United Mexican States

FY2023 Ex-Post Evaluation Report of Technical Cooperation Project

"Project for Automotive Supply Chain Development in Mexico"

External Evaluator: Hajime Sonoda, Global Group 21 Japan, Inc.

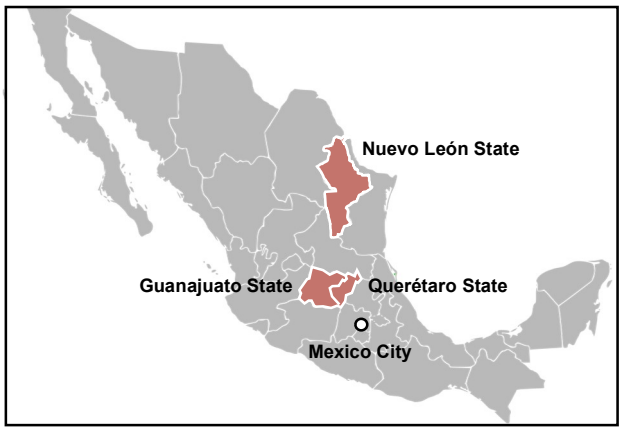
0. Summary

The "Project for Automotive Supply Chain Development in Mexico" (technical cooperation: hereinafter referred to as "the Project") was implemented from October 2012 to October 2015 with the overall goal of "strengthening of Mexican automotive supply chain" and the project purpose of "strengthening of mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) in the target states (Guanajuato, Nuevo León, and Querétaro)." [1] The project plan and approach are appropriate and consistent with the development plans and needs of Mexico and the target states both at the time of planning and at the time of completion. The Project is consistent with Japan's ODA Policy at the time of planning and has synergistic effects with other JICA projects as well as specific collaboration effects with JETRO (Japanese External Trade Organization) and Japanese companies. Therefore, relevance and coherence of the Project are high. Most of the planned outputs of the Project were achieved, although the update of the "Mexican Automotive Supplier Directory" and the results dissemination seminar were partially unachieved. Many of the Mexican companies that received technical assistance such as Kaizen support through the Project and many of the companies that participated in the state government business matching meetings have achieved new or increased business with Japanese Tier-1 suppliers, and it is judged that the project purpose has been achieved. After the completion of the Project, based on its results, the state governments and the automobile cluster associations in the three target states continued to provide support to the automobile industry, including business matching and Kaizen support, thereby contributing to the achievement of the overall goal of the Project. Therefore, the effectiveness and impact of the Project are high. Project cost exceeded the plan, the project period was as planned, and some of the outputs were not in line with the plan due to the change of administration and other factors. Therefore, the efficiency of the Project is moderately low. There are no issues regarding the sustainability of the Project in the policy and system, institutional/organizational, technical, and environmental and social aspects and preventive measures to risks. In terms of finance, although each state budget is limited, there are no serious challenges, given the policy importance of promoting the automotive industry in each state and the efforts being made by the automotive cluster associations to become self-financing. Therefore, the sustainability of the Project is high. In light of the above, the Project is evaluated to be highly

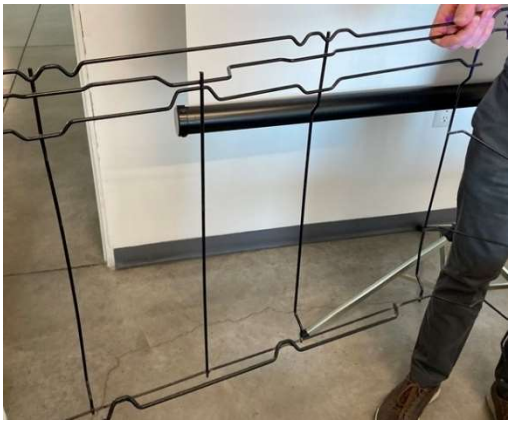
[1] Auto parts suppliers that deliver directly to complete vehicle manufacturers are called Tier-1 suppliers, and parts suppliers that deliver to Tier-1 suppliers are called Tier-2 suppliers. The Project mainly deals with strengthening the supply chain by Mexican Tier-2 suppliers to Japanese Tier-1 suppliers in Mexico. Although there are many foreign Tier-2 suppliers in Mexico, the Project in principle targets Mexican Tier-2 suppliers, which are local companies.

satisfactory.

1. Project Description



Project Locations



An example of auto parts produced by a target company (parts for car seat) (Photo taken by the evaluator)

1.1 Background

The debt crisis of 1982 triggered Mexico's shift to a path of reform and openness to the outside world. In 1986, Mexico lowered tariffs and deregulated imports, and proceeded with reforms such as easing restrictions on foreign investment, privatizing state-owned enterprises, and liberalizing the financial sector. Taking advantage of its proximity to the giant market of the U.S., Mexico became a manufacturing and export base, and its accession to the North American Free Trade Agreement (NAFTA) in 1994 further accelerated these trends. Subsequently, it concluded free trade agreements with several countries, including the Japan-Mexico Economic Partnership Agreement, which was signed in 2004 and entered into force in 2005.

Mexico ranked 8th in the world in automobile production (2.56 million vehicles/year) and 5th in its exports in 2011, and Japanese automakers (Nissan, Honda, Toyota, Hino, Isuzu) had production plants in Mexico. Mazda decided to build a plant in Mexico in 2011, and other Japanese automakers also decided to expand their production bases not only in the North American market but also in the Mexican and Brazilian market in South America. In conjunction with these decisions, Japanese auto parts suppliers have been rapidly expanding their operations in Mexico. These Japanese automakers have been facing the challenge of increasing the local procurement rate to improve production efficiency and reduce costs, as well as to obtain tariff exemptions under NAFTA.[2] The Japanese auto components suppliers (Tier-1) was trying to increase production by Mexican auto parts suppliers (Tier-2) with which it already had business and to find new Tier-2 suppliers in preparation for the automakers' production increase plan, but

[2] Automobiles receiving tariff exemptions under NAFTA were required to procure at least 62.5% of their components from within the region, i.e. Mexico, the U.S., and Canada.

local procurement from the Mexican suppliers remained below 30%. On the other hand, the Mexican Tier-2 suppliers were not able to fully make use of the potential for industrial development associated with the expansion of the automotive industry.

Against this background, the Project was implemented in the states of Guanajuato, Nuevo León, and Querétaro for three years from October 2012 to October 2015 with the state governments and ProMéxico as implementing agencies,[3] with the project purpose of "mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) are strengthened."

1.2 Project Outline

Overall Goal		Mexican automotive supply chain is strengthened.
Project Purpose		Mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) are strengthened.
Outputs	Output 1	System of providing local auto parts suppliers (Tier-2) with support service to strengthen automotive supply chain is strengthened in each State government.
	Output 2	Loal auto parts suppliers (Tier-2) become capable of maintaining Kaizen of QCD to have them involved in the supply chain of the Japanese auto products.[4]
	Output 3	Database is enhanced to have potential local auto parts suppliers (Tier-2) systematically and smoothly recommended to model Japanese auto component suppliers (Tier-1)
	Output 4	Participating local auto parts suppliers (Tier-2) and staff of the State governments enhance their understandings of Japanese business practice and Kaizen.
	Output 5	Opportunities for business matching between Japanese auto component suppliers (Tier-1) and potential local auto parts suppliers (Tier-2) are increased.
Total cost (Japanese Side)		766 million yen
Period of Cooperation		October 2012 – October 2015
Target Area		States of Guanajuato, Nuevo Leon, Querétaro, Mexico City
Implementing Agency		State Governments of Guanajuato, Nuevo Leon, and Querétaro ProMéxico
Other Relevant Agencies/ Organizations		None
Organization in Japan		Japan Development Service Co., Ltd.

[3] ProMéxico was established under the Ministry of Economy by presidential decree in June 2007, and supported export procedures for companies in Mexico and coordinated services related to attracting foreign investment.
[4] QCD refers to Quality, Cost, and Delivery.

Related Projects	Technical cooperation of JICA: "Project for Automotive Cluster Promotion in Mexico" (JICA, 2018 – 2024) "The Project for Human Resource Development for the Automotive Industry in El Bajio of Mexico" (JICA, 2015 – 2020) "Project for Human Resource Development in the Technology of Plastic Transformation" (JICA, 2010 – 2014) Projects by other donors: "Mexico Auto Parts Support Industry Formation Project" (JETRO, 2002 – 2010) "Supply Chain Development Program" (UNDP, 2002 – 2012)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

Although there are delays in some activities, they are expected to be completed by the time of the project completion, and therefore the project goals are expected to be met.[5]

1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation (including other impacts)

The effectiveness of the Project has been confirmed in increasing business of Mexican Tier-2 suppliers with Japanese Tier-1 suppliers and starting new businesses of Mexican Tier-2 suppliers. While, steady implementation of the master plan after project completion is a prerequisite for the realization of the overall goal. It is difficult to foresee the achievement of the overall goal in three to five years, since it takes time for Kaizen activities to become widespread in the industry.

1.3.3 Recommendations from the Terminal Evaluation

Recommendations were made regarding the following:

- Handover of the master plan and the action plan to the new administration (Querétaro and Nuevo León)
- Steady implementation of the master plan and deepening of public-private partnerships for this purpose
- Revision of the master plan according to the needs of the industry
- Promotion of information sharing between Japanese Tier-1 suppliers and Mexican Tier-2 suppliers
- Continued operation of the Mexico Automotive Supplier Directory and its dissemination to other states

2. Outline of the Evaluation Study

2.1 External Evaluator

Hajime Sonoda (Global Group 21 Japan, Inc.)

[5] The terminal evaluation was conducted in July 2015.

2.2 Duration of Evaluation Study

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

Duration of the Study: September 2023 - January 2025

Duration of the Field Study: February 5-19, 2024 and July 27-31, 2024

2.3 Constraints During the Evaluation Study

This ex-post evaluation was conducted eight years after the completion of the Project, coinciding with the conclusion of the "Project for Automotive Cluster Promotion in Mexico" (technical corporation: hereinafter referred to as "the subsequent project"), which began three years after the completion of the Project and overlapped with some of the target states. As a result, the number of stakeholders with direct knowledge of the implementation phase was limited. Additionally, isolating and analyzing the impact and sustainability of the Project in Guanajuato and Querétaro States where the subsequent project was also implemented proved challenging.[6]

3. Results of the Evaluation (Overall Rating: A[7])

3.1 Relevance/Coherence (Rating:③[8])

3.1.1 Relevance (Rating:③)

3.1.1.1 Consistency with the Development Plan of Mexico

The National Development Plan (2007-2012) of Mexico at the time of planning (2012) listed "creating a competitive economy and employment" as one of the priority areas, and one of its goals was to "enhance productivity and competitiveness," which called for strengthening public-private partnerships and forming regional industry clusters for high value-added automobiles and automotive components.[9]

At the time of project completion (October 2015), the National Development Plan (2013-2018) had identified productivity growth and human resource development as key national goals. It also aimed to increase the competitiveness of micro, small, and medium-sized enterprises (MSMEs) and supporting industries, strengthen their role in industry, and increase the country's export competitiveness. In the automotive sector, the goal was to strengthen the automobile and auto parts industry clusters.

On the other hand, from the time of planning to the time of the ex-post evaluation, the three target states of the Project have been emphasizing the automotive sector in their industrial development policies from the perspective of economic growth and job creation and have made

[6] The subsequent project was implemented for the states of Guanajuato, Querétaro, Aguascalientes, and San Luis Potosi.

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

[8] ④: Very High, ③: High, ②: Moderately Low, ①: Low

[9] An "industry cluster" is a concept proposed by the American management scholar Michael E. Porter that refers to "a geographic concentration of related companies, specialized suppliers, service providers, companies in related industries, and related institutions (universities, standards bodies, trade associations, etc.) in a particular field, competing and cooperating simultaneously."

continuous efforts to promote the sector.

The above shows that the Project, which targets the automotive industry, is consistent with the development plan of the Mexican government and the target states at the time of planning and completion of the Project.

3.1.1.2 Consistency with the Development Needs of Mexico

As mentioned in "1.1 Background of the Project," at the time of planning, the key issue for Japanese Tier-1 suppliers was to find Mexican Tier-2 suppliers that could participate in the automotive supply chain. On the other hand, Mexican companies needed to take full advantage of the potential for industrial development associated with the expansion of the automotive industry. Although Japanese companies were starting to discover and direct Mexican Tier-2 suppliers through their own initiatives, local procurement from Mexican companies remained below 30% due to several factors. Firstly, it was challenging for Japanese companies to acquire information about reliable local companies. Additionally, Mexican companies lacked an understanding of Japanese business practices and production systems. Lastly, a significant cultural gap further complicated these efforts.[10]

With Mazda and Honda starting operations at their new finished vehicle plants in 2014 (Mazda's new plant: production capacity of 250,000 vehicles/year, Honda's new plant: production capacity of 200,000 vehicles/year), Japanese Tier-1 suppliers became even more active, and by the end of 2015, after the Project was completed, the number of Japanese auto parts companies in Mexico had doubled from five years earlier. However, due to a lack of local suppliers of materials such as steel sheets, aluminum, resin, and rubber, processed metal products and plastic injection molding products, Japanese Tier-1 suppliers continued to rely on imports of materials and parts from outside, including the US and Japan, and foreign Tier-2 suppliers (including Japanese companies) that had expanded into Mexico. Therefore, in order for the Mexican automotive industry to continue to generate stable profits in the future, it was necessary to further promote local procurement of parts and materials and expand the value added within the country.[11]

The Project was timed to coincide with the construction of new plants by Japanese automakers and the subsequent entry of Japanese Tier-1 suppliers into Mexico and was designed to foster local companies that can participate in the automotive industry. The Project not only meets the needs of the Japanese Tier-1 suppliers that have entered the Mexican market, but it also supports local companies in Mexico to take advantage of the growth potential of the automotive industry, which is driven by foreign companies, and therefore is in line with the development needs of the

[10] Based on the ex-ante evaluation sheet of the Project.
[11] According to "Challenges and Prospects for Mexico's Growing Automotive Industry," Mitsui & Co. Global Strategic Studies Institute. https://www.mitsui.com/mgssi/ja/report/detail/1220974_10674.html

target states.[12] This situation has not changed significantly at the time of project completion. Therefore, the Project is consistent with the development needs of Mexico at the time of planning and completion.

3.1.1.3 Appropriateness of the Project Plan and Approach

There are no serious project planning or approach issues in the Project that would reduce its effectiveness, impact, or sustainability.

One year after the start of the Project, a new output (Output 1: System of providing local auto parts suppliers (Tier-2) with support service to strengthen automotive supply chain is strengthened in each State government) was added to ensure sustainability, and Master Plans and Action Plans were prepared in each state for the continuation of activities after the completion of the Project. This revision, along with other revisions to other descriptions and indicators, were necessary and appropriate.

The Project provided Kaizen support at the production site in accordance with global standards required by the automotive industry, but there was no training organization in the region capable of serving as a platform to develop personnel who could provide Kaizen support at that level. On the other hand, a rapid response was required in conjunction with the entry of Japanese companies into the market. Therefore, the program provided direct support to the target companies by Japanese experts rather than a cascade method.[13] The direct guidance by Japanese experts to a total of 38 companies produced good results in each company, but the number of companies that benefited from the Project was rather limited and the cost was high (see Effectiveness and Impacts). However, considering the above situation at the time of the project planning, it was difficult to imagine other approaches, and the direct guidance method by the experts to the enterprises in the Project is considered appropriate.

The Project sought the active cooperation of Japanese Tier-1 suppliers, and the target Mexican Tier-2 suppliers were selected in line with the recommendations of the Japanese Tier-1 suppliers. Selecting and supporting the subcontractors expected by the prime contractor was a new practice in each state, and since it is directly linked to the establishment of the supply chain, it has been emulated by each state. While Japanese companies generally have a habit of supporting subcontractors, the cooperation of Japanese Tier-1 suppliers in the Project was almost limited to

[12] However, in order for Japanese Tier-1 suppliers to increase their local procurement rate, it does not matter whether Tier-2 suppliers are Mexican or foreign-affiliated. Therefore, the fact that the Project focused its support on Mexican Tier-2 suppliers is not perfectly consistent with the needs of Japanese-affiliated Tier-1s.

[13] When there are a large number of beneficiaries to be trained, the so-called “cascade method” may be adopted, whereby existing training institutions prepare instructors to provide training in related fields, and the training is provided to the beneficiaries through these instructors. However, this method, in which instructors are trained first, requires several years before training is provided to the final beneficiaries. For example, Japanese Tier-1 suppliers dispatch local Kaizen leaders to Japanese factories for more than one year to train them. Continuous on-the-job training at the production site is necessary to develop qualified instructors who can lead the company, and it is considered difficult to prepare them in a short period of time.

the selection of target companies.[14]

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

The Japan-Mexico Economic Partnership Agreement, which came into effect in April 2005, stipulates bilateral cooperation in the fields of supporting industries and SMEs. In line with this agreement, JICA has developed a program for "Strengthening the Competitiveness of SMEs and Supportive Industries" to contribute to the further deepening of Japan-Mexico relations. The Project falls into this and is consistent with Japan's ODA Policy at the time of planning.

3.1.2.2 Internal Coherence

Several instructors from the National Teacher Training Center (CNAD), who were trained through the "Project for Human Resource Development in the Technology of Plastic Transformation" (technical cooperation, 2010-2014) that preceded the Project, conducted training at the production sites of the target companies. The instructors are highly competent and highly evaluated by the target companies. Thus, part of the outcomes of this project became an input to the Project, and specific linkages related to Outcome 2 can be confirmed.

The approach for the subsequent project was planned based on the experience and results of the Project. The detailed planning study for the subsequent project states that it was expected to be implemented efficiently by utilizing the human assets of the Project. The subsequent project includes two of the three target states of the Project, Guanajuato and Querétaro, and the training of new "Kaizen trainers" has progressed, increasing the possibility of continuous high quality Kaizen support.

The completion report of the Project learned the lesson that "effective public-private partnerships would have been possible if industry, such as the Automotive Cluster Associations established in each state, had been included earlier in the process". Another lesson learned was that "from the perspective of realizing continuous Kaizen support after the completion of the Project, it would be effective to plan activities from the outset with a view to providing Kaizen support with in-country resources in Mexico." The subsequent project, which included the Automobile Cluster Associations in each state as implementing agencies and trained Kaizen trainers with local resources, can thus be said to have been implemented by fully utilizing the experience of the Project.[15]

[14] According to the consultant for the Project, at that time, even the Japanese Tier-1 suppliers that had entered Mexico had not developed sufficient local human resources capable of instructing Mexican Tier-2 suppliers. Japanese engineers of the Japanese Tier-1 suppliers stationed in Mexico were extremely busy providing on-site guidance, and it was difficult to obtain further active involvement.

[15] The same Japanese consulting firm is involved in the Project and the subsequent project.

3.1.2.3 External Coherence

During the preparation phase of the Project, the needs of Japanese companies and information on local companies obtained through JETRO were referred to and reflected in the plan.[16] During the implementation phase, short-term experts who would provide support to the target companies visited JETRO to share information and exchange opinions. This was useful for the short-term experts to accurately understand the context of the Project and consider appropriate measures based on the various management and operational issues faced by the target company. It also provided a valuable opportunity for JETRO to learn about the evaluation of the production sites of Mexican companies as seen through the eyes of experts in various fields.

The Project was an all-Japan effort to support Japanese companies, with the cooperation of many Japanese companies, including Japanese automakers and their parts suppliers through the Japan Automobile Manufacturers Association, the Japan Auto Parts Industries Association, and others. Many of the state government officials and companies that participated in the training in Japan, at the time of this ex-post evaluations, maintained high motivation and close relationships with Japanese companies, which is believed to have contributed to the continued effective support to the automotive industry in each state and to the growth of each company.

In summary, the Project is highly consistent with Mexico's development plan and development needs, and the project plan and approach are appropriate. The Project is highly consistent with Japan's ODA Policy. Furthermore, it is highly consistent with JICA's other projects because it has contributed to the achievement of results through more concrete collaboration than planned, and also because it has shown concrete effects of collaboration with JETRO and Japanese companies, as planned. Based on the above, the relevance and consistency of the Project are high.

3.2 Effectiveness and Impact[17] **(Rating:③)**

3.2.1 Effectiveness

3.2.1.1 Achievement of Output

In the Project, with “mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) are strengthened” as the project purpose, Kaizen support was provided to 27 Mexican Tier-2 suppliers that are expected to do business with Japanese Tier-1 suppliers in the three target states, and QCD improvement at the production sites was confirmed (Output 2). The companies that received Kaizen support created “Kaizen groups” in each state to continue and spread Kaizen activities, which is a loose inter-company collaboration system. Through seminars, Kaizen support, and training in Japan,

[16] Since 2002, JETRO has been working to improve the technological capabilities and parts supply capacity of Mexican parts suppliers and to strengthen the foundation for promoting the supply of parts to Japanese auto parts manufacturers.
[17] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Mexican Tier-2 management and state government officials in Mexico deepened their understanding of Japanese business practices and Kaizen (Output 4). The “Mexico Automotive Supplier Directory” (a database) was established and made public to facilitate matching between Japanese Tier-1 and Mexican Tier-2 suppliers based on the supplier information held by the three states, ProMéxico, and JETRO (Output 3). In total 12 business meetings were held during the 3 year period in the three state, and seminars were held by ProMéxico to disseminate project results (Output 5). Furthermore, to ensure sustainability, an action plan and a master plan were developed by each state government to continue supporting auto parts suppliers after the Project's completion (Output 1).

Regarding the establishment of the “Mexico Automotive Suppliers Directory” (Output 3), among the indicators, information on the progress of database improvements and the number of Tier-2 supplier referrals to Tier-1 suppliers by the time of project completion was unavailable. The results dissemination seminar (Output 5) could not be held in two of the three states due to the change of government. Therefore, the above two outputs were judged to have been partially achieved, but all other outputs were judged to have been fully achieved based on the set indicators.

3.2.1.2 Achievement of Project Purpose

Table 1 shows the status of achievement of the two indicators set for the project purpose.

Table 1 Achievement of Project Purpose

Project Purpose	Indicators	Actual
Mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) are strengthened.	Indicator 1: Business opportunities between local auto parts suppliers (Tier-2) which receive technical assistance and Japanese auto component suppliers (Tier-1) are increased.	Results: Achieved through a business status survey of 27 Tier-2 suppliers.
	Indicator 2: Opportunities for business matching between Japanese auto component suppliers (Tier-1) and local auto parts suppliers (Tier-2) are increased through Kaizen support, database enhancement and business matching meetings.	Results: Achieved through a business status survey of 27 Tier-2 suppliers.

In the terminal evaluation, approximately 80% of the Mexican Tier-2 suppliers that received technical assistance indicated that the Project support led to the generation of new or increased business with Japanese Tier-1 suppliers. In addition, approximately 80% of Mexican Tier-2 suppliers that received technical assistance indicated that participation in business meetings organized by the state government contributed to increased business opportunities with Japanese Tier-1 suppliers. The same situation was confirmed in the business situation survey conducted at the completion of the Project. The project purpose was thus judged to have been achieved.

3.2.2 Impacts

3.2.2.1 Continuation of Activities after Completion of the Project

(1) Continuation of Activities by the Implementing Agencies

According to the questionnaire responses from each state government and interviews during the field survey, the statuses of continuing activities of each implementing agency are as follows.

a. ProMéxico

ProMéxico was dissolved with the change of government in 2018, and the "Mexico Automotive Supplier Directory" ceased operations. However, since it was originally created by connecting the databases of each state, the data from each state remains and is utilized.

b. Guanajuato State

The master plan prepared as the Output 1 of the Project was approved by the state government of Guanajuato as the official strategic plan to support the automotive industry, and on-site Kaizen, training, business matching, information provision, and financing were implemented by the state government and the Automotive Cluster Association of Guanajuato throughout its planning period (2015-2017).

In 2013, the Automotive Cluster Association was established as a system of collaboration between industry, government, and academia.[18] The state government continues to support automotive industry through the above master plan and the subsequent collaboration through the Association. The "Kaizen group" (related to Output 2), which was created by the target companies of the Project, was taken over by the Association.[19] The Association provides support to Tier-2 suppliers (not limited to Mexican companies) through Kaizen and lean production systems (production systems that eliminate waste, developed in the U.S. based on Toyota's production system), as well as training on various themes. On the other hand, the state government pointed out that while the support from the Project was highly useful, if documents or educational materials summarizing the processes and outcomes had been created, the state government and participating companies could have more efficiently disseminated the results after the Project's completion.

As of March 2017, 12 Japanese companies were members of the Automotive Cluster Association and were actively participating in its activities. The supplier database was also actively utilized, and the state government took the initiative to update and provide information to help Japanese companies find Mexican Tier-2 suppliers as business partners.

[18] The Project was not directly involved in its establishment.

[19] The Tier-2 suppliers that received support under the Project established "Kaizen Groups" in each state, which are loose networks among companies, for the purpose of continuing and spreading Kaizen activities necessary to ensure QCD required by Japanese Tier-1 suppliers, and continued Kaizen activities within the group and introduced Kaizen activities to other companies.

The state's database is operated and updated by the Automotive Cluster Association, which operates its own online business matching system. The state holds an annual automotive forum (exhibitions and business meetings), which in 2023 was attended by nearly 2,000 companies, mostly from within the state.

Through the subsequent project, 12 Kaizen trainers were fostered in the state by 2024, and 30 companies received Kaizen support.

c. Nuevo León State

The master plan was treated as an official document of the Nuevo León State Government and was implemented until 2016. It led to an increase in productivity and competitiveness of a total of 40 companies. Group training, technical assistance, database registration, and business meetings were provided. This was subsidized by the National Institute of Entrepreneur (INADEM). But in 2017, the following year after the dissolution of INADEM, no financial resources were available, so only less costly activities such as business meetings were conducted.

The first automotive cluster association in the country was established in the state in 2007, and the state government has always supported the automotive industry under its partnership. The Kaizen group of the state remained active for a couple of years after the Project ended, visiting factories on a weekly basis and implementing Kaizen support in a number of factories. The Automotive Cluster Association of Nuevo León provides training to Tier-2 suppliers by private consultants, and also visits Tier-1 suppliers to inspect their sites and share good practices, etc. From 2023, the state government is implementing the "Import Substitution Program," which includes subsidies for certification and consulting fees for quality management systems, capital investment for process technology enhancement, quality control, standardization, and measurement, as well as training for employees, and certification on quality management such as ISO. Local consultants hired under the Project also participate in the program to provide guidance to companies.

The state established a database called "Supply Hub" prior to the Project, where online business matching is conducted. It is open to all industries, including the automotive industry, with nearly 3,000 companies registered. The government and the Automotive Cluster Association co-host three thematic annual conferences for the automotive industry for suppliers on strengthening the supply chain, technological innovation, and human resource development, as well as numerous business meetings and technical training programs in conjunction with universities.

d. Querétaro State

The Government of the State of Querétaro did not take over the master plan prepared by the Project when the government took over in 2015, and has been proceeding with activities

based on the state's own development plan. Although there is no specific plan on the automotive industry, as a part of its economic development program, the state government is implementing two sub-programs: "investment promotion and job creation" and "competitiveness of enterprises." Starting in August 2024, a new "Supplier Development Program" is being implemented in collaboration with the Automotive Cluster Association to provide training, technical assistance, equipment funding, and business meetings.

The Automotive Cluster Association of Querétaro was established in 2013 in parallel with the Project. According to the state government, the Project was one of the triggers for the establishment of the Cluster Association. The Association in the state opened an office in 2016 with a dedicated staff and began full-fledged activities. The state government has always supported the automotive industry through its collaboration with the Association.

After the completion of the Project, the Kaizen group was taken over by the Tier-2 Committee of the Automotive Cluster Association, where Kaizen activities continue. About six companies a year receive Kaizen support. In addition to the Kaizen support on production site implemented in the Project, the Committee also provides support for improving the operational management of companies, called "management Kaizen" in contrast to "on-site Kaizen." Various training sessions (lectures) are also provided, which Tier-2 suppliers can participate in. On the other hand, the state's Government's SME Support Bureau support local companies on competitiveness strengthening including Kaizen, certification acquisition for quality control such as ISO, training, etc., but due to limited financial resources, it is not able to support many companies.

The state government database will soon complete its transition to an online platform named "Business Network." Each year, numerous business meetings including business conferences and trade fairs are held to promote networking and business matching.

Through the subsequent project, 9 Kaizen trainers were trained in the state by 2024, and 20 companies received Kaizen support.

(2) Implementation of recommendations by the Terminal Evaluation (See "1.3.3 Recommendations from the Terminal Evaluation")

The master plan prepared under the Project was transferred to the new administration and put into implementation in the States of Guanajuato and Nuevo León, but not in the State of Querétaro. However, regardless of the existence of the master plan, the activities initiated by the Project such as Tier-2 support (Kaizen support and other training) and business matching promotion have continued in each state. On the other hand, public-private partnerships have deepened in each state through the Automotive Cluster Associations. Industry needs have been aggregated through the Association and reflected in industrial development plans and support programs in each state. The master plan itself, which has a planning period through 2017, was

not revised. To promote information sharing between Japanese Tier-1 and Mexican Tier-2 suppliers, some Japanese Tier-1 suppliers joined the Kaizen group in Querétaro State, and Tier-1 and Tier-2 suppliers are sharing information through each state cluster. The dissemination of the "Mexico Automotive Suppliers Directory" to other states was not realized due to the dissolution of ProMéxico.

(3) Current status of companies involved in the Project[20]

Six of the eight Mexican Tier-2 suppliers visited in the field survey have increased their business since the completion of the Project, updating and enhancing their production facilities and expanding their plants. The other two companies are also continuing their operations while updating necessary production facilities. This is due not only to the growth of the automotive industry, but also to the fact that demand is expanding in various fields in response to the wave of nearshoring.[21] On the other hand, it was pointed out that competition is intensifying due to the entry of Chinese and other foreign companies into the market. It should be noted that some of the companies supported by the Project have been closed, but the circumstances surrounding their closure are unknown.

Automotive parts account for about 20-60% of the total output of these Mexican Tier-2 suppliers visited, which originally operated outside of the automotive sector, but have entered the automotive sector, while maintaining the diversity of their businesses. In particular, many of these companies want to maintain diversity because demand in the automotive sector has plummeted recently due to the COVID pandemic and the world-wide shortage of semiconductors.[22] On the other hand, foreign Tier-2 suppliers came to Mexico basically produce only automotive parts.

Most of the Mexican Tier-2 suppliers have highly evaluated the effectiveness of the Kaizen support provided by the Project and are still maintaining the results. Some companies have applied similar Kaizen to other production lines in their factories. On the other hand, some of the participants commented that the period of Kaizen support was too short, and that follow-up is needed to further develop the results and link them to business growth.

Many of the Mexican Tier-2 suppliers visited during the field survey participated in the activities of the Kaizen group, but their activities ceased one to two years after the Project was completed. Since then, they have made use of private consultants, training by the state governments and the Automotive Cluster Associations, etc. Some of the companies hired Mexican engineers who had worked for Japanese Tier-1 suppliers for many years and

[20] In the field survey, three Japanese Tier-1 suppliers and eight Mexican Tier-2 suppliers involved in the Project were visited.
[21] Nearshoring refers to the outsourcing of business activities, such as production or provision of services, to the companies close to the market country. Nearshoring in Mexico mainly targets the U.S. market.
[22] For example, one company survived the pandemic without problems because it was manufacturing plastic parts for the medical sector.

conducted Kaizen activities in their factories on a daily basis. In addition, some Japanese Tier-1 suppliers cooperate with their Mexican Tier-2 business partners to solve problems.

The Japanese Tier-1 suppliers visited during our field survey procure parts from many Mexican and foreign Tier-2 suppliers, but about half of the parts are imported from overseas. In some cases, the headquarters procures parts globally. Even in the case of domestic procurement, most of the suppliers are foreign Tier-2 suppliers, and there are not many transactions with Mexican Tier-2 suppliers. One Japanese Tier-1 supplier having business with a large number of Mexican companies pointed out that production management and business operations of Mexican companies are in general weak compared to foreign companies. It should be also mentioned that each Japanese Tier-1 supplier is developing local personnel who can lead Kaizen activities through training provided by its head office or related automakers, and is conducting Kaizen activities continuously within the company.

(4) Changes in the business environment after completion of the Project

In July 2020, the new U.S.-Mexico-Canada Agreement (USMCA) went into effect. Since the USMCA's rules of origin are stricter than those of NAFTA, more intra-regional production is needed to meet origin standards. On the other hand, having experienced the global supply chain disruption caused by the COVID pandemic, many companies are considering restructuring their supply chains to minimize risk. In addition, trade friction between the U.S. and China has caused U.S.-based companies to reduce the risk of dependence on China and to avoid the high tariffs imposed by the U.S. government on Chinese goods. As a result, many companies are looking to further expand their local sourcing to Mexico.[23] More Tier-1 suppliers are now seeking Mexican Tier-2 suppliers or encouraging foreign Tier-2 suppliers to expand into Mexico.[24]

It is important for Tier-1 suppliers to ensure that Tier-2 suppliers meet the required quality standards, and for local procurement, whether the supplier is a foreign or Mexican company does not make a big difference. Since foreign firms require less time to start operations than Mexican firms which take time to develop, even Japanese Tier-1 suppliers are increasingly relying on Japanese and foreign Tier-2 suppliers to meet growing demand. In terms of job creation, there is no major difference between foreign-owned and Mexican companies, but foreign-owned companies may withdraw from the market depending on the situation. For this reason, state governments are emphasizing the development of Mexican companies.

On the other hand, the supply of human resources has not kept pace with the rapid growth of the automotive industry in Mexico after 2010s, resulting in frequent job transfers to

[23] According to JETRO, the lack of goods coming in from China by COVID pandemic, the world-wide shortage of semiconductors, and the steep rise in transportation costs made companies widely aware of the risk that transporting goods from far away is expensive and risky, and if done poorly, could shut down their factories.
[24] Many Tier-1 and some Tier-2 suppliers have production bases around the world.

companies with more favorable conditions and the inability of some companies to secure sufficient human resources. In addition, the automotive industry is undergoing rapid technical changes, such as the shift to EVs, automated driving, and connected systems. Each state government considers the development of human resources in the automotive industry in general, including the development of human resources capable of responding to these changes, to be an important issue.

3.2.2.2 Achievement of Overall Goal

The achievement status of the indicators set for the Project's overall goals is shown in Table 2, and all indicators are considered to have been achieved.[25]

Table 2 Achievement of Overall Goal

Overall goal	Mexican automotive supply chain is strengthened.
Indicator (Note 1)	Results
Indicator 1: Procurement of Mexican auto parts by Japanese auto component suppliers (Tier-1) increases	All three Japanese Tier-1 suppliers visited are working to increase their local parts procurement rate, and local procurement is actually increasing. They are also expanding their business and working to increase local procurement. Therefore, Indicator 1 is considered to have been achieved. (Note 2)
Indicator 2: Increase of business opportunities between Tier-1 and Tier-2 suppliers as a result of using service in Master Plan in the target states	Six of the eight Mexican Tier-2 suppliers visited have expanded their business since the completion of the Project, updating and enhancing their production facilities and expanding their plants, having increased their business with Japanese and other Tier-1 suppliers. The other two companies are also continuing their business while updating their production facilities as necessary. Therefore, Indicator 2 is considered to have been achieved.
Indicator 3: Number of companies which used services in the Master Plan	Three state governments, working with the Automotive Cluster Associations, continue to provide various types of assistance for Mexican companies to enter the automotive supply chain. After the Project, about 40 companies in Nuevo León, and about 50 companies in Guanajuato and Querétaro through the subsequent project, in total about 90 companies received Kaizen support. Thus, Indicator 3 is considered to have been achieved, as support to companies has continued in the three target states.

(Note 1) No target values were set for any of the indicators.
(Note 2) Local parts procurement rates for individual companies were highly confidential, and specific information was not available.

Based on the following, the state governments consider that the overall goal have been achieved.

- Guanajuato State: The state government learned through the Project how Mexican companies can enter the automotive supply chain. After the USMCA was signed, Japanese Tier-1 suppliers began to look more seriously for local companies. Support was provided

[25] Although no target values were set for the project's overall goal indicators, this ex-post evaluation judged the level of achievement, including from a qualitative perspective, based on the situation of the companies visited in the field survey and information obtained from the respective state governments.

to companies according to the master plan, and many Mexican Tier-2 suppliers have entered and grown in the automotive industry.

- Nuevo León State: Kaizen was implemented in 10 companies supported by the Project and in 40 companies subsequently supported by the master plan, leading to increased business opportunities through improving QCD and increasing competitiveness.
- Querétaro State: Based on the efforts of the government and the Automotive Cluster Association, more companies are engaging in Kaizen activities, more business negotiations are taking place, and manufacturing process specialization is becoming clearer.

As a result of the above, it is judged that the project's overall goal "Mexico's automotive supply chain is strengthened" has been achieved. Also, as mentioned above, based on the results of the Project in the three target states, the state governments and Automotive Cluster Associations are providing continuous support to the automotive industry including business matching and Kaizen support. Therefore, the Project is considered to have contributed to the achievement of the overall goal of "Mexico's automotive supply chain is strengthened" in the three target states. However, the role of the supported companies in local procurement by Japanese Tier-1 suppliers was small,[26] therefore, the contribution of the Project to Japanese Tier-1 suppliers was limited. Moreover, part of the contribution of the Project at the time of the ex-post evaluation was the synergistic effect with the subsequent project.

3.2.2.3 Other Positive and Negative Impacts

(1) Impacts on the Environmental, Resettlement and Land Acquisition

The Project was determined to fall under Category C because it does not have the sensitive characteristics and sensitive areas listed in the "JICA Guidelines for Environmental and Social Considerations" (published in April 2010) and the undesirable effects on the environment are considered to be minimal. No significant environmental impacts were identified.

There was no resettlement or land acquisition due to the Project.

(2) Gender Equality, Marginalized People, Social Systems and Norms, People's Well-being and Human Rights

No notable impacts were identified with respect to "gender equality," "marginalized people," "social systems and norms, people's well-being and human rights."

[26] According to JETRO's "Survey of Japanese Companies in Mexico 2020," the local procurement ratio of Japanese transportation equipment and component manufacturers in Mexico is approximately 33%, most of which are sourced from Japanese companies, and less than 10% are sourced from Tier-2 suppliers in Mexico.

(3) Other Impacts

The Project targeted potential Mexican Tier-2 suppliers (companies that want to be integrated into the supply chain but consider certain improvements necessary) recommended by Japanese Tier-1 suppliers, and conducted specific, targeted Kaizen activities. Since this is an effective way to support the strengthening of supply chains, the target states began to provide focused and specific support not only to the automotive sector, but also to parts supplier companies selected based on the opinions of parts purchasing companies. Until then, technical assistance and training had been provided by randomly soliciting companies that wished to receive assistance.

Moreover, state governments, Automotive Cluster Associations, and Mexico's Tier-2 suppliers have gained a deeper understanding of doing business with Japanese companies. They have become familiar with the Japanese approach and culture of manufacturing, particularly the concept of Kaizen. As a result, state governments and Automotive Cluster Associations can now provide more tailored support to local companies aiming to engage with Japanese firms.

As a result of the implementation of the Project, the project purpose of "mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) are strengthened" was achieved. As for the overall goal, the Project's contribution to the strengthening of Mexico's automobile supply chain has been confirmed, and the effects of the Project have been realized as planned. Therefore, the effectiveness and impact of the Project are high.

3.3 Efficiency (Rating:②)

3.3.1 Inputs

The inputs to the Project were as shown in Table 3.

Table 3 Planned and actual inputs to the Project

Input	Plan	Actual
(1) Dispatch of Experts	➢ Experts directly assigned by JICA: chief advisor, automotive industry policy and operations coordinator (36 person-months x 3), production management (approx. 24 person-months) ➢ Consultants: public-private partnership system establishment, support for database establishment, on-site Kaizen support, press working,	➢ Experts directly assigned by JICA: chief advisor, automotive industry policy, production control and project operation coordinator (5 persons, total 108 person-months), production management (approx. 12 person-months) ➢ Consultants: production management, on-site Kaizen support, molds and casting, presses, plastic injection molding, impact study, database Kaizen support,

	plastic injection molding, mold maintenance, impact study (10 persons, 84.5 person-months) ➢ Total: approx. 217 person-months	Toyota production system (14 persons, 108 person-months) ➢ Total 228 person-months
(2) Training received	Training in Japan: Japanese business practices, production management, production technology, and automotive industry policy and capacity building	Training in Japan: "Management System for Strengthening Automobile Industry Infrastructure for Administrative Officers" (8 persons), "Training for Managers of Automobile Parts Suppliers" (30 persons), "Technical Training for Automobile Suppliers" (14 persons), total 52 persons
(3) Equipment	Vehicles, office equipment	2 vehicles, office equipment, etc.
(4) Others	(No plan)	Project operating expenses: 44 million yen Impact study: 13 million yen
Japanese Side Total Project Cost	590 million yen	766 million yen
Mexico Side Total Project Cost	(No plan)	8,220 thousand pesos (about 6.43 million yen)

Note: 1 peso = 7.82 yen (average rate from October 2012 to October 2015)

3.3.1.1 Elements of Inputs

According to the terminal evaluation of the Project, Output 2 was efficiently achieved by narrowing down the theme of support to companies to 5S and Kaizen, and by appointing short-term experts exclusive to each state. In addition, the use of local resources such as Japanese Tier-1 suppliers and CNAD (the implementing agency of JICA's technical cooperation "Project for Human Resource Development in the Technology of Plastic Transformation") led to good results. While there were cases in which small companies with limited basic capabilities were selected in the first half, the selection of larger companies as targets in the second half of the Project led to greater efficiency. On the other hand, personnel turnover in the targeted companies affected efficiency. In addition, due to the large number of people involved and the unfamiliarity of the Mexican side with the JICA technical cooperation, communication among the parties involved was not very good in the first half of the Project, but this improved in the second half.

At the time of the ex-post evaluation, the target state governments commented that the number of target companies for the Project was rather small compared to the inputs. The Project is considered to have incurred a large amount of costs compared to the number of companies, including the costs of Japanese experts involved in supporting the companies and the cost of participation in training in Japan (generally one person from each company participated).[27] On

[27] A simple calculation shows that the Project required approximately 20 million yen to support one company (770 million yen to support a total of 38 companies).

the other hand, despite the large costs involved, the training in Japan provided the participants with an understanding of the overall picture of the Japanese automobile industry, the operations of automobile parts suppliers, and actual practices of Kaizen, as well as the support provided by Japanese experts with practical experiences at production sites, were highly appreciated by the companies.

3.3.1.2 Project Cost

The cost of the Project was 770 million yen, slightly higher than the planned 590 million yen (131% of the plan). The main reasons for this are an increase of approximately 24 person-months in the amount of experts (consultants) and an approximately 10% increase in the cost per person-month, both of which led to an increase in the amount of the contract with consultants. On the other hand, the amount of Japanese experts directly assigned by JICA decreased by 12 person-months. Although there were other factors such as a decrease in the number of participants in the training in Japan and a decrease in the cost of equipment provided, the above-mentioned increase in project expenses exceeded them, resulting in a total increase of about 31%.

3.3.1.3 Project Period

The project period was 31 months, from October 2012 to October 2015, as planned. Considering the partial achievement of some outputs, it can be said that the period did not match the level of outputs.

Project cost exceeded the plan, the project period was as planned, and some of the outputs were not in line with the plan due to the change of administration and other factors. Therefore, the efficiency of the Project is moderately low.

3.4 Sustainability (Rating:③)

3.4.1 Policy and System

The Mexican administration (President Lopez Obrador) at the time of ex-post evaluation has made “encouraging private investment” a key policy in its own economic policy, and has identified the automotive industry as one of the five key strategic sectors to achieve this goal and to strengthen its value chain.

Guanajuato's industrial policy has maintained consistency over the past 30 years. It has followed the Kaizen and other methods of the Project as part of its efforts to promote MSMEs, and has worked to promote other industrial sectors as well, not limited to the automotive sector. In recent years, the program has emphasized involvement through cluster associations in various industrial sectors and has been oriented toward a shift from manufacturing to research and development.

Nuevo León's development policy focuses on industrial promotion, taking advantage of its location adjacent to the United States to improve the competitiveness and productivity of MSMEs in order to create jobs. The state's development plan identifies 13 strategic sectors, including automotive, and supports the private sector by identifying its needs through cluster associations in each industrial sector. In the automotive sector, the plan aims to create an industrial hub for electromobility.

The development plan for Querétaro at the time of ex-post evaluation identifies economic development as one of its priority areas, and in industrial development, it emphasizes the use of information technology, the growth of local suppliers, and the promotion of technological innovation. As the state's main industries have specialized and shifted from consumer electronics to automotive and aerospace, the plan focuses on these three sectors and considers parts supplier companies in these industries to be the most important players in the state's development. Cluster laws, industrial development laws, and innovation policies are being considered.

Based on the above, there are no particular challenges to the sustainability in the aspects of policy and system.

3.4.2 Institutional/Organizational Aspect

ProMéxico has been dissolved and no organization has taken over the operations of the Mexican Automotive Suppliers Directory. The National Network of Automotive Cluster Associations (REDCAM), which coordinates the automotive cluster associations established in each state, conducts various information sharing and training programs, as well as industry associations such as the Mexican Association of Automotive Industries (AMIA) and the National Industry of Auto Parts (INA).

In Guanajuato, the Secretariat of Sustainable Economic Development is working with industry-specific state cluster associations to promote industry. The state has 11 cluster associations by sector, and approximately 200 companies, which are part of the state’s automakers, Tier-1 and Tier-2 suppliers, are registered in the Automotive Cluster Association of Guanajuato (CLAUGTO). The Secretary of Economy of Nuevo León has sections in charge of investment promotion, supply chain, and clusters. It works with the Automotive Cluster Association of Nuevo León (CLAUT) to promote the automotive industry. CLAUT includes 120 companies registered, which are part of the state's automobile manufacturers, Tier-1, and Tier-2 suppliers, covering about half of the whole automotive industry. The Industrial Promotion Section (in charge of attracting investment to the state) and the Business Development Section (in charge of following up with companies in the state) of the Secretary of Sustainable Development of Querétaro are working to promote the automotive industry in collaboration with the Automotive Cluster Association of Querétaro.

Thus, state governments are working to promote the automotive industry through their

partnerships with Automotive Cluster Associations. Compared to state governments, Automotive Cluster Associations are expected to have a higher degree of continuity, with less personnel turnover with changes in state administration. In addition, in Nuevo León, the establishment of clusters is provided for by state law, which guarantees state budget allocations. The subsequent project has strengthened the Automotive Cluster Associations, and the Associations in each state are now internationally recognized as mature clusters.[28]

Based on the above, a system to promote and support the automotive industry has been established in each state, mainly through collaboration between state governments and Automotive Cluster Associations, and there are no particular issues in terms of sustainability in institutional / organizational aspect. At the national level, there is no system to sustainably operate the Mexican Automotive Supplier Directory of the Project, but since the database is maintained in each state and information is shared also by the National Network of Automotive Cluster Associations, etc., there are no particular issues.

3.4.3 Technical Aspect

ProMéxico has been dissolved and no one involved in the Project or the training in Japan remain. In the State of Guanajuato, all personnel in the Secretariat of Sustainable Economic Development were replaced after the change of government in 2015. The Executive Director of the Automotive Cluster Association at the time of the ex-post evaluation is from the state government and was the counterpart of the Project. The capacity of the State Government and the Automotive Cluster Association was strengthened through a follow-up project, and 12 Kaizen trainers were trained by company engineers, consultants, and instructors from CONALEP.[29] Two Japanese trainees from the State of Nuevo León are still working for the Secretariat of Economy. Although no counterpart of the Project remains in the relevant department of the State of Querétaro, the current Secretary General of the Automotive Cluster Association is from the State Government and was a counterpart of the Project. The capacity of the State Government and the Automotive Cluster Association was strengthened through the subsequent project, and nine company engineers, consultants and instructors from the CONALEP were prepared as Kaizen trainers.

From the above, in Guanajuato and Querétaro States, the counterparts of the Project do not remain in the state government, but some of them have moved to the Automotive Cluster Associations to work. Furthermore, the Kaizen group has been taken over by the Automotive Cluster Association, and Kaizen trainers have been trained by the subsequent project. In Nuevo

[28] The Automotive Cluster Associations of Guanajuato, Nuevo León, and Querétaro were certified by The European Secretariat for Cluster Analysis (ESCA) with the Bronze Label, Gold Label, and Silver Label, respectively.

[29] CONELAP is an independent administrative agency with over 300 schools nationwide, providing technical education at the high school level. It served as the implementing agency for the JICA technical cooperation "Project for Human Resource Development in the Technology of Plastic Transformation," through which new automotive manufacturing courses were established in the states of Querétaro, Guanajuato, and Aguascalientes.

León, counterparts of the Project continue to work in the state government. Thus, there are no particular challenges to technical sustainability in each state. At the national level, ProMéxico has been dissolved, but there are no particular issues because the alternative database to Mexico Automotive Suppliers Directory is maintained in each state and there is information sharing through REDCAM etc.

3.4.4 Financial Aspect[30]

The State of Guanajuato has confirmed that the "Automotive Industry Forum," the largest automotive event in Mexico, will be held again in 2024, and the Secretary of Sustainable Economic Development has made a strong commitment to continue the event and secure the necessary funding. Considering the importance of the automotive industry in the state, especially for Japanese companies, it is highly likely that the budget will be secured and these activities will continue. In addition to the state government budget, paid training is also being considered.

In the State of Nuevo León, the budget for the next few years is secured, with a fixed amount of 1,420 thousand USD for the cluster and 8-9 million USD annually for the Import Substitution Program from the state budget, starting in 2022.

In the state of Querétaro, the budget for the promotion of the automotive industry has been secured. However, the amount is limited, and it is recognized that there is a need to review how much money and expenses are shared between the state government and companies. In the subsequent project, a system of independent profitability through fee-based training and kaizen guidance by the Automotive Cluster Association was piloted.

In light of the above, although each state's budget is limited, there are no serious financial challenges to the sustainability of the Project, considering the policy importance of promoting the automobile industry in each state and the efforts to achieve independent profitability in the Cluster Associations that have been promoted in some states through the subsequent project.

3.4.5 Environmental and Social Aspect

There are no notable environmental and social risks regarding the sustainability of the Project's effects. Furthermore, automakers, which place a high priority on environmental and social considerations, are also requiring their parts suppliers to take decarbonization initiatives.

3.4.6 Preventative Measures to Risks

Risks to the Mexican automotive industry include the following. However, these risks are not considered to be a major threat to the sustainability of the effects of the Project, as the state governments and the Cluster Associations are aware of and are working on these issues.

[30] ProMexico has been disbanded and will not be mentioned here.

- Shortage of engineers and workers: Technical cooperation of JICA "The Project for Human Resource Development for the Automotive Industry in El Bajio of Mexico" (2015-2020) has strengthened human resource development in the automotive field in CONALEP in regions including Guanajuato and Querétaro states. Each state is working on human resource development in collaboration with educational institutions through the Automotive Cluster Association.

- Responding to new technologies: State governments and Automotive Cluster Associations are working to develop human resources capable of responding to new technologies such as EVs, automated driving, and connected systems through collaboration with educational and research institutions. In addition, efforts are being made to introduce new technologies to the Mexican manufacturing industry, which until now has been supported solely by cheap labor.

- Change of state government administration: In some states, the master plan developed under the Project was not carried over due to a change of administration. State governments are trying to ensure continuity of support for the automotive industry by developing closer ties with Automotive Cluster Associations, which are less susceptible to changes of administration.

No issues have been observed in the policy/system, institutional/organizational, technical, and environmental and social aspects and preventative measures to risks. From a financial perspective, while there are some minor issues due to the limited budgets in each state, it can be said that there is a high likelihood of improvement and resolution. The sustainability of the effects generated by the Project is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project was implemented from October 2012 to October 2015 with the overall goal of "strengthening of Mexican automotive supply chain" and the project purpose of "strengthening of mechanisms for developing the automotive supply chain between Japanese auto component supplies (Tier-1) and local auto parts suppliers (Tier-2) in the target states (Guanajuato, Nuevo León, and Querétaro)." The project plan and approach are appropriate and consistent with the development plans and needs of Mexico and the target states both at the time of planning and at the time of completion. The Project is consistent with Japan's ODA Policy at the time of planning and has synergistic effects with other JICA projects as well as specific collaboration effects with JETRO and Japanese companies. Therefore, relevance and coherence of the Project are high.

Most of the planned outputs of the Project were achieved, although the update of the "Mexican Automotive Supplier Directory" and the results dissemination seminar were partially unachieved. Many of the Mexican companies that received technical assistance such as Kaizen support through the Project and many of the companies that participated in the state government business matching meetings have achieved new or increased business with Japanese Tier-1 suppliers, and it is judged that the project purpose has been achieved. After the completion of the Project, based on its results, the state governments and the automobile cluster associations in the three target states continued to provide support to the automobile industry, including business matching and Kaizen support, thereby contributing to the achievement of the overall goal of the Project. Therefore, the effectiveness and impact of the Project are high. Project cost exceeded the plan, the project period was as planned, and some of the outputs were not in line with the plan due to the change of administration and other factors. Therefore, the efficiency of the Project is moderately low. There are no issues regarding the sustainability of the Project in the policy and system, institutional/organizational, technical, and environmental and social aspects and preventive measures to risks. In terms of finance, although each state budget is limited, there are no serious challenges, given the policy importance of promoting the automotive industry in each state and the efforts being made by the automotive cluster associations to become self-financing. Therefore, the sustainability of the Project is high. In light of the above, the Project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agencies

The government of Guanajuato, Nuevo León, and Querétaro States will utilize the results of the Project, as well as the results of the subsequent project in the case of Guanajuato and Querétaro States, to secure necessary financial resources and continue effective support to auto parts suppliers in each state. It is necessary to work closely with the automotive cluster associations in each state to provide training of international level to candidate companies aiming to enter the global supply chain. On the other hand, a swift response is required to address the workforce shortage currently manifesting in the automotive industry, in collaboration with educational institutions such as CONALEP and state technical universities.

4.2.2 Recommendations to JICA

JICA will continue to provide effective support to enhance the feasibility of the above recommendations for the implementing agency through collaboration with state implementing agencies and the automotive clusters.

4.3 Lessons Learned

Selection of appropriate training delivery method

When there are a large number of beneficiaries to be trained, the so-called "cascade method" may be adopted, in which existing training institutions train instructors to provide training in related fields, and then provide training to the beneficiaries through these instructors. However, this method, in which instructors are first trained, requires some years before training is provided to the final beneficiaries. In addition, at the time the Project was planned, there were no training institutions with instructors with the advanced skills and experience required by the automotive industry. Therefore, considering the urgency of Tier-2 support in Mexico at the time, the Project did not use the cascade method, but provided direct support by Japanese experts to the target Tier-2 suppliers. This was an appropriate decision in accordance with the circumstances of the time. Although this method can provide high quality support to the target companies, it is disadvantageous in terms of cost-effectiveness and spillover effects after the project is completed, unless the companies receiving the support take the initiative to spread the support to other companies. In the Project, the activities of the Kaizen group and the Automotive Cluster Association played a certain role in expanding the spillover effect.

Based on the above experience, the Automotive Cluster Association was added as an implementing organization for the subsequent project, and candidate instructors were carefully selected from Japanese Tier-1 suppliers, which had gradually become well-stocked with competent Mexican engineers, from universities and consultants, etc. A mechanism was then prepared to develop a cascade system of human resource development by the Kaizen trainers prepared by Japanese experts.

Therefore, in technical cooperation where support to private companies is urgently needed, it is desirable to consider the advantages and disadvantages of both the cascade method and the direct support method, and to select or combine the appropriate method according to the changing situation.

Preparation of Materials and Educational Resources to Enhance Spillover Effects

In the Project, a master plan and action plan were created in each state to enhance the continuity of activities after the Project's completion. However, in some states, these were not passed down due to changes in administration, with the state government personnel also being reorganized, leading to the Project's outcomes not being fully retained. On the other hand, some states pointed out that if documents or educational materials summarizing the cooperation process, methodology, and outcomes had been prepared, it could have enhanced the continuity and spillover effects of the activities.

From the above, to improve the continuity and spillover effects of activities after the Project's completion, it is crucial to document the cooperation process, methodology, and

outcomes in materials and educational resources. Including this in the Project's activity plan is desirable.

5. Non-Score Criteria

5.1 Performance

5.1.1 Objective perspective (N/A)

5.2 Additionality

None in particular.

(End)