mid-Term Evaluation (2018)]</p> <ul style="list-style-type: none"> A Business Research Cell (BRC) was established in iNDEXTb. 23 business reports were prepared and made publicly available. A dedicated team for investment monitoring was established and an investment

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
	completion of new investment applications (e.g., obtaining approvals to start construction)	<ul style="list-style-type: none"> • Prepare and update technical information, studies/reports, project profiles, project briefs, etc. • Implement an investment monitoring and query management dashboard • Support grounding of one industrial project [FY2018-19] <ul style="list-style-type: none"> • Provide policy/incentive inputs and conduct their impact analysis on policies for 3 sectors • Prepare and update technical information, studies/reports, project profiles, project briefs, etc. • Support grounding of one industrial project • Implement recommendations for Gujarat's industrial strategy 	monitoring and inquiry management screen/system was developed <ul style="list-style-type: none"> • Assistance was provided to Swedish companies in obtaining the necessary approvals and permits to start projects. In addition, necessary assistance was provided to Korean and Indian companies [At the Final Evaluation (December 2019)] <ul style="list-style-type: none"> • Policies/incentives on Textiles Policy, Start-up policy, and Aerospace and Defense Policy were provided by the Policy Research Cell • As part of the investment attraction event "Vibrant Gujarat 2019", reports were prepared for 16 sectors. • Industrial strategies for the Automotive, Sector, the Marine Food Processing Sector, and the Pharmaceutical Sector were prepared and will be posted on iNDEXTb's website. [At the Ex-Post Evaluation] <ul style="list-style-type: none"> • Sector profiles for 10 priority sectors were updated and 13 project profiles were prepared and posted on iNDEXTb's website. • The Textile Policy and Start-up Policy were published.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

“Policy Item 6. Apex Training Institute and Training of Trainers (ToT) for Skill Development” was handled by the Labor and Employment Department, and the related policy actions had been accomplished at the time of project completion and were continuing at the time of the ex-post evaluation. The Apex Training Institute was established by reforming the existing ITIs, training programs for instructors based on the new standards were created and had been launched by the time of the project completion. As a result, four schools were selected from the existing ITIs as the state’s Apex Training Institutions (called Center of Excellences: CoEs), and eight teacher training centers were selected as equivalent institutions⁸. The institutional framework for the new state’s Apex Training Institute has been set up. These 12 schools will sustainably offer advanced technical training courses not only to instructors but also to trainees and industrial personnel. Following this, progress was delayed due in part to COVID-19, however, at the time of the ex-post evaluation, a technical cooperation project contract had been signed between GIZ and the Department of Labor and Employment in February 2022. With the support of GIZ, the development and improvement of training programs for instructors by Apex Training Institution,

⁸ The four schools designated as Centers of Excellence are (1) the Industrial Training Institute Becharaji (automotive technology), (2) the Industrial Training Center Tarsali (electrical and energy management), (3) the Industrial Training Institute Rajkot (advanced manufacturing technology), and (4) the Industrial Training Institute Gandhinagar (women (electronics and ICT).

the implementation of training programs for instructors, the expansion of training facilities, etc. have been undertaken.

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
6. Apex Training Institute and Training of Trainers (ToT) for Skills Development	<ul style="list-style-type: none"> Improvement of the quality of vocational training education through the establishment of a new state Apex Training Institute 	<p>[FY2017-18]</p> <ul style="list-style-type: none"> Develop a plan to operate the state's Apex Training Institute in a public-private partnership. Obtain accreditation from international organizations for relevant sector-specific courses. Develop benchmarking standards for teachers and students using indicators from external organizations (international organizations). <p>[FY2018-19]</p> <ul style="list-style-type: none"> Ensure that the development of the Apex Training Institute is as per the roadmap finalized. Gujarat Skill Development Mission (GSDM) under the Labor and Employment Department will manage the Apex Training Institute. 	<p>[At the Mid-Term Evaluation (2018)]</p> <ul style="list-style-type: none"> Following the approval by the Small Infrastructure Project Empowered Committee, the plan for the state Apex Training Institute was established. <p>[At the Final Evaluation (December 2019)]</p> <ul style="list-style-type: none"> The list of Industrial Training Institutions as ToT Centers was finalized along with the Draft Training Plans Private partners to run the Management Committees to support the ToT program were identified. The Director General for Employment and Training granted approval for teacher certification and authorized the start of the ToT program. The Industrial Training Institutions became affiliated with the Director General for Employment and Training of the Ministry of Labor and Employment on August 16, 2019, and the first ToT started in November 2019. The Labor and Employment Department, through the Ministry of Skill Development Entrepreneurship, requested technical cooperation from GIZ for the establishment of a State Apex Training institute and is planning to finalize a preparatory cooperation study for the implementation of the project by August 2020. <p>[At the Ex-Post Evaluation]</p> <ul style="list-style-type: none"> A list of 18 ToT centers was approved by the Ministry of Skills Development Entrepreneurship. Former industrial training institutions were reorganized into ToT centers. The above 18 ToT centers were narrowed down to 4 state Apex Training Institutions (called Centers of Excellences (CoEs)) and 8 ToT centers. These 12 schools will sustainably offer advanced technical training courses not only to instructors but also to trainees and industrial personnel. In February 2022, a technical cooperation project agreement was signed with GIZ.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

“Policy Item 7. Strengthening of Gujarat Skills Development Mission & Skills Gap Study” was handled by the Labor and Employment Department, and the related policy actions had been accomplished at the time of project completion and were ongoing at the time of the ex-post evaluation. At the time of the ex-post evaluation, skill gap surveys were underway in the

remaining 22 districts.

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
7. Strengthening of Gujarat Skills Development Mission & Skill Gap Study	<ul style="list-style-type: none"> Conduct a two-tiered state and district skill gap study Visualization of skills not traditionally recognized as skills through the implementation of skills certification programs Implementation of the National Skills Qualification Framework (NSQF) and Common Technical Codes through consultation and integration with various technical sectors Collaboration with industry (private sector) in the area of vocational training 	<p>[FY2017-18]</p> <ul style="list-style-type: none"> Conduct a two-tiered state and district skill gap study Introduce new job training programs Modification of existing training courses and curricula and elimination of outdated vocational training Reorganize training and employment-related services according to the preferences and needs of young people <p>[FY2018-19]</p> <ul style="list-style-type: none"> Conduct periodical surveys for potential new avenues in skills development on an ongoing basis Forecast skills required by industry type through skills gap analysis 	<p>[At the Mid-Term Evaluation (2018)]</p> <ul style="list-style-type: none"> Skills gap survey for 11 out of 33 districts completed. Based on the skills gap study and through discussions with various stakeholders, a list of new training courses and an action plan including the rationale for their introduction were reviewed Ongoing monitoring of the occupancy and popularity of various vocational training courses is underway A translated version of Gujarati technical books was published in December 2017 <p>[At the Final Evaluation (December 2019)]</p> <ul style="list-style-type: none"> Based on the recommendations from the skills gap study, a short course was initiated under the National Skill Qualification Framework as part of the scheme of the National Industrial Human Resource Development Program (PMKVY). District Skills Committee was organized under the SANKALP scheme Gujarat State Skills Development Plan and 12 District Skills Development Plans were formulated. <p>[At the Ex-Post Evaluation]</p> <ul style="list-style-type: none"> Skills gap study is ongoing for the remaining 22 districts. District Skills Development Plans for all 33 districts were submitted to the Ministry of Skills Development and Entrepreneurship. A new model/scheme has been developed to increase industry participation in vocational training. 2,100 young trainees are being allocated to each industry partner.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

“Policy Item 8. Acceleration of infrastructure development” involves several agencies, including the Industries and Mines Department, GIDC, and GIDB. The related policy actions had been accomplished at the time of project completion, and three small-scale infrastructure projects (infrastructure development in the Mandal Becharaji Special Investment Region) were still under implementation at the time of the ex-post evaluation (Table 2).

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
8. Acceleration of infrastructure development	<ul style="list-style-type: none"> Prioritization and budget allocation for small infrastructure projects by the Small Infrastructure Project Empowered 	<p>[FY2017-18]</p> <ul style="list-style-type: none"> Pool funds for the implementation of priority small infrastructure projects based on the budget 	<p>[At the Mid-Term Evaluation (2018)]</p> <ul style="list-style-type: none"> Six priority small infrastructure projects were selected by the Small Infrastructure Project Empowered Committee. A project progress monitoring matrix for small infrastructure projects was

Policy Items	Achievement Target	Policy Action	Status of Policy Action (Summary)
	Committee • Facilitate appropriate monitoring and implementation by agencies	• Selection of priority small infrastructure projects by the Small Infrastructure Project Empowered Committee • Development of the Project Progress Monitoring Matrix • Promotion of the implementation of priority small infrastructure projects in accordance with the Project Progress Monitoring Matrix [FY2018-19] • Facilitate implementation of the priority small infrastructure projects in accordance with the established Project Monitoring Matrix	developed. [At the Final Evaluation (December 2019)] • The implementation of six sub-projects was promoted using the Project Progress Monitoring Matrix. [At the Ex-Post Evaluation] • As for the six small infrastructure projects selected, three projects under the jurisdiction of GIDC have been completed, and three projects under the jurisdiction of the Mandal Becharaj Special Investment Region Development Authority (MBSIRDA) are under implementation.

Source: Documents provided by JICA, and Questionnaire responses from Gujarat executing agencies and related organizations.

Table 2 Small Infrastructure Projects

No.	Small Infrastructure Project	Executing Agency	Project Period	Status at the time Ex-Post Evaluation
1	Sanand II Connectivity Roads	GIDC	2019-2020	<ul style="list-style-type: none"> Connectivity Road: 17.1 km (2 lanes) Construction of a section (200-400m of the existing village road) has not yet started because the land acquisition procedure with residents along the road has not been completed.
2	Khorai Estate (Sanand III) Internal Road Network	GIDC	2019-2020	<ul style="list-style-type: none"> Internal Road: 36.87 km (2 lane) 1.2 km of road is not completed due to delay in land acquisition.
3	Bhagapur Estate Infrastructure (Excluding power facilities)	GIDC	2018-2020	<ul style="list-style-type: none"> Internal Road: 11.0 km (2 lane) Water supply facilities (water storage facilities, water pipes, etc) Street light poles: 454 units Tree plantation: 6,000 trees
4	Mandal Becharaji Special Investment Region (MBSIR) -External Road Connectivity in Cluster A	Road and Bridge Department / MBSIRDA	2019-2025	<ul style="list-style-type: none"> DP Road: 36.6 7km (4 lane) 600 access road from state highway to hospital building TP Road: 68 km DP Road TP2 & TP3: 35.98 km (4 lane)
5	MBSIR- Physical Infrastructure (Phase 1)	MBSIRDA	2022-2025	<ul style="list-style-type: none"> Water treatment plant, Sewerage treatment plant, Water and sewerage network, Industrial effluent network, etc.
6	MBSIR-Physical Infrastructure (Phase 2)	MBSIRDA	—	<ul style="list-style-type: none"> Improvement of storm water network

Source: GIDC and the Mandal Becharaj Special Investment Region Development Authority (MBSIRDA)

Note: DP (Development Plan), TP (Town Planning)



Connecting Road to Sanand II Industrial Estate



Internal Road of Sanad III Industrial Estate (Khorai Estate)



DP Road in Mandal Becharaji Special Investment Region

Source: Photos taken by evaluator (March 2022).

2) Project Implementation Structure

Each policy action was carried out by the respective related departments and agencies of the state government (the Industries and Mines Department, GIDB, the Labor and Employment Department, iNDEXTb and GIDC). The PMC meeting, chaired by the Principal Secretary in charge of the Industry Department and composed of Secretary-level representatives of related departments and agencies, was held approximately once a quarter (5 meetings in total) to review the progress of policy actions and evaluate the status of achievement. Based on this, the loan was executed three times in March 2018, February 2019, and February 2020. In addition to officials from JICA, JETRO officials also attended the PMC from the Japanese side. Issues raised by the Japanese side were shared with the Finance Department and related agencies, and necessary actions were taken accordingly.

Before the PMC, the Small Infrastructure Project Empowered Committee met to select eligible subprojects and approve funding. During the project period, the Committee met a total of four times. JICA, in cooperation with JETRO, used various opportunities, including PMC meetings, to lobby the state government to include infrastructure development around the industrial parks where Japanese companies were expanding, and for which there is a strong demand, in the state government’s list of priority infrastructure projects, and to steadily implement the projects once they are on the list. As a result, small-scale infrastructure projects reflecting Japanese proposals were implemented.

In addition, to support the Program Implementation Unit (PIU) established in the Finance Department, JICA supported the project implementation of the Gujarat Investment Promotion Program. According to the Finance Department, the support of the JICA experts (consultants) dispatched for the PMC was of great help to the PIU in fulfilling its responsibilities, as it enabled the PIU to smoothly communicate and coordinate with the related departments and agencies and monitor their progress. Additionally, a representative from JICA’s India office attended every PMC to hold policy dialogue with related state government agencies. The timely guidance and advice from JICA helped the executing agencies and related organizations to implement the program more efficiently and move toward the realization of faster results. Thus, the evaluation

of the project was that JICA provided support at various levels when necessary, based on its extensive experience and expertise in project management, including the Support for Project Implementation on the Gujarat Investment Promotion Program, which led to the smooth implementation of the project.

3.2.2 Impacts

3.2.2.1 Intended Impacts

1) Improve Capacity of State Governments to Implement Infrastructure Projects

The Small Infrastructure Project Empowered Committee plays a crucial role in the policy to accelerate infrastructure development. Six small infrastructure projects have been approved and implemented by the Committee to develop infrastructure in and around industrial parks, especially for Japanese companies. The progress of these six small infrastructure projects has been managed using a project management matrix. Therefore, with the approval of small infrastructure projects through the mechanism of the Small Infrastructure Project Empowered Committee as well as progress management using the project management matrix, it is considered that the project has contributed to improving the capacity of the state government to implement state infrastructure projects to a certain extent.

Meanwhile, in this project, (i) the Ministry of Finance put together a budget plan to allocate yen loans to small infrastructure projects on a priority basis and provided budgetary support, and the timely execution⁹ of budgets was made for sub-projects approved by the Small Infrastructure Project Empowered Committee; (ii) the procurement of small infrastructure-related consultants and contractors was carried out in accordance with the procurement procedures established by the Government of Gujarat, rather than JICA procurement guidelines. This is considered to be one of the major factors that enabled the smooth implementation of the infrastructure projects. Six small infrastructure projects were planned and implemented during the project period, exceeding the planned five projects, and three of these had been generally completed at the time of project completion.

2) Increase in FDI in Gujarat¹⁰

Table 3 shows the amount of FDI in Gujarat, which increased continuously from 2017/18 to 2020/21, surging to 16,283 billion rupees in 2020/21, or 278% over the previous year (in rupees). This represented 37% of India's total FDI in 2020/21, attracting the most significant investment

⁹ In the case of Program Loans (Development Policy Loans) such as this project, the loan funds disbursed by JICA to the partner government can be freely used by the partner government for public spending in general once they go into the national treasury, and the institutional rule is that there is no need to tie loan funds to a specific project or use.

¹⁰ Data on the amount of FDI, the number of investments, and the number of applications in Gujarat were not disclosed by the Gujarat government, and it has been difficult to obtain data from the executing agencies and related organizations. Therefore, the analysis was based mainly on publicly available information, such as from India's Ministry of Commerce and Industry.

in the country. About 94% of the investment in the state in 2020/21 was in the computer hardware and software sector, with Gujarat alone accounting for 78% of total domestic investment in this sector. In 2021/22, this figure decreased to 201.7 billion rupees, partly due to COVID-19. Even under these circumstances, the Gujarat state government continued to make efforts, such as signing a memorandum of understanding¹¹ for 20 investment projects worth 241.85 billion rupees in November 2021, before the investment attraction event "Vibrant Gujarat 2022" scheduled to be held in January 2022. The government continues to focus on promoting foreign investment and attracting companies to the region.

Table 3 FDI in Gujarat

Unit	2017/18	2018/19	2019/20	2020/21	2021/2022
Million Rupees	134,560	126,180	429,760	1,628,300	201,690
Million US Dollars	2,091	1,803	6,052	21,890	2,706

Source: Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry.

Note: India's fiscal year is 12 months from April to March

Table 4 shows the number of offices of Japanese companies in Gujarat. The decrease in the number of locations in 2019 compared to 2018 can be attributed to a reduction in directly managed offices (branches, sales offices, sub-branches, etc.) owned by companies that are no longer included in the scope due to the deduction of investment ratio or liquidation, as well as the decline in locations due to the consolidation of Indian offices as a result of mergers and acquisitions. There was no significant change in the number of locations of Japanese companies in the state from 2019 to 2020.

Table 4 Number of Locations of Japanese Companies in Gujarat

	2017	2018	2019	2020
Number of Japanese Companies in Gujarat	321	383	348	345

Source: JETRO

Note: The number of locations of Japanese companies is defined as: (1) representative offices, branch offices, etc. of Japanese companies (companies not incorporated in India), (2) locally incorporated Japanese companies (wholly owned subsidiaries and joint ventures) ((i) headquarters, head office, etc., (ii) production plants, (iii) branches, sales offices, sub-branches, etc.) (only directly managed offices, excluding dealers, sales agents, sales offices, etc. under franchise or license agreements), and (3) locally incorporated companies started by Japanese nationals in India.

According to interviews¹² with the Industries and Mines Department and iNDEXTb conducted by JETRO, the reasons for the increase in FDI in Gujarat were: (i) Gujarat consistently ranks among the top states in India in the Ease for Doing Business Report, with good access to roads and ports and a stable power supply; (ii) Gujarat's GDP accounts for about 8% of India's total GDP, and the state's automotive, heavy industry, chemical and petrochemical, pharmaceutical and medical equipment, and service industries are driving the state's economy

¹¹ JETRO Business Tanshin (Nov. 29, 2021) (<https://www.jetro.go.jp/biznews/2021/11/289091d7199e0f70.html>).

¹² JETRO Business Tanshin (July 06, 2020) (<https://www.jetro.go.jp/biznews/2020/07/b908cf8298ea7218.html>).

and the Indian economy; (iii) the management and operation of major industrial parks under the leadership of GIDC, securing more than 33,000 hectares of project sites in major areas of the state and providing basic infrastructure; (iv) the single window investment portal established by iNDEXTb that enables smooth one-stop approval procedures for all online applications and approvals to attract foreign companies to invest in the country; (v) information dissemination through exchanges of opinions with foreign investment promotion agencies and the holding of “Vibrant Gujarat,” India’s largest event for attracting foreign investment. In addition, Gujarat is the birthplace of Prime Minister Narendra Modi¹³, who has used the annual “Vibrant Gujarat” as an opportunity to make a sales pitch to attract investment and business to the state, which has probably contributed to the increase in FDI in Gujarat.

Strengthening the investment promotion capacity of GIDC and iNDEXTb was one of the important policy items of the project, and in this regard, the project seems to have made a certain contribution to the increase in FDI in Gujarat.

3) Improve Business Satisfaction of Foreign Companies, including Japanese Companies, through an Enhanced Investment Environment

In the State Investment Potential Index¹⁴ published by the National Commission for Applied Economic Research (NCAER) of India, Gujarat is among the top three highest-ranked states, ranking first in 2016, first in 2017, and third in 2018 (rankings after 2019 have not been published). In addition, Gujarat has ranked first in the Ministry of Commerce and Industry’s LEADS¹⁵ index for the past three consecutive years (2019-2021) due to its well-developed road network that facilitates the easy and rapid movement of cargo and passengers. On the other hand, in the Ease of Doing Business Report published by the Ministry of Commerce and Industry, Gujarat dropped from 3rd in 2016 to 5th in 2017 and 10th in 2019 (rankings for 2018 and beyond 2020 have not been published). The reason for this is that other states have also been actively attracting foreign investment and have taken various measures to improve their investment environment. Although Gujarat itself has made steady progress in improving its investment environment, it is considered that the Ease of Doing Business rank for the past three years from 2019 has continued to have dropped in relation to other states.

According to the local Japanese companies interviewed, Gujarat has advantages: in that the industrial estates owned by GIDC have large sites of more than 30 acres; and the state has fewer problems with power and water than other states. The JETRO Ahmedabad office also

¹³ Narendra Modi served as Prime Minister of Gujarat from 2001 to 2014.

¹⁴ The State Investment Potential Index ranks the competitiveness of Indian states in six areas: land, labor, infrastructure, economic environment, political stability and governance, and business perceptions.

¹⁵ The Logistic Ease Across Different States (LEADS) Index, developed by the Ministry of Commerce and Industry in 2018, evaluates regions in terms of planning support to facilitate commodity trade. The criteria are based on eight parameters, including price competition, availability of infrastructure and services (Services, Time, Track and follow, Infrastructure, Property security, Price competition, Operating environment, and Regulatory process).

recognized that since the Modi administration took office, the Gujarat government has been promoting the digitalization of investment activities and the centralization of contact points and that professional responses in attracting investment has progressed. This includes publicity and attraction through the single window investment portal and the establishment of a dedicated contact point for major investing countries, including a dedicated Japanese investment contact point (Japan Desk).

Regarding grievance redressals, iNDEXTb received 2,840 complaints in 2019/20, 2,288 in 2020/21, and 3,321 in 2021/22. These were mainly related to technical issues of the website (operating procedures, delays in presenting statistical data, website design, etc.) and issues related to payment methods (bank transfer methods, etc.). Grievances are sent by iNDEXTb to the relevant departments for individual action; of the 2019/20 cases, 90% of the 2,840 complaints were resolved, while the remaining 10% are pending because no formal documentation was submitted by the company that filed the complaint. In addition, as a result of this project, satellite offices managed by GIDC have been established in Sanand Industrial Estate and Mandal Industrial Estate, and these offices also directly receive requests from companies in the industrial parks and provide the necessary responses.

From the above, it can be assumed that the responses and services provided to foreign companies by GIDC and iNDEXTb have improved to a certain extent. However, the local Japanese companies interviewed had already established business bases in Gujarat, so they said they did not know what changes had taken place in the application and licensing procedures (ease and speed of processes, etc.) for new investment before and after the implementation of this project. As a result, specific answers were not obtainable. In addition, one local Japanese company pointed out that compared to industrial parks managed by private companies, those managed by GIDC often do not always provide sufficient support to companies that have moved in, and that the communication between the representative satellite office and the companies that have moved in needs to be improved. Some companies said¹⁶ that the satellite offices do not have sufficient authority and that, in some cases, essential matters require direct negotiation and discussion between the resident companies and officials of the GIDC.

Regarding industrial human resources, since the establishment of the State Apex Training Institute and the start of activities to improve the quality of vocational training education only fully began in February 2022, the effect of the project on industrial human resources development had not yet been emerged at the time of the ex-post evaluation. The Gujarat government's guidelines on local employment require that at least 85% of employees be from the state. The Japanese-affiliated firms we interviewed have always given priority to securing high-quality local workers, and although they sometimes hire graduates of state vocational

¹⁶ JETRO Ahmedabad Office has signed a Memorandum of Understanding (MOU) with the Gujarat State Government to support smooth communication between local Japanese companies and GIDC.

training institutions as on-site leaders, they have a perception that there is a lack of human resources for executive candidates in the local plants. Several Japanese-affiliated companies have established the Japan-India Institutes for Manufacturing (JIM)¹⁷ and are training cadres in cooperation with Gujarat Institute of Technology. The development of industrial human resources will continue to be a priority issue.

From the above, it can be seen that Gujarat's competitiveness ranks high in India according to various surveys conducted by the Indian government and that the responses and services provided to foreign companies by the GIDC and iNDEXTb have improved to a certain degree. Therefore, it is considered that this project has made some contribution to improving the business satisfaction level of foreign firms, including Japanese firms, by improving the investment environment. On the other hand, the project's impact on the development of industrial human resources was not yet evident at the time of the ex-post evaluation and, therefore, will need to be confirmed from a mid-to-long-term perspective.

3.2.2.2 Other Positive and Negative Impacts

1) Impacts on the Natural Environment

The project is considered to fall under Category C in *the JICA Guidelines for Environmental and Social Considerations* (2010), as it was judged that the undesirable environmental impacts of the project were minimal. The executing agencies of the small infrastructure projects, such as GIDC and the Mandal Bechraj Special Investment Region Development Authority (MBSIRDA), hired environmental consultants to look into the necessary environmental considerations, including environmental monitoring during construction work. No negative impacts on the natural environment associated with the construction of small-scale infrastructure projects have been identified.

2) Resettlement and Land Acquisition

Of the six small infrastructure projects, except for the connecting road to Sanand III (Khoraj) Industrial Estate, no land acquisition or resettlement has occurred, as the works are within industrial estates owned by government agencies such as GIDC and MBSIRDA. The connecting road to Sanand III (Khoraj) Industrial Estate is a widening of an existing road of approximately 17 km in length, and the land was acquired in accordance with Indian domestic laws and Gujarat government regulations. The 200-400m section of the road that crosses the village has not yet been constructed as a one-lane village road, as the land acquisition has not

¹⁷ The Japan-India Institutes for Manufacturing (JIM) is a human resource development institute established by Japanese companies in India, based on the Manufacturing Skill Transfer Promotion Programme agreed upon between the leaders of Japan and India in November 2016, in order to cooperate in human resource development in the Indian manufacturing industry. JIM offers a curriculum for the acquirement of Japanese-style manufacturing concepts and skills. As of April 2022, there were a total of 22 JIMs in India accredited by METI, including two in Gujarat.

yet been completed. At the time of the ex-post evaluation, negotiations between GIDC and residents were underway for land acquisition procedures.

3) Gender Equality

Since the planned vocational training and employment assistance were not fully implemented during the project period, the impact related to gender could not be observed.

In summary, of the eight indicators of quantitative effects, five were achieved or nearly achieved, one was not achieved, and two were of unknown achievement. As for qualitative effects, the policy actions planned in the project's policy matrix had been achieved at project completion, and the achievement status was continuing at the time of the ex-post evaluation. The project seems to have contributed to a certain extent to improving the state government's capacity to implement infrastructure projects and to increase FDI in Gujarat. It may also have made a certain contribution to enhancing the business satisfaction level of foreign companies, including Japanese companies, by improving the investment environment. On the other hand, some issues were identified, such as the need to improve the communication system between GIDC and the industrial park companies and to strengthen the authority and functions of the representative offices (satellite offices). No negative impact on the natural environment was identified as a result of the project, and although some land was acquired for road widening, the project was implemented following Indian domestic laws and Gujarat government regulations.

In light of the above, this project has mostly achieved its objectives. Therefore, the effectiveness and impacts of the project are high.

3.3 Sustainability (Rating: N/A)

3.3.1 Policy and System

As noted in "3.1.1.1 Consistency with Development Plan of India," the Gujarat government's development plan *Sustainable Vision 2030 for Gujarat (Vision 2030)* at the time of the ex-post evaluation identifies the promotion of private investment and improvement of the investment environment as priority areas. *The Gujarat Industrial Policy 2020* (formulated in August 2020) encourages further investment in the state, having announced 400 billion rupees in investments over the next five years to make the state a global business hub for sustainable manufacturing and service industries.

Therefore, no issues have been observed in the policy/system aspect necessary for sustaining the project effects.

3.3.2 Institutional/Organizational Aspect

The following agencies are responsible for the continuation of the results of each policy action

of the project after project completion.

[Gujarat Industrial Development Corporation (GIDC)]

GIDC was established under the Gujarat Industrial Development Act, 1962, with the objective of promoting industrialization in Gujarat. The major functions of GIDC are (i) development of infrastructure such as industrial estates, (ii) land allocation, (iii) development of Special Industrial areas (SIs) and Special Economic Zones (SEZs) across the state, (iv) e-government, and (v) the launch of various schemes for micro and small enterprises. GIDC owns 248 industrial estates on 33,441 hectares of land in Gujarat. GIDC has established a single window investment portal for the approval of new investments, and the operation and expansion of industrial parks owned by GIDC. It will continue to use this online system to simplify and expedite various investment applications and approval procedures, as well as to develop industrial parks and other infrastructure necessary to improve the investment environment.

[Mandal Becharaji Special Investment Region Development Authority (MBSIRDA)]

MBSIRDA is an organization established under the 2009 Gujarat Special Investment Region Act to implement development planning and urban planning schemes for the Mandal Becharaji Special Investment Region and to develop social infrastructure (roads, utilities, connectivity, etc.) in accordance with the investment objectives of the project. MBSIRDA is in charge of infrastructure development in the Mandal Becharaji area, which is one of the small infrastructure project targets of this project, and construction is underway for completion in 2025.

[Industrial Extension Bureau (iNDEXTb)]

iNDEXTb is the investment promotion agency of the State of Gujarat, focusing on investor facilitation, support, and grievance redressal, and serves as an interface and point of contact between investors and the government for the establishment of industrial ventures. The broad scope of work includes (i) organizing national and international exhibitions, campaigns, events and conducting research into potential investors to attract investment; (ii) facilitating strategic partnerships for joint ventures and industrial projects between various companies and the Gujarat state government, and informing investors about the rules and regulations related to industrial investment in the state; (iii) preparing and providing location analysis for investors covering key information such as location, land costs, infrastructure costs, the availability of human resources, distance to cities, etc., identifying potential investment sites and arranging site visits, assisting in the acquirement of land through lease or purchase; (iv) assistance through the establishment of investment contact points (country desks) offices in 29 countries, and (v) the creation and publication of sector profiles for the 14 priority areas, providing information to potential investors on investment, location, availability of raw materials, etc.

iNDEXTb currently has 47 staff members, sufficient to carry out its work. In addition, the regular training of staff is conducted to keep them informed of the latest market trends. iNDEXTb continuously works to improve the investment promotion environment, including strengthening the investment portals.

[Gujarat Infrastructure Development Board (GIDB)]

GIDB was established in 1999 under the Gujarat Infrastructure Development Act (amended in 2006) and functions as an advisory body for PPP projects in the state. GIDB also serves as the coordinating body for the Delhi-Mumbai Industrial Corridor Initiative. Furthermore, GIDB has been designated as the apex body under the Gujarat Special Investment Regions Act (2009) and given the role of regulator for all Special Investment Regions (SIRs) in the state. The scope of work of GIDB includes: (i) overall planning within Gujarat; (ii) coordination among specific sectors; (iii) approval of concession agreements in public-private partnerships; (iv) project preparation by conducting pre-feasibility and feasibility studies; (v) selection of developers through international competitive bidding, etc., (vi) monitoring of project progress; and (vii) capacity building of human resources and organizations in the infrastructure sector to meet international benchmarks.

GIDB continues to work on capacity building on an ongoing basis, including organizing capacity-building seminars for government officials in the area of PPP.

[Gujarat Skill Development Mission (GSDM)]

GSDM was established in February 2009 as an agency under the Labor and Employment Department and serves as the apex body for monitoring, coordinating, and focusing on the skills development and entrepreneurial activities that lead to employment in Gujarat. The aim of GSDM is to provide vocational training and employment services to the state's youth. It has a staff of 35 employees. With the support of GIZ, GSDM is developing and improving vocational training education programs, conducting the training of teachers, and improving training facilities.

No issues have been observed in the institutional/organizational aspect necessary for sustaining the project effects.

3.3.3 Preventative Measures to Risks

From March 2020, activities related to training and other industrial human resource development had to be suspended due to the urban lockdown and activity restrictions imposed in the state of Gujarat during the COVID-19 pandemic. The construction of small infrastructure projects was also suspended for the same reasons. On the other hand, the iNDEXTb continued

its investment promotion activities despite COVID-19, including the annual "Vibrant Gujarat" investment promotion event for foreign investors, which was held online during this period.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to encourage policy and institutional improvement in Gujarat State in West Central India through financial support with regard to private investment promotion including FDI, industrial advancement and skill development, as well as to improve the investment climate for the development of infrastructure in the state, including roads, electric power, and water, thereby contributing to increased private investment such as FDI in the state. The project was consistent with the development plan and development needs at the times of appraisal and ex-post evaluation. The project plan and approach were appropriate. There was also collaboration with donors such as the World Bank and GIZ. Therefore, the relevance and coherence of the project are high.

Five of the eight operation and effect indicators were generally achieved, and all planned policy actions had been accomplished by project completion with those achievements maintained at the time of the ex-post evaluation. The project seems to have made a certain contribution to improving the state government's capacity to implement infrastructure projects and increase FDI in Gujarat. The project may also have contributed to enhancing the satisfaction of foreign companies doing business in the state, including Japanese companies, by improving the investment environment. No negative impact of the project on the natural environment was observed. Although there was some land acquisition for small-scale infrastructure projects, this was implemented in compliance with Indian domestic laws and the regulations by the Gujarat government. The project has mostly achieved the expected outcomes, and the effectiveness and impacts of the project are high. No issues have been observed in the policy/system and institutional/organizational aspects of operation and maintenance, and risks have been well mitigated.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

The Labor and Employment Department delayed concrete progress in strengthening the state's apex training institute due to the COVID-19 pandemic, but in February 2022, a GIZ technical cooperation project was launched, finally creating an environment for sustaining and expanding the outcome of this project, with the development and improvement of vocational training education programs, the provision of training for instructors, and the improvement of training facilities. The Labor and Employment Department is expected to work in close cooperation with GIZ to ensure that the technical cooperation project will continue to produce solid results.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

1) The Necessity of Developing and Supporting an Implementation Structure for Smooth Project Execution

Since this project involved several executing agencies and related organizations in Gujarat, a PMC was established, chaired by the Principal Secretary in charge of the Industry Department and composed of Secretary-level representatives of related departments and agencies of the state government, to regularly monitor and evaluate policy actions. In addition, a PIU set up in the Finance Department served as the secretariat to liaise with related agencies. In India, which is generally known for its strong bureaucracy, inter-ministerial coordination is a painstaking task. In this project, JICA experts (consultants) were dispatched to the PIU of the Finance Department for the Support Project Implementation of the Gujarat Investment Promotion Program and provided support for coordination with each executing agency, for project progress management, and so on. In addition, a representative from JICA's India Office also attended each PMC to provide guidance and advice, as well as policy dialogue with related agencies.

In order to achieve smooth progress in projects involving multiple related organizations, such as Program Loans (Development Policy Loans), it is desirable that JICA experts are dispatched to support coordination between the executing agencies and related organizations and to monitor project progress. In addition, staff at the management level of JICA (JICA overseas offices and JICA headquarters) should actively engage in regular dialogues with implementing agencies and related organizations, as well as in project management and progress monitoring.

2) Public-private All-Japan Effort

As a result of the public-private all-Japan effort, from project formulation to implementation monitoring, the project generated project effects and impacts that have benefited Japanese companies in Gujarat. Prior to this project, METI conducted a study on improving the investment environment in Gujarat to help local Japanese companies. Based on the results of this earlier study, JICA managed the project's progress during project formation and implementation in collaboration with the JETRO office and local Japanese companies. For example, based on the development needs of Gujarat and as a priority candidate for a small infrastructure project, Japan proposed to the state government the development of infrastructure around an industrial estate where many Japanese companies were expanding. This was adopted. The JICA India office and the JETRO office also participated in the PMC during project implementation to monitor and confirm the progress of each policy action, and this information was shared with local Japanese

companies. As a result, the project not only improved the investment environment in Gujarat but also benefited local Japanese companies.

As seen above, JICA can formulate and implement projects that benefit not only the target countries but also Japanese companies by exchanging information with other government agencies and private companies, and utilizing the results of the discussions in Program Loans (Development Policy Loans) projects that support the promotion of investment and institutional reforms in specific sectors.

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

Since the conclusion of the "Memorandum of Cooperation on Public-Private Cooperative Actions towards Further Development of Gujarat between METI and the State Government of Gujarat" in January 2015, METI has held policy dialogues with the Gujarat government three times and has focused on building relationships with Gujarat as a strategically important state. METI has also conducted a study on improving the investment environment in Gujarat to benefit local Japanese companies and has analyzed issues related to the promotion of investment in the state. In forming the project proposal, based on the results of the METI survey mentioned above, JICA considered the requests of JETRO's local office, Japanese companies and Japanese associations operating in Gujarat and reflected these requests in the policy matrix (these included such requests as for the establishment of a single window portal by GIDC, strengthening of the authority of the local GIDC representative office in Mandal Becharaji area, and strengthening the capacity of the state vocational training school, etc.). Meanwhile, JICA also held discussions and dialogues with executing agencies and related organizations in Gujarat to identify policy items and areas for improvement, set policy actions, and operation and effect indicators, and so on. The policy matrix was developed through consultation and consensus building with the Gujarat state government.

In the selection of small infrastructure projects during project implementation, the Japanese side proposed to the Gujarat government the development of infrastructure centering on the construction of roads, water, sewage, and lighting facilities in and around industrial estates (Mandal, Sanand II, and Sanand III Industrial Estates) where Japanese companies were expected to be operating or moving in, and this proposal was adopted.

In addition, PMCs were held regularly (once a quarter) to monitor the progress of the project, and JICA and JETRO local offices participated from the Japanese side to monitor the progress of policy actions. This information was also shared with local Japanese companies.

Thus, when formulating the policy matrix and considering small infrastructure projects, JICA exchanged opinions with, and ask requests from METI, the JETRO office, and local Japanese

stakeholders (local Japanese companies, Japanese associations, etc.). After this, the policy matrix was created, and small infrastructure projects with a high potential for benefits to Japanese companies were selected. During the implementation of the project, JICA also collaborated with the JETRO office to confirm the progress of the policy actions and disseminated information to the private sector to share the progress of the project and promote collaboration.

(End.)