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Commission on Higher Education
Technical Education and Skills Development Agency
Republic of the Philippines**

**Republic of the Philippines
Industrial Competitiveness Enhancement
Project through Industrial Human
Resource Development and Value Chain
Development**

Final Report

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JAPAN INTERNATIONAL COOPERATION AGENCY

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Abbreviations

ABDD TVET	Area Based and Demand Driven Technical and Vocational Education and Training
ADB	Asian Development Bank
AI	Artificial intelligence
ASEAN	Association of Southeast Asian Nations
BEP	Break Even Point
BOI	Board of Investments
CARS	Comprehensive Automotive Resurgence Strategy
CASE	Connected, Autonomous, Shared, Electric
CHED	Commission on Higher Education
COD	Center of Development
COE	Center of Excellence
C/P	Counterpart
CREVI	Comprehensive Roadmap for the EV Industry
DAP	Development Academy of the Philippines
DID	Difference-in-differences
DOI	Department of Energy
DOST	Department of Science and Technology
DOLE	Department of Labor and Employment
DOTr	Department of Transportation
DTI	Department of Trade and Industry
EES	Electrical Energy Storage
EV	Electric Vehicle
EVIDA	Electric Vehicle Industry Development Act
FDI	Foreign Direct Investment
HEV	Hybrid Electric Vehicle
HNRDA	Harmonized National Research and Development Agenda
ICE	Internal Combustion Engine
IHRD	Industrial Human Resource Development

JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
KTI	Knowledge-and -Technology intensive Industry
MaaS	Mobility as a Service
MBN	Modern Basic Needs
MIRDC	Metals Industry Research and Development Center
MSMEs	Micro Small & Medium Enterprises
NC	National Certificate
NTTA	The National TVET Training Academy
NWPC	National Wages and Productivity Commission
ODA	Official Development Assistance
OEM	Original Equipment Manufacturing (Manufacturer)
OJT	On the Job Training
PDP	Philippine Development Plan
PEZA	Philippine Economic Zone Authority
PHEV	Plug-in Hybrid Electric Vehicle
PUVMP	Public Utility Vehicle Modernization Program
QCD	Quality, Cost, Delivery
R/D	Record of Discussions
SIPP	Strategic Investment Priority Plan
SVC	Supply Value Chain
SVCD	Supply and Value Chain Development
TESDA	Technical Education and Skills Development Authority
TR	Training Regulation
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme

Chapter 1. Background and Purpose of Work

1.1 Background of the Work

Since the 1980s, the Philippines has strengthened its manufacturing industry by means of export-oriented industrialization through the introduction of foreign capital. Although it lagged behind ASEAN countries, the growth rate of the manufacturing industry has been on a slight upward trend since 2010 due to the strengthening of the manufacturing industry and the active acceptance of foreign direct investment (FDI). On the other hand, the lack of measures to link foreign investment to local industries, the tendency of companies to invest in non-manufacturing industries, and the constraints on small and medium-sized enterprises' access to funds have led to the development of supporting industries in the ASEAN region (ASEAN) not being sufficiently developed. Against this backdrop, the Philippine government has launched various industrial policies and recognizes that the Philippines' participation in the supply value chain is an issue for strengthening industrial competitiveness in the global economy, where the international division of labor is advancing. In response, JICA implemented the "Project for Elaboration of Industrial Promotion Plans using Value Chain Analysis" from 2016 to 2019 with the Department of Trade and Industry (DTI) of the Philippines as the implementing agency. On the other hand, in the Philippines, the demographic dividend period in which the labor force is supporting economic growth is expected to continue for the foreseeable future, but the unemployment rate is higher than in neighboring countries, and job creation has not kept pace with the increase in the working-age population. In addition, it often takes several years for young people who have completed secondary and higher education to secure employment opportunities, and there is thought to be a mismatch between vocational skills and the needs of industry. From this point of view, DTI requested technical cooperation from Japan with the aim of building an effective model for industrial human resource development and strengthening the supply value chain as well as the international competitiveness of the Philippine automobile industry and other manufacturing industries. In response to this request, JICA conducted a detailed planning survey in June and July 2017 and concluded the minutes of the discussion (R/D) of this project in November 2017.

1.2 Project Objectives and Outcomes

The objectives and outcomes of this project are as follows.

Purpose	The purpose of the Project is to strengthen industrial human resource development (IHRD) and supply and value chain development (SVCD) by developing improved operational models for IHRD and SVCD in collaboration with foreign companies in the Philippines through implementing pilot projects for IHRD and SVCD.
Target Sector	The target of the Project is the automotive and auto parts industry. It includes supporting industries as well as fusion areas of IT and electronics such as engineering service outsourcing.
Output 1	Operational models for supply and value chains development (SVCD) that will address challenges and linkage problems between foreign and local companies.
Output 2	Recommendations and/or action plans for replicating SVCD models in other industries and/or regions.
Output 3	Improved operational models for industrial human resource development (IHRD) that will address the job-skill mismatch with industries.

1.3 Target Areas and Related Offices and Agencies

The target area is the Calabarzon region (Region 4A), where the automobile and electrical and electronic industries are concentrated.

The relevant government agencies and organizations are as follows.

- ✓ Principal authorities: Department of Trade and Industry (DTI) and Board of Investments (BOI)
- ✓ Other related organizations: Commission on Higher Education (CHED), Technical Education and Skills Development Authority (TESDA), Metals Industry Research and Development Center (MIRDC), Philippine Economic Zone Authority (PEZA) (Department of Labor and Employment (DOLE), etc.



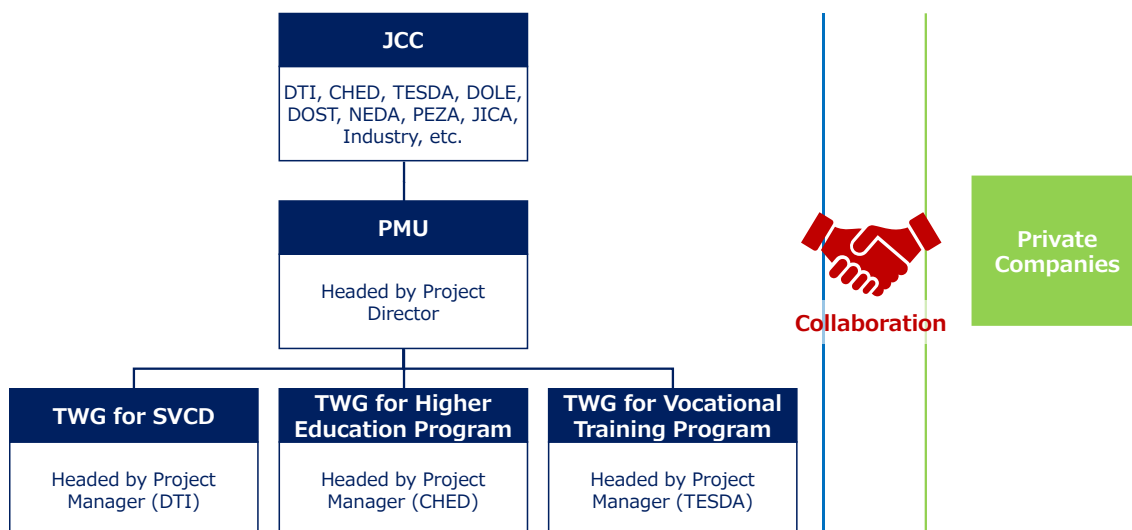
Source: Google Maps

Figure 1-1: Map of the Calabarzon Region

The project was originally requested by DTI to lead supply/value chain strengthening, and educational institutions CHED and TESDA will also be key implementing agencies for industrial human resource development aspects. DTI/BOI is in charge of strengthening the supply value chain, while MIRDC reinforces some technical areas. On the other hand, CHED is in charge of industrial human resource development in higher education, and TESDA oversees training working professionals. Since some areas cross both industrial human resource development and the supply/value chain, PEZA, DOLE, and other institutions are included as Joint Coordinating Committee (JCC) members to provide technical inputs.

1.4 Composition of the Implementing Agency

The project was implemented by three thematic working groups under the overall responsibility of the Project Management Unit, headed by DTI, and in close cooperation with industry, as shown in the figure below.



Source: JICA Team

Figure 1-2: Role of the Implementing Agency's Working Group

Chapter 2. Industrial Human Resource Development and the Current State of the Value Chain

2.1 Automotive Industry in the Philippines

While the annual growth rate of the Philippine manufacturing industry has recovered significantly to about 6 percent since 2010, annual new car sales in the Philippines have surged from 180,000 units in 2012 to 470,000 units in 2017, but sales have stagnated in 2018-19 and declined to 240,000 units in 2020 amid the COVID-19 pandemic. Although sales have recovered from 2021 and have grown to 400,000 units in 2023, Philippine auto parts manufacturers have experienced a significant drop in production due to the trend toward electric vehicles (EVs) in the global automotive industry, among other factors. Even at the peak of automotive sales, domestic production accounted for only about 30 percent of sales in the Philippines, which is different from countries such as Thailand, where domestic production far exceeds domestic sales, and Malaysia, Vietnam, and Indonesia, where domestic production also exceeds domestic sales. Tariffs on imports from ASEAN, which used to be in the 30 percent range, were reduced to zero in 2010 and, as a result of insufficient effective policies to protect and nurture industry with incentives to increase production, the price competitiveness of domestic products of finished vehicles was not strong, and the production scale was not sufficient compared to other ASEAN countries.

The Philippine government's "Comprehensive Automotive Resurgence Strategy (CARS)"¹ launched in 2015 through the Executive Order 182 s. 2015 and established fixed asset support and provided production incentives on the condition that each model be produced at a level of 200,000 units over six years to promote the expansion of domestic production. However, although three models were originally planned to be allocated to manufacturers, only two models from two companies were selected in the end due to strict application conditions. Increasing domestic production in the Philippines has some risks unless manufacturers are looking for backup sites outside of Thailand and Indonesia. From a manufacturing perspective, Thailand is generally the most preferred location, with Indonesia likely to be the next candidate. It is not easy for the Philippines to position itself in an advantageous position compared to other ASEAN countries, for example, even if manufacturers need to look for other alternative countries after production is halted due to an incident such as the floods that occurred in Thailand in 2011.

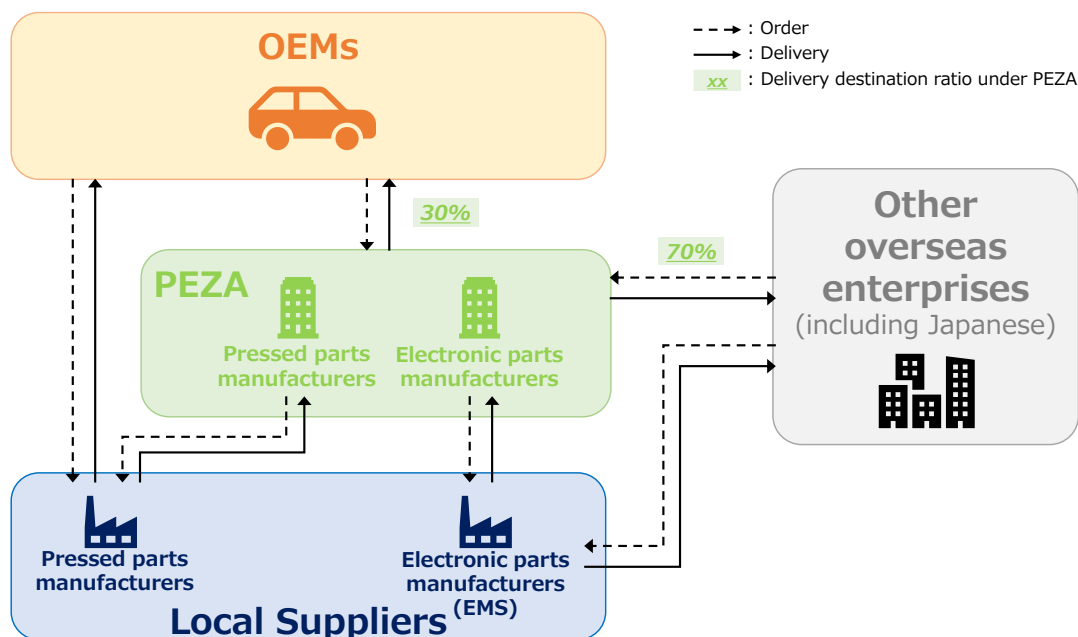
Looking at Tier 1 and Tier 2 suppliers in the Philippines' automobile-related industry, most of the manufacturers that assemble in the Philippines are Japanese companies. Tier 1 and Tier 2 suppliers operating in the Philippines mainly manufacture products that do not require precise work processes, such as machine parts, resins, and wire harnesses. On the other hand, while there are factories in the Philippines, only a few electronic component manufacturers make products for automobiles. Tenants of PEZA (Philippine Economic Zone Authority), which is a special export zone, basically aim to export, while general local companies are highly dependent on domestic production.

The structure of such an industry is shown in the figure below. Domestic parts suppliers receive orders from manufacturers based in the Philippines for parts that do not require precision work, and PEZA's resident companies supply these parts, but supply from these companies is limited. Orders from PEZA resident companies for domestic parts suppliers are also limited, and several

¹ This is a program launched by the Philippine government in 2016 to subsidize domestic automobile production, targeting three new four-wheeled vehicle models to be produced in the country, with a total subsidy of 90 million pesos per model for six years starting in 2016, or 270 million pesos in total. However, the program is subject to the following conditions: production of 200,000 units of one model over six years, new investment in parts manufacturing or shared inspection facilities, and domestic production of at least 50% of the vehicles on a weight basis.

<https://www.jetro.go.jp/biznews/2019/11/7d2cedc5d01f3ca6.html>

domestic electronic component manufacturers that have business with the automotive industry mainly export their products overseas.



Source: JICA Team

Figure 2-1: Structure of the Automotive-Related Industry

In general, it is said that about 30,000 parts are required for one complete vehicle. However, only about 330 of these parts can be procured in the Philippines. As domestic automotive production progresses, the number of items to be procured for domestically produced parts is expected to increase, but many local companies think that they will not be able to supply manufacturers unless they enter a joint venture or technical alliance with a foreign company. On the other hand, manufacturers cite unsatisfactory QCD as a disadvantage of local Tier 1 and Tier 2 companies. From the viewpoint of supplying parts for conventional internal combustion engine vehicles, it is necessary for the 330 domestic parts currently procured in the Philippines to be competitive in terms of quality compared to imported parts, and it is also necessary to increase the number of auto parts produced in the Philippines from the current 330 items. In this regard, there are several possible approaches, such as expanding ESO (Engineering Services Outsourcing), applying IoT (Internet of Things), and attracting overseas Tier 1 and Tier 2 companies, but the accelerating global shift to EVs (electric vehicles) also requires a different way of thinking than for conventional automotive parts.

2.2 Foreign Direct Investment/Business Promotion

Foreign direct investment (FDI) in the Philippines has been strong since the Lehman shock in 2008 and reached a record high in 2012. After another decline, there were signs of recovery in 2018, with investment of PHP 179 billion (up 69.2 percent year-on-year) from around the world. Looking at the breakdown of investment in 2018, the manufacturing industry accounted for the largest amount, accounting for nearly 50 percent of the total (according to Mizuho Research Institute's "Investment Environment in the Philippines October 2019" and JETRO's "World Trade and Investment Report"). The figure below shows the merits and demerits of investment in the Philippines based on that information.

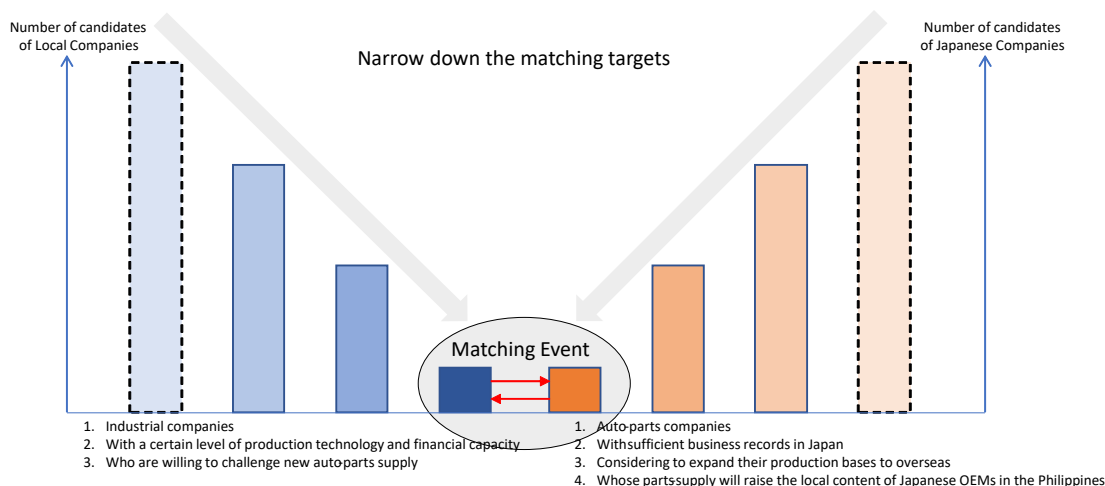
Benefit in Investment	Disadvantage in Investment
① Abundant workforce/Low wages	① Vulnerable infrastructure
② High penetration rate in English	② High corporate tax
③ Distance from Japan	③ High electricity rate
	④ Industry is immature

Source: Information collected by Mizuho Bank and edited by JICA Team

Figure 2-2: Philippines Investment Potential and Risks

The advantages are made the most of to attract FDI while the disadvantages should be addressed. Among the disadvantages in this table, ① ~ ③ are issues that should be addressed by the government continuously while ④ is a topic that can be intervened in with short-term milestones. Looking at the automobile industry in the Philippines, it is said that the supporting industry is not mature and there are only around 130 parts suppliers, which is overwhelmingly low compared to other ASEAN countries such as Thailand (2,300) and Indonesia (1,500). There is a vicious cycle in which parts suppliers are not clustered enough because it is not a base for automobile production, and therefore it is not at the desirable industrial ripeness of automobile production.

Business matching between Japanese and Philippine companies, which is less burdensome than direct investment, can be one way to overcome this situation within a short-term framework. Since the industry is still in its infancy, foreign technology and capital are needed, and the need to promote direct investment or joint ventures is recognized. It is assumed that one way to pioneer this is to explore business matching. In this project, the JICA Team narrowed down the needs of companies in Japan and the Philippines as follows and examined business matching in Japan. From the Philippine side, the list can be narrowed down to companies that have production technology and a financial base, taking into consideration their willingness to expand their business in the automotive-related industry. From the Japanese side, the list can be narrowed down to companies that have business experience in Japan related to automotive parts, interest in overseas production bases, and the potential to increase the local procurement rate in the Philippines.

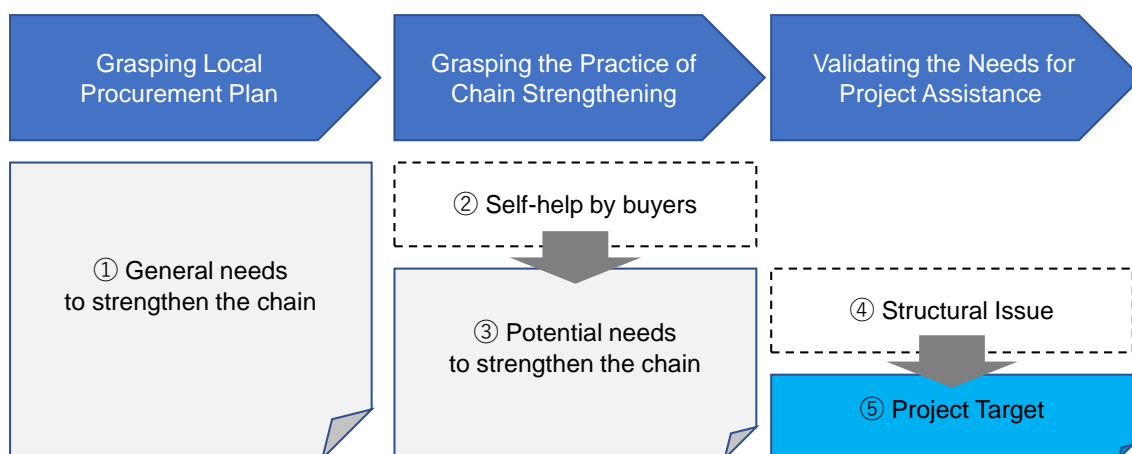


Source: JICA Team

Figure 2-3: Narrowing Down for Business Matching

2.3 Current Situation and Issues on Supply and Value Chain

By interviewing the local stakeholders, the JICA Team identified, through the following three steps, the needs of Japanese manufacturers focusing on domestic production and foreign companies that are global Tier-1 suppliers. The first step was to identify general needs related to the supply chain, followed by understanding the needs outside of the procuring companies' self-efforts to strengthen their supply chains. The JICA Team then identified structural issues and narrowed down the areas to be addressed by this project.



Source: JICA Team

Figure 2-4: Steps to Identify a Company's Needs

① General Needs to Strengthen the Chain

The Philippine government initially expected the entry of new suppliers and an increase in procurement volume as a result of the CARS program. In addition, the need for local procurement became apparent, and there was momentum to improve such skills as the design and maintenance of die and molds domestically, which had previously relied on imports. However, this did not necessarily result in an increase in the number of local suppliers. Manufacturers have an idea of

increasing the local procurement rate by maximizing the volume of transactions with the existing suppliers. Manufacturers require capacity in regard to QCD. These are enhanced by production management technology and production technology, and manufacturers are also making extensive efforts to develop suppliers over Tier 1, especially with regard to production management technology.

When evaluating potential suppliers, it is reasonable to avoid a cost for this evaluation. It takes several months to go through some of the processes. It is said that it takes about four years to get approval from the head office for new suppliers. Therefore, it makes sense to purchase from existing suppliers especially regarding relatively low-value auto parts. It is pointed out that weak cost competitiveness is a main challenge to raise the local content rate. This lack of cost competitiveness in the Philippines is due to the small scale of domestic production, high dependence on imports of raw materials, and insufficient product quality. The items to be localized could be headlamps, mirrors, seat belts, windshield wipers, window glass, window regulators, and airbags in such a situation.

When starting a business with a new supplier, a survey of basic corporate information, an estimate, and a process check at the factory are needed for manufacturers, which could be the first barrier for local companies in the Philippines to enter the chain. Even existing local suppliers may not meet such procurement standards. The main problems for local suppliers are the fragile financial environment and low product quality. In addition, even some manufacturers that had been producing in the Philippines have switched to importing CBU (Completely Built-Up) vehicles due to high unit production costs and long lead times.

② Self-help by Buyers

Manufacturers somehow have supplier development programs such as the dispatch of experts to suppliers to conduct audits and training.

It is pointed out that one of the most typical weaknesses of local companies is the lack of design proposal skills. Many local suppliers follow the instructions of the manufacturer and do not try to initiate improvements. Working together with suppliers to reduce costs, this ability to propose designs is important.

To increase the local content rate in the case of a manufacturer, not only are local suppliers sought, but related Japanese parts suppliers are also encouraged to manufacture in the Philippines. When the CARS program started, many Japanese suppliers came to the Philippines to investigate. However, since the excise tax was raised in 2018, few actually came and established operations in the country.

The main target for localization includes parts that were being manufactured in Thailand for CBU models originally produced there but have been reallocated for production in the Philippines. Starting with large automotive parts such as fuel tanks and bumpers, most of the local suppliers selected in this category have technical partnerships with Japanese companies. This is followed by medium-sized parts and then, in the third stage, small parts are intended to be localized.

③ Potential Needs to Strengthen the Chain

< Issue 1 >

One of the major challenges is how to improve the capacity of local Philippine companies regarding QCD beyond the manufacturer's own efforts to develop their Tier 1 suppliers. There is no mechanism to upgrade the level of the industry as a whole beyond the relationships between

manufacturers and their Tier 1 suppliers. According to a study on the division of roles among auto parts manufacturers in the Philippines, it is assumed that the capacity development of small and medium-sized suppliers will lead to the improvement of the industry as a whole. However, most of these local Tier 2 and Tier 3 companies are not necessarily well organized and directed to good training in the existing supply chain. Issues are that there is not sufficient know-how to independently improve the level of production management technology beyond the reach of the manufacturer's supplier training and incentives, and there is little motivation to achieve this end.

< Issue 2 >

The second issue is the enhancement of the QCD functions of local Philippine Tier 1 companies in regard to manufacturers. Issue 2 is that the specific level of practice of Kaizen in local Tier 1 companies should be upgraded in this regard toward the expected QCD level while Kaizen general diffusion is discussed in Issue 1. Existing Tier 1 companies are confident in their Kaizen practices and believe that no further intervention is needed. Certainly, there are many training opportunities for them, such as trainers dispatched by Japanese manufacturers and training programs provided by industrial associations. In fact, they have secured their position as Tier 1 suppliers by passing manufacturer audits. However, passing a Kaizen audit is not the same as thoroughly practicing Kaizen. In addition to meeting the delivery requirements imposed by manufacturers, suppliers should pursue improving the level of Kaizen implementation profoundly so that they can generate profits. Since the QCD improvement of Tier 2 and Tier 3 is also required to be associated with the improvement of the QCD of Tier 1, it can be said that the improvement of the Kaizen practice level of Tier 2 and Tier 3, coupled with Issue 1, will become important as the Kaizen practice level of Tier 1 increases.

< Issue 3 >

The third challenge is to improve production technology to take full advantage of the opportunities offered by the manufacturer's work order. Coupled with the CARS program, interest in local procurement of large stamped parts increased. The improvement of technical skills in die and mold design and maintenance in the Philippines is one base for technically meeting the requirements of client companies; however, the skills in die and mold design and maintenance are not sufficient. Improving production technology to meet these opportunities was identified as a challenge. Die and mold design and maintenance are the cornerstone of this process.

< Issue 4 >

The fourth challenge is deeper. It has been pointed out that the ability of local companies to propose design improvements is not good enough. Many local suppliers tend to produce as instructed by the manufacturer and do not try to make better products through improvements. The ability of the supplier to make design proposals is important for the manufacturer to work together with the supplier to reduce costs, although this will not be achieved in the short term. Experience in design and co-working with Japanese OEMs is required.

④ Structural Issue

As shown in the figure below, the project classified auto parts suppliers into four groups according to the required technical level and transportation cost. Category 1 items are manufactured in-house by manufacturers, while Category 4 items are imported from related suppliers in Japan. Project support provides opportunities for localization of items that fall into Categories 2 and 3.

#	Internal (Assemblers themselves)/ External	Country	Parts of each category		
			Engine	EXT/INT	Completed electrical parts
1	Internal	Philippines	Engine assembly Transmission assembly	Outer, Roof, Floor, Door panel, Bumper, Instrument panel	
2	External	Philippines	Clutch Crank	BIW frame, Sub-frame, f-tank, Muffler, Seat, Handle components, Mat, Lining, Glass, Air cleaner	Tire, Wheel assembly, Suspension arm, Pedal components, Air conditioner, Battery, Wire harness,
3	External	Third country	Piston, Connecting rod, Cam ECU, Throttle body, Catalyzer	Combination meter, Combination switch, Airbag, Rubber	ABS unit, Brake, Cushion unit, F pump, Hose
4	External	Japan	O-ring, Packing Bolt, Fixing, Sensor	Candidate categories that we can support	

Source: JICA Team

Figure 2-5: Automotive Parts Procurement Categories

Even for Category 2 and 3 items, there are other restrictions, as shown in the figure below. From the point of view of CAPEX and technical requirements, items in the first two categories are particularly difficult for new entrants to supply. When assisting suppliers who are trying to supply new parts to OEMs, the items covered must be in the third category.



Source: JICA Team

Figure 2-6: Barriers to Entry for Each Component

2.4 Industrial Human Resources

In the automotive industry, there is a wide range of occupations, from development and production to sales, and the levels of these occupations vary. According to interviews with the automotive industry, there are three job types: “manager/supervisor,” “engineer,” and “administrator,” and many of them are occupied mainly by university graduates. The table below summarizes three specific types of jobs that the automotive industry needs, based on frequently posted job types and interviews on Jobstreet (<https://www.jobstreet.com.ph/>), the leading job information site in the Philippines.

Table 2-1: Jobs of College Graduates in the Automotive Industry

Occupation	Job Title
Manager/Supervisor	Production manager, quality assurance manager, quality system supervisor, maintenance supervisor, etc.
Engineer	Industrial engineer, electrical engineer, mechanical engineer, design engineer, information system engineer, etc.
Administrator	HR, accounting, marketing, sales, procurement, supply chain specialist, etc.

Source: JICA Team

Japanese companies are often recruiting for clerical positions, and there are few openings for technical positions. This is because they recognize that the number of people with higher education is sufficient for the current domestic industry, but they hope that students and teachers will be exposed to the industry more in order to deepen their understanding of the actual work, even if the exposure is limited. The problems the industry is facing are becoming more complex, and it is difficult to solve them with theoretical knowledge alone. It is important to nurture students with an experiential perspective. Industry expects higher education graduates to develop important generic management skills, such as communication, presentation, and logical thinking.

Technical occupations with a high policy priority are identified in the National Technical Education and Skills Plan (NTESDP) 2018-2022. The listed occupations are core technical workers in automotive industry and ground transportation, electrical and electronics industry, and metals and engineering. These occupations are also labor-intensive and have a high potential for employment in the Philippines. TESDA and TVI, as organizations that address the weaknesses of human resource development in companies, must deal with the development of engineers and operators, especially in small and medium-sized enterprises, while keeping in mind the high degree of technical job hopping.

In particular, the Philippines has a system to support TVET graduates. It is a law that strengthens the “ladderization” interface between TVET and higher education, the “Ladder Education Act 2014”. The law aims to pave the way for career advancement and educational advancement opportunities for students and workers between TVET and higher education through credit transfer. This law and system are considered to be of main benefit to TVET graduates because it allows them to acquire more advanced knowledge and skills, and a more advanced degree leads to higher positions in companies, etc. If engineers and operators recognize the need to acquire advanced engineering knowledge and skills due to the lack of applied practical knowledge and skills in production, they can learn them at the Higher Education Institutions (HEIs). As stated in the NTESDP 2018-2022, the strengthening of lifelong learning through professional life is becoming more and more poised. As engineers with both practical skills and academic backgrounds, such as R&D capabilities and skills, will be required at production sites, it is consistent with corporate needs.

2.4.1 JobsFit 2022

JobsFit 2022 is an alternative report to the Human Resources Development Roadmap 2020 and a labor market intelligence report by the Department of Labor of the Philippines. An overview of topics related to higher education and vocational training in the automotive industry is presented below.

Labor Supply

The number of registered professionals has increased by an average of 5.3 percent per year, reaching a cumulative total of 4.1 million as of 2016 (according to the Professional Registration Committee). Most professionals are teachers, nurses, and midwives, accounting for 62 percent of all professionals. As of 2016, there were 112,000 mechanical engineers, professional mechanical engineers, mechanical plant engineers, and certified plant mechanics, accounting for 2.8 percent of registered professional occupations.

As of 2016, a total of 646,000 people completed higher education, of which 76,000 (12 percent) were in engineering and technology. The largest number of graduates are graduates from business and management courses, followed by 300,000 graduates (47 percent) from education and teaching courses.

The number of graduates of technical and vocational education and training (TVET) increased by an average of 10 percent per year to 2.1 million in 2016. The majority of TVET registrants and alumni are women.

Labor Demand

Between 2013 and 2017, the service sector remained the main source of employment at 56 percent, followed by agriculture at 25 percent and the industrial sector at 18 percent. A total of 1,468 job fairs were monitored by DOLE in 2017, with 46,510 employers participating and 3.7 million vacancies nationwide. NCR had the highest number of employees participating, with 25,112 and 716,962 vacancies, respectively. This was followed by Region 4A with 4,446 companies and 706,666 cases. About 65.6 percent are local employers, and more than half of the vacancies are local businesses. A total of 602,357 job seeker registrations were recorded, of which 70 percent were qualified. In Region 4A, a total of 108,000 people registered as job seekers, with 68 percent eligible. About 32,000 people were hired on the spot.

Priority Skills Requirements

For high-demand occupations (especially in the automobile manufacturing industry), active job openings and job seekers are repeatedly posted, regardless of the place of business or industry. These include:

1. Automotive Brake System Service Technician
2. Automotive Painter
3. Molding and Foundry Technician
4. Laborer
5. Technical Support Specialist
6. CNC Machinist

Hard-to-fill occupations are those that are difficult to fill or take a long time to fill because the hiring process is difficult, such as when a company or employer is unqualified for a job, there is a shortage of supply of job seekers, or the job seeker wants to work abroad or is seeking a higher

salary. These hard-to-fill jobs require high-skilled labor by university engineering graduates, and there is a shortage of such job seekers. Jobs that are in demand but are difficult to fill are called cross-sectional positions when there are repeated openings and postings from different industries, and the hiring process takes time to find the right people. The top five cross-sectional occupations in the automotive industry are:

1. Electrical Engineer
2. Electrician
3. Machinist
4. Mechanical Engineer
5. Welder

JobsFit Action Plan

A series of consultations with various stakeholders, including government agencies, industry associations and academics, were held to exchange insights on the labor market and related issues. These findings are summarized in the JobsFit Action Agenda, which addresses issues, behaviors, and responsible bodies in the summary.

2.4.2 Development of Industrial Human Resources through Higher Education

Through interviews with universities and companies, the JICA Team identified the following issues of the higher education system in cooperation with the automobile industry with reference to the policy.

<Current Status>

[Industry Linkage]

Cooperation with companies is limited to accepting on-the-job training and teacher training, dispatching temporary guest lecturers, and providing donations and scholarships. Efforts have been made by universities to collaborate with industry, but many of them are facing difficult conditions.

[Quality of On-the-Job-Trainings (OJT)]

Although CHED requires engineering students to participate in a minimum of 240 hours of on-the-job training in most engineering programs, it was observed that the evaluation method of projects is based on quantity rather than quality. Some universities point out that faculty members should be sent to the field of on-the-job training to evaluate them, but there seems to be no specific guideline.

[Quality of Faculty]

Due to the limited number of qualified teachers, some higher education institutions employ teachers who receive qualification as qualified teachers. Teachers must have a master's degree to be eligible to teach. Some companies have commented that, after on-the-job training, students are more knowledgeable about a particular field than faculty members because some faculty members have no exposure to the industry at all.

[Curriculum]

Some Japanese companies have pointed out that curricula need to be improved. That's because, in most universities, engineering classes seem to discuss visual representations but provide no hands-on experience with actual engines or machines. Engineering graduates learn mainly theory at school and lack practical training.

< Issues >

One of the major challenges is the lack of connectivity between universities and industries, especially the automotive industry. For example, formulation of effective internship programs for students at companies is difficult if the linkages between industry and academia are weak. Second, once industry-academia collaboration has been established, the next challenge is to improve and sustain its quality. Appropriate guidelines for assessing the quality of students' business-based learning is very important. Third, in order to improve the level of students in collaboration with companies, it is also important to develop the skills of teachers in the field. It is important for faculty members to have opportunities to learn about the latest technologies and actual work environments in companies through guidance on corporate internships and faculty immersion. Finally, issues in the way of enriching the existing automotive curriculum should be addressed. University curricula are not exactly up-to-date and do not respond to the immediate needs of industry, so they need to be updated. However, it can be said that there is neither a mechanism nor a network to identify the latest needs of industry and to develop a curriculum in line with these needs, and the process of curriculum revision takes a long time. This is an issue that should be addressed in the medium to long term through industry-academia collaboration.

2.4.3 Industrial Human Resource Development through Vocational Training

Through interviews with vocational training schools and companies, the JICA Team identified the following issues of the vocational training system in cooperation with the automobile industry.

< Situation >

TRs (Training Regulations) for the automotive and land transport industry accounted for 81 percent before 2009. TRs revised since 2011 are mainly for the service industry. For the electrical and electronics industry, this is not a big problem, as 53 percent of TRs were implemented in 2015, but 31 percent of TRs were still implemented in 2006 and 2008. In the metals and engineering industry, 99 percent of TRs were conducted before 2009. These are technical fields that are strongly linked to the manufacturing and automotive industries. It is recognized that existing TRs should be improved, and new TRs should be implemented as needed.

The demand for high-level training courses has already been noted by industry. TESDA is also aware of this problem and wants to conduct a high-level training course.

The quality of training is associated with the problem of outdated TRs. The training course consists of three competencies: basic competencies, common competencies, and core competencies. Core competencies are the most important part of training, but the TRs are old and somewhat outdated. Training courses in the fields of foundry, automotive machinery and electrical assembly, mold making, metal stamping and forging have not been offered at VTI since 2014. These training courses lead to industrial competitiveness, but TVI's facilities and equipment are old or non-existent. There are also very few trainers for these courses.

The limited capacity and industrial experience of trainers hampers the formation of a structured trainer training system.

< Issues >

The situation and issues of TVET (Technical and Vocational Education and Training) are shown in the table below, from NTESDP 2018-2022. These problems have been mentioned and pointed out in previous projects.

Table 2-2: Challenges in TVET

Issues
1) Outdated Training Regulations (TRs)
2) Few high-level training courses
3) Insufficient quality of training courses to strengthen technical workers
4) Insufficient instructional methods and technological bases for TVET trainers

Source: NTESDP 2018-2022 Annex 5 and edited by the JICA Team

The following steps are necessary to address such issues.

- 1) Focus on training provisions and training courses.
- 2) Focus on technicians and operators.
- 3) Focus on small and medium-sized auto parts suppliers.

In order to develop a new curriculum, TRs must be revised one at a time. In doing so, attention should be paid to utilization of the existing curriculum and to working on a collaborative program with the company based on the needs of the company for efficient and practical TR formation. In general, TVET trainers do not visit companies as part of their duties to conduct needs assessments, so it is important for trainers to learn techniques, knowledge, and skills at the production site through company collaboration. This enables companies to also benefit from hands-on training in the future.

2.5 Overview of Policy Landscape of the Philippines

2.5.1 Development of Policies Supporting Supply/Value Chain Development in the Automotive Industry (MVDP, CARS, PUVMP)

1) Motor Vehicle Development Program (MVDP)

EO 156, s. 2002 - Providing for a comprehensive industrial policy and directions for the motor vehicle development program and its implementing guidelines (December 12, 2002)

- The MVDP is “to enhance the capabilities of the Philippines motor vehicle manufacturing firms to be globally competitive producers of completely build-up units (CBUs) and their parts and components for the local and export markets” through imports of parts and components with reduced import duty.
- The reduced import duty rates of 0 percent or 1 percent are applied to OEM completely knocked down (CKD) parts and components to be used in the assembly of applicable motor vehicles. The program covers i) passenger cars, ii) commercial vehicles, and iii) motorcycles. To be eligible for the incentive, the participating manufacturer and assembler of motor vehicles is to invest \$10 million for assembly of passenger cars or \$8 million for commercial vehicles or \$2 million for motorcycles.
- Ban the importation of all types of used motor vehicles and parts and components.

EO 488, s. 2006 - Modifying the rate of import duty component, parts and accessories for the assembly of Hybrid, Electric, Flexible fuel and compressed natural gas motor vehicles (January 12, 2006)

- Section 6 of EO 488 stipulates providing privilege tariffs for e-vehicle components, parts, and accessories for the assembly of hybrid, electric, flexible fuel, and CNG motor vehicles through the MVDP.

EO 877-A, s. 2010 - The Comprehensive Motor Vehicle Development Program (June 3, 2010)

- The program is to strengthen the program under EO156 providing wider coverage of vehicles and models. The “iv) other vehicles” is included as additional coverage to that of three vehicles in EO 156.

Recent Development:

- The BOI is continuing close consideration of the relevant introduction of a wider scope, to relax the eligibility conditions for participation of electric vehicles coverage with quotas.

2) **Comprehensive Automotive Resurgence Strategy Program (CARS)**

EO 182, s. 2015 - Providing a Comprehensive Automotive Resurgence Strategy (May 29, 2015)

- The CARS Program is a strategic program that aims to “revitalize the Philippine automotive industry and develop the country as a regional automotive manufacturing hub.” The aim of the program is “to provide timebound, and output- or performance-based fiscal support to attract strategic investments in the manufacturing of motor vehicles and parts thereof” while non-fiscal supporting measures have been provided such as MVDP.
- The program is applied to the manufacture of three models of four-wheeled motor vehicles, and addresses domestic activities in the areas of “i) Production of the enrolled Models, ii) Manufacture of Body Shell Assembly and Large Plastic Assemblies of the Models, iii) Manufacture of Common Parts and Strategic Parts not currently produced in the country at Original Equipment Manufacturer (OEM) standards of the Models, and iv) Shared Testing Facility for vehicles and/or parts.”
- The participating car makers (PCMs) of enrolled models are to make new investments in body shell assembly and large plastic parts assemblies, and to plan production of 200,000 vehicles (minimum of 100,000) over a maximum of six years. Requirements include at least 50 percent of the assembly by weight in the case of body shell assemblies, and major components being manufactured in the case of large plastic assemblies. PHP 9 billion is allocated to each of the three PCMs for the support of its new capex (40 percent of the total) as fixed investment support (FIS) and based on the production volume (60 percent of the total) as a production volume incentive (PVI).

Recent Developments:

- In 2017, as the automotive market experienced a slowdown, the Comprehensive Automotive Resurgence Strategy (CARS) program emerged as a significant driver, sustaining and advancing the automotive industry while creating more opportunities for domestic auto suppliers. Mitsubishi Motors Philippines Corporation (MMPC) and Toyota Motors Philippines Corporation (TMP) joined the program in 2016. MMPC expanded its production to include the CARS participating model, Mirage/Mirage G4, producing 13,400 units in 2017. Meanwhile, TMP steadily increased production from 34,881 units in 2016 to 39,909 units in 2017.
- However, the impact of the COVID-19 pandemic resulted in lower-than-expected production figures. According to the Department of Trade and Industry (DTI), the combined production under the program reached 207,165 units as of December 2022, with TMP contributing 134,242 Vios units and MMPC producing 72,923 Mirage units. Taking into account requests from the two participating motor companies (PMCs) and recommendations from the Private Sector Advisory Council (PSAC), President Marcos

approved a five-year extension of the program in May 2023. MMPC has expressed interest in continuing the CARS program into Phase 2, evaluating its effectiveness in terms of employment contribution and support for automotive industry suppliers. The Board of Investments (BOI) is developing a comparative scheme for Electric Vehicles (EVs) within the Electric Vehicle Incentive Scheme (EVIS).

3) **Public Utility Vehicle Modernization Program (PUVMP)**

DOTr, DO No. 2017-11: the Omnibus Guidelines on the planning and identification of public road transportation services and franchise issuance

- The PUVMP is the DOTr's program for comprehensive reform of the public transportation system and operation combined with fleet modernization compliant with the new standards such as the Euro 4 emission system or systems powered by an electric motor, GPS systems, automated fare collection systems, CCTV cameras, front-facing seats, and new exits on the right side. It consists of 10 components of measures: i) Regulatory Reform, ii) LGU Local Public Transportation Route Planning, iii) Route rationalization, iv) Industry Consolidation, v) Fleet Modernization, vi) Financing PUV Modernization, vii) Vehicle Useful Life Program, viii) Pilot Implementation, ix) Stakeholder Support Mechanism, and x) Communication.
- Regarding the fleet modernization, operators and drivers subject to the program are required to renew their PUVs within three years from June 2017 to be compliant with the standards in the program. There is a policy financing scheme provided through the DBM (Development Bank of Philippines) and Land Bank. PHP 2.5 billion is allocated from the national budget and 5 percent of the purchase amount of PUVs is deducted as a down payment from the loan amount. The loan is prepared with an annual interest rate of 6 percent for a maximum of seven years.

Recent Development:

- There is little resistance within the industry regarding the component of modernization of vehicles, which has significant implications for the automotive industry. The government is proceeding with this program while responding to the requests from the business sector. One major challenge lies in the component of "industry consolidation" involving the integration of operations for the establishment of an efficient management foundation. The business group Piston (Pinagkaisang Samahan ng mga Tsuper at Operator Nationwide) has requested the abolition of consolidation requirements.

2.5.2 Development of Tax Policies Supporting the Promotion of Automotive Industry and Investment (TRAIN, CREATE)

The Comprehensive Tax Reform Program (CTRP) is one of the "0 - 10 Points of Socioeconomic Agenda" of Philippine Development Plan 2017-2022 and is introduced by DOF upon the Agenda. It consists of four packages – Package 1: Tax Reform for Acceleration and Inclusion (TRAIN), Package 2: Corporate Income Tax and Incentives Rationalization Act (CITIRA), Package 3: Real Property Valuation Reform, and Package 4: Passive Income and Financial Intermediary Taxation Act (PIFITA). Within these four packages, TRAIN (Package 1) and CITIRA (Package 2) have direct impacts on the automotive industry. The former was passed into law on December 19, 2017, and the latter was passed as CREATE (Corporate Recovery and Tax Incentives for Enterprises) on March 26, 2021.

1) Tax Reform for Acceleration and Inclusion (TRAIN)

- TRAIN is providing i) lowered and simplified personal income taxes, ii) simplified taxes for small and micro self-employed and professional taxpayers (SEPs), iii) unconditional

cash transfers, iv) simplified estate and donor's taxes, v) expanded value-added tax (VAT) base, vi) adjusted oil excise taxes, vii) adjusted automobile excise taxes, viii) introduction of an excise tax on sweetened beverages, and ix) other taxes (mining/tobacco/cosmetic excise tax, etc.).

- The personal income tax (PIT) rate is lowered especially for the lower income range: a PIT rate of 0 percent (down from 5 to 25 percent in the previous scheme) for income up to PHP 250,000 which covers 83 percent of taxpayers. The graduated rates for the over PHP 250,000 income range are also lowered in two steps, one from January 2018 and another from January 2023.
- In relation to the automotive industry, the higher excise tax rates are introduced for oil and automotives, such as PHP 7 (2018), PHP 9 (2019), PHP 10 (2020) per liter for unleaded gasoline compared to PHP 4.35 in the previous scheme, and 4 percent (SRP up to PHP 600,000), 10 percent (SRP over PHP 600,000 to 1,000,000), 20 percent (SRP over PHP 1,000,000 to 4,000,000), 50 percent (SRP over PHP 4,000,000) while 2 percent (SRP up to PHP 600,000), 20 percent (in excess of PHP 600,000 up to 1,100,000), 40 percent (in excess of PHP 1,100,000 up to 2,100,000), and 60 percent (in excess of PHP 2,100,000).
- As a result, the excise tax is higher than the previous system for automobiles with a suggested retail price (SRP) below PHP1.64 million. This price range applies to popular and relatively affordable passenger car models, including the Vios, Corolla, Mirage, Honda Brio, City, Civic, Nissan Sylphy, Almera, Mazda 3, Hyundai, and Volkswagen models. The Department of Finance (DOF) explained that the benefits from the lower personal income tax (PIT) regime in the Tax Reform for Acceleration and Inclusion (TRAIN) are more than sufficient to offset other increases in the new tax system. Additionally, the excise tax is waived for electric vehicles (EVs), with a 50 percent discount for hybrid electric vehicles (HEVs), which could incentivize consumers to shift their purchasing preferences from traditional internal combustion engine (ICE) cars to EVs.

2) Corporate Recovery and Tax Incentives for Enterprises (CREATE)

- CITIRA, which is Package 2 of the CTRP, was recalibrated as the CREATE Act and was enacted on March 26, 2021, in response to the needs and requests of the business community. CREATE accelerated the reduction of the corporate income tax (CIT) rate. Starting from July 1, 2020, the CIT rate for corporate incomes over 5 million pesos was lowered from the existing 30 percent to 25 percent, aligning it within the leveled rates range among countries such as Myanmar, Indonesia, and China, and eliminating significant disparities. (Under the CITIRA schedule, there was a planned annual reduction of 1% each year from 29 percent in 2020.)
- Specifically in relation to the automotive industry, an agreement was reached with investors to extend the sunset period of the most attractive 5 percent Gross Income Earned (GIE) preferential tax scheme, which is considered favorable for PEZA investors, for an additional 10 years after the Income Tax Heaven (ITH) period.

Table 2-3: Corporate Tax Changes on CREATE

Tax and Tax Payers	Previous Rate	New Rate	Effectivity
Corporate Income Tax: Domestic Corporations with Net Taxable Income not exceeding ₱5M and total assets not exceeding ₱10M	30%	20%	July 1, 2020
Corporate Income Tax: Domestic Corporations other than above	30%	25%	July 1, 2020
Corporate Income Tax: Resident Foreign Corporations (RFCs)	30%	25%	July 1, 2020
5% on GIE: PEZA export-oriented corporation	No time limits	10 years	April 11, 2021

Source: JICA Team

2.5.3 Initiatives of PEZA for Industrial Human Resource Development

- **DOLLAR Program:** In June 2020, PEZA launched the DOLLAR Program (Development Outreach for Labor, Livelihood, and Advancement of Resources Program) to focus on the development of industrial human resources through a registration and matching system (based on EO 114, signed on May 6, 2020).
- **SEZ Institute and Training Centers for Industrial Skills:** As part of PEZA's Transformation Road Map (TRM), PEZA is committed to nurturing Philippine workers into world-class experts with a wealth of knowledge and diverse skills. PEZA operates the PEZA Academy program, which harnesses the capabilities of its staff, enhances ecozone management, promotes innovation, and conducts internal education and training. Under this program, collaboration with 29 state universities for worker development within ecozones is underway, with 10 SEZ institutions already established.
- **KIST (Knowledge, Innovation, Science Technology) Park:** PEZA actively promotes collaboration between industry and academia. In July 2020, PEZA partnered with Batangas State University (BatStateU) to establish the Philippines' first Knowledge, Innovation, Science, and Technology (KIST) Park. The KIST Park is expected not only to enhance Batangas State University's research capabilities but also to contribute to research that meets industry needs and supports the incubation of domestic and regional startup enterprises to address market demands.

2.5.4 EVIDA/CREVI/EVIS

- 1) **EVIDA:** In April 2022, the Electric Vehicle Industry Development Act (EVIDA) was signed. The primary objectives of this act are to foster the growth of the domestic electric vehicle industry, reduce the significant reliance of the transportation sector on imported fuels, enhance environmental conditions, and bolster the nation's energy security and self-sufficiency. The key provisions of the legislation are outlined below.
 - In an effort to boost the electric vehicle (EV) industry and facilitate the introduction and commercialization of EVs, the government will create a comprehensive national industrial development plan, the Comprehensive Roadmap for the EV Industry (CREVI).

- In the logistics, food delivery, travel, hotel, electric, and water utility industries, a minimum of 5 percent of business vehicles will be electric vehicles (EVs). Specific timelines for the introduction of EVs will be established in CREVI.
 - The vehicle fleets of operators of public transportation services and government agencies will have a minimum of 5 percent electric vehicles (EVs).
 - Buildings and facilities constructed after the enactment of this law must provide dedicated parking spaces for EVs. In cases where there are more than 20 parking spaces, a minimum of 5 percent must be designated for EVs.
 - Evaluate whether activities related to EV manufacturing, assembly, charging stations, battery and component production, and EV research and development qualify for various incentives under the “Strategic Investment Priority Plan (SIPP)”. (As of June 2022, EV-related businesses have become eligible for incentives under SIPP, including corporate income tax exemptions under the “CREATE Act” and other favorable treatment for corporations.)
- 2) **CREVI:** Based on the provisions of EVIDA mentioned above, a “Comprehensive Roadmap for the EV Industry (CREVI)” is being developed through the coordination of the Department of Energy (DOE), in collaboration with the Department of Trade and Industry (DTI) and the Department of Transportation (DOTr). This roadmap outlines the blueprint for the adoption, utilization, and disposal of EVs in the country, with plans for legalization and publication expected in the first quarter of 2023. The key plans related to EV adoption are as follows.

These are the goals related to EV adoption:

- **Long-term Goal (by 2040):** Aim for complete EV adoption by effectively phasing out the sale of Internal Combustion Engine (ICE) vehicles in the Philippines by 2040.
 - **Short-term Goals (2023-2025):**
 - Streamline the registration process for private and public EVs.
 - Implement a unified charging system.
 - Standardize regulations.
 - Provide incentives (subsidies) for the adoption of EVs in public transportation.
 - **Medium-term Goals (2026-2030):**
 - Reduce import tariff rates on EVs.
 - Introduce policies to further stimulate demand for locally manufactured EVs.
 - **Long-term Goals (2031-2040):**
 - Mandate the complete transition to EVs for all public transportation vehicles.
 - Mandate the installation of EV charging stations at public facilities.
 - Introduce dynamic pricing based on charging time slots.
 - Develop a business model for the disassembly and disposal of used EVs.
- 3) **EVIS:** In October 2023, DTI introduced the “Electric Vehicle Incentive Scheme (EVIS).” The scheme is aimed at supporting domestic production of e-bikes, e-trikes, e-PUVs (public utility vehicles), and e-buses, with a particular focus on targeting niche export markets in Southeast Asia for e-PUVs and e-bikes. Over the next decade, the goal is to increase domestic EV production from its current level of approximately 9,000 units to 4 million units. The incentives under this scheme are being considered not only for the supply side but also for the demand side, and the key features of the e-PUV program are outlined as follows:
- The e-PUV program is designed to support commercial EV manufacturing, following a program similar to the Comprehensive Automotive Resurgence Strategy (CARS), with the assumption of allocating the third slot of the CARS program to domestic EV

production. It aims to provide manufacturing support for the domestic and export markets in the EV manufacturing industry (PUVs, trucks, buses), light truck platform manufacturing industry, and public transportation vehicle manufacturing industry.

- The CARS program established tax rate peaks for domestically assembled vehicles sold, and the e-PUV program extends these tax rate peaks under the CREATE framework not only to passenger cars but also to environmentally friendly mining and its processed products used for EVs, automotive-related electronic equipment, and charging station infrastructure.
- DTI is considering measures to support the battery manufacturing industry for EVs, including assistance of up to 50 percent of CAPEX, as well as incentives such as vouchers for buyers of e-PUVs, e-bikes, and e-trikes.

2.5.5 Philippine Development Plan 2023-2028 and Harmonized National R&D Agenda 2022-2028

(1) Philippine Development Plan 2023-2028 (PDP 2023-2028)

In January 2023, the Philippines announced its new development plan, the “Philippine Development Plan (PDP) 2023-2028,” which will be in effect from 2023 to 2028. Chapter 6 of this plan, focusing on the industrial sector, aims to activate industries through industrialization based on science, technology, and innovation. It also supports the direction of the EV policy mentioned above and presents proactive strategies. Key points related to EV development include:

- i) Expanding the domestic market and supplier base (including EV incentive strategies).
- ii) Strengthening the value chain through digitization and innovation, as well as efforts towards Industry 4.0.
- iii) Enhancing cross-industry linkages to promote a favorable environment for EV development (strengthening collaboration between government policies, industries, academic institutions, and the industrial sector).

Due to changes in the industrial environment, the boundaries between traditional industry sectors have become increasingly ambiguous. In particular, the boundaries within the automotive industry, especially in the field of EVs, have become increasingly unclear. For example, advancements in collaboration between the automotive industry and the electrical and electronic sector (such as sensors and motor control devices for EVs) and the communication sector (CASE, MaaS, etc.) have contributed to this ambiguity.

Not only within the industry but also across different sectors (primary, secondary, tertiary) and between industries, academia, and the public sector, boundaries have become increasingly blurred. These trends of cross-sector and cross-industry collaboration are essential processes in transitioning the traditional automotive industry environment to the next-generation EV-oriented automotive industry. This transition aligns with the broader shift of the entire industry towards Industry 4.0, such as the integration of manufacturing and service industries in MaaS or collaborative research on autonomous driving technology between private companies and universities.

In the PDP 2023-2028, addressing these challenges and opportunities, the strengthening of cross-industry collaboration is positioned as one of the essential strategic goals. Below are the primary strategic items that are likely to have a deep connection with this project and contribute to the development of the next-generation automotive industry.

Outcome 1: Domestic market production and supplier base expanded

- Enhance business-matching activities across regions: With the aim of scaling up industries through localized business matching at the regional level, this strategy promotes addressing challenges in the value chain from upstream to downstream, particularly in sectors such as the automotive industry and parts manufacturing.
- Foster regional industrialization: Within this category, collaboration and cooperation between DTI (Department of Trade and Industry), CHED (Commission on Higher Education), and TESDA (Technical Education and Skills Development Authority) are envisioned. Selected regional universities are proposed to provide support schemes for R&D assistance to companies, entrepreneurial training, and employee education.
- Provide targeted, time-bound incentives to establish labor-intensive industries and business: In this strategic area, specific incentives, similar to those under the CARS (Comprehensive Automotive Resurgence Strategy) program, are proposed, especially for the EV manufacturing sector. The implementation of these measures is being actively pursued under EVIDA (Electric Vehicle Industry Development Act).

Outcome 2: Moving up the value chain achieved

- Accelerate the digitalization and innovation of MSMEs and startups: Promotion of digitalization and innovation among micro, small and medium-sized enterprises (MSMEs) and startups: This section focuses on fostering linkages between startups/MSMEs and large/multinational corporations, particularly in terms of capital investment and innovation cooperation. It also proposes support for MSMEs through the provision of digital platforms to facilitate this collaboration.
- Upskill and reskill workers to adapt to technology: Recognizing the need for a system that produces workers with advanced skills and technical education to meet the demands of employment affected by mechanization and digitization, the importance of industry-academia collaboration is emphasized.
- Bolster science-based industries linked to global value chain: The primary focus is on strengthening the high-value segments of the value chain. In the Industrial Plan 2022-2028, there is a direction specified to promote clustering of knowledge- and technology intensive industries (KTI) through collaboration among DTI/BOI and DOST and other relevant authorities. The Strategic Investment Priority Plan (SIPP) is encouraging investment in technology-driven industrial production capacity. In the Harmonized National Research and Development Agenda 2022-2028 (HNRDA), there are various plans for R&D expansion into industrial sectors.
- Embrace Industry 4.0 for mature-technology firms: Acknowledging the need for new skills and capabilities to leverage emerging technologies brought by Industry 4.0 at various stages of the global value chain, DTI collaborates with DOST to propose initiatives such as AI development support and the establishment of advanced manufacturing centers, advanced mechatronics/robotics and industrial automation labs, among others.

Outcome 3: Inter-sectoral linkages enhanced

- Link industrial policy with trade and investment policy: The direction is to promote increased investment in the fields of science, technology, and innovation (STI), including the electronics industry, through free trade agreements, regional comprehensive economic partnership agreements, and the like.
- Strengthen academe-industry linkages: DTI, in collaboration with DOST, is supporting advanced scientific and technological development in educational institutions, such as universities, through initiatives like industrial support, joint research with industry, and collaborative product design and development.

- Activate business networks across industries: The importance and strengthening of the industrial ecosystem through cooperative collaboration between manufacturing industries and cross-industry sectors are emphasized.
- Promote agglomeration or co-location of industry and services, including academic institutions: As part of promoting academe-industry linkages, the enhancement of the Knowledge, Innovation, Science, and Technology (KIST) park is emphasized, which serves as a hub for university-industry collaboration, within PEZA.

(2) Harmonized National Research and Development Agenda 2022-2028 (HNRDA)

On July 15, 2022, the National R&D Agenda (HNRDA) 2022-2028 was announced. The HNRDA was developed in collaboration with government and private research and development institutions, academia, industry, and other relevant institutions to “ensure that the results of science, technology and innovation are directed to and utilized in areas that provide the greatest economic and social benefit to the public.”

Regarding the industrial sector, in “Section 4: Industry, Energy, and Emerging Technology Research and Development Agenda 2022-2028,” the focus and roadmap for this sector are being discussed for 28 sectors and programs. In relation to the automotive industry, which is progressing with cross-industry collaboration due to electrification, developments in the context of “Energy Materials” are planned in various areas, including the advanced utilization of lead and lithium, research on platinum and metal-free catalysts, and the development of Electric Energy Storage (EES) systems used in all EVs, including hybrid vehicles (HEVs) and plug-in hybrid vehicles (PHEVs).

In the “Transport” section, the focus is on e-PUVs, lightweight vehicle bodies, and the standardization of EV components are discussed. In the “Metal Processing” section, there is a direction discussed for the design and development of tooling and molds for the automotive industry, as well as the use of minerals extracted from Philippine mineral resources, such as copper, gold, chromite, and non-metals (bauxite), for the development of solar cells, fuel cells, and lightweight metals for the automotive industry.

The roadmap also includes future cross-industry government collaborations, promotion of industry-academic collaboration within PEZA, development agendas with a focus on talent development in the technology field, technological developments related to EV charging needed for the next-generation automotive industry, ICT platforms used in CASE (Connected, Autonomous, Shared, Electric) applications, and technology developments related to smart manufacturing.

Table 2-4: Major R&D Agendas Closely Related to the Shift to EVs and the Next-Generation Automotive Industry

Sector	Focus	Initial development agenda
C. Materials for Energy	EES: Electric Energy Storage system	- EES/battery for EV
N. Transportation	Modernized, energy efficient & safe e-PUV	- e-PUV, - Flexible e-Van (FLEV), - Lightweight body EV, - EV parts & components standards (battery related)
T. Metal and Engineering	Tools and Dies	- Tool and Die for automotive industry
	Program on Critical Elements/Metals	- Emerging technology application (for light weight alloys for automotive industry)
Y. Startup Development Program	Startup Grant Fund (SGF)	- DOST-DTI-DICT partnership
Z. Technology Business incubation Program	Science & Technology Parks for Accelerating Research and Knowledge (SPARK)	- Implemented in partnership with PEZA
F. Electronics Industry	Adopting device architecture and prototyping (ex., CMOS/CMOS sensor)	- Development of local EV chargers (2026) - Prototyping of electronic component for autonomous vehicle (2027)
G. ICT Innovations	Ecosystem for the Networked Society	- 5G/6G contributing autonomous vehicle
H. Industry 4.0	Technology for smart factories, manufacturing, and cities	- Development of Manufacturing Execution System (MES) for smart factory - Development of Supervisory, Control and Data Acquisition (SCADA) connecting factory equipment

Source: JICA Team

2.6 Policy Implications

As mentioned earlier, initially this project primarily focused on promoting the automotive and related parts manufacturing industry, with a particular emphasis on internal combustion engine (ICE) vehicles. Therefore, it started with project activities aimed at advancing the industrial workforce and Supply Value Chain (SVC) development within the scope of the traditional automotive industry. In a way, it was a challenge to further enhance the matured industrial ecosystem and penetrate niches within the SVC.

However, in Phase 2 of the project, due to changes in the industrial structure, it became necessary to expand the project's scope to include EV and EV parts-related manufacturing, technology, and information (marketing). Rather than expanding the scope, it could be said that the initial focus (development of domestic component manufacturers, expansion of domestic production and sales, enhancement of positioning in the SVC, increased investment, and export promotion) remained the same. However, the project shifted its focus to cross-industrial linkages within the transforming next-generation automotive industry, the construction of "new" supply chains, including collaboration between industries, academia, and the public sector, and activities to foster industrial talent that contributes to these endeavors.

In particular, the actual scope of the next-generation automotive industry and its parts manufacturing industry has many unknowns and is in the midst of structural changes. It is not yet clear what new components or services will be developed and to what extent cross-industrial initiatives will contribute to them. Therefore, in the exploration of new SVCs and talent development, the project has shifted its focus towards broader collaboration and cooperation across sectors, beyond the confines of traditional technologies and services.

Chapter 3. Concept of Pilot Activities

3.1 Direction of Intervention

The project was initially launched with an emphasis on the promotion of the automotive industry. However, the environment surrounding the automotive industry has changed dramatically due to the impact of COVID-19 and rapidly changing new business trends. As a result, the shift from the automotive industry, which is centered on conventional combustion engine vehicles, to EVs is being accelerated, and the existing supply and value chains are being reorganized, leading to the development of businesses across sectors such as electronics, EMS, ICT, logistics, and construction.

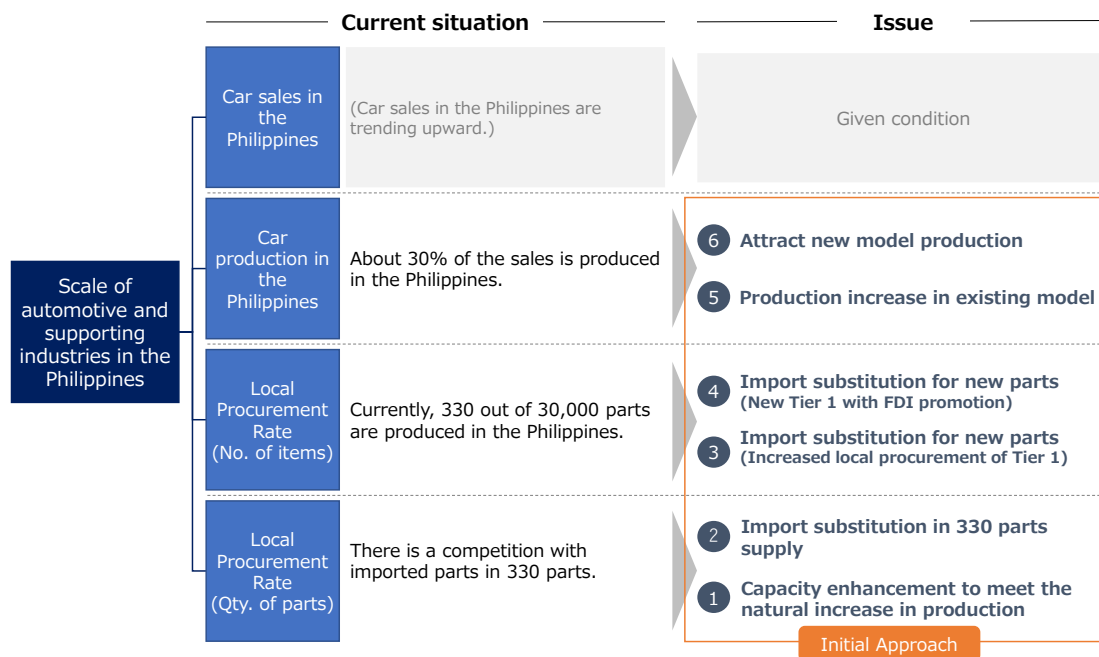
In the automotive industry, there is growing demand for new technologies such as electrical technology, electronics, semiconductors, batteries, and IT, which will play a more important role in the next-generation vehicle supply chain. As this supply chain is still developing, there are also more chances for new players to enter the supply chain and market. It can be said that this trend should be seen as an opportunity. And, especially in the Philippines, where local companies have a long history and strength in the electronics and ICT sectors, it can be a priority area to make the most of the Philippines' strengths and enhance the industrial base of the future.

While it remains unclear what the next-generation automotive industry will look like, the focus of this project needs to be adjusted to cover a somewhat broad range of industry classifications in order not to miss out on important opportunities in the automotive industry in the future. From this perspective, the JICA Team recognizes that strengthening a more specific business promotion framework between the Philippines and Japan and fostering sustainable industrial human resources in a broader scope is a realistic and effective policy that will provide a basis for confidence in mutual business development. It can be said that forward-looking recommendations should include these aspects both financially and institutionally, and the pilot activities have been revised and restructured with this in mind from the beginning of the project.

3.2 Scenario for the Promotion of the Automotive Industry

The scenario for the promotion of the automobile industry in the Philippines was assumed as shown in the figure below, with the presumption of a conventional engine vehicle. Items 1 to 6 are arranged in chronological order from the introduction of the policy to the achievement of the results, from the lowest to the most difficult, or from the shortest to the longest. The bottom line shows the current competition for 330 parts. The main theme is to increase the domestic production rate in this parts group. The main issues are ① to increase the supply capacity for the increase in the number of finished cars manufactured and ② to increase the competitiveness of existing domestic parts against imports. The next issue is to increase the number of parts handled in response to the current situation where only 330 parts are handled. This will be achieved by ③ having domestic parts suppliers enter the market to supply Tier 1 companies as they increase the kinds of parts handled in the Philippines, or, by ④ attracting new Tier 1 companies from overseas. The goal is to increase domestic production of ⑤ existing and ⑥ new vehicles, which currently account for 30 percent of domestic sales.

In order to realize such a scenario, (i) vitalization of finished car sales is important as a precondition for Philippine firms to supply parts, and (ii) reduction of import material costs is a constraint for the supply of high-quality, inexpensive parts. In addition, (iii) strengthening the export of auto parts from PEZA firms should be considered together with the supply of parts to the domestic market.



Source: JICA Team

Figure 3-1: Scenario for the Promotion of the Philippine Automobile Industry

As shown in the table below, issues (1) to (6) can be addressed from the perspectives of business promotion, SVC (Supply Value Chain), and human resource development. In the area of business promotion, all of these issues will require measures to lower the break-even point (BEP), and, regarding the SVC, links with foreign firms will be important, and efforts by domestic parts suppliers should be stimulated. In terms of human resource development, the theme can be the expansion of human resources active in the automotive industry, based on the assumption that there will be more jobs. From these perspectives, the pilot activity plan was developed accordingly as a concrete measure.

Table 3-1: Measures to Achieve the Scenario

Scenarios to achieve Goals	Solutions under the Project		
	Business Environment/FDI	SVC Development	Human Resource Development
1 Preparation for the Increase of Production under the Existing Plan			Sustaining of the existing ties
2 Import Substitution of Back-up		Creation of New Business Relation Cost reduction for foreign companies to search good local suppliers	Enlargement of Human Resource Pool for Auto Parts suppliers
3 Enlarged Import Substitution by Local Suppliers		Partnering with local enterprises Strengthening connection for JV formulation or technical tie-up with local suppliers	Capacity Development for new business transaction
4 Attraction of Foreign Suppliers	Downward shift of BEP Attraction of Production Base of Foreign Auto Parts Suppliers and cost reduction, Incentive Provision		Enlargement of Human Resource Pool for Auto Parts suppliers
5 Enhancement of Domestic Production of the Existing Car Models	Downward shift of BEP Incentive Provision for OEMs to increase production in the Philippines		
6 Attraction of a New Car Model Production	Downward shift of BEP Cost reduction/Incentive Provision for OEMs to found new car factories in the Philippines		

Source: JICA Team

Looking at the labor force, there is a supply-demand gap in the employment situation of students and job seekers as job creation has not kept pace with the growth of the working-age population. It has also been pointed out that the lack of coordination between the curriculum and industry prevents students and job seekers from acquiring practical knowledge and skills. On the other hand, young people also tend to avoid working in the automotive and manufacturing industries. In such a situation, students and job seekers are unable to develop their careers smoothly with their own initiatives in the transition from school to work.

In the medium to long term, it is important to help the younger generation plan their professional lives, help them develop their careers, and encourage them to work for the same company for a long time, through any government interventions. If students and job seekers can develop their careers spontaneously, the industry will become more flexible and stronger, which will promote the development of Philippine industry as a whole. There is a need for measures that allow students and job seekers to increase their learning ability and motivation to work while learning in the workplace.

The BOI is also implementing policies for the promotion of the automotive industry in cooperation with stakeholders from industry, government, and academia. In this project, under the leadership of the BOI in the Philippines, a series of pilot projects have been implemented to develop industrial human resources and strengthen the value chain in automobile-related industries, and a roadmap for dissemination and development has been presented by modeling this project.

3.3 Possible Initiatives on Supply and Value Chain

The issues indicated in “2.3 Current status and issues in the supply value chain ③ Potential needs to strengthen the chain” are Issue 1: Kaizen diffusion beyond existing Tier 1 suppliers, Issue 2: Further deepening of Kaizen at existing Tier 1 suppliers, Issue 3: Die and mold design and maintenance technical capabilities, and Issue 4: Ability to propose design improvements. The following initiatives are envisioned to address these issues.

⑤ Project Target

< Measures >

Measures to address these issues are shown in the table below. Issue 1 should be looking to expand the number of new Tier 1 suppliers or develop Tier 2 and Tier 3 suppliers, to generally promote Kaizen diffusion to improve QCD. Issue 2 should aim to further improve QCD by deepening Kaizen implementation by existing Tier 1 suppliers. Issue 3 is a response to the momentum to substitute imports for die and molds and to strengthen maintenance capabilities but will be modified according to the current state of the industry. Regarding Issue 4, efforts to link Philippine companies and foreign companies will also be important as a driving force toward resolving other issues.

Table 3-2: SVCD Challenges and Approaches (from Progress 1)

Number	Issue	Intervention Approach	Pilot Activity
1	Lack of diffusion system of Kaizen outside the Tier 1 circle	- Install self-directive Kaizen diffusion mechanism	- Providing Kaizen consultation to auto parts suppliers
2	Kaizen for the company performance is not yet achieved	- Instruct Kaizen to improve company performance	- Providing Kaizen consultation to auto parts suppliers
3	Lack of die designing and maintenance skills	- Enhance the capability of Philippine local companies by establishing MIRDC as the technology hub	- Providing capacity development of die engineering
4	High entry criteria for local companies	- Attract FDI or technical partnership from Japan	- Holding matching seminars

Source: JICA Team

Regarding the first issue, the system for disseminating Kaizen outside the existing Tier 1 circle, it is necessary to design the intervention in an economically rational manner. Given the size of the target companies and the limited resources of government support, it is impractical to rely on public or private business development services for Kaizen. Rather, the JICA Team should seek self-help tools that allow them to practice basic Kaizen on their own. This diffusion will be key to raising the level of potential that the industry has.

As for the second issue, something new may be needed when the target companies are a local Tier 1 company since they are familiar with Kaizen. In order to increase such added value, it is necessary to intervene in the business content of each company.

Third, in order to address the lack of technology and knowledge in die design and maintenance, MIRDC, whose mission is to provide technical expertise to the private sector, can be strengthened as a technology hub.

Fourth, an exploration can be carried out to bridge the Philippines companies and Japanese companies to fill the gap between the requirements of Japanese manufacturers and local suppliers if there is room to accelerate technical cooperation between Japanese and Philippine companies.

Finally, apart from the supply chain of conventional combustion engine vehicles, support for the new E-PUV value chain is envisaged. The Philippine government expects this sector to be a driving force for future SPV (Special Purpose Vehicle) exports.

3.4 Policy Significance

The Philippine government has implemented various policy programs aimed at i) strengthening supply and value chains (SVCs) between major automotive manufacturers and their domestic suppliers, ii) securing the comparative advantage of domestically manufactured vehicles over imported vehicles, and iii) enhancing the domestic auto parts production system (e.g., the CARS program) in order to promote the Philippine automotive industry. As mentioned in the previous chapter, this project has supported these objectives through pilot activities to develop industrial human resources and improve the business environment centered on the supply and value chain and has been working to develop domestic auto parts suppliers. The results of the pilot activities have been aimed at contributing to the promotion of the automotive industry in the form of further enhancement and sophistication of existing policy programs and/or the introduction of new programs.

The initial perspective of this project focused on the first three points from the perspective of expanding SVCs with Japan and foreign OEMs, with gasoline engine (internal combustion engine, ICE) vehicles in mind, and the last point from the perspective of promoting the development of an export-oriented auto parts suppliers

1. “Policy measures for reduction of raw material import costs / promotion of domestic production” that are important in eliminating bottlenecks in the auto parts manufacturing industry (auto parts suppliers).
2. “Policy direction options for enhancing the foundation of auto-related manufacturing industry” for advantageous SVC positioning.
3. “Incentive measures for the domestic vehicle sales market” including increasing efficiency through the economies of scale and promoting a comparative advantage in terms of cost.
4. “Direction of enhancement of PEZA function” in consideration of further incentives for the investment in new manufacturing and strengthening functions to respond to changes consequently contributing to auto-parts export promotion.

Against this backdrop, major changes surrounding the industry, including the COVID-19 pandemic, have accelerated the momentum of the automotive industry’s shift to EVs globally. The shift to EVs has brought about a major structural change from a production and sales system centered on ICE vehicles to a system that supports EVs. In addition, the acceleration of EVs will further promote partnerships with sectors that have not had a strong direct connection with the automotive industry, such as the ICT/electronics, logistics, housing, and entertainment fields, in order to advance new mobility services such as CASE and MaaS. Structural changes have progressed in the automotive industry toward a new generation.

In this project, collaborating with the BOI, the JICA Team has examined ways to make project activities more effective while maintaining the initial focus. Compared to the nearly matured industrial structure of ICE vehicles, there are still many unknowns and potentialities in the structure of the next-generation automobile industry (EVs), such as the flow of parts manufacturing and supply for EVs, the form of new products and services through cross-sectoral collaboration, and the way in which these products should be linked. Therefore, the above focus was interpreted in the context of the industrial human resource development and the state of the supply and value chain that is required for EVs, and the decision was made to reflect it in pilot activities from a broader perspective.

In the following, the JICA Team will review the policy developments related to the transition to EVs in the Philippines and examine the policy position and direction of the pilot activities of this project.

Chapter 4. Pilot Activities

4.1 Background and Policy of Pilot Activities

Based on the current state of industrial human resource development, the supply and value chain in the Philippines, and the policy situation described in the previous chapter, the JICA Team has formulated several pilot activities to develop a sustainable operating model. This chapter identifies weaknesses in the Philippine automotive industry, determines how to address those weaknesses, and explains how pilot activities are formulated by considering the development of an operating model. This chapter also explains the progress and future plans of each pilot activity, as well as the achievement and lessons learned from the design and formulation of the pilot activity.

4.2 Changes in Circumstances Related to Project Implementation

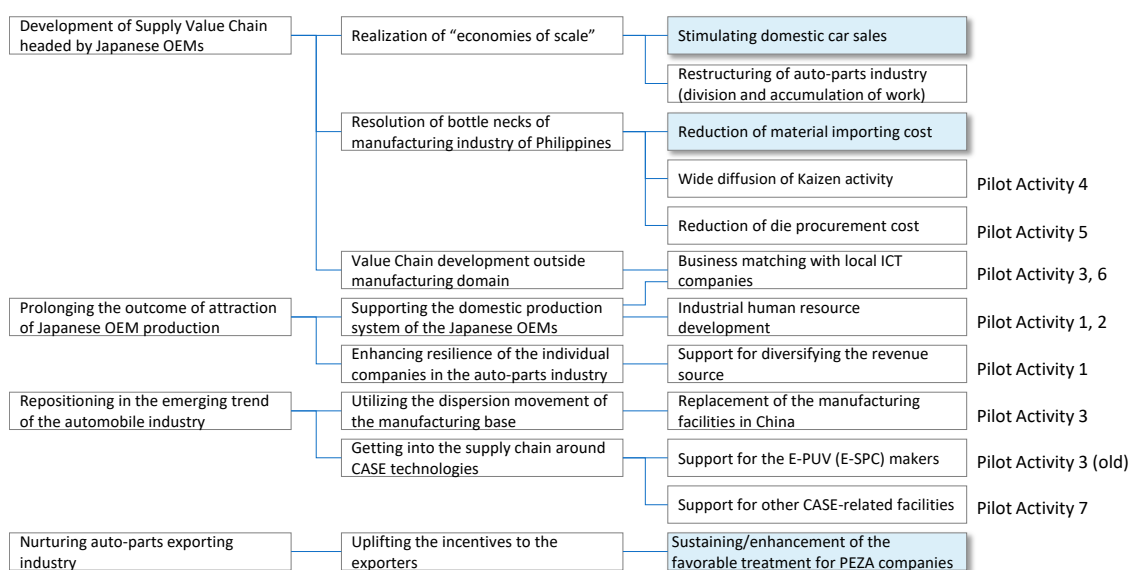
In early 2020, the Taal Volcano in Batangas province, located about 50 km south of Manila, erupted. Ashfall covered cities near the capital, financial markets were suspended, and the Manila airport was forced to be closed. In the manufacturing industry, especially precision products, some production lines were shut down. In January 2020, the World Health Organization (WHO) declared a state of emergency due to COVID-19, which shocked the global, regional, and national economies. In this project, travel was restricted and remote work was compelled.

The automotive industry has also witnessed the impact of COVID-19, which has led to factory closures, supply chain disruptions, and a decline in global demand. On the other hand, coupled with the spread of social distancing in our lives, the trend of digital utilization has accelerated. In view of this situation, it was decided to revise the direction to focus not only on the automotive industry but also on the interrelated ICT sector and build a foundation for effective and efficient industrial development in this project.

For the Philippine automotive industry, strengthening the supply value chain under Japan manufacturers, achieving positive effects from increased FDI and local content, adapting to new trends in the automotive industry, and promoting auto component exports remain the main challenges. However, new aspects need to be taken into account, such as diversification of SVCs and strengthening resilience.

From the perspective of promoting the Philippine automobile-related industry, the important considerations remain: (i) revitalization of sales of finished vehicles, (ii) reduction of the cost of imported materials, and (iii) strengthening of exports of auto parts from PEZA companies, as mentioned in “2.2 Scenario for the promotion of the automotive industry”. However, it is very important to adapt to new industry trends such as Industry 4.0 and digital transformation. In particular, considering the trend of CASE², it can be said that it is increasingly important for the Philippine automobile-related industry to pay attention to the use of ICT. In response to the new situation, the positioning of each pilot activity was organized as shown in the figure below.

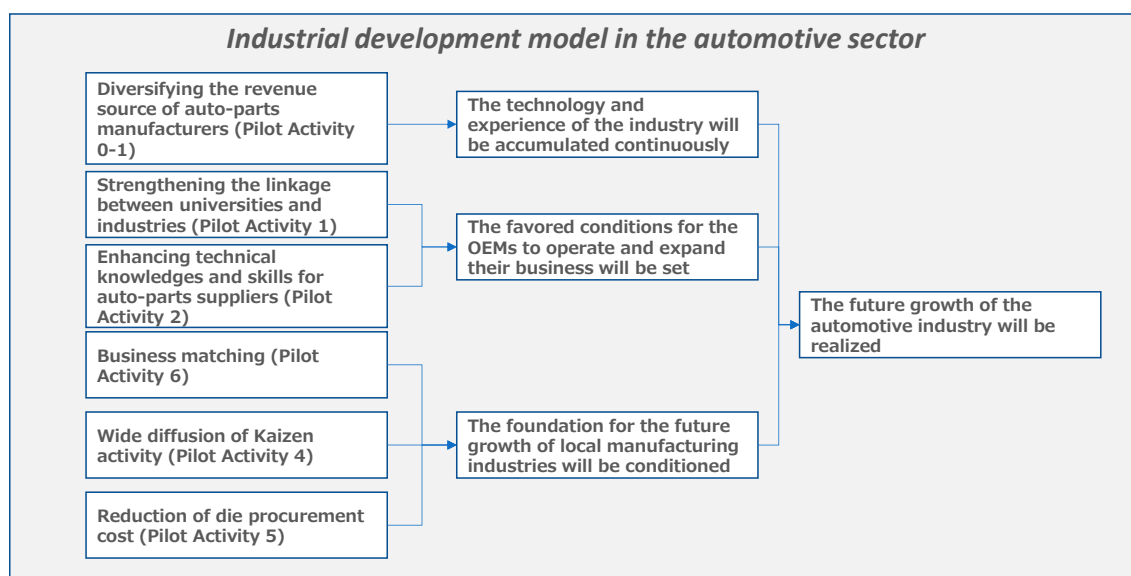
² A term coined from the initial letters of Connected, Autonomous/Automated, Shared, and Electric. It is considered to be a trend in future vehicle development.



Source: JICA Team

Figure 4-1: Positioning of Pilot Activities

The intrinsic value of the project remains to demonstrate an effective methodology for industrial enhancement models, and in particular to demonstrate how to gain stakeholder buy-in. Originally, it was envisaged that pilot cases in the automotive industry would be recognized as best practices and referenced by other regions and sectors, and the final year of the four-year project was set as a dissemination phase to attract other regions and sectors regarding the success of the pilot program implemented in the first three years. This concept will be maintained, but it will be necessary to respond quickly to changes in the business environment, and the pilot activities will be required to simultaneously work in industries other than the automotive industry, such as ICT and EMS, while aiming to build a foundation for industrial capacity development as a whole. The figure below shows the expectations that pilot activities should contribute to from the bottom up.



Source: JICA Team

Figure 4-2: Contribution of Pilot Activities

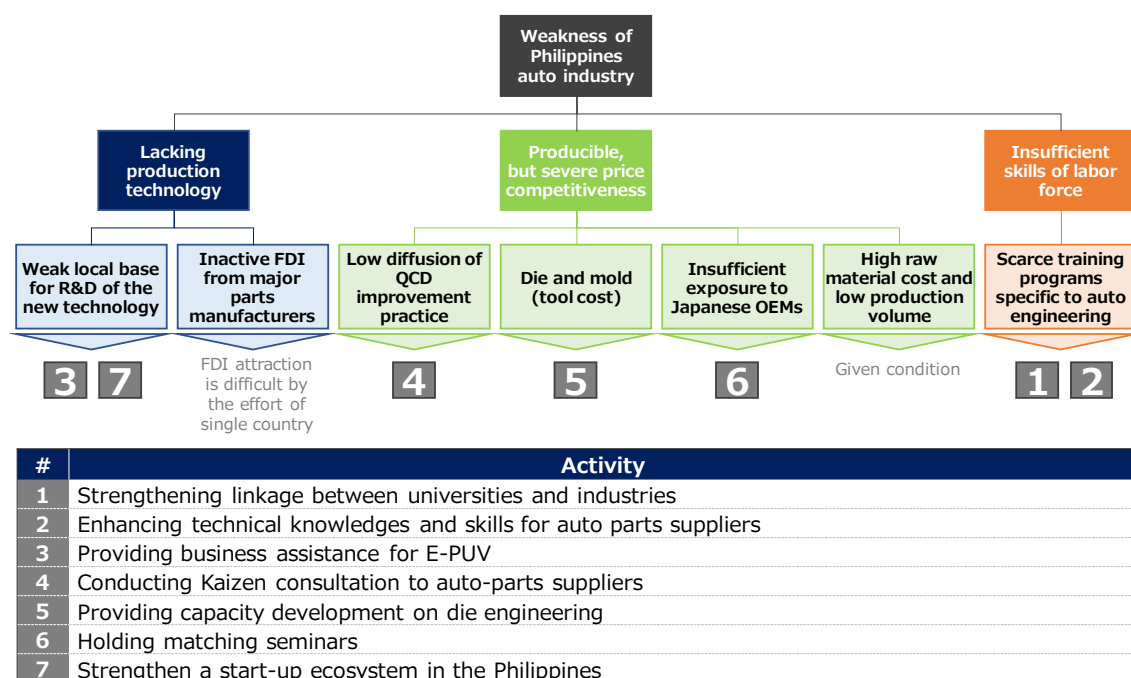
4.2.1 Framework of the Pilot Activities

The figure below is an achievement scenario for the promotion of the automotive industry in the Philippines, and this project is required to address these issues: “production technology”, “strict price competitiveness”, and “skilled labor”. To achieve this, it is necessary to address three points: production technology, strict price competitiveness, and skilled labor. Each point can be subdivided, and the JICA Team consulted with the BOI and JICA to derive seven pilot activities in Phase 1 to address each point.



Source: JICA Team

Figure 4-3: Examination of the Challenges and Approaches of the Philippine Automotive Industry

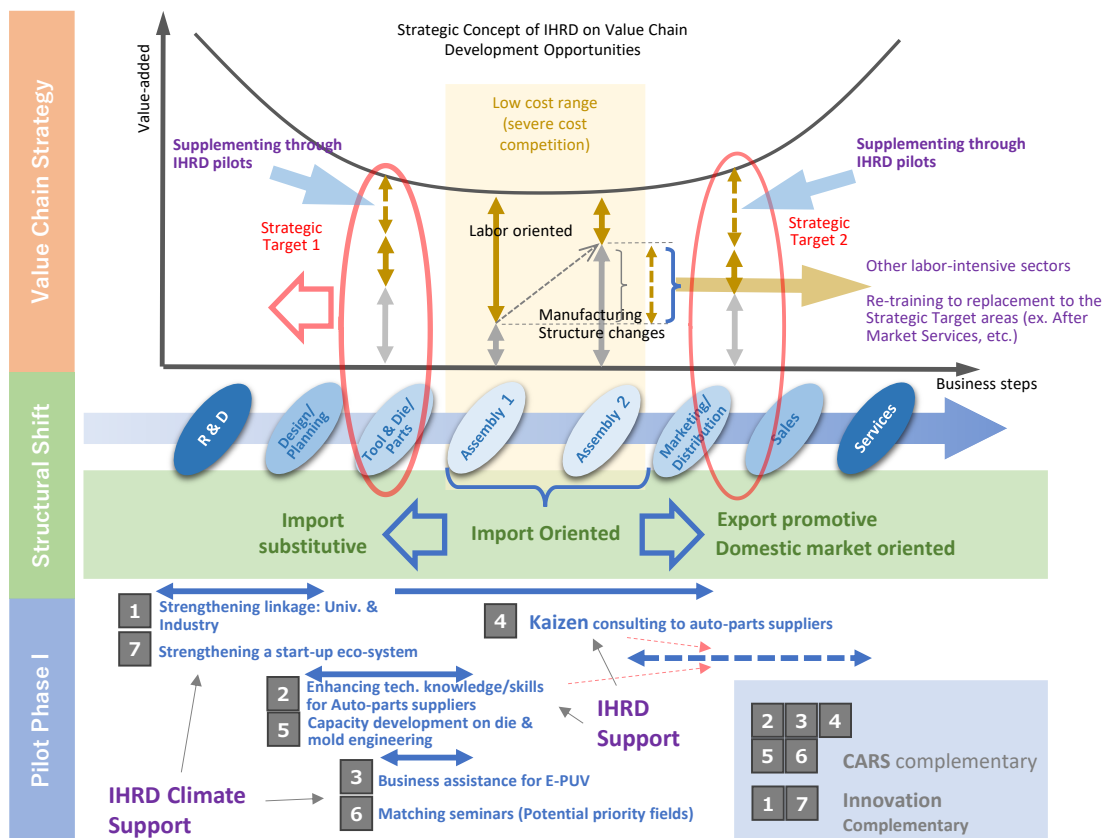


Source: JICA Team

Figure 4-4: Organizing the Challenges of the Philippine Automotive Industry and the Pilot Activities Examined

The figure below plots pilot activities on the “smile curve” of industry structure and value chain strategy. It can be seen that the Philippine automotive industry is “import-oriented” in the value chain structure, that is, it is at the bottom of the smile curve.

Strategic Goal 1 is to shift in the direction of “import substitution orientation”, which requires more design and R&D areas. On the other hand, Strategic Goal 2 is to shift in the direction of “export promotion and domestic market orientation,” which is more about after-sales and service areas. Since the shift of Strategic Goal 1 or Strategic Goal 2 or both depends on government policy, this project will grasp the direction of policy in the Philippines. In accordance with the policy direction, the approach and development of pilot activities will change along with the operating models of IHRD and SVCD. Based on this qualitative analysis, the JICA Team considered narrowing the scope of efforts to engage in quantitative analysis to derive numerical data and indicators when evaluating pilot activities and operating models.

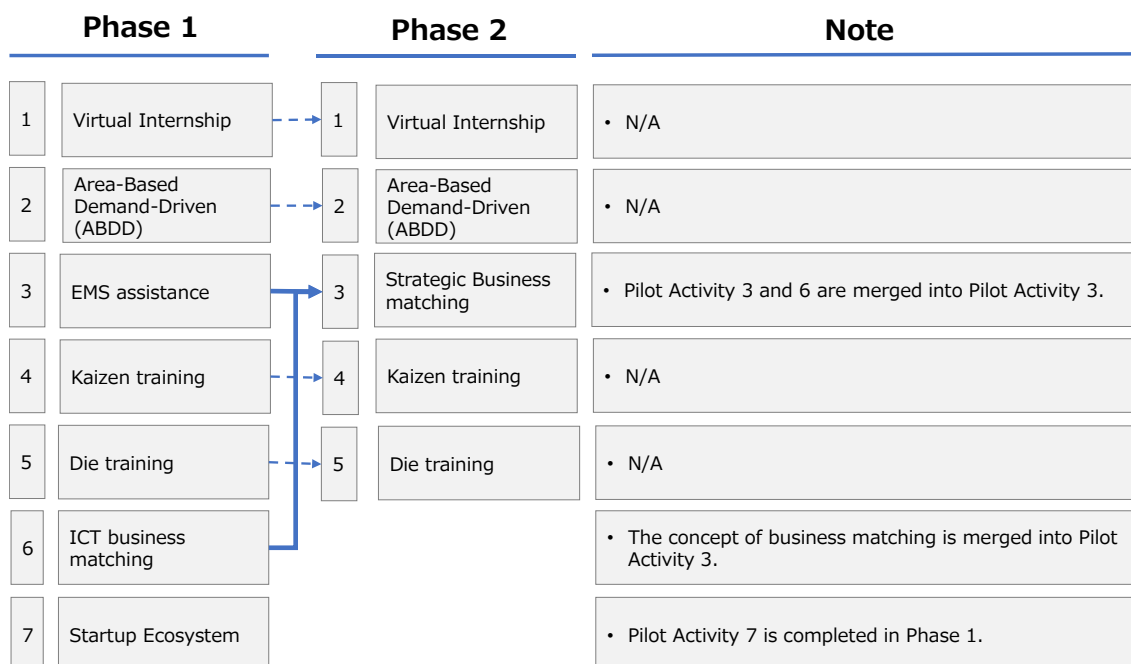


Source: JICA Team

Figure 4-5: Value Chain's Smile Curve and the Positioning of Each Pilot

4.3 Changes during the Transition from Phase 1 to Phase 2

Due to the impact of the pandemic and changes in the business environment, each pilot activity has been redesigned to be flexible in regard to these changes. The JICA Team tried to conduct the pilot remotely using technical means while in Japan. Based on the lessons learned from some of the pilot activities, the JICA Team reorganized the Phase 2 pilot activities as shown in the figure below.



Source: JICA Team

Figure 4-6: Organize the Pilot Activities from Phase 1 to Phase 2

One of the highlights is Pilot Activity 3, which was newly established by integrating the existing Pilot Activity 3, which also has the element of supporting Philippine companies' expansion into Japan, and Pilot Activity 6, which has the element of business matching. In this new initiative, JICA Team strategically prepared for business matching, such as launching a special website in the Philippines and promoting the attractiveness of the Philippines to more potential business partners in Japan. The following table lists the final pilot activities between IHRD and SVDC that have been categorized by their respective agencies.

Table 4-1: List of Pilot Activities with a View to Modeling

#	Pilot Activity	Responsible Institution	Category	
			IHRD	SVCD
1	Strengthening linkage between universities and industries (Virtual Internship)	CHED	○	
2	Enhancing technical knowledge and skills for auto-parts suppliers (ABDD)	TESDA	○	
3	Strategic business matching	BOI		○
4	Kaizen diffusion	BOI (MIRDC)		○
5	Providing capacity development for die engineering	BOI (MIRDC)		○

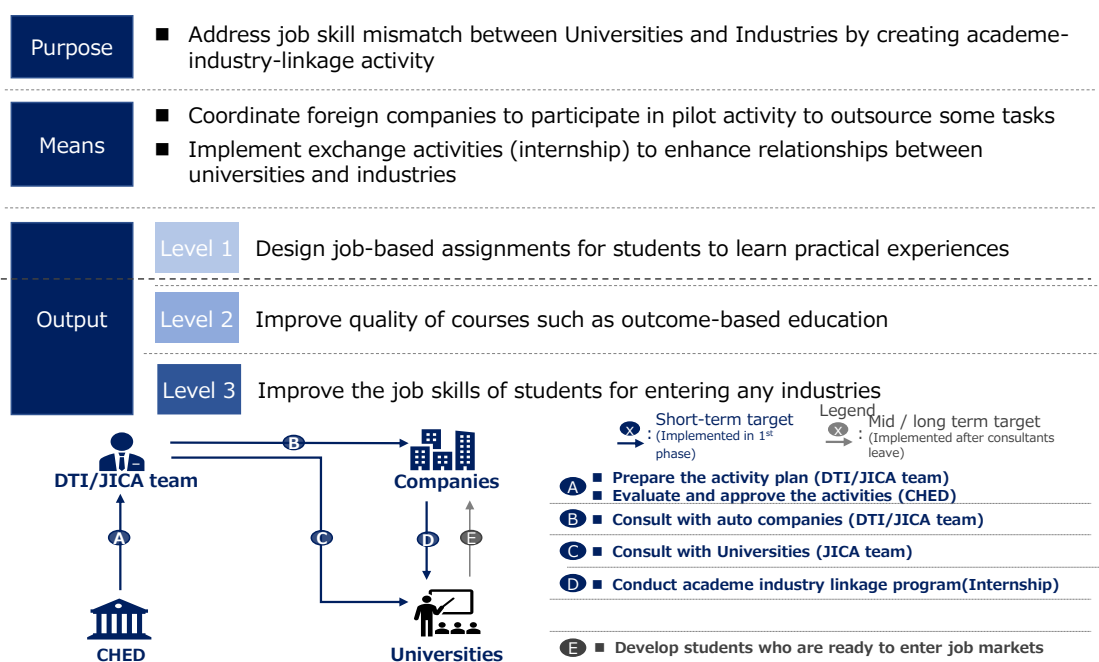
Source: JICA Team

4.4 Concept and Achievement of Each Pilot Activity

4.4.1 Pilot Activity 1: Implementing industry-academia collaboration activities (Virtual internship with Japanese companies by students from the Philippines)

(1) Concept

Pilot Activity 1, which is one of the industrial human resource developments, is a project related to higher education. The main goal of Pilot Activity 1 is to strengthen collaboration between universities and industry by providing opportunities to exchange information and discuss ways to improve the education system to encourage university graduates to enter the automotive manufacturing industry. The concept of the pilot activity is as follows, and the JICA Team aimed to implement industry-academia collaboration activities as a pilot and institutionalize the results.



Source: JICA Team

Figure 4-7: Conceptual Diagram of Pilot Activity 1

(2) Background

In order to have a forum to exchange opinions with industry and universities in preparation for the start of Pilot Activity 1, a meeting was set up by the project in November 2019. The JICA Team invited 20 universities that obtained the Center of Excellence (COE) and Center of Development (COD) of the Calabarzon region for their industrial engineering, mainly engineering faculties such as mechanical engineering and electrical engineering. From the industries, the JICA Team invited parts manufacturers, electronic equipment manufacturers, etc., mainly from the automotive industry, and also reached out to industry associations. The following is a list of when the JICA Team considered invitations to a meeting.

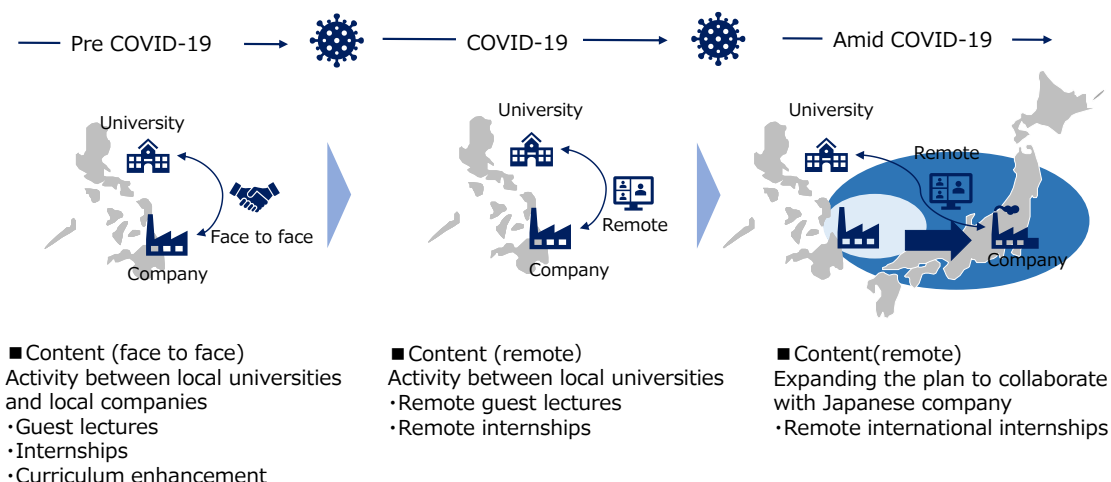
Table 4-2: Invitation List for Industry-Academia Collaboration Meetings

No.	University	COE,COD	No.	Industry	Number of companies
1	Batangas State University	○	1	Auto Assemblers	5
2	De La Salle University - Dasmariñas	○	2	Auto Parts Companies	15
3	University of the Philippines – Los Banos	○	3	Electric Vehicle Companies	5
4	Adamson University	○	4	Die and Mold Companies	5
5	Asia Pacific College	○	5	Auto Electronics Companies	10
6	Ateneo de Manila University	○			
7	De La Salle University	○	No.	Name of Industry Association	
8	Mapua Institute of Technology	○	1	CAMPI (The Chamber of Automotive Manufacturers of the Philippines, Inc.)	
9	Technological Institute of the Philippines Manila	○	2	PPMA (Philippine Parts Maker Association)	
10	Technological Institute of the Philippines Quezon City	○	3	SEIPI (Semiconductor and Electronics Industries of the Philippines Inc.)	
11	University of Santo Tomas	○	4	EIAP (Electronic Industry Association of the Philippines Inc.)	
12	University of the Philippines Diliman	○	5	E-VAP (Electric Vehicle Association of the Philippines)	
13	Technological University of the Philippines		6	PDMA (Philippine Die and Mold Association)	
14	Colegio De San Juan De Letran				
15	Laguna State Polytechnic University				
16	Laguna State Polytechnic University-San Pablo City				
17	Laguna State Polytechnic University-Siniloan				
18	Lyceum of the Philippines-Laguna				
19	Malayan Colleges of Laguna				
20	University of Perpetual Help System-Laguna				

Source: JICA Team

The event was held in Laguna, and a total of 47 people, including 23 from universities, 23 from industry, and one from an industry association, participated and were divided into groups to exchange opinions on what kind of industry-academia collaboration activities would be implemented as a pilot. At the conclusion of the meeting, 1) hands-on and training by companies 2) job fairs on university campuses, and 3) effective internships were the leading candidates for pilot activities.

In January 2020, the JICA Team planned to materialize the activities while coordinating with universities wishing to become pilots based on the above strong candidates. However, due to the impact of COVID-19, local activities could not be carried out. The JICA Team continued to design the activities through online meetings and was able to collaborate with Batangas State University, Mapua University, and De La Salle University, but it remained difficult to obtain cooperation for the activities of this project, as the industry was forced to suspend production due to the impact of COVID-19. Therefore, the JICA Team considered temporarily moving the industry activities away from the Philippines and targeting Japanese companies in Japan. The JICA Team examined whether it was feasible to conduct activities via the Internet, and at the same time identified issues such as language barriers. The following diagram shows the transition between the activities envisioned before COVID-19, and those attempted immediately after COVID-19. The implementation of guest lectures, internships, and company-participatory curricula was under consideration before COVID-19 (left). However, due to the COVID-19 pandemic, local companies suspended their production, and online guest lectures from local companies were not feasible (middle). As a strategy for activities under these circumstances, the scope of companies was switched from the Philippines to Japan, and the concept of a virtual internship was developed by considering the implementation of activities only remotely (right).



Source: JICA Team

Figure 4-8: Transition Diagram of Examining the Activities of the Internship during COVID-19

The JICA Team spent about six months from January 2020 carefully studying the feasibility of the pilot activity and proposed a trial virtual internship to realize internships between Philippine students and Japanese companies in Japan via the Internet. Japanese companies were accepted with the cooperation of a company in Hachioji, which had a partnership with Mapua University. The host universities were Batangas State University and Mapua University. As for how to set the most important tasks in a virtual internship, the JICA Team was conscious of the difference from face-to-face internships, and asked students to complete certain tasks in the form of homework, such as researching issues faced by companies and new markets and devised a way to make progress on the assignments in regular online meetings once a week. The language used was English, and even people who could not speak English at Japanese companies could communicate while sharing the screen of online translation software in online meetings. In addition, even though it was a pilot activity, this virtual internship made it possible to earn credits as usual. The table below shows the program proposals that were considered at the hypothetical level before the virtual internship. Initially, De la Salle University was among the candidates but, in the end, Mapua University and Batangas State University remained model universities. Due to the nature of the pilot, it was designed to limit the number of students to about 10, but in fact it ended up conducting the internship with 33 students.

Table 4-3: Outline of a Virtual Internship

Number	Item	Content
1	Candidate Company	Companies in Hachioji city, suburb of Tokyo
2	Candidate University	1) De La Salle University 2) Mapua University 3) Batangas State University
3	Number of students	10 in total
4	Term	Academic year of 2021 (August 2021)
5	Duration	3 months
6	Methodology	Remote work with periodical online meeting
7	Type of work	Problem solving or research via internet
8	Language	English
9	Cost	Covered by Project
10	Credit	Credit approving

Source: JICA Team

(3) Content

In Phase 1, preparations were made by conducting virtual internships for three months from September to December 2021, which is the first semester of the 2021 school year. In January 2021, an orientation was held for companies, and seven interested companies applied. In March, the company set the assignment, and in May, an online corporate orientation was held for students from Batangas State University and Mapua University. In June, interviews were held between companies and students, and after the companies selected the students, a pre-orientation was held to confirm the schedule and deliverables of the three-month virtual internship. The table below lists the attributes of the seven companies and their challenges. It was designed as one on one internships, among seven companies. A few companies chose several students, and ultimately 11 students engaged in virtual internships with Japanese companies.

Table 4-4: Phase 1 Virtual Internship Companies and Assignments

Number	Name	Industry	Assignment	Assignment topic
1	A	Service (Bookbinding)	Research	Market research on the on-demand printing business for personal use
2	B	Food and Beverage	Research	Survey on food truck business in Philippines and other countries
3	C	Manufacturing (Metal Processing)	Problem solving	Let's Kaizen: Inventory management and layout of storage
4	D	Manufacturing (Metal Processing)	Problem solving	Proposal for improvement of "Iron clogs" or "TETSUGETA" prototype
5	E	Manufacturing (Electronics)	Problem solving	Development of tool management database for manufacturing printed circuit boards (PCB)
6	F	Manufacturing (Precision)	Problem solving	Research on possibilities and application for precision component technology
7	G	Food and Beverage	Research	Survey on demand and sales method of Japanese tea for entering the market in the Philippines

Source: JICA Team

Here is one example of a virtual internship program at seven companies. Company C, which corresponds to 3 in the above table, is a small company engaged in the manufacture of metal products. The company had a problem with the management of a material storage area. Therefore, a virtual tour was conducted of the material storage site online for the students to understand the current situation. The students were then given layout drawings and information on the weight and shape of the materials and were asked to work on the task of improving the layout. Through weekly online meetings, students proposed improvements to the layout, and the specific work was handled by Company C’s employees. The following diagrams and photographs illustrate the process.



Source: JICA Team

Figure 4-9: Phase 1 Virtual Internship (Company C)

Preparations were made for Phase 2 to be held in the first semester of 2022, which is a three-month period from September to December in 2022. The flow of preparations was the same as in Phase 1 but, as it moved to Phase 1 and Phase 2, the impact of the pandemic was subsiding, and it was observed that some companies started operations in the Philippines. Therefore, in addition to 100 percent virtual internships, the JICA Team proposed a hybrid internship trial in Phase 2 that links local universities and local Japanese companies. By selecting students from Company N and Batangas State University in Laguna, an environment was thought to be created in which internships can be conducted face-to-face if necessary. As a result, Pilot 1 activities in Phase 2 will include 100 percent virtual internships by six companies from Japanese companies and hybrid internships by one Japanese company based in the Philippines. The table below lists the attributes of the seven companies and their challenges. In the second internship, 22 students worked on virtual and hybrid internships.

Table 4-5: Phase 2 Virtual and Hybrid Internship Companies and Assignments

Number	Name	Business	Assignment (tentative)
Virtual Internship			
1	H	Apparel	Database development of cloth manufacturing process
2	I	Metal Machining	Online technical guidance of lathe and milling machine
3	J	Steel construction work	Optimization of human resource allocation in the factory
4	K	Leather products	Marketing research on its products entering Philippine market
5	L	Metal Machining Start-up business	Research on establishing start-up business in Philippines
6	M	Food and beverage	Research on ethical consuming and branding its prototype
Hybrid Internship			
7-1	Denso Philippines	Automotive products	Research on material conveyance thru tape less AGV(Automatic Guided Vehicle)
7-2	Denso Philippines	Automotive products	Research on Various Smart-Agri System in the Philippines
7-3	Denso Philippines	Automotive products	Research on commercial Farm Greenhouse and Cultivation technology

Source: JICA Team

Here is one example of a virtual internship program at seven companies. For the hybrid internship program by DENSO Philippines, which corresponds to 7 in the above table, three projects were proposed by the company: 1) a new improvement proposal for unmanned transportation equipment in the factory, 2) a survey of smart agriculture equipment that could be a new business, and 3) a market survey of smart agriculture, which is a new business. Since it was a hybrid internship, students were able to work efficiently on the three projects by, in one aspect, coming to the office as needed to check on and discuss the progress, and the other aspect by conducting interviews in the field and working from home in the form of homework.



Source: JICA Team

Figure 4-10: Phase 2 Hybrid Internship (Case of DENSO Philippines)

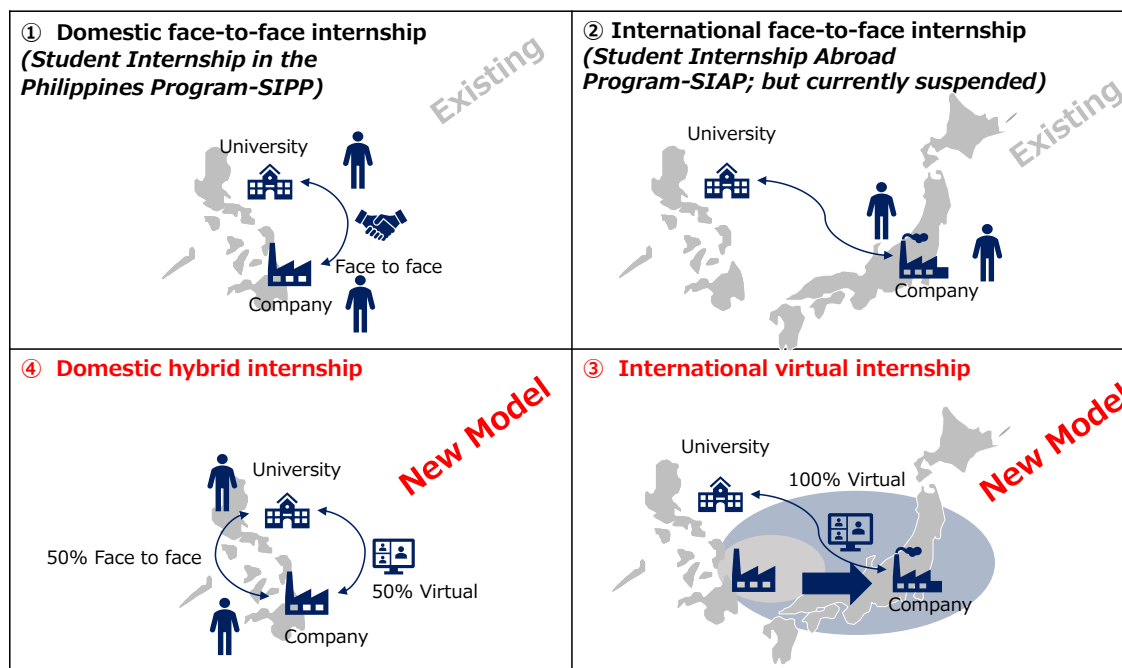
(4) Issues and Lesson Learned

Because this pilot was conducted entirely remotely during the COVID-19 pandemic, there were some misunderstandings among the parties involved. For example, although the JICA Team requested the universities to inform their students one month prior to the orientation, they did not inform the students until one week prior to the orientation. This could have been prevented earlier if the orientation had been conducted in person but, because it was conducted remotely, there were several incidents in which both parties thought they had done so.

Another lesson learned was the difficulty of setting up tasks for the companies. One company was so concerned about having students learn effectively that it set tasks that were different from those in the actual business, and another company declined to accept interns because it was unable to set tasks, although it was willing to accept them. There were also companies that refused to accept interns because they did not understand the purpose of the virtual internship.

(5) Results

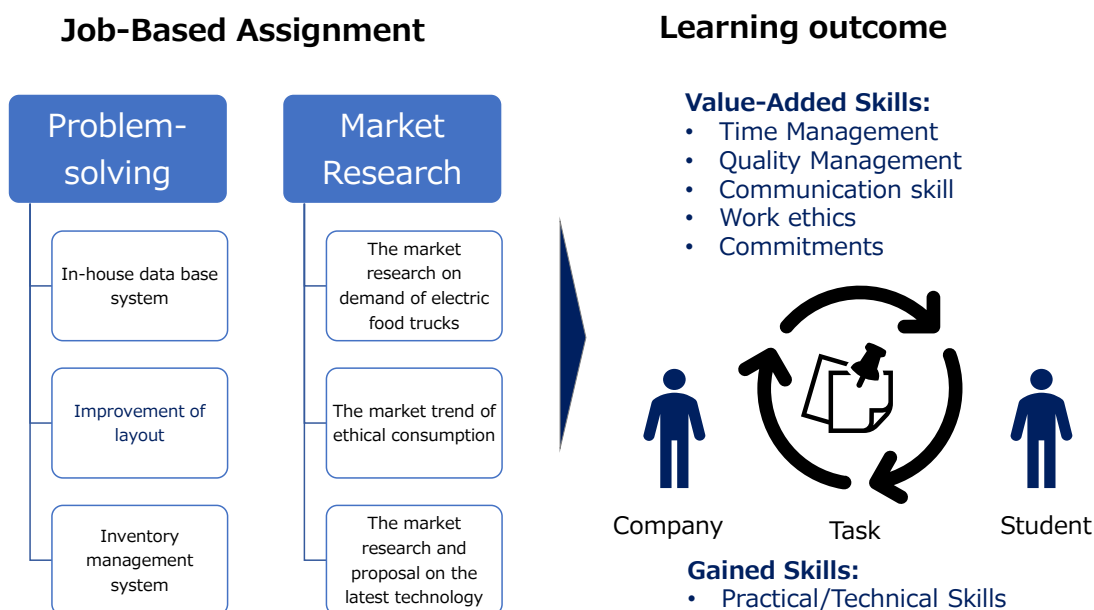
The result of this pilot activity is the implementation of a new internship attempt. As shown in the figure below, (1) face-to-face domestic internships and (2) in-person international internships have existed as guidelines for CHED. This attempt is an international virtual internship (3) conducted in Phase 1 and an efficient hybrid internship between a local university and a local company (4) conducted in Phase 2.



Source: JICA Team

Figure 4-11: Existing Internship Systems and New Systems Tested in Projects

The Virtual Hybrid Internship is not only a new endeavor, but also includes new elements in the content of the internship. In the past, face-to-face internships emphasized work experience and were aimed at work in the office but, in reality, there were cases where they were limited to supporting paperwork. This year's virtual internship program was a win-win for both parties because the tasks were set in advance, and the tasks were problem-solving and market research related to the company's profit-making activities, so the companies could receive the deliverables, and the students could experience the company's specific initiatives. In addition to investigating the issues and needs of companies, it can be said that, through the virtual internship, students have also acquired the time management, quality control, and communication skills necessary in the job market. The figure below shows that virtual internships are job-based and that students can also learn the basic skills in the job markets. Since Philippine students had the opportunity to acquire experience in the practical work that is done by industry by collaborating not only with the manufacturing industry in the Philippines but also with the manufacturing industry in Japan, it is commendable as a pilot activity achievement.



Source: JICA Team

Figure 4-12: Conceptual Diagram of the Tasks to Be Set in the Virtual Internship and the Skills that Can Be Acquired

(6) Monitoring Evaluation

As shown in the table below, the monitoring of Pilot Activity 1 consisted of 1) learning outcomes, 2) feedback to students, universities, and companies, and 3) tracing study of interns after graduation.

Table 4-6: List of Monitoring Evaluations of Pilot Activity 1

Category	Subcategory	Year	Status	Comments
1. Learning outcome	Students	AY2021	Completed	Comparison between virtual internship students and face-to-face internship students
		AY2022	Completed	
2. Feedback	2-1. Students	AY2021	Completed	Questionnaires on both qualitative and quantitative questions for students, HEIs and companies such as satisfaction levels, operations, etc.
		AY2022	Completed	
	2-2. HEI (Batangas, Mapua)	N/A	Completed	
	2-3. Companies	AY2021	Completed	
AY2022		Completed		
3. Tracing Study	Students	AY2021	Completed	Follow-up survey on how the experience of virtual internship affects one year later such as job hunting and employment
		AY2022	Completed	

Source: JICA Team

In terms of learning outcomes, based on the fact that the main purpose of the internship is to develop industrial human resources, the JICA Team evaluated how the internship changed how the students' (1) career orientation, (2) career awareness, and (3) general skills. For this purpose, the JICA Team used the difference method (DID), which is a method of comparing the changes before and after the internship between internship participants and non-interns. (1) Career orientation was surveyed in four areas: 1) industry, 2) occupation, 3) company size, and 4) market, and there was no change in 1) to 3) before and after the internship, but for 4) markets, there was a growing

tendency to focus only on foreign-affiliated markets among the options of domestic and overseas, foreign-affiliated companies, and domestic. This suggests that they showed interest in overseas companies because they had the opportunity to interact with them virtually. In (2) career awareness, internship participants and non-interns were compared in terms of (1) interest, (2) autonomy, (3) planning, and (4) overall professional career score (an index with a value between 0 and 1). There was an overall difference between participants and non-participants, but the gap between professional careers in (4) was the largest. The general skills of (3) were analyzed from the viewpoints of 1) problem-solving skills, 2) interpersonal relationships, 3) leadership, 4) information and communication, 5) critical thinking, 6) self-management, and 7) overall score (0 to 1 index).

2) For feedback, the JICA Team asked students, universities, and companies what they expected from virtual internships. Quantitative and qualitative questionnaires were conducted three times during the internship period for students, once after each phase was completed by companies, and once after the completion of Phases 1 and 2 for universities. The table below is a summary of the results of the quantitative questionnaire, and the results all averaged more than 9 out of 10 points, so it can be said that it is a good evaluation.

Table 4-7: Internship Feedback by Students

Evaluation Items	2021+2022		
	2nd	3rd	4th
1. Conformity of interest: The content of the internship is suitable for my interests.	9.1	9.3	9.2
2. Usefulness: The content of the internship is useful for me.	9.4	9.4	9.6
3. Communication: During online meetings, I can communicate properly with the Japanese company.	9.1	9.3	9.0
4. Workload: Given the time allowed, the amount of work is appropriate.	9.4	9.5	9.5
5. Overall satisfaction: Overall, I am satisfied with the internship program.	9.5	9.8	9.8
6. Recommendation: I would recommend this program to my colleagues.	9.7	9.8	9.7

Source: JICA Team

Table 4-8: Internship Feedback by University

Number	Question	Average
1	The workload of university faculty and staff to implement the internship program was adequate and reasonable.	8.0
2	The internship program was well informed and recognized by our students.	9.0
3	The content of the internship program was suitable for the interests of our students.	9.3
4	The content of the internship program was useful for our students.	9.3
5	Remote online communication with Japanese companies was effective for our students.	9.0
6	The workload of the internship program was adequate for our students.	9.3
7	The activities of the internship program were well shared with other students who did not participate in the internship.	8.5
8	Overall, the internship program was satisfactory for our students.	8.8
9	I would like to continue this internship program at my university in the future.	9.3
10	I would recommend this internship program to other universities.	9.5

Source: JICA Team

Table 4-9: Internship Feedback by Companies

Evaluation Items	2021+2022
1. Performance: I am satisfied with student's performance.	9.2
2. Delivery: I am satisfied with the student's delivery	9.3
3. Communication: During online meetings, I can communicate properly with the student(s).	8.9
4. Workload: Given the time allowed, the amount of work (review and supervision) is appropriate.	8.7
5. Overall satisfaction: Overall, I am satisfied with the internship program.	9.3
6. Recommendation: I would recommend this program to my colleagues.	9.3

Source: JICA Team

Some highlights are described below. One comment worth mentioning is that while students generally expressed positive opinions, such as “It was a valuable experience”, “I gained soft skills that are required in the job field”, and “I recommend to junior colleagues” On the other hand, companies also expressed realistic opinions, such as “It took more effort than expected” and “There is no direct relationship between internships and employment,” in addition to comments such as “The quality of the students was high” and “It was a good experience”. The university commented that it took longer than expected for the internship supervisor to catch up with the individual and specific issues of the company, perhaps because the virtual internship was a first attempt, and the quantitative data also rated the program low at 8.0.

(7) Operations Manual

For Pilot Activity 1, the JICA Team compiled an operation manual as shown in the table below. If virtual internships are institutionalized as guidelines within CHED, it is assumed that companies and universities will use these operation manuals. Companies are expected to refer to corporate seminars and methods of organizing issues in Manual No. 1-3, and universities are expected to refer to operational manuals that focus on preparing for virtual internships, such as orientations in Manual No. 4-9. In particular, Manual 1 describes how to set up assignments that are important for companies, which is important for them to understand the advantages and disadvantages of virtual internships before considering their preparation. On the other hand, most of the manuals used by universities do not differ much from those used in regular face-to-face internships, except for the online seminars, so the JICA Team has assumed that universities will consider using the manuals at their discretion.

Table 4-10: List of Operation Manuals Created in Pilot Activity 1

Number	Name of manual	Contents	User	How and when
1	Company Recruitment	General information of virtual internship such as pros and cons, importance of the assignment preparation	Industry	Before applying to the internship
2	Company Recruitment (Company orientation)	How to conduct orientation to potential Japanese companies	Industry	Before applying to the internship
3	Company Recruitment (assignment sheet)	Template of assignment sheet with company profile and topic to be covered in internship	Industry	Once applying to the internship
4	Virtual Internship Operation Guideline	How to conduct orientation to potential universities and students	University	Upon the conduct of the orientation
5	Virtual Internship Operation (invitation letter)	Template of invitation letter for the orientation who applied pre-registration	University	Upon the conduct of the orientation
6	Virtual Internship Operation (orientation program)	Template of orientation program	University	Upon the conduct of the orientation
7	Virtual Internship Operation (orientation seminar)	Sample of presentation for orientation	University	Upon the conduct of the orientation
8	Virtual Internship Operation (application)	Template of application form	University	Upon the conduct of the screening
9	Monitoring and Evaluation	How to conduct monitoring and evaluation during and after the virtual internship	University	Upon the completion of the internship

Source: JICA Team

4.4.2 Pilot Activity 2: Implementing training courses based on local business needs (Area-Based and Demand-Driven TVET (ABDD))

(1) Concept

Pilot Activity 2 aims to contribute to the IHRD (Industrial Human Resource Development) led by TESDA, and it has been conducted to strengthen vocational training programs, especially for employees. One of the reasons for this is that TESDA's vocational training programs mainly target young unemployed people, and there are relatively few high-level vocational training programs for employees and supervisors who lead production sites. The National Certificate (hereinafter NC) I and II shown in the table below are the training for high school students to beginner technicians, and NC III and IV are equivalent to high-level training for intermediate employed technicians and supervisors.

The table below explains that the automotive and land transportation field teaches mechanical and electrical assembly, casting and forging technology, body painting technology, and plastic injection molding technology. Many of the Training Regulations (TRs) in this field were created before 2009. Mechanical technicians, electrical technicians, and machine operators have been developed in this field. The electrical and electronics field teaches control technology, domestic wiring, electronic product assembly, mechatronics technology, and semiconductor technology. Most of the TRs in this field were created between 2006 and 2015 and include new technologies. This field has been developing technicians in the electrical and electronic fields and mechatronics, which are closely related to the development of automotive manufacturing technology in the Philippines. The metals and engineering field teaches electrical welding, gas welding, CNC³ lathe operation techniques, CNC milling machine operation techniques, and CAD/CAM⁴ operation methods, which are the fields of particular need in the Philippines. More than half of the TRs in this area were created between 2006 and 2009. Welding technicians and lathe/milling

³ Abbreviation for Computer Numerical Control. CNC machines are operated by human input of programs to grind automobile parts, etc.

⁴ Abbreviation for Computer-Aided Design/Computer-Aided Manufacturing. Software with functions for designing, drafting, and creating NC data to operate CNC machine tools on a computer.

machine operators have been developed in this field. While skills and technologies develop, the challenge is that many of the TRs were created more than 10 years ago and are not updated, but TVIs are supplementing them by teaching new skills and technologies to the extent possible on their own initiative.

Table 4-11: Areas and Number of Training Regulations

	NC I		NC II		NC III		NC IV		Total
	No.	%	No.	%	No.	%	No.	%	No.
Automotive and land transportation	2	5	21	57	13	35	1	3	37
Construction	4	9	33	77	6	14	0	0	43
Electrical and electronics	0	0	10	53	5	26	4	21	19
Heating, ventilation, air-conditioning and refrigeration	0	0	4	67	2	33	0	0	6
Information and communication	0	0	7	37	12	63	0	0	19
Metals and engineering	9	32	10	36	7	25	2	7	28
Utilities	1	9	3	27	5	45	2	19	11
Total	16	10	88	54	50	31	9	5	163

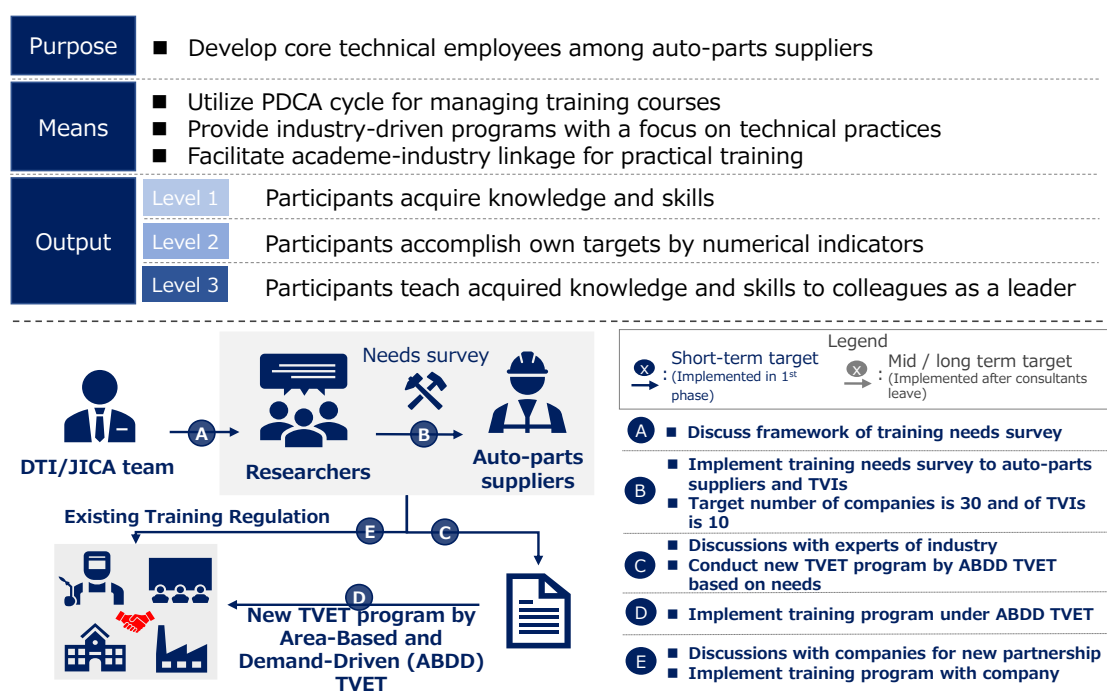
Source: Promulgated Training Regulations (as of January 2019)

In addition, in-house training for employees by automakers, dealers, and parts manufacturers was conducted in R4A; tailor-made beginner-level training for new employees ordered to TVIs by these companies was also conducted there. These companies were able to develop human resources sufficiently. On the other hand, according to the needs survey described later, many small and medium-sized enterprises were unable to conduct in-house training due to difficulties in securing in-house instructors and insufficient human resource development budgets. In Japan, public TVIs conduct training programs provided to several small and medium-sized enterprises, and there is a system that enables those enterprises that cannot develop skilled employees on their own to make effective use of them, but such training programs and mechanisms were not available by local TVIs. The local vocational training school mentioned the difficulty of securing the training budgets and development of vocational training instructors, and the aging of the equipment, etc. It can be summarized that local small and medium-sized enterprises are in a situation where they are unable to develop core skilled employees on their own, and they are also unable to use TVIs to train them.

To elaborate on the above-mentioned issues observed during the visit to the TVIs, overall, the PDCA cycle was not fully functioning at the TVIs. For example, in terms of securing vocational training instructors, there were no more than two instructors in each training department due to budget constraints at R4A TVIs. While the number of training hours per instructor was high, the small number of instructors made it difficult to spend their time in training preparation, which was thought to reduce the quality of training. It also makes it difficult for vocational training instructors to have time to develop their own skills. In terms of training quality assurance, there were not many opportunities for vocational training instructors to actually access and learn how to use the equipment used in private companies. Although it would be possible to reflect efficient acquisition of skills and techniques in the training curriculum by having vocational training instructors actually learn how to use the equipment at manufacturing sites, such a system was not sufficiently in place. In the pilot activity, it was considered necessary to apply with the creation of a system that would allow vocational training instructors to create and increase contacts with in-house instructors at private companies. It was thought that one of their future goals would be to be allowed to use the company's manufacturing sites and equipment.

Regarding the overall picture of the pilot activity, although various needs surveys have been conducted in the past, it was considered necessary to conduct an initial needs survey based on the objectives of this project first. TESDA, the needs surveyors, and the JICA Team discussed and formulated a survey framework and developed a survey questionnaire and interview items that were developed through discussions among them as well. In considering the companies to be surveyed, it was decided to include Tier 2 and Tier 3 companies among 30 companies based on the TORs of this project. On the other hand, although it was not included in the TOR, it would be useful for TESDA and this project to survey the training programs offered by the local TVIs as well, and it was decided to do so additionally. The above is the framework for forming the overall picture of the pilot activities.

From the above, it was considered that it would be in line with the objectives of this project to formulate a high-quality vocational training program for employees based on skill requirements, and to verify the applicability of this program to local companies and TVIs so that small and medium-sized enterprises with weak human resource development resources can develop core skilled employees. The conceptual diagram of Pilot Activity 2 including Area-Based and Demand-Driven TVET (hereinafter ABDD TVET), which will be described later, is as follows.



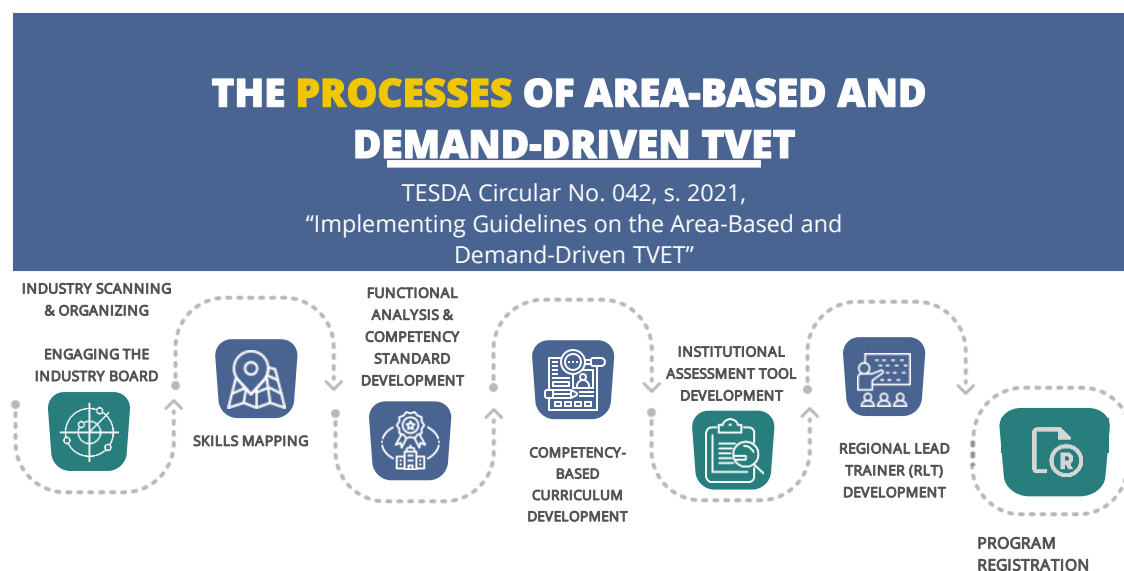
Source: JICA Team

Figure 4-13: Conceptual Diagram of Pilot Activity 2

(2) Background

In the Philippines, the unemployment rate rose due to the outbreak of COVID-19 in January 2020. To address this issue, TESDA established ABDD TVET in April 2021 which can rapidly develop human resources with suitable skills for local industries. TESDA's Training Regulation (hereinafter TR) formulation process began with a needs assessment and took about one year to be recognized as a formal vocational training program. In addition, TVIs in each region were unable to immediately address the needs for industrial human resource development in the region because they trained and secured vocational training instructors and publicized and disseminated training programs. Also, many vocational training programs took more than six months, so time was needed for industrial human resources to be developed. These were recognized issues in the

industry. ABDD TVET is a measure that solves this problem, and it took 46 days⁵ without going through the TR formulation process. It was formulated as a system that allows the creation of a training program and set the training period flexibly. The flow of ABDD TVET is shown in the figure below. The main flow is to identify industries and skills that are greatly needed in the region, identify what skills need to be developed through training in order to acquire those skills, set qualifications for training and criteria for determining whether those skills have been acquired, formulate a training curriculum, train regional lead trainers, and register as a training program.



Source: TESDA

Figure 4-14: TESDA Area-Based and Demand-Driven TVET

The table below shows the main activities for each step and the expected number of days required as stipulated in ABDD TVET. Step 1 includes identifying industries and skills with high demand in the region, Step 2 details the skills that need to be strengthened through training, developing the necessary curriculum, and obtaining those skills. Step 3 includes setting of qualifications for training and skill acquisition, Step 4 covers RLT and considers an action plan to disseminate training, and Step 5 includes the registration as a training program. The estimated time required is 10 days for Step 1, 10 days for Steps 2-3, 18 days for Step 4, and three days for Step 5. In principle, the estimated number of days is based on the assumption that the parties involved will hold face-to-face discussions and training. The number of days actually required for the pilot activity is compared again in the results of the pilot activity and will be described later.

⁵ Circular for ABDD TVET guideline, April 2021. In the case of New and Emerging skills, 46 days and 51 days in the case of Existing skills are stipulated as the expected number of days.

Table 4-12: Each Step in ABDD TVETEP's Main Activities

Step	Subitem	Main Activities	Process Cycle Time
Step 1 Skill Mapping	-	To list up skills that are in high need in the target area and to identify the most priority skills	10 days
Step 2 Competency Standard	Functional Analysis (FA)	To define the function of the skills to be developed.	15 days
	Competency Standard Development (CS)	To define the competency which the training will develop in the participants.	
	Institutional Assessment Tools Development (IAT)	To define the eligibility requirements and the criteria for determining whether participants have acquired the competencies defined in the CS.	
Step 3 Curriculum Development	Competency-Based Curriculum Development (CBC)	To define the Learning Objective (LO) for the curriculum to acquire the competencies defined in the CS and to estimate the time required for each. To match the LOs with the standards and measures defined in the IAT. To identify the method of conducting the training, the equipment and materials for the training. To define the qualifications of instructors.	
Step 4 Regional Lead Trainer Training	Training of Trainers (ToT)	To conduct training to develop the human resources who will be the instructors of the training.	18 days
Step 5	Program Registration	To register the training as one of the programs by TESDA.	3 days
Total days			46 days

Source: Created by JICA Team based on Implementing Guidelines on the Area-Based and Demand-Driven TVET, issued April 22, 2021

(3) Content

Step 1

In Phase 1, skill mapping corresponding to Step 1 of the aforementioned ABDD TVET framework was conducted of 29 manufacturing companies (Tier 1: 14, Tier 2: 18, Tier 3: 7) located in R4A. Surveys were conducted through questionnaires and interviews with companies belonging to multiple tiers, and skills were identified as highly needed by companies. As for the identification of skills, three fields of automotive and land transportation, electrical and electronics, and metals and engineering provided by TESDA and strongly related to the manufacture of automotive parts were selected, and the skills requirements and human resource development issues were surveyed among the human resource development personnel and supervisors in companies. Also, the status of vocational training programs in 10 public and private TVIs (eight public and two private) that are part of the region's public and private TVIs was surveyed. The above surveys indicated the skill needs in companies and the implementation status of training programs at TVIs.

As a result of the survey, the six skills shown in the table below were identified, and those to be implemented in the pilot activities were also considered. Skills 1 and 2 were excluded from the candidates for pilot activities because they were in existing TRs. Skills 3 and 4 were also excluded because they entail costly equipment and maintenance costs. And Skill 6 was excluded because it was confirmed in the survey that there was a high need, but the technical skills related to 3 and 4 were prerequisites. On the other hand, with regard to QCD, it was assumed that, with the exception of local Japanese companies, technicians and others had acquired QCD in their own way. Therefore, it was thought that if QCD could be disseminated locally at the level required by Japanese automakers, it would be possible to strengthen the domestic auto parts and supporting industries, and there was also a possibility to develop QCD leaders at the individual company. On

the other hand, local TVIs taught limited items such as safety and health in existing TRs as QCD, but if Japan's QCD could be introduced into local vocational training programs, high-quality technicians could be developed, and the possibility of developing technicians not only in the region but also in a wide area was considered by the spread of programs in future. From the above, it was considered that it would be effective to form a skilled employee training model by trialing a vocational training program in the QCD field in a pilot activity.

Table 4-13: 6 Skills in High Demand in the R4A Region

Number	Target qualifications	Sector	Training provision by TVIs
1	Machining NC II (Existing)	Metals and Engineering	Yes
2	CAD/CAM Operation III (Existing)	Metals and Engineering	Yes
3	CNC Lathe Machine Operation NC III (Existing)	Metals and Engineering	Not provided
4	Tool and Die Making NC II (Existing)	Metals and Engineering	Not provided
5	Skills to improve Quality, Cost, Delivery, Safety, Environment, and Productivity (QCD)	General to all	No qualification yet
6	Robotics	Metals and Engineering	No qualification yet

Source: JICA Team

In Phase 2, in response to the QCD identified in Phase 1, it was decided to formulate a vocational training program for SMEs involved in the automotive industry in R4A to develop core technicians with QCD at the level required by Japanese companies, and to implement it in accordance with the ABDD TVET framework. While considering the following three points, the flow from Step 2 onwards was modified for QCD and executed.

First, the ABDD TVET has a standard formulation flow and a predetermined number of days, which is a good guideline for efficiently proceeding. While ABDD TVET is more likely to be fitting to design technical skills, Number 5. QCD among the six listed skills in the table is not aiming to acquire technical capabilities including other skills (numbers 1 to 4, and 6 in the table), but rather a versatile skill that acquires a mindset and a way of thinking about behavior that will be the basis for technicians to perform their work as a member of an organization. There were some unfamiliar aspects of the TVET flow and the number of days required, so it was necessary to make a course correction for QCD.

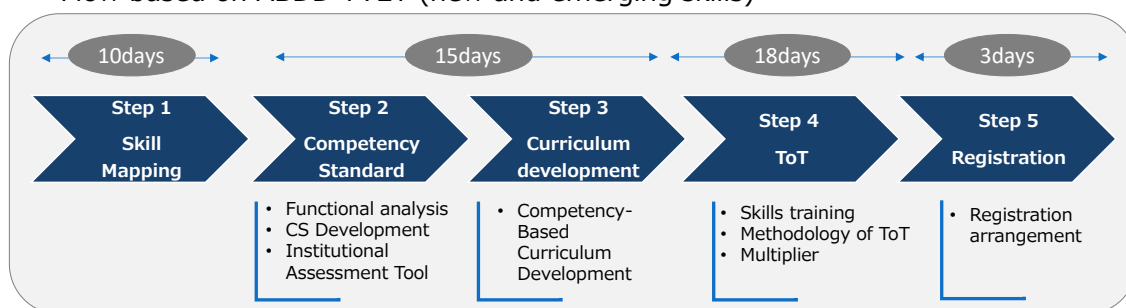
Second, local TVIs have knowledge and experience to teach QCD-related items such as safety and health in existing TRs. However, it was necessary to have a more comprehensive knowledge of QCD to formulate a QCD curriculum that meets the requirements of Japanese companies.

Third, local TVIs had relatively weak relationships with those in charge of human resource development in private companies in the R4A region, partly because there were few vocational training programs for incumbents and supervisors who lead production sites in the region. However, it was necessary to formulate a sustainable training program that would make it easier for private companies to participate by understanding the needs of local private companies. In this

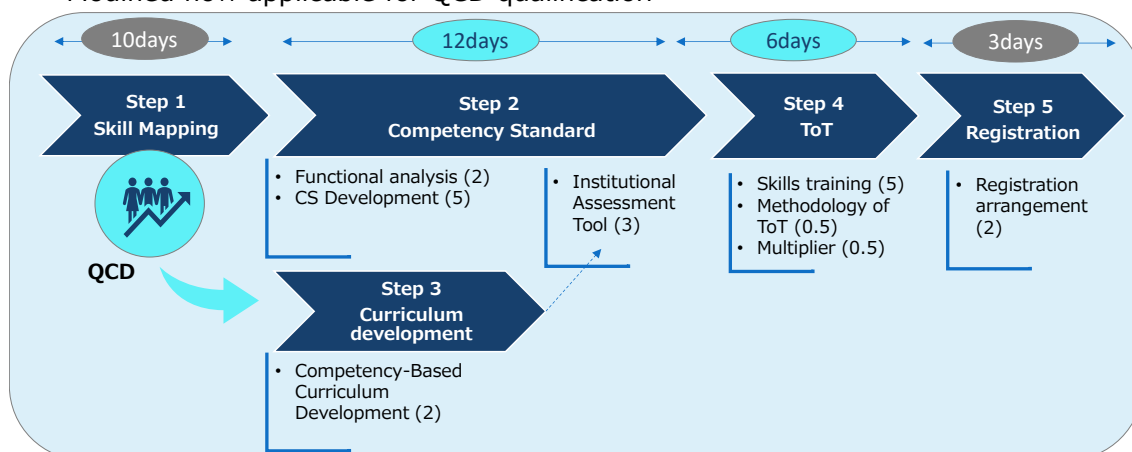
regard, the ABDD TVET guidelines also stipulate that local industries should be involved as a resource person in the development of the program.

As a countermeasure to the above three points, the JICA Team devised an implementation system to proceed with Steps 2 and 3. Namely, the QCD experts who perform the ToT in Step 4 participated in the meetings from the stage of identifying QCD skills and formulating the curriculum development in Steps 2 and 3, and provided the technical knowledge of QCD so it contributed to a more suitable ToT curriculum in Step 4. In addition, the private companies in the automotive industry of R4A were invited to participate in the meetings as industry experts. In this process, in cooperation with the facilitator of the TESDA department who is familiar with the flow of Steps 2 and 3 of ABDD TVET, they conducted an orientation for each flow on the first day, and formulated the workflow suitable for QCD, the method of review meetings, and the number of days required for each step. The figure below shows a comparison of the specified flow of ABDD TVET and the flow formulated for QCD. Details are described in the difference between the ABDD TVET guidelines and the QCD implementation shown in the next paragraph.

■ Flow based on ABDD TVET (new and emerging skills)



■ Modified flow applicable for QCD qualification



Source: JICA Team

Note: The number in parentheses is the estimated number of days required for each step calculated for QCD.

Figure 4-15: Comparison of ABDD TVET and Modified Flows for QCD

The following three points are the differences between the ABDD TVET guidelines and the implementation of QCD.

✓ **Modality about each step**

The work of Steps 2 and 3 other than RLT was not in face-to-face meetings, but online meetings, and the participants, including QCD experts, local industry experts, and TESDA facilitators, filled in the prescribed format as their homework and distributed the outputs to the members. In situations where local experts did not know where to start, such as the Competency Standard (CS) work in Step 2, online meetings (or face-to-face meetings) were effective. There are already several formats available in ABDD TVET, and in some cases it is only a matter of filling them in. After becoming familiar with the content of QCD and how to proceed to some extent, it was decided to make it a homework format for the participants, and each participant would work remotely and dispersed. Each person would then bring their homework to the online meeting on a fixed date and time, making it easier for participants from the private sector to participate. As a point to keep in mind, it is desirable to set aside time to check the level of understanding at the meeting after the submission deadline in order to ensure the progress of the understanding of the content that was done as homework. (For example, the participants are allocated enough time to explain and ask through Q&A.) If an online meeting is held immediately after the submission deadline to proceed to the next stage of work, it might not be possible to confirm the understanding of the participants who are not familiar with QCD and, as a result, there was some concern that the confirmation activity was owed to the QCD experts only.

✓ **The days to be spent in each step**

The QCD implementation took 31 days, which was 15 days shorter than the guideline of 46 days. As described above, in addition to the ingenuity of the embodiment of Steps 2 and 3, the RLT of Step 4 was shortened to six days. This depends on the theme of the training but, as a result of actually implementing ABDD TVET on the QCD, the JICA Team got the impression that the number of days stipulated for each step was excessive. The greater the number of days to review the content of the study, and the larger the review team, the more difficult it is to get everyone together, so a large number of reserve days may be included.

✓ **About the flow of each step**

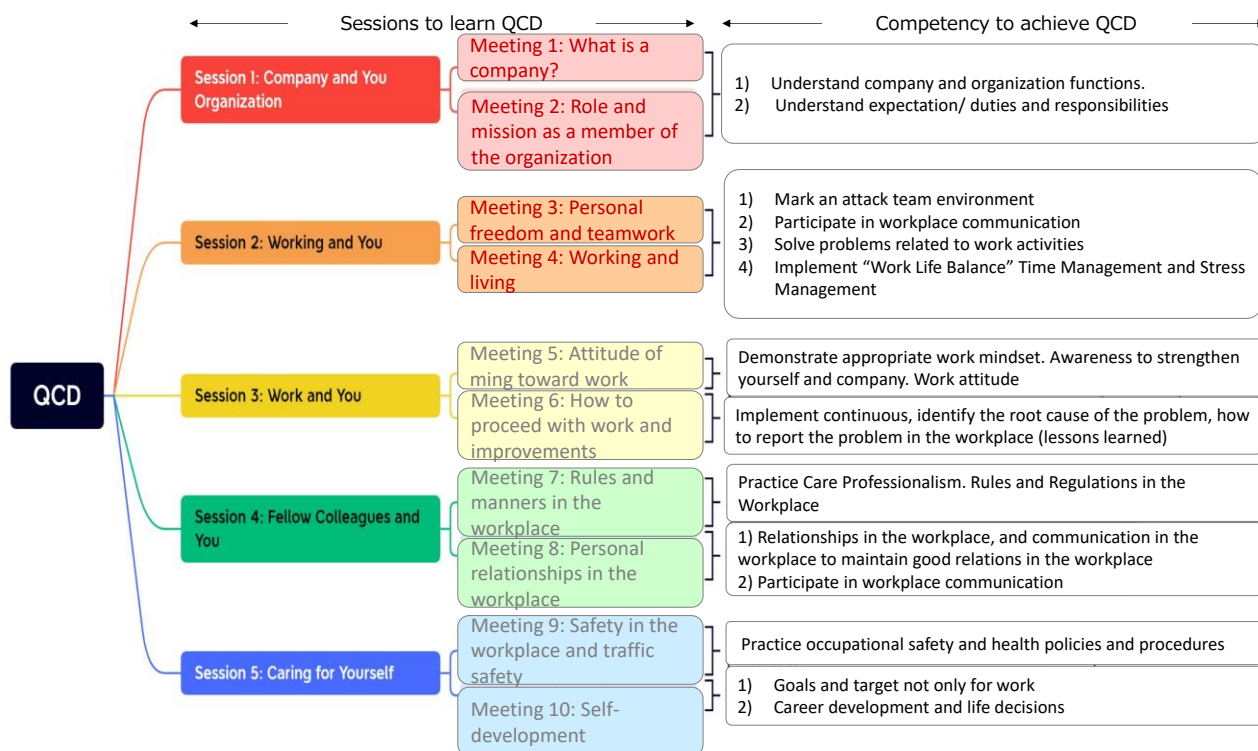
While the ABDD TVET plan proceeded through CS, Institutional Assessment Tools (IAT), Competency Based Curriculum Development (CBC), and RLT in the order of Steps 2 to 4, the pilot activity followed the order of CS, CBC, IAT, and TOT. It is necessary to keep in mind that each step will be before and after due to the schedule of the meeting, etc., but since CS is the starting point for defining skills first, it is necessary to implement it first as a flow. Although the order of CBC and IAT was originally reversed, the QCD experts believe that it is more natural to create evaluation criteria and exam questions after the content of the curriculum has been decided.

In addition, as a point to keep in mind regarding the order, each step of ABDD TVET has a different department in charge of TESDA, with CS for QSO and CBC for NITESD-CTADD. Since NTTA is in charge of facilitating IAT, it was important to ensure that information could be transferred seamlessly and smoothly among the steps in order to proceed efficiently. In this regard, the JICA Team and the TESDA Planning office smoothly bridged each step, and the finished output (the documentation format) and the orientation materials were shared in Google Cloud, which enabled all participants to access them online.

Step 2 and Step 3

In Step 2, after formulating the Functional Analysis and Curriculum Standard, Competency-Based Curriculum Development was implemented and finally the Institutional Assessment Tool was formulated in Step 3. CS formulation was a session that described what was expected to be strengthened through the training and began with the task of enumerating the main elements that

need to be strengthened. Since the training materials for RLT had already been prepared by QCD experts, the participants were able to extract the elements of the main items of QCD skills, mastery criteria, necessary knowledge, and skills in the ABDD TVET format proceeded smoothly. If there are no established materials for RLT in advance, it may take more time to extract the CS Element. The figure below shows the five training sessions for learning QCD (left side) and the corresponding competencies required for QCD (right side).



Source: Created by the JICA Team based on materials from the TESDA QSO team

Figure 4-16: Five Training Sessions Related to QCD and the Associated Competencies (Behavioral Characteristics)

CBC (Competency-Based Curriculum Development) is based on CS development, and local industry experts prepare a draft. In the online meetings with QCD experts, the participants examined the time required for the implementation of each curriculum in particular, and it was completed in two days. Finally, as for the IAT, which formulates the evaluation criteria for QCD, the JICA Team mainly prepared test questions. Participants formed groups online and created questions in a workshop format and, although there was remote work, it was completed in three days.

Step 4

RLT was conducted as face-to-face training in Manila for six days. The participants and details of the program are shown in the table below. In addition, since many of the participants were instructors or training personnel in the middle-level or manager-class, the QCD trainers focused on helping them understand the overall picture of QCD skills because the participants were already familiar with the methodology as trainers. Through group work and presentations, the participants had the opportunity to become familiar with how to effectively proceed with the QCD training as a trainer.

Table 4-14: Overview of RLT Program

Date/Venue	<ul style="list-style-type: none"> ■ September 20, 21, 22, 25, 26, 27. Total of 6 days (main training hours: 9:00-16:00)
Trainees	<ul style="list-style-type: none"> ■ TESDA National TVET Training Academy (NTTA), Marikina
Trainers	<ul style="list-style-type: none"> ■ P.IMES: 2 participants, TESDA R4A Training Specialists: 8 participants
Training Materials	<ul style="list-style-type: none"> ■ JICA QCD Experts: 2
Curriculum	<ul style="list-style-type: none"> ■ Hand outs which were prepared by JICA QCD experts. Presentation materials were shown during each lecture. ■ Session 1: Company and You ■ Session 2: Working and You ■ Session 3: The Work (Job) and You ■ Session 4: Fellow Colleagues and You ■ Session 5: Caring for Yourself
Method	<ul style="list-style-type: none"> ■ Lecture, Groupwork, Small quiz, Discussion, and Presentation (by each participant, by group)
Evaluation	<ul style="list-style-type: none"> ■ Comprehension test, and stress test, which is provided by the JICA project team ■ Participation rate, Contribution to the classes, online assignment (quiz) which are provided by NTTA are also considered for overall evaluation.

Source: JICA Team



Source: JICA Team



Figure 4-17: During QCD Training



Source: JICA Team

Figure 4-18: 10 Trainees at the Closing Ceremony

(4) Issues and Lessons Learned

One challenge to implementing Pilot Activity 2 was how to get pilot companies and training institutions involved following the predetermined ABDD TVET framework. RLT requires 18 days normally and CS/IAT development expects pilot companies to participate in several seminars as an industry expert. During the period of RLT, the companies and TVET institutions had to pull the participants out of their regular operations, and this was likely a hurdle for them to commit to the involvement of training. To reduce this hurdle, the duration of RLT was adjusted to six days through the efforts of QCD lecturers, and CS/IAT development was conducted online. As for lessons learned, the modality of the ABDD TVET framework was discussed for future improvement.

(5) Results

The following three points are the results of this pilot activity. First, as mentioned in the concept and background of the pilot activities, there were few vocational training programs for incumbents and supervisors who led production sites at local TVIs. Although there are limited training programs such as safety and health in existing TRs, there have been no comprehensive lectures on QCD in R4A. Thus, this newly developed QCD program within TESDA is a major achievement because it will serve as a foundation for strengthening the core human resources of the automotive industry in R4A in the future.

In addition, the pilot activity formulated a QCD program to implement ABDD TVET guidelines issued in 2021. In the process of implementation, the participants were able to modify the flow and number of days required in ABDD TVET for QCD and to actually use the prescribed format. This not only provided an opportunity for the facilitators in TESDA, especially the departments in charge of each step (QSO, NITESD-CTADD, NTTA), to become familiar with the process, but also provided a valuable opportunity to modify the flexible workflow, number of days, and modality. As will be described later, QCD will be included as an example in the operation manual so that it can be used as a case study for creating a program plan using ABDD TVET.

Finally, as an unexpected and positive outcome, trainers from TESDA TVIs in the R4A region participated in the pilot activity together with Japan experts and participants from companies in the R4A region. During the lectures, there were many valuable opportunities to exchange different opinions from the standpoint of the public and private sectors.

In general, trainers at TVIs have limited opportunities to visit private companies even though they are located in the same regions, and there are few opportunities to understand what kind of workplace the human resources sent by trainers are working in. The participants also had the opportunity to learn the knowledge of localized QCD by P. IMES, which is owned by Japanese companies. For this reason, the training of TESDA trainers with practical experience was a valuable experience and achievement for TESDA, which intends to incorporate the needs of local private companies and develop human resources through ABDD TVET in the future.

Although it was a short period of six days, there were many situations where the training instructors from TESDA and the participants from private companies communicated in a friendly manner through group work and other activities. The networking that resulted from this pilot training will lead to the smooth implementation and expansion of QCD training in line with the ABDD TVET at R4A.

(6) Monitoring Evaluation

In Activity 2, the following three surveys were conducted targeting 10 RLT participants.

- (A) Training evaluation by participants: nine items related to difficulty, usefulness, satisfaction, etc. (scale of 1 to 5)
- (B) Comprehension check of training content: 16 questions from each topic (three-choice quiz)
- (C) Stress check: 57 items based on the Brief Occupational Stress Questionnaire (scale of 1 to 4)

In the survey, three self-administered questionnaires were prepared in Tagalog. A baseline survey was conducted at the end of the RLT. For [2] and [3], an endline survey was also conducted approximately one month after the RLT (end of October to beginning of November) to assess changes in comprehension and stress.

First, the results confirmed that [1] the training was very highly appreciated by the participants, and that the materials and explanations were useful and easy to understand. In the free comments section, many participants expressed their desire to take the knowledge on 5S learned in the training back to their workplaces and utilize it.

Second, the table below shows the correct answer rate for each question in [2] the comprehension check of training content. The correct answer rate was almost 100% (1.00 in the table) for teamwork, “muri, muda, mura”, cost awareness, PDCA, manners of seating, and tidiness. On the other hand, some questions that are more likely to reflect subjective attitudes (professionalism, meaning of work, interpersonal relationships, etc.) tended to be answered incorrectly. The correct answer rate for all questions at the baseline was approximately 70% (0.72 in the table), and the same level of results was maintained at the endline, one month after the end of the training. Thus, it can be said that the level of comprehension persisted.

Table 4-15: Results of the Comprehension Check: Correct Answer Rates

No.	Question	Baseline	Endline	Difference
1	Organizational activity	0.80	0.90	0.10
2	External role	1.00	0.90	-0.10
3	Teamwork (1)	1.00	0.90	-0.10
4	Teamwork (2)	1.00	1.00	0.00
5	Professionalism	0.30	0.50	0.20
6	Meaning of work	0.30	0.20	-0.10
7	"Muri, Muda, Mura"	0.50	1.00	0.50
8	Cost awareness	1.00	1.00	0.00
9	PDCA	1.00	0.90	-0.10
10	"Hourensou"	0.30	0.10	-0.20
11	Manner of seating (1)	1.00	1.00	0.00
12	Manner of seating (2)	1.00	1.00	0.00
13	Interpersonal relationship	0.50	0.40	-0.10
14	"Four windows in the mind"	0.60	0.40	-0.20
15	Work clothing	0.40	0.20	-0.20
16	Tidyness	1.00	1.00	0.00
17	Total	0.72	0.67	-0.05

Source: JICA Team

Finally, regarding [3] the stress check, the table below shows the index⁶ of occupational stress and the resulting mental and physical reactions and satisfaction with work and life aspects. The quantitative and qualitative work burden was found to be particularly heavy. The other occupational stress (workplace environment, job suitability, reward of work, support from superiors and colleagues, etc.), mental and physical reactions (fatigue, depression, somatic complaints, etc.), as well as satisfaction with work and life were generally favorable. For all items of the stress check, no significant changes were identified between the baseline and the endline. Due to the small number of participants surveyed, it is unclear whether RLT had a direct impact on participants' occupational stress. However, at least a satisfactory result was confirmed regarding the high evaluation and comprehension of the training program. Details of the results of surveys [1], [2], and [3] are provided in the Appendix.

⁶ For all items, the aggregate results are converted into an index, with a value closer to 1 indicating a better situation. As a rough approximation, the index would be 0.67 if everyone chose the second-best situation out of a four-point scale and 0.33 if everyone chose the second-worst situation.

Table 4-16: Results of Stress Check: Occupational Stress (Index)

Occupational stress	Baseline	Endline	Differences
Quantitative workload	0.21	0.36	0.14
Qualitative workload	0.20	0.32	0.12
Physical burden	0.53	0.57	0.03
Interpersonal relationships	0.77	0.79	0.02
Workplace environment	0.70	0.80	0.10
Control of work	0.69	0.68	-0.01
Skill utilization	0.73	0.73	0.00
Job suitability	0.87	0.80	-0.07
Reward of work	0.87	0.87	0.00
Support from superiors	0.81	0.73	-0.08
Support from colleagues	0.81	0.80	-0.01
Support from family	0.98	0.98	0.00

Source: JICA Team

Table 4-17: Results of Stress Check: Mental and Physical Reactions and Satisfaction (Index)

Mental and physical reactions/satisfaction	Baseline	Endline	Differences
Vitality	0.78	0.81	0.04
Irritation	0.79	0.74	-0.04
Fatigue	0.86	0.77	-0.09
Anxiety	0.90	0.82	-0.08
Depression	0.93	0.88	-0.04
Somatic complaints	0.87	0.87	0.00
Satisfaction with work	0.93	1.00	0.07
Satisfaction with life	0.97	1.00	0.03

Source: JICA Team

(7) Operations Manual

Unlike other pilot activities, Pilot Activity 2 already has guidelines for ABDD TVET within TESDA. Therefore, in order to supplement the existing guidelines and make them implementable, the following four operation manuals shown in the table below are developed.

Table 4-18: Operation Manuals Created in Pilot Activity 2

Number	Name of manual	Contents	Target audience to use the manuals	Method to use	Points to note (relation with ABDD TVET)
1	Needs survey for identifying enterprise-required skills	How to identify the training needs of the industry	TESDA Planning office, etc.	TESDA may use as complementary with ABDD TVET	Step 1 Skill mapping
2	A guide to actual intervention with private companies	How to support when TESDA to connect to the industry	TESDA Planning office, etc.	Same as above	Same as above
3	Case study of QCD	Example about how ABDD TVET was applied to QCD	TESDA Trainers	The trainers may use when planning of RLT as a reference	Step 4 Regional Lead Trainer (RLT) Training
4	ToT QCD evaluation tool	QCD example about how to evaluate trainees	TESDA Trainers	Same as above	Same as above

Source: JICA Team

As a supplement to skill mapping, which is Step 1 of ABDD TVET, (1) “Needs survey for identifying enterprise-required skills” is provided as a guide to identify the training needs of industry, and (2) “A guide to actual intervention with private companies” which supports TESDA in connecting with the industry.

In addition, as a supplement to Steps 2-4, (3) “Case Study of QCD” is prepared. In particular, QCD case studies include the experience and know-how of QCD instructors who have conducted QCD trainings in Japan, and those lectures could not be covered in this RLT.

Regarding Step 4, (4) “RLT evaluation tool” is created to help the trainers to evaluate trainees. This evaluation tool includes three example formats: “QCD comprehension test”, “Stress test” that evaluates changes in attitudes and behaviors in the workplace related to QCD, and “Satisfaction questionnaire for RLT”. In the future, when RLT instructors need to evaluate the trainees in other fields under certain standards, those example formats are referred to as an evaluation tool.

4.4.3 Pilot Activity 3: Establishing a mechanism for lead generation for regular investment in the Philippines

Pilot Activity 3 was launched as part of the activities to strengthen the supply value chain. The main objectives of the activities are to expand the recognition of the Philippine industry through government-led activities and to implement strategic business matching to improve the accuracy of business matching, thereby expanding Japan-Philippines industrial cooperation. The concept of the pilot activity is as follows, and the JICA Team aims to create a system that will continue to achieve the above objectives even after the end of this project.



Source: JICA Team

Figure 4-19: Conceptual Diagram of Pilot Activity 3

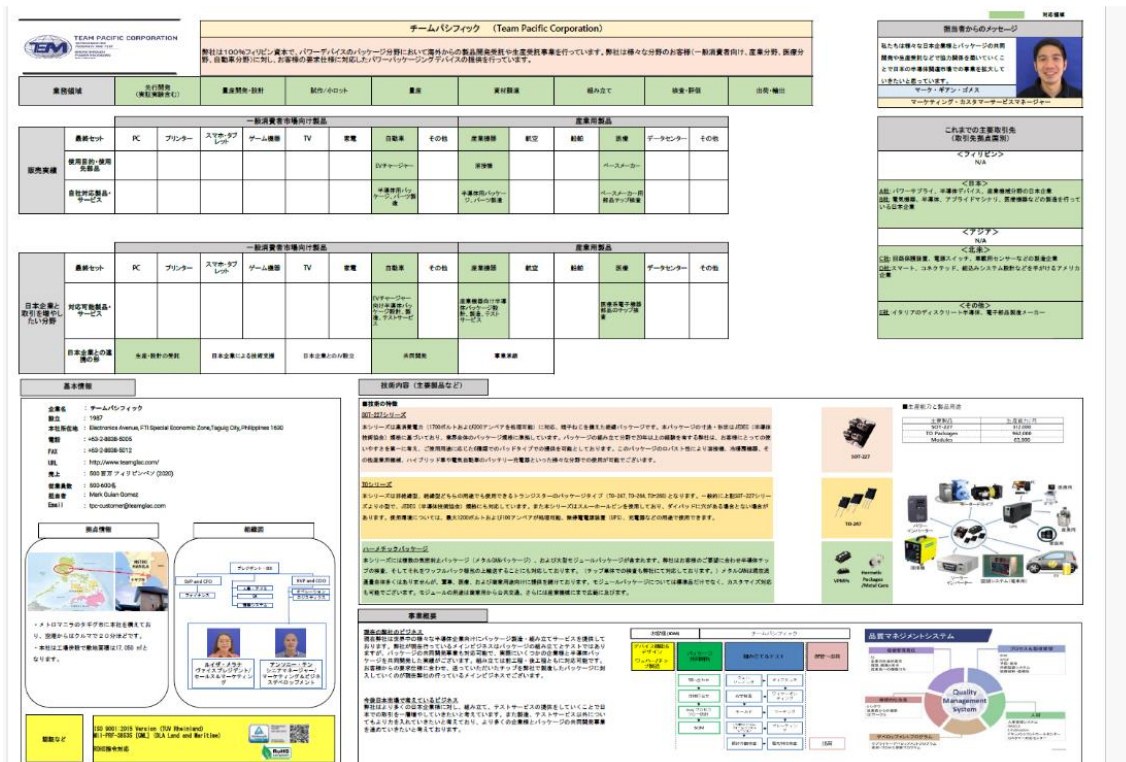
(1) Concept

The automobile industry in the Philippines is mainly an automotive supply chain centered on vehicles with internal combustion engines but, in countries such as Japan, new companies in industries such as Evs, electrical and electronics, and IT are entering the automotive supply chain amid trends such as CASE and MaaS. Since the beginning of the project, the DTI/BOI requested to promote investments in the Philippines in emerging priority sectors, such as electric vehicles and its value chain.. Therefore, it was decided to carry out activities involving electrical and electronics-related companies, which play an important role in CASE, and this activity was started. Specifically, three companies in the electronics industry were added to the automotive supplier database made in the previous project, thereby supporting the promotion of the industry. Based on the results of the activities conducted in Phase 1, the JICA Team held discussions with DTI and BOI and decided to focus on the automobile industry, particularly Evs and its allied industries such as electronics and ICT. The JICA Team also proposed to integrate the business matching activities under Pilot 6 in Phase 2 and conduct Strategic Business Matching. Both proposals which revised the content of the Pilot Activity 3 were approved by the JCC.

(2) Background

In Phase 1, as mentioned above, three companies in the electronics industry that had not been previously listed in the supplier database were added. Since the business partners are different from companies in the existing automobile industry, the JICA Team created a new format that is different from the existing format. When creating the new format, the JICA Team referred to individual interviews with Japanese companies and corporate introduction portals created by local governments in Japan, and included charts and photos as much as possible so that products and businesses could be better understood. In addition, it also strengthened the appeal to the reader by showing the face of the person in charge. One of the features of the electronics industry is that they have clients in multiple business fields, and this format provides detailed breakdown

information on what products and services they provide in each industry. An example of the created format is attached below.

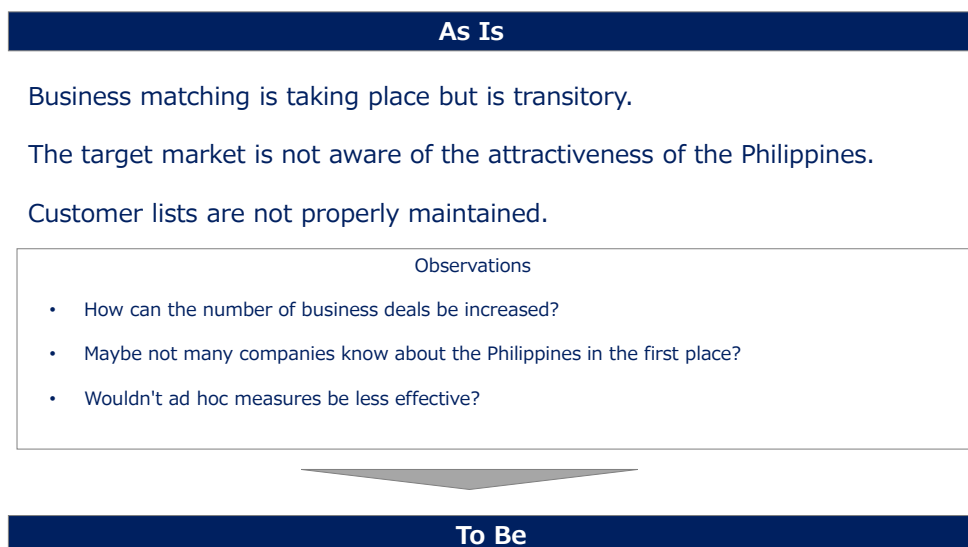


Source: JICA Team

Figure 4-20: Supplier Database Additional Formats

(3) Content

For Phase 2, as Pilot Activity 3 was merged with Pilot Activity 6 in Phase 1, strategic business matching for priority sectors previously identified was conducted. Through business matching and interviews with Philippine and Japanese companies, the following problems in Philippine industry have been identified: there is no continuity after business meeting events; the Philippine side is not able to continuously communicate about its industry; and the Philippines has a list of Japanese companies to promote but is not able to utilize it effectively. Based on previous business matching activities and interviews conducted with Philippine and Japanese companies, the JICA Team identified recurring issues: (1) no continuity or follow through after business matching activities; (2) the Philippine side is not able to provide information and updates about the industry to the Japanese market.



Regularly disseminating the attractiveness of investing in the Philippines to the target market, and generating leads constantly

Source: JICA Team

Figure 4-21: Current Situation and Direction of the Philippines

First of all, the JICA Team collaborated with Resorz, who provides a one-stop service platform for SMEs in Japan to obtain all kinds of information for overseas expansion. And they organized the way to create a mechanism for lead generation as follows: 1) strategy formulation, 2) media construction, 3) decision to conduct business in the step of marketing activities.

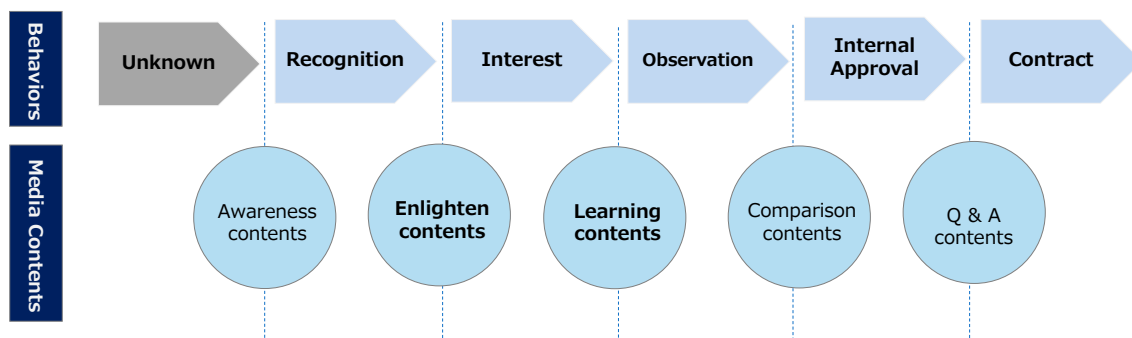


Source: JICA Team

Figure 4-22: Conceptual Diagram of Strategic Business Matching

First, strategy formulation is the establishment of a strategic approach for Philippine companies to conduct business matching with potential Japanese companies. The first thing the JICA Team did was to understand the current state of investment by Japanese companies in the Philippines. Specifically, in order to grasp how Japanese companies perceive the Philippines, the JICA Team organized the industries and business categories of the 1,020 Japanese companies based in the Philippines from open data. At the same time, the JICA Team collated the demand for the

Philippines by organizing the contents of consultations on the Philippines expansion in the last seven years received on Resorz’s online platform Digima. After this step, in order to decide what media to use and information to disseminate, the customer journey was determined as shown in the figure below. The customer journey is a series of experiences that customers follow from learning about products and services to purchasing and using them. This method is used in this pilot activity and, based on what the JICA Team has heard from Japanese companies, assumptions of what the Japanese customer will want were summarized. Based on this, content for articles was created to be disseminated on a special website and webinar plans were created.



Source: JICA Team

Figure 4-23: Customer Journey and Proper Post Placement

Media construction is the design and production of media that conveys the appeal of the Philippines through web media to potential business partners in Japan. Through Pilot Activities 3 and 6 of Phase 1, the JICA Team has confirmed that the Philippine government side has a list of Japanese companies interested in the Philippines but is losing opportunities because it is unable to disseminate sufficient industrial information compared to other ASEAN countries. In order to solve this problem, the JICA Team launched a website dedicated to the Philippines with information and articles about the Philippine industry and promoted to the Japan market the attractiveness of the Philippines.



Source: JICA Team

Figure 4-24: Top Page of the Special Website “Philippines Business Gateway” Table

The items of the website are organized as follows based on the customer journey conducted in the strategy formulation.

Table 4-19: Special Website Structure

Number	Content
1	Outline and objective of the Project
2	Features and the Project
3	Why doing business with Philippine companies can accelerate your business
4	Flow of business with Philippine companies
5	Advantages of doing business with Philippine companies
6	Articles
7	Companies
8	Useful information for download

Source: JICA Team

Of the above, item (6), the list of articles, and item (7), the list of Philippine companies, were the points the JICA Team focused on. As for the articles, in cooperation with Digima, operated by Resorz, in addition to rewriting and editing existing articles created by the company, the JICA Team also created an interview article with a Philippine company participating in the pilot activity this time. In addition, in the list of Philippine companies, the JICA Team examined the items to be described so that the corporate profiles of the eight companies became easily understood and translated them from English to Japanese.

At the final process, “marketing activity”, the JICA Team provided opportunities for business matching between Japanese and Philippine companies online and face-to-face. In preparation for the face-to-face business meeting at World Business EXPO 2023 Tokyo hosted by Resorz to be held in Tokyo in November 2023, the JICA Team has set up an opportunity to hold online meetings in advance with the aim of increasing the probability of business collaboration in business negotiations. The JICA Team picked up the interest leads of Japanese companies through online activities such as holding webinars to foster interest among the companies and uploading articles related to Philippine companies and industries and directed them to online meetings when both Japanese companies and Philippine companies agreed. A face-to-face meeting was set up after the online meeting if agreed to. At this time, the cases that have been conducted from online interviews to face-to-face business negotiations are attached.

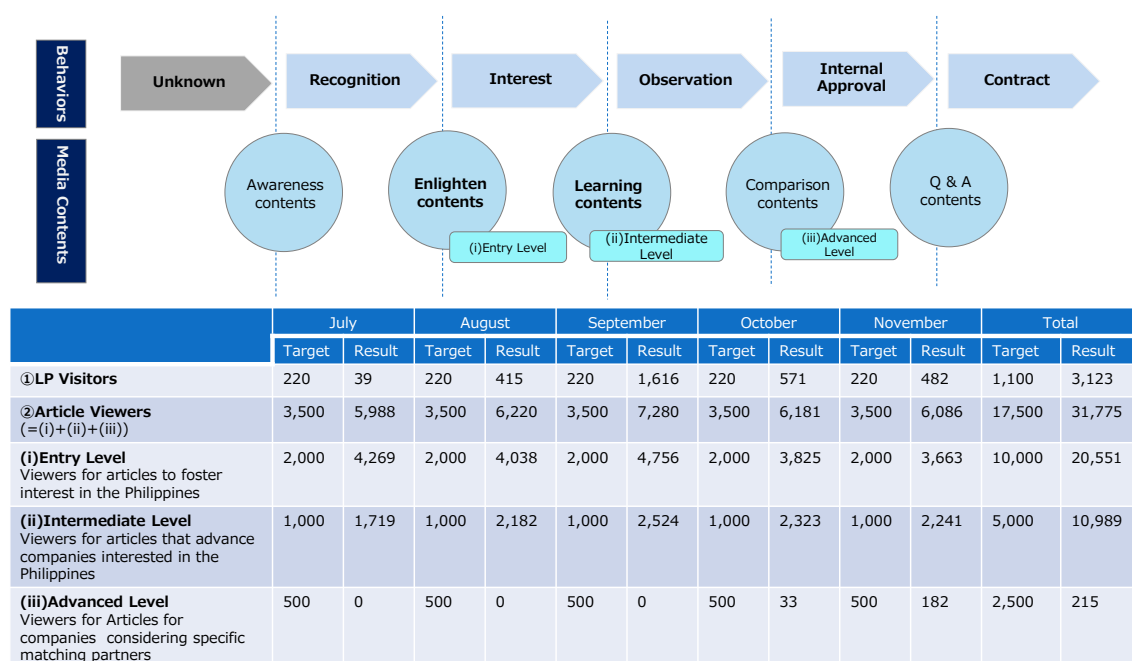
(4) Issues and Lesson Learned from the Pilot Activity

In this pilot activity, the project activities were delayed by three months from the original schedule, as it took time to identify the target industries and list the companies. A schedule should be prepared well in advance.

(5) Results

This project is designed to increase leads from Japanese companies interested in doing business with Philippine companies. A Japanese-language website was launched on a trial basis to increase leads from Japanese companies interested in doing business with Philippine companies. The project also used a marketing technique called “customer journey” to guide articles posted on the website according to the level of interest of potential customers. The following diagram shows

the results of the website visits. The transition from Recognition to Interest is defined as the Entry level, The transition from Interest to Observation is Intermediate level, and that from Observation to Internal is Advanced level. The number of visits to the website from July 2023, when the website was opened to the public, to November 2023, when the business meeting was held, was recorded. As shown in (i), the number of website visits was set at 220 per month, but the number of visits exceeded the target, resulting in 3,123 visits in five months, compared to the target of 1,100. (The number of references to the article was set at 2,000 per month, but the number of references was almost double the expected number. The Intermediate level (ii) is a page containing company information on eight companies that have visited Japan for business negotiations. The final stage, (iii) Advanced level, contains interviews with the eight companies that came to Japan for business meetings, but the information for July and September could not be obtained because the articles were published in October. Even after the article was published in October, the number of page references was less than the initial estimate of 500. (iii) Advanced level is the final decision-making stage of the customer journey, and the numerical target and the level of difficulty in achieving it were analyzed as the reason for the delay in publishing the article and the lack of coordination between the delay in publishing the article and the publicity at the time of the article publication. Overall, it can be said that the Philippines Business Gateway website, launched as a pilot project, was effective enough to arouse interest and attract potential customers who are interested in doing business with Philippine companies by providing information about the Philippines in Japanese.



Source: JICA Team

Figure 4-25: The Number of Website Visits according to the Interest Level of the Customer Journey

In this project, focusing on setting up pre-arranged meetings is a higher priority to guide potential customers through the customer journey to business meetings by launching a website on a trial basis and updating website articles. Twenty-six pre-arranged meetings were scheduled just before the EXPO on November 28 and 29, but some were cancelled on the day, resulting in 21 pre-arranged meetings. Since the target set before the start of the pilot was 30, it was assumed that the remainder would be covered by walk-in interviews on the day of the pilot. The actual number of

walk-ins was 61, resulting in 82 total business discussions. Below is a table showing the breakdown of pre-pilot and walk-in meetings, by company.

Table 4-20: Result of Business Meetings by Company

Day 1				
	Company	Pre-arranged	Walk-in	Sub-total
1	A	5	11	16
2	B	4	6	10
3	C	2	8	10
4	D	3	2	5
	Total	14	27	41
Day2				
	Company	Pre-arranged	Walk-in	Sub-total
5	E	2	7	9
6	F	1	5	6
7	G	1	8	9
8	H	3	14	17
	Total	7	34	41

Source: JICA Team

(6) Monitoring Evaluation

The monitoring for this pilot is targeted at Japanese companies that visited the website. The objectives of the monitoring are 1) to find out what kind of transactions (selling and buying) Japanese companies are seeking with Philippine companies and 2) to make preliminary arrangements for business negotiations at the Overseas Business Expo.

A questionnaire was sent to Japanese companies that visited the website. The questions were divided into four main categories as follows:

- (i) Do you have details, prices, and delivery dates for the products you wish to purchase or sell (Nos. 2-4)?
- (ii) Have you prepared your company's materials and legal checks for business negotiations (Nos. 5-8)?
- (iii) Have you researched the trends of competitors (Nos. 9-11)?
- (iv) Do you set conditions (company size, initiatives, etc.) that you require of your business partners (Nos. 12-21)?

The survey items were designed to determine the conditions under which a company is trying to conduct business meetings by answering the questions on a three-point scale. The following table shows the survey questions and response items.

Table 4-21: Set of Questions and Answers

No.	Question	Answer
1	Please select all types of companies you have done business with.	(1) Japanese company, (2) Philippine company, (3) Overseas company (excluding the Philippines)
2	Have you decided on the products/specifications you would like to purchase/sell?	(1) All of them are decided, (2) Some of them are decided, (3) Not decided at all
3	Have you decided on a budget/desired wholesale price?	
4	Have you decided on the desired delivery date/timing of the transaction?	
5	Have you prepared the English version of your company's materials needed for negotiations?	(1) All of them are prepared, (2) Some of them are prepared, (3) Not prepared at all
6	Have you organized the size of your current transactions?	
7	Have you prepared a legal check system for contracts in English?	
8	Have you organized your trade terms and conditions?	
9	Have you surveyed the trends of your Japanese competitors?	(1) All of them are surveyed, (2) Some of them are surveyed, (3) Not surveyed at all
10	Have you surveyed the trends of your Philippines competitors?	
11	Have you surveyed local suppliers/merchandise?	
12	Location of Head Office	(1) Already set specific conditions, (2) Want to set certain conditions but have not yet defined them, (3) No need to set conditions
13	Capital	
14	Number of Employees	
15	Achievements	
16	Have you set conditions for your business partners in the Philippines regarding the following items?	
17	Skill Set/Technical Qualifications	
18	Supply Availability	
19	Turnover Rate	
20	Efforts for Information Security	
21	Efforts for Quality Control	
	Efforts for SDGs	

Source: JICA Team

Of the 111 companies that visited the website, 30 cooperated in responding. The following are some of the noteworthy points from the aggregate results. First, with regard to companies that have done business with the Philippines before (No. 1), more than 80 percent of the companies were already doing business with Philippine companies or other overseas firms. This indicates that the main objective of many of the companies was to further expand their existing overseas sales channels and supplier networks.

Table 4-22: Business Experiences with Overseas

No 1. Companies with which you have done business in the past	Num. of Companies	%
Japanese companies only	4	13%
Japanese and Philippines companies	1	3%
Japanese and overseas companies excluding the Philippines	12	40%
Japanese, Philippines, and other overseas companies	13	43%
Total	30	100%

Source: JICA Team

Next, while responses varied with regard to the details, price, and delivery date (Nos. 2-4) of the products they wished to purchase and sell, nearly half of the respondents answered that they had “not decided at all” with regard to the desired price and delivery date. This suggests that many of the companies that responded to the survey did not necessarily wish to participate with specific settings or goals in mind, but were seeking to expand sales channels in an exploratory manner.

Table 4-23: Decision of Type of Business

No 2. Have you decided on the products/specifications you would like to purchase/sell?	Num. of Companies	%
All of them are decided	9	30%
Some of them are decided	6	20%
Not decided at all	10	33%
Not answered	5	17%
Total	30	100%

Source: JICA Team

Regarding preparation for business negotiations (Nos. 5-8), more than 60 percent of the respondents answered that they were “all prepared and organized” or “partially prepared and organized” for English versions of their own documents, the scale of transactions, legal checks of English-language contracts, and trade conditions. Since many of the companies already had experience doing business with foreign companies, it appears that they were already prepared, even if only partially, for these items.

Table 4-24: Readiness of Business Meeting in English

No 5. Have you prepared the English version of your company's materials needed for negotiations?	Num. of Companies	%
All of them are prepared	11	37%
Some of them are prepared	10	33%
Not prepared at all	8	27%
Not answered	1	3%
Total	30	100%

Source: JICA Team

Of the 30 firms that responded, only two set up preliminary business meetings, so it is difficult to say that the second objective of effective matching based on the preliminary questionnaire survey was achieved. However, this can be said to be the result of prior coordination that revealed differences in needs and conditions between Japanese and Philippine companies. In other words, for those companies that responded to the questionnaire but did not participate in the EXPO, it is thought that this had the effect of reducing unnecessary transaction costs that would have been incurred without prior coordination. As mentioned above, there were 21 business meetings held in advance and 61 meetings held on the day of the EXPO without advance reservations. It was found that the important indicator was whether the respondents had business negotiations with Philippine companies after learning of its existence for the first time when they dropped by on the day of the meeting.

(7) Operations Manual

The operations manual for Pilot Activity 3 mainly includes 1) a procedure manual for the creation of each content of the website and 2) the questionnaire items asked to Japanese companies that visited the website during the monitoring and evaluation. The manual for the website content in (1) is designed so that the points for updating the website can be grasped when the counterpart continues to utilize the website created by the project. The monitoring and evaluation questionnaire items (2) were prepared and implemented by the project to ascertain the readiness of Japanese companies for business transactions, but they can be used as a manual to ascertain

the readiness of Philippine companies for business matching, as they will serve as indicators of the readiness of companies when registering Philippine companies in the future.

Articles (1) and (2) are assumed to be handled by the BOI since the main body of the article is written in English, but since it will eventually be written in Japanese on the website, support from Philippine Trade and Investment Center in Japan (Tokyo and Osaka) may also be necessary.

Table 4-25: Manual Items for the Strategic Business Matching

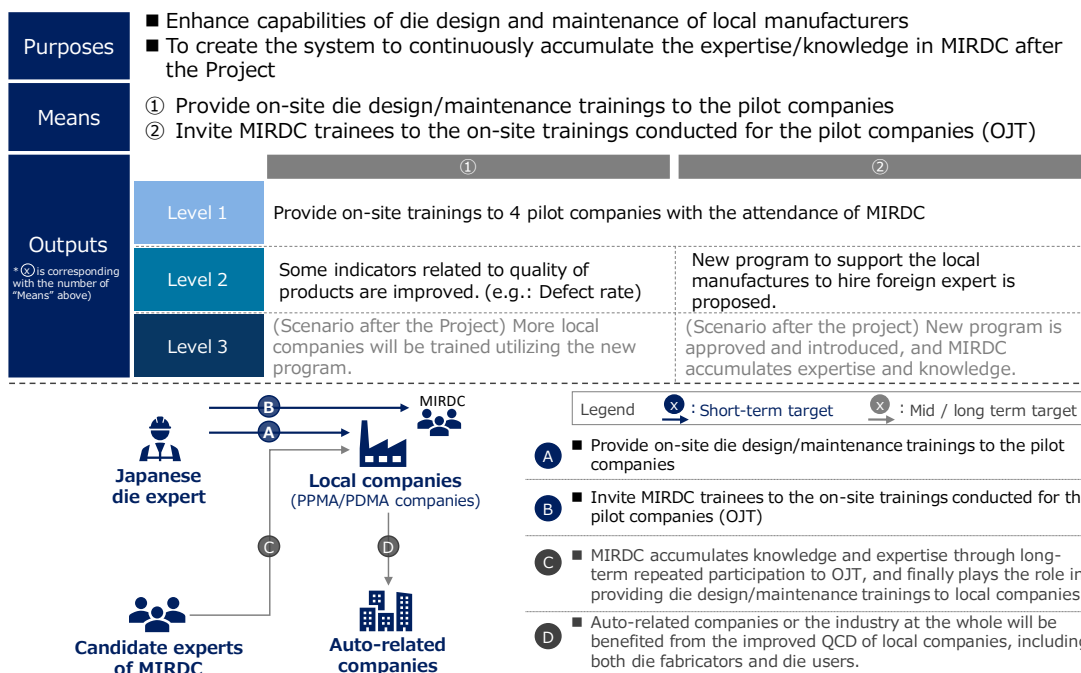
Number	Name of manual	Contents	User	How and when
1	Company Profile	How to update company profile on the website	BOI	When a new company is requested to post its company profile to the website
2	Company depth Interview	How to conduct an interview with newly registered company to post its company's information	BOI	When a new company is request to be exposed its company information on the website
3	Company's readiness check	How to check the company's readiness to conduct business matching with Japanese companies on the business matching meeting	BOI	Reference information for screening a company to register on the website

Source: JICA Team

4.4.4 Pilot Activity 4: Creating a mechanism for promoting and establishing Kaizen

(1) Concept

The main goal of Pilot Activity 4 is to diffuse Kaizen as a QCD management method to the manufacturing industry in the Philippines, to enhance corporate performance and resilience, and to raise the level of the industry as a whole. The concept of the pilot activity is shown in the figure below; it is to conduct training for pilot companies by Japan experts and training instructors affiliated with partner organizations, aiming to institutionalize the autonomous diffusion of Kaizen on the Philippine side.



Source: JICA Team

Figure 4-26: Conceptual Diagram of Pilot Activity 4

(2) Background

In the preceding GVC project, Kaizen initiatives were implemented within pilot companies, yielding significant outcomes under the guidance of Japanese experts. However, it is noted that within two years after the conclusion of the GVC project, the sustained implementation of Kaizen activities within the initial pilot companies ceased, revealing a pertinent issue regarding continuity after the intervention by Japanese experts. In light of this observation, the present initiative is conceived with the primary objective of ensuring sustained continuity within individual companies, in tandem with the broader dissemination of Kaizen practices.

(3) Content

At the initiation of the activity, Japanese experts meticulously devised a standardized training plan for the chosen pilot companies. The thematic focus of each visit was carefully delineated: the inaugural visit aimed to delineate Kaizen themes and outline implementation strategies through expert-led company diagnostics and on-site assessments; the subsequent visit aimed to verify the progress of Kaizen implementation through data analysis; the third visit aimed to galvanize internal engagement by showcasing tangible results achieved thus far; and the final visit aimed to elucidate the transformative impact of Kaizen on management practices while instilling motivation among participants to sustain their endeavors. (Refer to the table below.)

Table 4-26: Kaizen Training Plan (Phase 1)

#	Steps	Action	Contents	Key notes
1	First Visit Greeting	<ul style="list-style-type: none"> ■ Greetings ■ Introduction of Kaizen Consultation ■ Explanation from the company 	<ul style="list-style-type: none"> ■ Introductory presentation material of Kaizen consultation 	<ul style="list-style-type: none"> • Attract attention by introducing actual Kaizen cases • Deep listening to the company's core issue
	Interview	<ul style="list-style-type: none"> ■ Quick company diagnosis using a questionnaire ■ Confirmation of Kaizen theme direction 	<ul style="list-style-type: none"> ■ Company quick check list 	<ul style="list-style-type: none"> • Seek the intervention of the management perspective • Seek the opportunity of a quick win
	Walk-through	<ul style="list-style-type: none"> ■ Plant walk-through 	<ul style="list-style-type: none"> ■ Walk-through guide 	<ul style="list-style-type: none"> • Record OFI by photo and video • Brainstorm Kaizen opportunities
	Wrap-up	<ul style="list-style-type: none"> ■ Feedback of plant walk-through ■ Visualization of issues felt by the company ■ Explanation of how to proceed Kaizen ■ Arrangement for data collection 	<ul style="list-style-type: none"> ■ Kaizen guide 	<ul style="list-style-type: none"> • Compare with Japanese cases • Distinction whether the issue needs solution or cause finding • Motivation of the company • Evoke awareness of recording • Formulation of Kaizen team
2	Second Visit Review	<ul style="list-style-type: none"> ■ Checking the progress of Kaizen analysis ■ Checking the Kaizen theme and activity plan 	<ul style="list-style-type: none"> ■ Kaizen guide 	<ul style="list-style-type: none"> • Check progress or data analysis • Evoke awareness of issue/solution analysis • Training for the company
3	Third Visit Review & Workshop	<ul style="list-style-type: none"> ■ Checking the progress of Kaizen activity ■ Kaizen workshop 	<ul style="list-style-type: none"> ■ Kaizen guide 	<ul style="list-style-type: none"> • Analyze issues or solution • Heighten awareness by company's presentation • Expansion of the stakeholders inside the company
4	Final Visit Review & Workshop	<ul style="list-style-type: none"> ■ Checking the results of Kaizen activity ■ Kaizen workshop 	<ul style="list-style-type: none"> ■ Kaizen guide 	<ul style="list-style-type: none"> • Checking the meaning of Kaizen on management • Evoke awareness of activities onward

Source: JICA Team

Six pilot companies were selected from the automotive industry, which was the scope of Phase 1, with the cooperation of the BOI and the PPMA, an industry association. The breakdown was two each from E-PUV manufacturers, Tier 1 parts suppliers of Japanese OEMs, and Tier 2 and 3 parts suppliers.

On-site training for the pilot companies was scheduled to start in January 2020 but, due to the eruption of Taal Volcano in the same month, the automobile plant was shut down, and then COVID-19 began to spread, so the training could not be carried out as planned. In that time, the JICA Team sought to sustain pilot activities remotely using digital tools. The Project opted for Nossa 360, a live-streaming application, enabling Japan-based experts to remotely explore the factory and identify Kaizen opportunities. However, due to communication discrepancies, the trial at TOJO Motors, one of the eight pilot companies, didn't yield effective results. Consequently, full-scale pilot activities resumed in August 2022, coinciding with Phase 2, when travel by Japan-based experts became feasible again.

Furthermore, the Philippine automotive industry faced substantial disruption due to the COVID-19, causing some pilot companies that were initially identified to be unable to maintain regular production which resulted in their withdrawal from the offered Kaizen training. In the end, only one of the six companies remained as a pilot company, TOJO Motors, and even this company had to withdraw from the pilot activities temporarily due to cash flow problems and the prospect of production planning.

Amid these conditions, Kaizen promotion webinars were held in January and May 2022 to recruit new pilot companies. About 50 participants from various sectors attended each session, expressing interest during the Q&A. However, despite specific intentions from some, logistical hurdles within corporate groups prevented their participation.

Phase 2 began with TOJO Motors as the sole pilot company, later joined by Nuvali Steel. The initial August 2023 Kaizen training, originally planned for three weeks, was condensed to two due to unforeseen circumstances. Japan experts adapted by focusing on five key topics, combining lectures with practical exercises to maximize participant engagement and leverage existing business knowledge. This innovative approach, though untested by the experts themselves, yielded impressive results, particularly evident in Nuvali Steel's success. See below for a comparison of this new method with traditional approaches.

In conventional Kaizen training, the Japanese expert first observes the movements of workers and the quantities of work-in-process and product inventory at each work area at the client's factory. Based on this, Japanese experts will develop a Kaizen plan, and the employees and managers of the companies receiving training will implement the Kaizen plan according to the suggestions, and later measure the effectiveness of the Kaizen in terms of improved productivity or reduced defect rates.

The advantage of this approach is that Japanese experts with extensive Kaizen experience who have observed various sites are involved and, thus, it is easy to achieve significant effects. On the other hand, one disadvantage is that the more complex the factory operations are, the more time will be required for the Kaizen expert to first get a good grasp of the factory's current situation. Furthermore, as Japanese experts make Kaizen proposals based on their own experience and knowledge, it is difficult for company trainees to learn the entire process of how the experts observed the factory and came up with their Kaizen ideas. As a result, cases occur where companies are no longer able to carry out Kaizen on their own after the Japanese experts leave and the intervention is over. In fact, such cases have been observed in the Philippines.

In contrast, the methodology used in this pilot activity focused on improving the practical Kaizen skills of company trainees, such as factory workers and managers. The training program began with classroom lectures by Japanese experts on specific Kaizen themes, such as Poka-Yoke, and was followed by an exercise in which company trainees applied what they had learned to their own workplaces and presented practical Kaizen ideas. This approach not only eliminated time for expert observation by leveraging the knowledge and insight of company trainees in their own workplaces, but also helped to empower the trainees to practice Kaizen through case studies. As a result, some of the pilot companies have conducted their own in-house Kaizen training and are continuously building up their Kaizen cases.

Conventional factory Kaizen methods

Steps

- (1) Japanese factory Kaizen experts observe how workers work and the amount of inventory at each process. And Japanese experts come up with Kaizen plans.
- (2) Implement the proposed Kaizen with the cooperation of workers and managers of the companies implementing the Kaizen.
- (3) Calculate and enter the numerical value of the Kaizen effect (e.g., productivity improvement, reduction in defect rate, etc.)

Advantages

The Japanese experts will make full use of their previous experience and trained knowledge, which often produces good results.

Disadvantages

- (1) If a worker performs many tasks in a day, the factory Kaizen specialist must spend a long time observing the worker, which is time inefficient.
- (2) Factory workers do not know what kind of principles and knowledge factory Kaizen specialists use to come up with Kaizen ideas.

→ After the Japanese experts return to Japan, factory workers alone will not be able to proceed with Kaizen activities.

Source: JICA Team

New method adopted from this time

Steps

The following three-step method was used to train factory managers and employees in various Kaizen methods so that they can improve their practical Kaizen abilities.

Example: Poka-yoke (a mechanism to prevent careless mistakes)

- (1) Lecture (general explanation of contents)
- (2) Using a personal computer, the training participants think about the contents of careless mistakes and the Poka-Yoke plan.
- (3) Practical exercise: Participants go to a factory workplace, think about the contents of careless mistakes that have occurred and examples of Poka-yoke, and present their ideas in a PowerPoint presentation.

Advantages

By learning these three sets of training, participants in the training could learn Kaizen case studies that are appropriate for the actual factory workplace.

→ By using this method to train multiple kaizen methodologies, companies (e.g., Nuvali Steel) that have trained their employees in Kaizen methodologies have been able to significantly improve productivity and quality and have also increased employee motivation.

Figure 4-27: Comparison of Conventional Kaizen Instruction and Guidance in this Activity

The most prominent example is Nuvali Steel, where the Kaizen training effect was propagated and continuously implemented within the company after the completion of the first batch of training and remarkable results were achieved. In the Philippines, there have been reports of cases where outside experts lead Kaizen training and achieve temporarily high results, but the activity does not continue once the expert's engagement ends. However, by the time of the monitoring visit at the end of January 2023, Nuvali Steel had proposed and introduced more than 50 Kaizen plans. On the back of Nuvali Steel's success, sister companies under the same management umbrella as Nuvali Steel expressed interest in the pilot activity, including SSI Metal, engaged in construction metalworks; PlasticPlus, engaged in plastic injection molding; Maximetal, engaged in production of various metal and plastic products; and Presline Steel, engaged in metal fabrication, and participated in the training. YCA/Ambrose, engaged in metal processing, is a member of PDMA, the same industry group as Nuvali Steel, and is also a pilot company for Activity 5, Die Training. As will be described below, MD Juan, engaged in automotive parts production, was named as a pilot company through a pilot Kaizen diffusion event in June 2023. The table below summarizes all eight pilot companies that participated in any of Batch 1-4 and the implementation period of the training.

Table 4-27: Duration of Kaizen Training and List of Participating Pilot Companies

Training dates	Company Name	Industry
1 st Batch (August 22 – September 2, 2022)	TOJO Motors	E-PUV manufacturer
	Nuvali Steel	Stamped parts for automotive and motorcycle
2 nd Batch (January 16 – February 3, 2023)	SSI Metal	Construction metalworks
	PlasticPlus	Plastic injection molding
3 rd Batch (April 17 – May 5, 2023)	Maximetal	Various metal and plastic products
	YCA/Ambrose	Metal processing
4 th Batch (July 17 – July 29, 2023)	MD Juan	Automotive
	Presline Steel	Metal Fabrication

Source: JICA Team

(4) Issues and Lessons Learned

The most difficult part of implementing Pilot Activity 4 was securing pilot companies. The training required at least five or six on-site visits per company, since the JICA Team was required to produce a certain level of Kaizen results to set a good case in the Kaizen diffusion phase, and the training also served as on-the-job training for the lecturers at the partner institutions. During the period of the Kaizen training, the companies had to pull the participants out of their regular operations, and this was likely a hurdle for the companies to accept the training. In addition, some candidate companies declined to participate in the training because the visit of not only one Japanese Kaizen expert but also lecturers from partner institutions was avoided from the viewpoint of information security.

Another difficulty was coordinating schedules with the candidate lecturers from partner institutions. For some trainees, the assignments at their institutions overlapped with the Kaizen training schedule, and they were not able to fully participate throughout the entire batch. The schedule was adjusted based on the requests of the three partner institutions in addition to the pilot companies all together, which resulted in uneven participation. In retrospect, to ensure the training of lecturers at all three institutions, the JICA Team could have set a priority institution for each batch and coordinated the schedule. This can be considered a lesson learned when conducting similar activities in the future.

(5) Results

The results of Pilot Activity 4 can be broadly divided into Phase 1, the creation and continuation of the results of Kaizen activities at the pilot company, Phase 2, the training of Kaizen instructors at local partner institutions, and Phase 3, the establishment of a Kaizen dissemination mechanism. Since Phase 1 is described in 5) Monitoring Evaluation, Phases 2 and 3 are mainly reported on in this section.

In Phase 1, Kaizen instructor training targeted MIRDC⁷ resource persons exclusively. However, in Phase 2, the scope expanded to include resource persons from the National Wages and

⁷ MIRDC is an agency under the DOST mandated with providing technical training, information exchange, quality control and testing, research and development, technology transfer, and business economic advisory services to the

Productivity Commission (NWPC⁸) and the Development Academy of the Philippines (DAP⁹), being two partner institutions during the Kaizen activity in the previous GVC project.

For the Kaizen instructors' training, the Japanese expert led the lectures and exercises wherein the partner institutions were able to work with pilot company trainees in preparing Kaizen training materials. In addition to this, the partner institutions were exposed to on-the-ground training as they joined the Japanese expert during the visits to some pilot companies. Lastly, the textbook of the Kaizen training was developed by the Japanese expert and was reviewed and supplemented with pertinent information by the partner institutions.

In this way, a total of seven instructor trainees participated in the instructor OJT held in the second to fourth batches. The breakdown is two from MIRDC, three from NWPC, and two from DAP. The Japanese expert established the following criteria for instructor certification within this project.

- (A) Participating in the lectures and exercises by a Japanese expert or other instructor trainees for all five subjects.
- (B) Conducting lectures and exercises in at least three of the five subjects.





There were five trainees who met the above criteria, but one of them left during the project, so the following four were finally certified as instructors. They are, namely, Mr. Adonis Marquez from MIRDC, Mr. Francis Atangan and Mr. Mark Leroy from NWPC, and Ms. Janina Ferrer from DAP. As a result, MIRDC, NWPC, and DAP have all had at least one certified instructor. After the completion of the project, it is expected that the know-how provided by the project will be utilized in accordance with the framework of the respective training programs provided by the institution to the enterprise.

metalworking and related industries. In relation to Kaizen, MIRDC provides classroom training and individual consultation services to companies, mainly in the metalworking industry.

⁸ The NWPC is an important policy-making body on wages, income, and productivity established under the DOLE and is mandated with determining minimum wages at the regional, state, or industry level, as well as promoting productivity improvement and profit-sharing schemes, especially for micro, small, and medium enterprises. In relation to kaizen, it offers training programs such as Lean Management and 7S.

⁹ DAP, established by government presidential decree, is the Philippine arm of the Asian Productivity Organization (APO), which promotes productivity awareness and the principles, techniques, and practices of productivity and quality in key sectors of the economy. In relation to Kaizen, DAP provides quality and productivity training to public institutions and the service sector.

Table 4-28: List of Certified Instructors Through This Activity

Certified Trainer	Role and Organization	
Mr. Adonis Marquez	Accredited resource speaker with Production and Operations Management, MIRDC	
Mr. Francis Atangan	Technical trainer on Lean Management and 7S, NWPC	
Mr. Mark Leroy	Technical trainer on Lean Management and 7S, NWPC	
Ms. Janina Ferrer	Productivity/Quality Enhancement Project Manager, DAP-PDC	

Source: JICA Team

(3) On the establishment of a Kaizen dissemination mechanism, a Kaizen diffusion event was first held by the BOI in June 2023. The Kaizen Diffusion Event, in which Philippine companies share best practices for applying local Kaizen activities and use them to discover new Kaizen interested companies, is a concept that is different from the Kaizen Promotion Seminar held online in 2022. In fact, at the diffusion event in June, the CEO and in-house Kaizen promotion staff from Nuvali Steel, the pilot company, gave presentations under the title of “The Nuvali Steel Kaizen Journey”. The program for this event is shown below. In addition, instructor trainees from MIRDC, NWPC, and DAP presented Kaizen-related programs from their respective institutions and introduced a scheme for Kaizen training that can be used after the project is completed. The entire program for this event is shown below.



Source: JICA Team

Figure 4-28: Program of the Kaizen Promotion Seminar (held on June 30)

One of the touchstones of this Kaizen diffusion event was to find from the audience the two pilot companies participating in the fourth batch through this announcement. In fact, three companies, including MD Juan, which became the pilot company, expressed interest in participating in Kaizen training and, although the remaining two companies could not be coordinated in terms of schedules, the JICA Team was able to verify the model of finding new interested companies through a Kaizen diffusion event.

The Kaizen Diffusion Event to be held in November 2023 and its results will be described in Chapters 4 and 5, along with a discussion of modeling.

(6) Monitoring Evaluation

In this activity, we conducted surveys in eight companies that were the target of Kaizen training. Although the survey timing differed among the companies, we conducted three surveys for each company: a pre-survey before the training, a post-survey immediately after the training, and a final survey more than three months after the training. This analysis aims to understand the overall and long-term impact of Kaizen training on these target companies by examining data from these three time points.

The evaluation mainly focused on two aspects: (1) management activities at the production sites and (2) employees' occupational stress (work style and attitudes). For management activities, 25 items were surveyed based on previous research, such as basic 5S, communication among employees, and setting rules and goals. Work styles and attitudes were surveyed using the Brief Job Stress Questionnaire, an internationally standardized checklist. The method of analysis is to quantitatively compare the situation before the training (at the time of the pre-survey) with the situation immediately after the training (the post-survey) and more than three months later (the final survey). Data were converted into the deviation score, and the changes were statistically examined by t-tests.

The results of the analysis are as follows. First, management activities became more active overall immediately after the training. At the time of the final survey, more than three months after the training, many activities such as "control of defective products," "workplace environment," "tool management," "cleaning," and "communication and trial-and-error" remained active, suggesting that the impact of the training was not temporary but long-term.

Regarding occupational stress, most of the items in both stressors and mental and physical reactions changed to better conditions in the long term. Although those changes were not so large overall, there was an improvement of two to three deviation scores for the three items: "physical burden," "support from superiors," and "anxiety." The essential psychological outcome "satisfaction with work and life" also remained increased.

The results above confirm that management activities have become more active in the long term after Kaizen training and that occupational stress has also generally improved, although the changes are not so significant. This analysis has several limitations, and it is difficult to attribute all of these changes to the direct causal effects of Kaizen training. However, given that several previous studies that have rigorously verified the impact of Kaizen and similar training in randomized controlled trials have confirmed the effectiveness of Kaizen and similar training, there is a high probability that the Kaizen training in this activity contributed significantly to the above results.

Table 4-29: Management Activities

Management activities	Pre ①	Post ②	Final ③	Trend	Short-term difference ②-①	Long-term difference ③-①
Control of defective products	47.0	50.5	50.6		3.5 **	3.5 **
Workplace environment	46.3	50.5	50.3		4.2 **	4.0 **
Tool management	46.4	51.5	52.4		5.1 ***	6.0 ***
Management of raw materials	47.1	52.1	49.5		5.0 ***	2.4
Management of final products	47.3	50.8	49.2		3.5 **	1.9
Cleaning	47.4	50.3	51.0		2.9 *	3.7 **
Management of work process	48.4	50.7	50.6		2.3	2.3
Communication and trial-and-error	45.8	50.6	50.9		4.9 ***	5.1 ***
Setting rules and goals	47.4	51.4	49.2		4.0 ***	1.8

Note: Each value indicates the deviation score calculated by scoring each item on a five-point scale from 0 to 4 and aggregated for each category. A higher deviation score indicates a greater level of activity (or a better situation). The “short-term difference” and “long-term difference” are the difference between the post- or final survey minus the pre-survey. As a result of the t-test, “*,” “**” and “***” indicate a difference at a statistical significance level of 10%, 5% and 1%, respectively. For example, “***” indicates that if the hypothesis of “no change” is assumed to be correct, there is less than a 1% chance that the actual obtained data would occur. As such a situation is very rare, it provides evidence to consider that the original hypothesis (“no change”) was incorrect in the first place (i.e. “there is a change”).

Table 4-30: Occupational Stress

Stressors	Pre ①	Post ②	Final ③	Trend	Short-term difference ②-①	Long-term difference ③-①
Quantitative workload	49.0	50.5	49.7		1.5	0.8
Qualitative workload	50.1	49.3	51.4		-0.8	1.4
Physical burden	49.5	48.2	52.4		-1.3	2.9 *
Interpersonal relationships	47.8	50.6	49.7		2.8 *	1.9
Workplace environment	49.2	48.3	49.4		-0.9	0.2
Control of work	48.9	50.7	50.5		1.8	1.6
Skill utilization	49.0	48.5	49.9		-0.5	0.9
Job suitability	48.8	50.9	49.9		2.0	1.0
Reward of work	48.1	51.7	49.6		3.6 **	1.5
Support from superiors	50.1	50.5	52.3		0.4	2.2
Support from colleagues	52.4	49.4	52.2		-3.0 *	-0.2
Support from family	51.8	50.4	52.1		-1.4	0.3

Note: See the table above.

Table 4-31: Mental and Physical Reactions and Satisfaction

Mental and physical responses and satisfaction	Pre ①	Post ②	Final ③	Trend	Short-term difference ②-①	Long-term difference ③-①
Vitality	49.0	50.4	48.3		1.4	-0.7
Irritation	47.3	52.3	49.1		5.0 ***	1.8
Fatigue	49.4	49.8	51.0		0.4	1.7
Anxiety	47.5	50.8	50.7		3.2 **	3.2 **
Depression	48.4	51.1	48.6		2.7 *	0.2
Somatic complaints	49.5	50.5	49.0		1.0	-0.5
Satisfaction with work and life	48.1	50.3	49.7		2.2	1.6

Note: See the table above.

(7) Operations Manual

Pilot Activity 4 will compile the operation manuals 1-7 in the table below.

1. Kaizen Diffusion Event Operation Guideline will be developed as the operational guide for BOI for preparation and follow-up of the Kaizen Diffusion Event. It is to enable BOI staff to continue to work with partner agencies, MIRDC, NWPC, and DAP, and to host the Kaizen Diffusion Events if the BOI approves continuing to host the event on a regular basis.

2-6. Kaizen Training Textbooks are teaching materials related to the five lecture themes selected for this project (Poka-yoke, 5S, Multi-skill development, Waste Removing, and Small Group Activities). The MIRDC, NWPC, and DAP instructors are expected to lecture and conduct exercises based on these textbooks when conducting training at local companies. After the training, the materials will be shared with the companies where the training was conducted so that they can also use the materials for their own in-house training.

7. Plant Walk-through Guide is a guide to identify Kaizen opportunities during plant walk-throughs, which will also be shared with the beneficiary companies through the lecturers after the training and is expected to support the continuation of autonomous Kaizen activities after the training.

8. Employee Survey is a questionnaire form distributed to employees for monitoring and evaluation purposes. As mentioned above, it can measure the impact of Kaizen on the company in terms of Management Activities and Occupational Stress. The company is expected to use this score trend as a target management tool to continue Kaizen activities.

Table 4-32: List of Operation Manuals Created in Pilot Activity 4

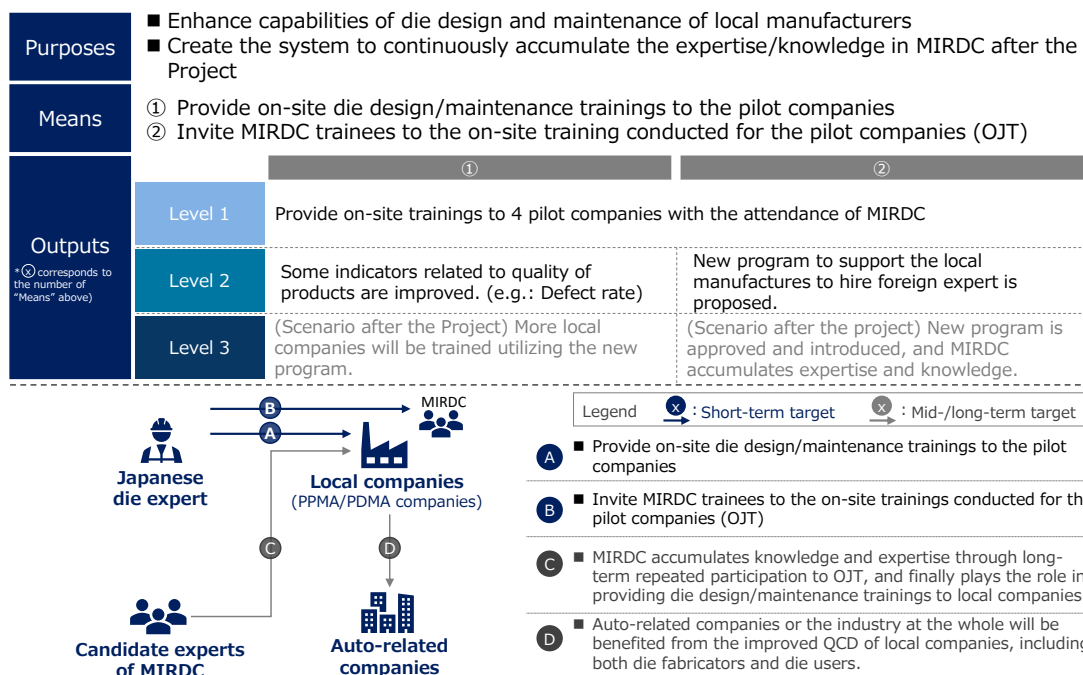
#	Name of Manual	Contents	Who to use	How to use	Notes
1	Kaizen Diffusion Event Operation Guideline	How to organize Kaizen Diffusion Event in collaboration with MIRDC, NWPC and DAP	BOI	Person in charge refer to this when conducting Kaizen Diffusion Events to identify preparation and coordination tasks	
2	Kaizen Training Textbook (Poka-yoke)	Standard textbook to organize lecture and exercise on Poka-yoke	Kaizen lecturers	The lecturers refer to this as a textbook and conduct lectures and exercises on Kaizen at the training sites. After the training, this should be shared with the trainees.	
3	Kaizen Training Textbook (5S)	Standard textbook to organize lecture and implementation on 5S	Kaizen lecturers	(Same as above)	
4	Kaizen Training Textbook (Multi-skill development)	Standard textbook to organize lecture and exercise on Skill Map	Kaizen lecturers	(Same as above)	
5	Kaizen Training Textbook (Waste Removing)	Standard textbook to organize lecture and exercise on Waste Removing	Kaizen lecturers	(Same as above)	
6	Kaizen Training Textbook (Small Group Activity)	Standard textbook to organize lecture and exercise on Small Group Activity	Kaizen lecturers	(Same as above)	
7	Plant Walk-through Guide	Guideline of how to find opportunities for Kaizen in factory	Kaizen lecturers	Lecturers will share this with trainees as a guidebook for Kaizen exercises and post-training Kaizen activities.	
8	Employees Survey	Employee survey form to continuously measure Kaizen's impact on company	Pilot Companies	Distribute forms to employees and ask them to respond, then tabulate and monitor their score trends.	

Source: JICA Team

4.4.5 Pilot Activity 5: Implementing technical guidance for die and mold technology at pilot companies

(1) Concept

Pilot Activity 5, one of the supply value chain development activities, is a capacity-building initiative for the Philippine die industry. The main goal of Pilot Activity 5 is to realize sustainable assistance for the Philippine die industry by transferring press die technology to MIRDC as the main target organization, and to strengthen the competitiveness of the entire manufacturing industry where press dies are used, including the automotive industry. The concept of the pilot activity is shown in the figure below, and the Japanese expert provides consultation to the pilot companies and teaches the MIRDC trainees how it can be done, with the aim of enabling MIRDC engineers to continuously provide the same level of consultation to local companies as Japanese experts in the future.



Source: JICA Team

Figure 4-29: Conceptual Diagram of Pilot Activity 5

(2) Background

In the preceding GVC project, it was identified that it would be useful to strengthen die and mold technical capabilities in order to improve the competitiveness of the manufacturing industry, especially in the automotive industry. MIRDC has been particularly active in strengthening its capacity in both fields and, even before the start of this project, it invited Japanese experts to conduct trainings. On the other hand, MIRDC has received support from the Korean government for molds, and progress has been made, such as the groundbreaking ceremony of the Mold Technology Support Center (MTSC) in October 2019. For this reason, it was decided by the JICA Team to specialize in strengthening the capacity of press die, where there is no overlap of support.

As a form of training in the pilot activities, it was planned to provide on-site practical guidance, and it was assumed that a Japanese expert would accompany MIRDC trainees in on-the-job training and give lectures and guidance on die design and maintenance at the pilot companies. As for the pilot companies, by 2019, the six companies were selected on the recommendation of the die and mold industry group PDMA and the automotive parts industry group PPMA and, in March 2020, an initial skill survey and preliminary visits were conducted to confirm training needs. As shown in the table below, the JICA Team identified die maintenance capacity enhancement needs from the perspective of die users at Ambrose, Roberts, and Valerie, and die engineering capacity enhancement needs related at Nuvali Steel, Stampform, and Amantech, which manufacture their own dies. Although full-scale on-site training was planned to start in 2020, due to the travel restrictions after COVID-19 that occurred in the same year, it was not possible to provide on-site training for a while.

Table 4-33: Initial Die Training Plan (as of Phase 1)

Number	Name	Industry Group	Activity Plan
1	Ambrose	PDMA	■ Technical support to enhance the capability of die maintenance
2	Nuvali Steel	PDMA	■ Technical support to enhance the capability of die engineers for fabricating middle dies and manufacturing parts by using them
3	Stamp form	PDMA	■ Technical support to enhance the capability of die engineering
4	Roberts	PPMA	■ Technical support to enhance the capability of middle-size/large die maintenance
5	Amantech	PPMA	■ Technical support to enhance the capability of die engineers for fabricating middle-size dies and manufacturing parts by using them
6	Valerie	PPMA	■ Technical support to enhance the capability of middle-size/large die maintenance

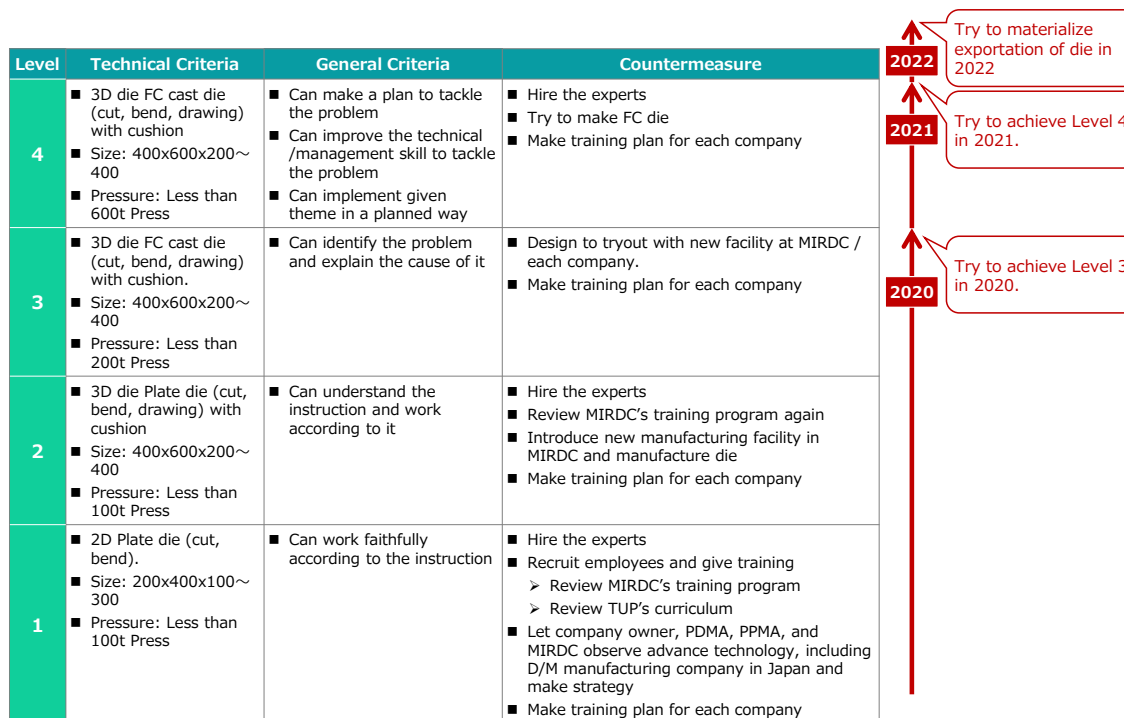
Source: JICA Team

During this period, the JICA Team also tried to put remote training to practical use using digital technology in parallel with research on the press die industry, which scoped to other ASEAN countries. In fact, in November 2020, the JICA Team connected online with one of the pilot companies and conducted a trial of remote training, but the evaluation by the training participants was not good and, as a result of discussions with BOI, MIRDC, and the pilot company, it was decided to postpone the activity until after the resumption of travel by Japanese experts instead of continuation of the remote training.

As the second phase began and restrictions on travel for Japanese experts were lifted, the JICA Team began full-scale training activities in November 2022.

(3) Content

As mentioned above, Phase 1 strongly reflects the context of the promotion of the automotive industry, and the capacity of the pilot companies and MIRDC was to be strengthened based on the roadmap shown in the figure below, which was formulated and supported by Japanese expert on the JICA Team in 2019. This roadmap was based on the premise that the needs of the automotive industry were growing and it aimed to foster the development of press die manufacturing capacity for larger presses over a three-year period starting in 2020, thereby replacing dies currently imported from abroad with domestic products and eventually exporting domestically produced dies.



Source: JICA Team

Figure 4-30: Die Industry Development Roadmap (as of 2019)

However, since press die technology is for mass production and related capital investment is enormous, such a technical need will not arise in the first place unless domestic production of large automotive parts is seen as realistic to some extent.

The COVID-19 pandemic, which occurred during the first phase, significantly changed the context of the die industry in the Philippines. Not only did two of the six pilot companies decline to participate due to changes in the business environment, but the other pilot companies, with the exception of Valerie, also saw a marked change in client structure, i.e., a decline of the share of the automotive industry in the total sales. In the face of such a crisis in the industry, the pilot activity was not limited to the automotive industry but focused on the survival of individual die companies and shifted to a policy of providing capacity enhancement in line with the actual situation of the pilot companies.

In Phase 2, a Japanese expert traveled to Philippines five times to provide die training. (At the time of writing this DFR, the fifth trip was not completed.)

The following table summarizes the activities from the first trip to the fifth trip.

Table 4-34: Die Training Period and List of Activities (Results)

Training Dates	Company Training	MIRDC Training
1 st Mission (Nov. 21 – Dec. 2, 2022)	Die engineering lecture at MIRDC Auditorium	
	On-site consultation	Participation in on-site OJT
2 nd Mission (Feb. 20 – Mar. 3, 2023)	On-site consultation	Participation in on-site OJT
	Explanation of checklists/standards	Die development exercise (1)
3 rd Mission (May 22 – Jun. 2, 2023)	On-site consultation	Participation in on-site OJT
	Explanation of checklists/standards	Die development exercise (2)
4 th Mission (Sep. 18 – Sep. 29, 2023)	- (Ended)	Die development exercise (3)
5 th Mission (Nov. 9 – Dec. 4, 2023)		Die development exercise (4)

Source: JICA Team

During the first trip, the JICA Team provided a lecture on dies, and conducted a two-day classroom training focusing on the theory of dies, which is rarely covered by universities and other institutions of higher education. As for the responses of the participants, both MIRDC trainees and corporate trainees appreciated the knowledge that was new to them, but the results of the comprehension test conducted by the project after the lecture showed no significant change in performance before and after the lecture, and the project recognized the difficulty of establishing the theory in practitioners.

On the other hand, the on-site consultation from the first trip to the third trip was conducted with extremely practical guidance, and Japanese expert analyzed the factors and proposed solutions while sharing the issues faced by the pilot companies in the actual operation. As described later in (6) Monitoring and Evaluation, this initiative was able to make a significant contribution to the pilot companies.

In the second and third missions, in parallel with the on-site consultation, the JICA Team also advised pilot companies to develop checklists and standards such as the ones used by die manufacturing companies in Japan, and to encourage each company to share know-how and strengthen communication within the company. It is rare for die manufacturing companies in the Philippines to have a business model in which the die manufacturing itself is contracted from the client as a service, and many companies are engaged in in-house die development for the purpose of in-house production by contracting the mass production of parts from the client. The materials used as a reference are checklists used by Japanese die manufacturing companies, but these regulations take into account an “allowance” that does not cause so many defects even if they are taken outside, and the background is different from the actual situation of Philippine companies that want to develop dies at a reduced cost as much as possible. Therefore, instead of adopting Japan’s standards and specifications as they are, it is realistic to formulate their own version with reference to the Japanese one and use checklists as a reference when something goes wrong.

The fourth and fifth missions focus on die development exercises for MIRDC trainees and aim to develop MIRDC’s consultation capabilities on press dies in the future.

(4) Issues and Lessons Learned

One of the challenges in implementing Pilot Activity 5 was the evaluation of MIRDC’s consultation skills. In Phase 1, the JICA Team conducted skill assessment at the pilot companies and MIRDC, but this was a self-assessment and lacked objectivity. In addition, the fact that

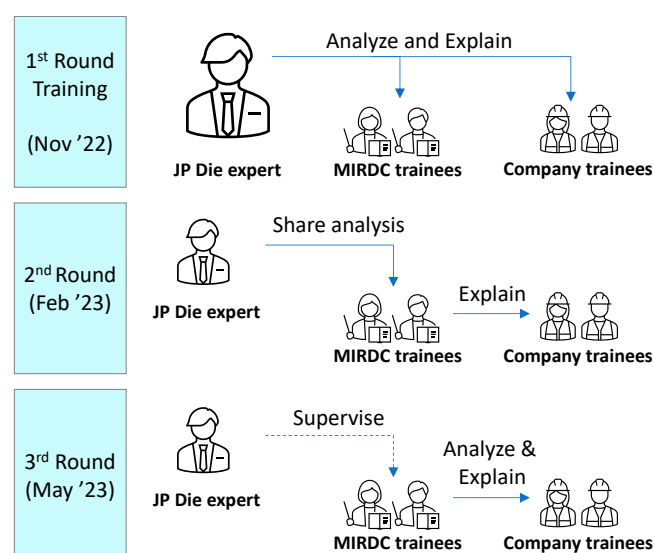
MIRDC trainees, unlike the company trainees, did not have the opportunity to experience the actual production of press dies on a daily basis was underestimated. As a result, the level of understanding of the MIRDC trainees was misjudged, and they proceeded to the on-site consultation OJT, the application part, without basic knowledge. The MIRDC trainees were able to understand the results of the analyses performed by the Japanese expert and explain the results to the companies with little difficulty, but they seemed to have little understanding of the process of how to analyze and present solutions to problems.

Designing a quantitative skill assessment of die knowledge is difficult, especially for an institution such as MIRDC that is positioned as a research center, but it would be helpful to assess individual skills through more practical case studies.

(5) Results

The results of Pilot Activity 5 can be measured from two viewpoints: 1) improvement of the technical skills of MIRDC trainees under the guidance of Japanese experts, and 2) contribution to the pilot companies. Of these viewpoints, the second is described in the Monitoring Evaluation, and the first is described in this section.

While completing the on-site training at the pilot companies by the third mission, the JICA Team was able to respond to all the issues and consultations raised from the companies. But new issues were discovered in the implementation of the training to strengthen the skills of MIRDC trainees. Originally, the aim was to enhance the ability of MIRDC trainees to provide consultation services for companies by encouraging them to participate in on-the-job training by accompanying them on on-site visits to pilot companies. As shown in the figure below, capacity development was divided into three stages: in the first round, MIRDC trainees focused on listening to and understanding the issue analysis and commentary of the Japanese experts with the company trainees; in the second round, MIRDC trainees listened to and understood the Japanese expert's analysis and then presented their own commentary to the company; in the third round, MIRDC trainees conducted their own analysis with the Japanese expert's supervision, thus gradually increasing their level of involvement.

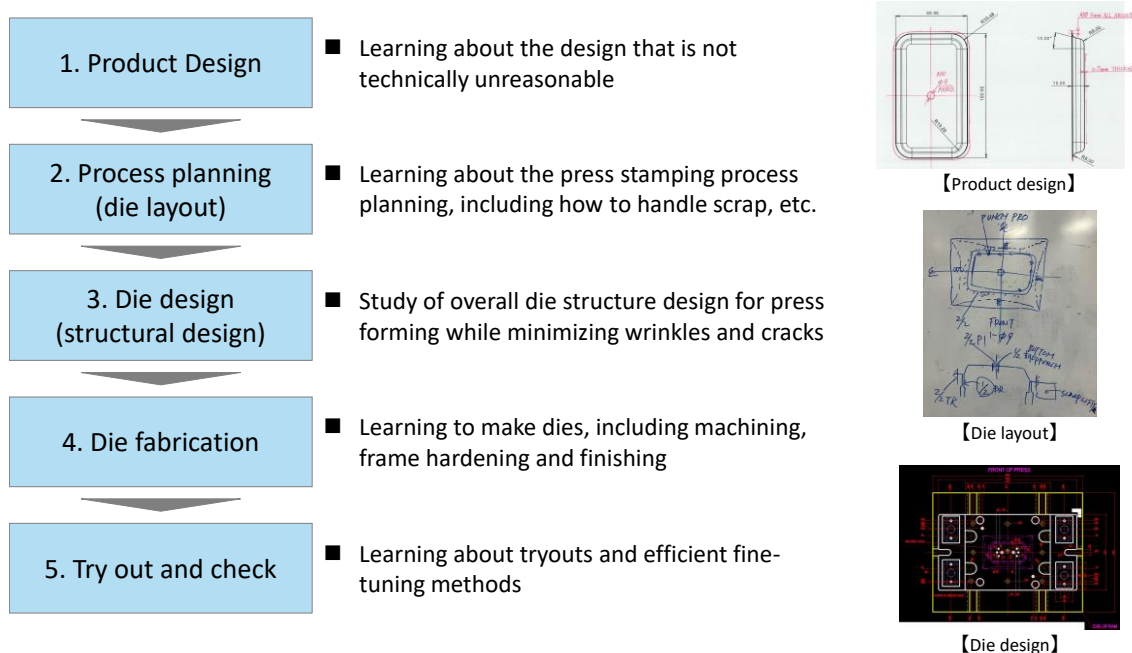


Source: JICA Team

Figure 4-31: Steps to Strengthen MIRDC Trainees' Consultation Capacity through OJT

In response to this training approach, from around the time of the second trip, MIRDC trainees started to insist that they were eager to experience the process of die design and development in a more comprehensive manner, rather than in a symptomatic approach based on corporate issues. For the first time, the level of understanding of press dies among MIRDC trainees, which had not been visible in the skill evaluation based on self-evaluation conducted in Phase 1, was highlighted. It is because press dies have some similarities with molds in terms of elemental technology levels such as the creation of 3D design models and machining, and MIRDC already has sufficient knowledge of molds and undertakes consultations and prototype production for the companies.

Therefore, in this pilot activity, the JICA Team decided to incorporate an exercise to learn basic die technology by actually developing a die according to the process shown in the figure below. The die development exercise started with the design of a final product using a press die, which was conducted at the end of the second mission of the Japanese expert. The program includes process planning of what press method will be used to achieve the product shape and how scrap will be processed, design of the die to minimize wrinkles and other concerns in advance, and die fabrication, including machine processing of purchased steel raw materials and assembly, and finally try-out and adjustment.



Source: JICA Team

Figure 4-32: Die Development Exercise Steps for MIRDC Trainees

Although the Project needed a considerable amount of time (until mid-February 2024) to complete this exercise, finally they were able to fabricate the die and obtain a press product from the die that was almost exactly as designed. As shown in the representative examples below, there were some structural challenges in the MIRDC operations observed during the course of the exercise that will certainly need to be overcome in order to reach a level of substantial technical assistance to the industry.

Main issues observed during the die development exercise are listed below.

- In the product design phase, MIRDC engineers were asked to design the product to be manufactured in this exercise. The product design submitted by the MIRDC team was

one that could not be processed in the two processes of DRAW and TRIM & PIERCE. Japanese expert pointed out the problems and made corrections to complete the product design data. The MIRDC engineers learned that product design requires basic knowledge of the drawing and trimming processes and press die structure.

- In the die design phase, MIRDC engineers were often confused by the difference between a mold for plastics, which they were already familiar with, and a press die for steel plates. For mold, it is sufficient to design the core (moving side) and cavity (fixed side) individually, but for the cross-sectional drawing of the press die, it is necessary to assume both the state of the upper die attached to the press machine slide at the point where it enters the lower die and drops completely (bottom dead center) and the state when the die first touches the steel plate or work in progress. The MIRDC engineers spent a lot of time on the design because they struggled to understand the movement of the moving parts. In terms of creating a bill of materials, the Japanese experts finally created the bill of materials after some problems due to their limited understanding of the MISUMI catalog and unfamiliarity with looking up the standard numbers of purchased parts and filling in the information. It is expected that the participants will deepen their understanding of press die design by comparing the drawings they created this time with the actual movements of the prototype dies.
- In the materials procurement phase, the Japanese expert assisted in the creation of a bill of materials, but the training participants understood the necessary goods and the formulas for selecting the specifications required for functionality. Although it was an error in the content of the quotation prepared by the supplier, the MIRDC trainees were not aware of the difference in quantity between the bill of materials and the quotation prepared by the supplier due to lack of confirmation, and problems occurred when goods were delivered in the wrong quantity upon receipt, or when steel materials were delivered in a condition not suitable for processing. Since the trainees were gathered across multiple organizations within MIRDC, it may have been difficult to assign a project leader, but it is recommended that a person in charge be appointed for each production project.
- The die fabrication phase resulted in more time required than initially estimated by the Japanese expert. The cutting tools required for machining were minimal, and efficient cutting was not possible, so these preparations were also necessary. Some inefficient machining practices were observed, such as machining to a precision and extent beyond what was required due to a lack of understanding of press die operation. It was necessary to change MIRDC's current approach to full machining to drawings with the minimum required machining extent at the design stage. The chrome molybdenum steel was gas-cut and hardened, so it took a lot of time to machine. It was necessary to strongly request cutting with a saw blade when ordering. In addition, the size of the steel material received was much larger than the size ordered due to the steel market standard, so processing took a long time. It is necessary to design with a good understanding of the standards (thickness and size) of steel products distributed in the Philippine steel market at the design stage. Through this prototype die production, MIRDC trainees now have a better image of how the structure works and how it affects the product, and the Project expect them to verify and further improve their understanding on die technology.

The prototype die developed in this project is simpler than those used in industry, and this exercise is only the first step in understanding the basic structure and basic operation of press dies, but it was definitely a big step forward for MIRDC engineers who had not had the opportunity to cultivate practical knowledge about press dies until now. It is expected that MIRDC will further improve its technical capabilities by verifying the prototype dies and drawings produced this time, and by continuing to receive additional training on press dies.

The roadmap for completing the capacity enhancement of MIRDC formulated by a Japanese expert is shown in the figure below.

	Round	Training Items	Technical Level Target
Additional Training Year 2	8	Fundamentals of die design (CAM-TRIM,PIERCE DIE/ CAM-FLANGE,RESTRIKE DIE/ PROGRESSIVE DIE)	<ul style="list-style-type: none"> ■ Able to design simple process plans, create die design specifications, and design flange and cam dies under guidance ■ Able to design progressive dies under guidance ■ Understand die manufacturing methods and tryout techniques under guidance
	7	Fundamentals of die design (TRIM & PIERCE DIE/ FLANGE & RESTRIKE DIE)	
	6	Fundamentals of die design (BLANKING DIE/ DRAW, FORM DIE)	
5	Tryout technology (DRAW DIE/ TRIM & PIERCE DIE/ FLANGE & RESTRIKE DIE/ CAM-TRIM, PIERCE DIE/ CAM-FLANGE, RESTRIKE DIE)		
Additional Training Year 1	4	Factor analysis and countermeasures for product accuracy defects. (Poor surface position/ Defective trim line/ Poor hole position/ Poor bending line)	
	3	Main problems of FLANGE & RESTRIKE DIE (Scratch/ Wrinkle/ Crack)	
	2	Main problems of TRIM & PIERCE DIE (Burr/ Breakage of piercing punch)	
	1	Main problems of DRAW and FORM DIE (Wrinkle/ Crack/ Scratch)	
Present	0	Designing and manufacturing a simple die (DRAW DIE, TRIM&PIERCE DIE)	<ul style="list-style-type: none"> ■ Able to design and manufacture simple dies under guidance

Source: JICA Team

Figure 4-33: MIRDC Capacity-Building Roadmap

This indicates the need to continue training for MIRDC by inviting die experts after the completion of this project, and in order to achieve this, it is necessary to organize a new project.

(6) Monitoring Evaluation

With regard to contributions to pilot companies, the JICA Team has completed on-site consultation by the third mission, and the main achievements of the consultation are summarized in the table below.

Table 4-35: Results of On-site Consultation, Monitoring and Evaluation of Pilot Companies

Company	Major achievement (JICA Expert)
Nuvali Steel	<ul style="list-style-type: none"> - A problem of large distortion in products produced with drawing dies supplied by a home appliance manufacturer and all products were defective. After expert's advice to increase blank holder's pressure, the problem was solved. - Trim and Pierce die had a problem with two piercing punches breaking immediately. After expert's advice to adjust the height of scrap lifter, the problem was solved.
Stampform	<ul style="list-style-type: none"> - Trim type had a problem that the product did not cut. JICA expert proposed to set up a strong backup that could take the thrust force of the upper blade and modified the die, and now the problem has been solved.
Valerie	<ul style="list-style-type: none"> - There was a problem that a lot of time had to be spent performing handwork due to wrinkles on the outer surface of products produced with molds purchased from Thailand. JICA experts identified a problem with the placement of the blanks, and as a result of placing the blanks in the same position as in the Thai factory, they were able to produce the same level of products as those produced in Thailand. - There was a cracking problem in another product. JICA expert proposed to clean up the scratches made during the previous cutting process by hand work, and the problem has been resolved.
Ambrose	<ul style="list-style-type: none"> - The tapered legs of a chair component are currently produced by stamping more than 100 times continuously with the same die while moving the processing position in the press process. The company consulted more efficient way of processing, and the JICA expert introduced swaging process. - The company consulted on how to produce jaws for cultivators and screws for screw conveyors as new products, and JICA expert showed them how to use the technology of their press facilities to handle this.

Source: JICA Team

Nuvali Steel and Stampform have achieved remarkable results, such as analyzing the causes and proposing solutions to the die design issues they consulted, and resolving the issues that prevented

the company from delivering to clients. One of the companies reported that the solution to a production problem that the client did not know how to solve led to an increase in the trust of the client and, although it is unclear whether there is a direct relationship, the client's order line has expanded. In addition, at Valerie, factors were analyzed and solutions proposed for the production process using press dies, which had a high defect rate in the factory, and these steps contributed greatly to the reduction of the defect rate here as well. Regarding Ambrose, the Japanese expert provided much practical advice on how to efficiently manufacture a wide variety of products using the company's press machine and dies.

According to the observations of the Japanese experts, all of the pilot companies had basic development technology related to press dies, but their approach to investigating the cause of any problems in production was evaluated as weak. Utilizing the checklist developed and shared by the project is expected to contribute to the analysis of the causes of problems that occur by referring to the checklist as a textbook while avoiding to some extent the recurrence of problems.

Another feature that was pointed out was that there is no in-house documentation of standards for the development and maintenance of dies. Each company has a core die designer, and although the standard seems to have been established to some extent in the mind of the designer, it cannot be said that it is necessarily shared with other designers and on-site workers who actually perform machining, and there is a concern that this will delay the work and affect the accuracy of the finished product. In response to this, it is desired that the companies will continue to develop their own version of specifications and standards while referring to the specifications and standards developed and shared based on the practices of Japanese die manufacturing companies.

(7) Operations Manual

For Pilot Activity 5, the operation manuals 1~7 in the table below will be compiled.

1. Die Engineering Textbook is the text of the die design lecture conducted in this project, and it is expected to be used by the lecturers who will be invited to the training program (DiMo Guru) when such lectures are conducted again. In the future, it is ideal that these lecturers will be from MIRDC, PDMA or other resources in the Philippine die and mold industry.

2.~7. are the samples of standard documents and check sheets that should be used by various die-related companies. It is expected that the lecturers invited for the training program (DiMo Guru) will explain and encourage the trainees to adopt them in order to promote the collective knowledge and documentation of know-how in the Philippine die companies.

Table 4-36: List of Operation Manuals Created in Pilot Activity 5

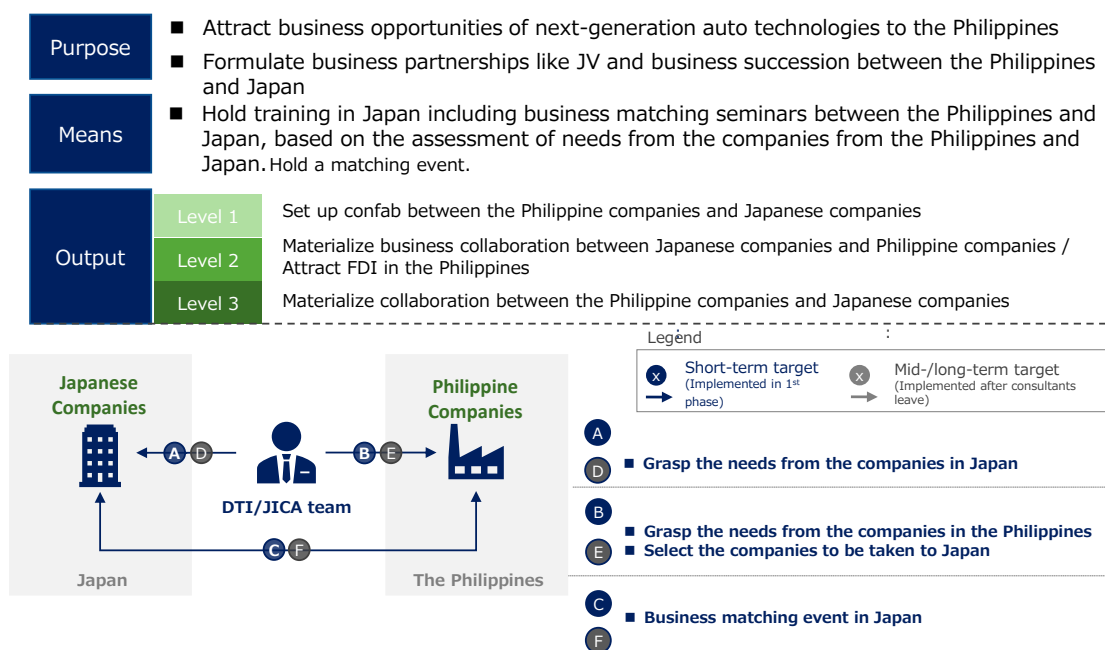
Number	Name of Manual	Contents	Who to use	How to use	Notes
1	Die Engineering Textbook	Theories of die engineering	DiMo Guru	Based on this content, the trainer will give a lecture on die design theory.	The trainer should be carried by MIRDC or PDMA in future.
2	Product data review check sheet	Checkpoints to harmonize client's expectation and cost estimation	DiMo Guru	It will be explained by the trainer and then provided to the companies as a reference material.	It's Important to be localized and utilized by the companies.
3	Die Layout check sheet	Checkpoints to select the efficient die development process	DiMo Guru	(Same as above)	(Same as above)
4	Press die design specifications (Sample)	Die design specification document employed by Japanese die maker	DiMo Guru	(Same as above)	(Same as above)
5	Press die design standard (Sample)	Die design standard document employed by Japanese die maker	DiMo Guru	(Same as above)	(Same as above)
6	Draw die design check sheet	Checkpoints to avoid problems occurring to draw die	DiMo Guru	(Same as above)	(Same as above)
7	Other die design check sheet	Checkpoints to avoid problems occurring to other types of die	DiMo Guru	(Same as above)	(Same as above)

Source: JICA Team

4.4.6 Pilot Activity 6: Implementing online matching between Philippine and Japanese companies in the ICT area

(1) Concept

The pilot was made in response to the request of the DTI/BOI, which expects an increase in foreign investment related to the automotive industry from Japan to the Philippines. Based on this, the project considered a plan to conduct business tour in Japan, including business matching, in 2019. The pilot concept is as follows.



Source: JICA Team

Figure 4-34: Conceptual Diagram of Pilot Activity 6

(2) Background

As mentioned above, the tour was originally scheduled to take place in Japan in 2019, but it was postponed due to COVID-19. In view of the difficulty of visiting the Philippines and the need to work remotely, as well as the importance of the future uptake of new technologies such as IT in the automotive industry, the pilot activities were changed to online business matching activities targeting the above sectors.

(3) Content

The event was originally scheduled to be held for only two days at the end of January 2021, but was extended to five days from February 1 to 5, 2021 in order to provide more matching opportunities for participating Philippine companies and to balance with other large-scale IT events during the same period. The program consisted of three parts: business matching, seminar sessions, and online booths for all exhibitors, and the event program was made after discussions with the PSIA, BOI, and DTI Tokyo. The following table shows the overview of business matching programs.

Table 4-37: Overview of ICT Online Business Matchin

Date	Feb 1 – 5, 2021
Time	10:00-12:00 (JST) Feb 1 – 3, 2021 10:00-18:00 (JST) Feb 4 – 5, 2021
Main Organizer	JICA Project Team
Co-Sponsor	Philippine Software Industry Association (PSIA) Department of Trade and Industry Philippines (DTI) Board of Investments Philippines (BOI)
Supporting Organizer	JETRO Manila ASEAN-JAPAN CENTRE
Venue	Online (EventHub)
Number of participating PH ICT companies	37 companies
Contents of event	1) Business Matching Space 2) Broadcasting recorded seminar videos by public sector and 30 companies 3) Virtual Booth Exhibition

Source: JICA Team

Invitations were sent to 41 PSIA member companies that expressed interest in the exhibition, and 41 companies formally applied, and 38 companies were selected from among them. The first briefing session was held for these selected companies in December 2020.

In addition, as a promotional activity for this event, the JICA Team exhibited at World Business EXPO 2020 Tokyo (organized by Resorz). By contacting several Japanese companies at this event, the JICA Team was able to connect to the business meeting at the event. A summary of the results is shown below.

Table 4-38: Information on ICT Online Business Matching, Including Participants

Registration	147
Visitors for 5 days	583
Number of business meetings	98
Number of viewers of Opening Session	57 viewers - Opening remarks
	80 viewers - Introduction of JICA business and JICA PJ in the Philippines
	70 viewers - [Keynote Speech] Investment Environment in the Philippines
	71 viewers - Trend of ICT companies in the Philippines
	84 viewers - Listing and Re-Starting by outsourcing business
	Total: 362 viewers

Source: JICA Team

(4) Issues and Lesson Learned

The number of exhibiting companies was so large that the JICA Team was unable to provide sufficient support for them; the JICA Team had envisaged around 20 participating companies at the initial planning stage but, at the request of PSIA, with whom the JICA Team was cooperating, the decision was made to increase the number of participating Philippine companies to 37 before

the selection process. This reflected PSIA’s desire to give as many Philippine companies as possible the opportunity to participate. However, as a result, the number of business meetings set up almost doubled, and some companies were not able to have sufficient meetings with Japanese companies. The number of business meetings was scored low in the post-event questionnaire described below, and it will be necessary to give more consideration to the participants’ level of satisfaction with the meetings.

(5) Results

A total of 583 people from 122 companies participated in the five-day event, and 98 business negotiations were held between Japanese and Philippine companies. Japan’s IT and telecommunications-related companies accounted for 30 percent of the participants, while other industries, such as human resources-related companies and consulting firms, were also represented by participants. After the event, the team surveyed the Philippine companies that were exhibiting. The results are as follows.

Table 4-39: Questionnaire of Exhibitors Immediately after ICT Online Matching

Contents	Evaluation (On a scale of 1-5)
Event overall	3.81
Number of business meetings	3.05
Quality of business meetings	3.65
Expectation for next similar type of events	4.46
Evaluation for preparation period) (Dec 10, 2020 - Jan 31, 2021)	4.00
Communication with organizer	4.43
Online platform for event (Eventhub)	3.59
Online platform for meeting (Whereby)	4.03

Source: JICA Team

The overall rating was 3.81 on a five-point scale, with high scores of 4 or more in the categories “expectations for the next event”, “communication with organizers”, “activities during the preparation period” and “ease of use of the online platform”. On the other hand, the item “Number and content of business meetings” was rated slightly lower than the above items. The reason for this is that the originally planned process was pushed back, which meant that there was not enough time to arrange business meetings. In addition, the business meetings were concentrated on relatively large companies.

In addition to the above, the JICA Team had the opportunity to hear from some Japanese companies after the event that they did not gather enough information for the Philippine industries and companies. Also, the JICA Team found that DTI Tokyo was not able to effectively disseminate information to the Japanese market about them through the discussion with them.

Therefore, it was decided to consider formulating a system that constantly disseminates industrial information of the Philippines that can respond to the resolution of these issues, and this pilot activity will be integrated with Pilot Activity 3.

(6) Monitoring Evaluation

In this pilot activity, the number of contracts after the business meetings at the event was set as a monitoring indicator, and the final number of contracts reached five, including the conclusion of NDAs and MOUs, which is the preliminary stage of the start of concrete transactions between Philippine and Japanese companies, exceeding the target of three.

In addition to the indicators, according to the results of the questionnaire to exhibitors after six months, there were seven cases in which advisory agreements were concluded with Japanese companies or experts. In a separate section of the same questionnaire, 60 percent of exhibiting Philippine companies stated that they would like to promote business in Japan in collaboration with partners who know Japan. This shows that exhibitors are also interested in business collaboration, such as in researching overseas markets and strengthening sales structures prior to purchasing and selling. As in this case, if participants include Philippine companies that have no experience in business with overseas companies or in the Japanese market, it would be meaningful to include the number of specialist or advisory contracts as an indicator of business matching.

Table 4-40: ICT Online Matching Post-Match (6 Months Later) Questionnaire Summary

Trade outcomes:	<ul style="list-style-type: none"> <input type="checkbox"/> 2 Exhibitors closed a trade deal. One of them reported the value as US\$40,000. <input type="checkbox"/> 3 Exhibitors signed NDA. <input type="checkbox"/> 8 Exhibitors have contacts keeping in touch. (One of them reported the value of the deal under negotiation as US\$5,000,000)
Investment outcomes:	<ul style="list-style-type: none"> <input type="checkbox"/> There was no investment deal closed in the past 6 months. <input type="checkbox"/> 1 Exhibitor has an investment deal under negotiation (value was not reported) <input type="checkbox"/> 6 Exhibitors have contacts keeping in touch
Other outcomes:	<ul style="list-style-type: none"> <input type="checkbox"/> 2 Exhibitors engaged someone they met at the event as an advisor. <input type="checkbox"/> 3 Exhibitors engaged someone they met at the event as a director.
Worth joining?	<ul style="list-style-type: none"> <input type="checkbox"/> Event was rated moderately worth participating (3.12 out of 5). <input type="checkbox"/> Two-thirds of the respondents are interested in joining similar event again.
Lead generation methods:	<ul style="list-style-type: none"> <input type="checkbox"/> "Referral from Existing Client" is the strongest lead generation (90%). <input type="checkbox"/> Various forms of "Referrals" are nearly 70% of all lead generation responses.
Helpful support:	<ul style="list-style-type: none"> <input type="checkbox"/> 61% of the respondents want consultation session for Business Development in the Japanese Market. Followed by a Japan Business 101 session (52%) and Interpreter Service (35%).
Request for the future event:	<ul style="list-style-type: none"> <input type="checkbox"/> Measures to improve quality/efficiency of matching was the most dominant request followed by use of better online platform for the meeting, and longer time to prepare.

Source: JICA Team

(7) Operations Manual

The JICA Team prepared an operational manual on the implementation of online business matching. The manual, which assumes that the BOI is the user, was prepared for use when conducting online business matching as in this project. The content of the manual was prepared with reference to the work process of this ICT online matching project. Specifically, it is divided into five steps: planning, MOU signing, pre-seminar (for exhibitors), reception of participating companies, and implementation.

Table 4-41: Operation Manual Items for Online Business Matching

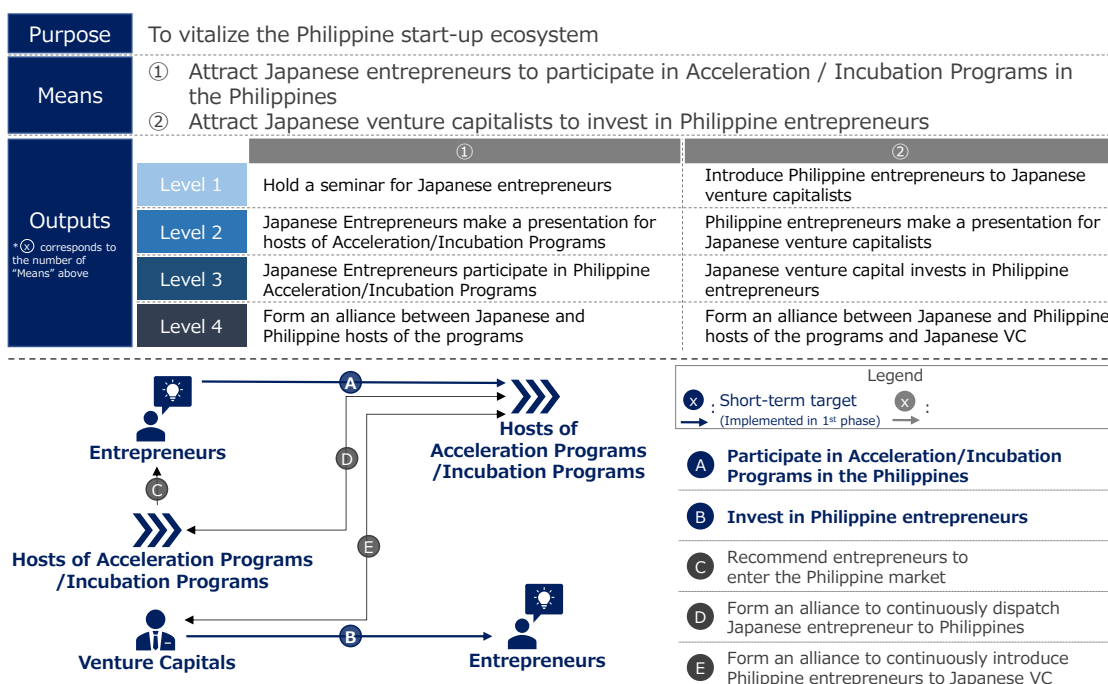
Number	Content of Operation Manuals
1	Planning
2	MOU
3	Pre-seminar
4	Application (selection)
5	Implementation

Source: JICA Team

4.4.7 Pilot Activity 7: Supporting the formation of a start-up ecosystem

(1) Concept

Support for start-up businesses was considered as part of foreign direct investment derived from the strengthening of supply value chains. In recent years, the Philippine government has seen startups as agents of economic transformation and has implemented initiatives to develop the startup ecosystem, such as launching the QBO Innovation Hub in 2016, adopting the Philippine Innovation Act in 2017, and holding Philippine Startup Week in 2019. When it comes to the automotive industry, many automotive-related startups are thriving globally, and almost all OEMs are working with them to adopt their cutting-edge technologies. Considering this situation, it is important for the Philippine automotive industry to nurture such start-ups in parallel with the development of ICE SVC, which requires a mature startup ecosystem. To revitalize the startup ecosystem in the Philippines, the JICA Team and BOI planned to attract Japan entrepreneurs and venture capital to the Philippines. The following is a conceptual diagram of the pilot. The figure below compares Southeast and East Asian countries with the Philippines in the context of CASE required for next-generation vehicles and illustrates the importance of forming a start-up ecosystem.

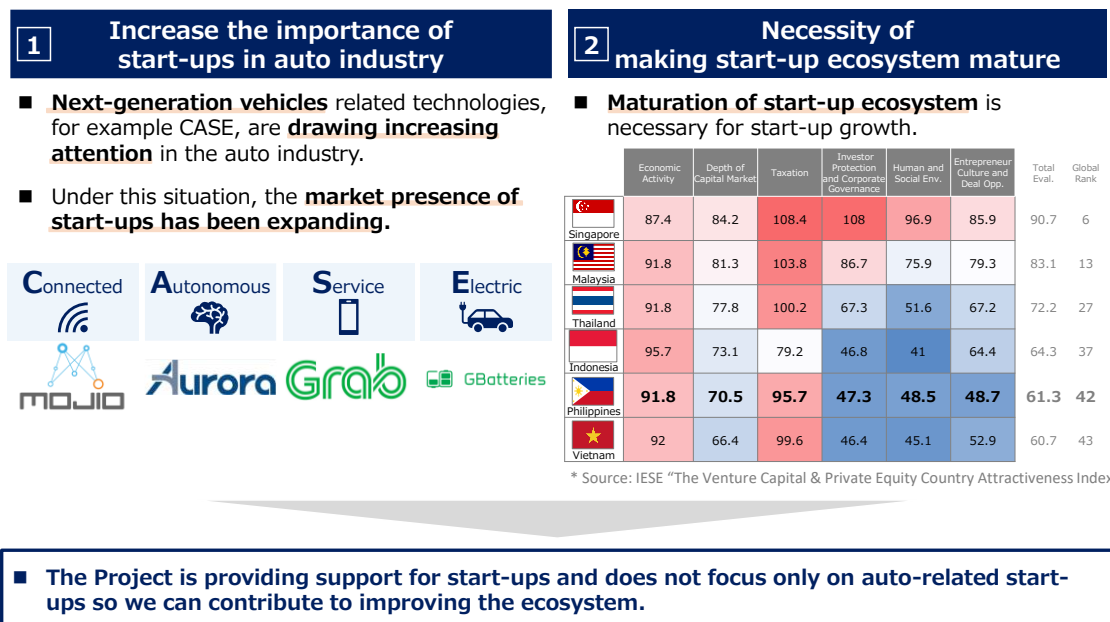


Source: JICA Team

Figure 4-35: Conceptual Diagram of Pilot Activity 7

(2) Background

Rather than focusing on a specific startup or industry, the entire ecosystem needs to mature. On the other hand, according to the startup ecosystem maturity assessment conducted by several institutions, the current maturity of the startup ecosystem in the Philippines is low compared to other Southeast Asian countries. Therefore, in order to develop automobile-related startups, it needs to be more mature.



Source: JICA Team

Figure 4-36: Background of the Need for Startup Support

The startup ecosystem consists of many actors, including entrepreneurs, financial institutions, governments, universities, incubators/accelerators, and stock markets but, in general, one of the key actors is financial institutions, as the emerging startup market faces a lack of access to the financing needed for startups to grow rapidly. A 2017 PwC consulting report also pointed out that the lack of adequate financial resources is hindering more innovative activities. Due to this situation, the JICA Team decided to prioritize attracting Japan venture capital to the Philippines, and the JICA Team and BOI agreed to invite Japan investors to hold a pitch event to draw attention to the Philippine startup ecosystem.

(3) Content

The JICA Team, in collaboration with DTI's QBO, sent applications for pitch events to accelerators, incubators, and venture capitalists in the Philippines and asked them to distribute their portfolios. The JICA Team received nearly 40 applications from startups, and asked three Japan investors, Rakuten Capital, Spiral Ventures, and SBI Holdings, to choose the startups they wanted to listen to for presentations. As a result, three Japan investors were interested in Philippine startups, and 10 startups were selected as presenters. To make the most of this opportunity, the JICA Team also arranged individual meetings between startups that were not selected as presenters and investors from Japan. There were 76 participants on the day, and Philippine media reported on the event on their web pages. The table below shows the Japanese investment firms' votes for the startups that applied. The number 3 on the right side indicates that three Japanese investment firms expressed an interest in hearing the startups' pitches. Eleven

companies were selected, with two of the three Japanese investment firms expressing interest as the cutoff point.

Table 4-42: Initial Screening of Investors for Startup Companies

Company name	Rakuten Capital	Spiral Ventures	SBI Holdings	Total
Maria Health	○	○	○	3
PearlPay, Inc.	○	○	○	3
Mober	○	○	○	3
Tangere	○		○	2
eCFulfill Inc	○		○	2
Washub Philippines	○		○	2
Edukasyon.ph*¹	○	○		2
Xpensio Corp	○		○	2
Qwikwire	○	○		2
ISI Inc.	○		○	2
UPROOT	○		○	2
Drive		○		<i>1</i>
StyleGenie Asia Pte. Ltd	○			<i>1</i>
Magpie.IM			○	<i>1</i>
Corpus Wind Turbine	○			<i>1</i>
Lyon Software Technologies			○	<i>1</i>
Omnibus			○	<i>1</i>
MachiBox Inc.			○	<i>1</i>
Hiraya Water* ²			○	<i>1</i>
Taxumo Inc			○	<i>1</i>
FAME			○	<i>1</i>
FHMOMS* ²			○	<i>1</i>
MAD Travel			○	<i>1</i>
CARRUX XPRESS APP CO INC			○	<i>1</i>
Stock Knowledge* ²			○	<i>1</i>
LexMeet, Inc.			○	<i>1</i>

Source: The Daily Manila Shimbun, DTI, JICA hold pitch event for Filipino, Japanese startup businesses, November 14, 2019

(4) Issues and Lessons Learned

Since the pilot activities were stopped in the middle of the project, no lessons learned are extracted.

(5) Results

As mentioned above, both Philippine startups and Japan investors were interested in forming a startup ecosystem but, as indicated at the beginning of this chapter, it is not directly related to the automobile-related industry, and it is difficult to create and nurture automobile-related startups only by supporting automobile-related startups. It was decided to stop this activity in Phase 1 after the consultations with JICA and counterpart organizations. On the other hand, if the JICA Team finds an opportunity to support an automobile-related venture company, it will proceed with it in Pilot Activity 1 because it is the closest activity to supporting the venture company or innovative technology.

(6) Monitoring Evaluation

Since the pilot activities were stopped in the middle of the project, no monitoring evaluation was conducted.

(7) Operations Manual

There is no operation manual for this pilot activity because it was discontinued in the middle of the operation.

4.5 Investment Mission to Japan

The Investment mission to Japan for this project is associated with Pilot Activity 3, which is implemented with the aim of business matching between Japan and the Philippines and attracting investment to the Philippines. Therefore, the details of the investment mission to Japan are described at the end of the Pilot Activities in Chapter 4. The outline of the training program in Japan, the participants, and the process are as follows.

(1) Objectives

To promote discussion, examination, and foundation building for business promotion between Japan and the Philippines by taking advantage of the strengths of the domestic industry in the Philippines and using next-generation industry trends as an opportunity to promote business between Japan and the Philippines.

(2) Targets

- (a) To visit relevant Japanese organizations to exchange opinions and build relationships based on the strategy for Japan-Philippines business promotion.
- (b) Participate in matching events aimed at promoting business between Japan and the Philippines based on the same strategy.
- (c) Explore the aim of business promotion between Japan and the Philippines by visiting examples of smart cities and the supply chain for electrification through public-private partnerships in Japan.
- (d) To provide an opportunity for the public and private sectors to participate simultaneously in order to update strategies and share implementation policies in line with the actual situation of the Japanese market and Japanese companies.

(3) Participants

The total number of participants was 15, consisting of government officials from 1 to 7 and private companies from 8 to 15 in the following list.

Table 4-43: Participants List for the Investment Mission to Japan

No	Name	Position	Designation
1	Dr. Rafaelita "Fita" M. Aldaba	Undersecretary	DTI/BOI
2	Ms. June Villasanta	Supervising Investments Specialist	DTI/BOI
3	Ms. China Pring	Supervising Investments Specialist	DTI/BOI
4	Ms. Morinaella Jeusine M. Torgo	Senior Investments Specialist	DTI/BOI
5	Ms. Graciela Marie A. Juatco	Senior Investments Specialist	DTI/BOI
6	Ms. Linda G. Rivera	Senior Science Research Specialist	DOST/MIRDC
7	Ms. Jenny June G. Romero	Officer-In-Charge Deputy Director General for Finance and Admin and concurrent Group Manager of Legal Affairs Group	PEZA
8	Ms. Ana Santana	Vice President Sales, Marketing and Customer Service	Automated Technology (Phil.) Inc.
9	Ms. Nimfa T. Mariano	BU Head	Digital In-Building Systems, Inc. (DIBS)
10	Mr. Noel C. Ramirez	Chief Revenue Officer	Gruppo EMS Inc
11	Mr. Sherwin C. Nones	Strategic Planning and Marketing and Corporate ESG Manager	Integrated Micro-electronics Inc.
12	Dr. Robert Kerwin C. Billones	CEO and Co-founder	Intelligent Systems Innovation (ISI Inc.)
13	Mr. Fernando Silva	CEO	Mobilecycle Technologies, Inc.
14	Mr. Gilbert Cunanan	VP for Business Development	Smartfox Data Solutions, Inc.
15	Mr. Ralph Legaspi	Chairman & CEO	TOJO MOTORS CORP

Source: JICA Team

(4) Duration

November 26, 2023 – December 2, 2023

(5) Process

Because of the large number of participants with 15 and the EMS and ICT/EV teams being split up for business matching on November 28 and 29, it was decided to divide the group into three teams: (1) GOV (public organizations), (2) EMS (Electronics), and (3) ICT/EV. The following is a one-week timetable, including destinations to be visited by each team as the teams will be split up.

Table 4-44: Schedule for the Investment Mission to Japan

Date (2023)	Activity	Location/Venue
11/26(Sun)	Arrival	Tokyo
11/27(Mon)	9:30-10:00 : Project briefing	JICA Tokyo
	10:00-12:00 : JICA Briefing	
	14:30-15:30 : SME Support Japan	SME Support Center HQ
11/28(Tue)	①GOV,③ICTEV	Aizu-wakamatsu, Fukushima
	9:00-12:00 : Aizu bus	Aizu-wakamatsu, Fukushima
	13:30-16:15 : AiCT	
	②EMS	World Business EXPO
11/29(Wed)	9:00-17:00 : Business matching	World Business EXPO
	①GOV	
	World Business EXPO	JETRO HQ
	11:00-12:00 : Seminar	
	15:45-16:45 : JETRO	
	②EMS	Tokyo
	10:00-11:00 : Elematec	
	13:00-13:30 : Nissan Global Gallery	
	15:00-16:00 : NC Network	
Tokyo		
③ICT/EV	World Business EXPO	
9:00-17:00 : Business matching		
18:00-19:00 : Wrap-up		
11/30(Thu)	Kashiwa no ha Smart City	Kashiwa, Chiba
	10:00-11:30 : UDCK site	
	11:55-12:30 : Autonomous bus	
	14:30-16:30 : UDCK presentation	
12/ 1 (Fri)	9:30-14:00 : Wrap-up	JICA HQ
	①GOV	
	11:00-12:00 : JICA HQ	
12/ 2 (Sat)	14:15-16:15 : Reporting session	Tokyo
	Departure	

Source: JICA Team

(6) Comments from the Participants

The purpose of the investment mission is divided into “relationship building,” “business matching,” and “site visit” for participation in the training, and the questionnaire feedback on each item is summarized below.

- **Relationship building**
Under Relationship Building, the mission aims to introduce new agencies and organizations to the Philippine Government that they may partner with for their promotion initiatives. This includes SMRJ where discussions on their initiatives have resulted in a proposed MOU between the DTI/BOI and SMRJ to further introduce partnerships between Philippine companies and Japanese SMEs.
- **Business Matching**
Under Business Matching, B2B meetings have been pre-arranged between Japanese and Philippine companies with the objective of establishing new partnerships between the parties, depending on needs and objectives.
- **Site Visits**
Under Site Visits, the project hopes to introduce to both government and private sector representatives from the Philippines to products and initiatives of Japanese companies and institutions in the fields of EV transportation operation, smart cities and technologies

(7) Findings

The following are the considerations in line with the objectives of the training.

(a) Visits to relevant Japanese organizations to exchange opinions and build relationships based on the strategy of Japan-Philippines business promotion

The mission visited SME Support Japan and JETRO to discuss future business matching opportunities. Regarding SME Support Japan, although there was already a history of cooperation with DTI, contact had been lost for some time because of a change in the person in charge, and it was agreed that future cooperation would be deepened in the form of concluding an MOU. As for the private companies, it was decided to register them on the web platform managed by the organization for further business matching opportunities. During the JETRO visit, it was confirmed that the Philippines' position would be examined by comparing data on ASEAN countries neighboring the Philippines held by JETRO headquarters. In the future, the mission member will work with JETRO headquarters and JETRO Manila to seek business matching opportunities.

(b) Participate in matching events aimed at promoting business between Japan and the Philippines by strategic business matching

Business matching was held at the venue of the Overseas Business Expo for two days on November 28 and 29. Since four seats were reserved for the Philippine booth, the 28th was allocated to four companies from the EMS team and the 29th to four companies from the ICT/EV team. A total of eight companies had two business meetings reserved in advance, but there were 61 walk-ins on the day of the event, resulting in a final total of 82 business meetings over the two days. This was an average of 10 business meetings per company, which exceeded the number of meetings originally planned.

(c) Explore the aim of promoting business between Japan and the Philippines by observing examples of smart cities and the supply chain for electrification through public-private partnerships in Japan

The visit to the Aizu bus company that actually operates electric buses was useful in order to reflect the policy of EVs, one of the exit strategies of this project. In particular, the ingenuity of battery charging methods was a useful insight in the Philippines, where electricity is considered expensive. In addition, since smart cities are a long-term policy in the Philippines, it was meaningful for the mission member to visit two smart cities this time. In particular, the formation of smart cities through industry-government-academia collaboration was a great learning experience for the Philippine side.

(d) The simultaneous participation of the public and private sectors provided an opportunity to update strategies and share implementation policies in line with the actual situation of the Japanese market and Japanese companies.

On December 15 (Friday) after returning from the training, the training participants and other related parties gathered for a debriefing session and discussion on the future direction of the program. During the session, the participants discussed signing an MOU with SMRJ, tracking and reviewing business matching meetings, and planning for the next business matching session. The discussions and results were shared at the forum on Wednesday, January 24, 2024.

Chapter 5. Pilot Dissemination Policy

The previous chapter described the evolution and results of the pilot activities to date. This chapter describes the dissemination policy of each pilot based on the workshops and seminars conducted for each pilot, organized into the following sections: 1) model, 2) activities for dissemination of the pilot models, and 3) action plan for dissemination of the models. Finally, the results of the presentation of all pilot activities, the Forum, conducted on January 24, 2024, will also be discussed.

5.1 Achievement of Workshop and Seminar in Each Pilot Activity

5.1.1 Pilot Activity 1: Implementing industry-academia collaboration activities (Virtual internship with Japanese companies by students from the Philippines)




(1) Model

The model of Pilot Activity 1 is the implementation of a virtual-hybrid internship. Until now, face-to-face internships have been the norm due to existing guidelines, but due to the impact of the pandemic, people have not been able to travel, and digitalization has been compelled to be adopted in the field of education. By digitizing through the pilot activity, it was possible to conduct education remotely, and there was also the advantage of not having to choose a region or country. In implementing virtual and hybrid internships, the pilot activity also revealed that providing job-based education in addition to remote learning was an added value that bridged the gap between industry and education. Face-to-face internships were time based, but remote internships require task based. By using the results to solve problems in the industry and market research for new development, it is possible to address the needs of industry, which will lead to the production of human resources that the industry needs. In addition, through virtual internships, students can acquire the necessary skills in job markets, such as time management and communication.

(2) Activities to Disseminate Models (Workshops, Seminars)

Workshops were held in three sessions in CHED to institutionalize virtual internships. In the first session, Attorney Benitez-Jaro of the Office of Executive Director (OED) was briefed on the virtual internship. Next, a technical panel was held, where technical questions were asked about the institutionalization of virtual internships. Finally, the outline of the virtual internship was reported to the Chairman of CHED at the Commission en Banc, and it was agreed that preparations for institutionalization would proceed after listening to the opinions of related parties at the seminar. The following is a list of the dates of the workshops held and the people involved.

Table 5-1: Dates and Members of the Workshops

Date	Name of Workshop	Person in charge	
June 15, 2023	Introduction of Virtual Internship	Att. Cinderella Filipina Benitez-Jaro, Executive Director IV	
July 18, 2023	Technical Panel	Dr. Edgardo Atanacio, Professor of UP Diliman	
August 8, 2023	Commission en Banc	Dr. Prospero De Vera, Chairperson	

Source: JICA Team

Next, a virtual internship experience-sharing seminar was held on November 7, 2023. At the seminar, after explaining the background and outline of the virtual internship from the project, the OJT office of Batangas State University, a model university that actually experienced the virtual internship, explained the procedure, and then the students introduced specific examples. In addition, a case study by Company N, which participated in the hybrid internship by means of a representative of the company, was introduced. The participants included 40 officials from Japanese companies and local companies, and 40 university officials, and a lively question-and-answer session was held. In summary, virtual internships were perceived as an activity to bridge the gap between industry and universities, and there were calls for full-scale institutionalization while utilizing the existing guideline of flexible learning. The seminar program of the day is shown below.

Table 5-2: Virtual Internship Experience Sharing Seminar Program

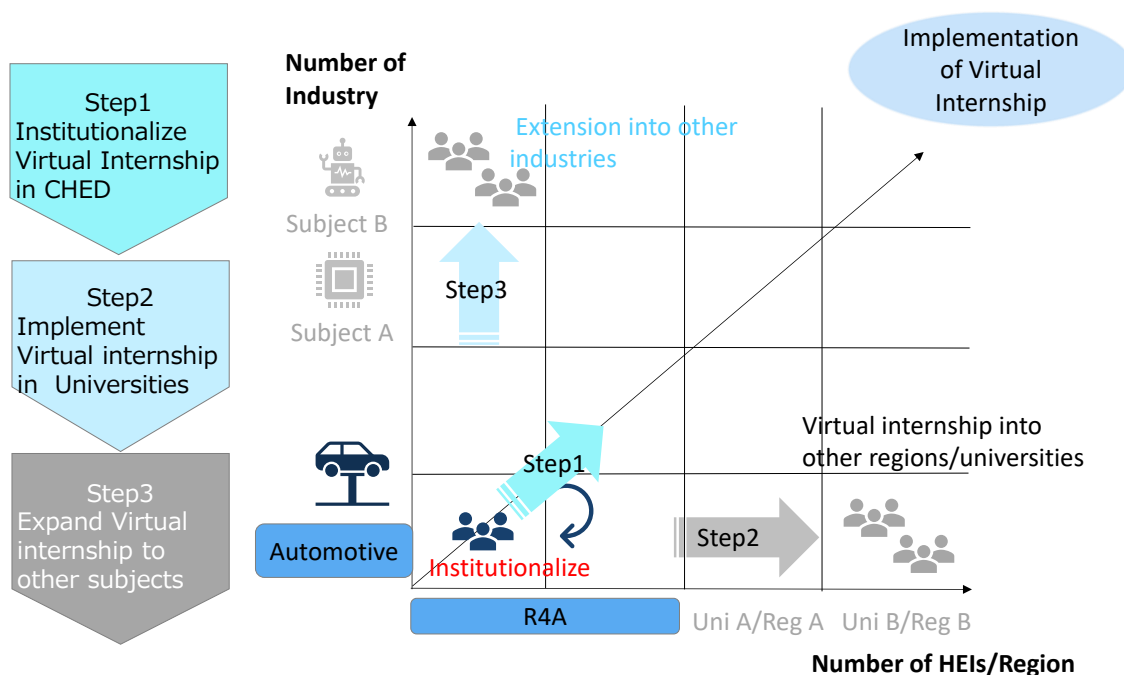
- Date: November 7, 2023, 8:30-12:00
- Venue: A Hotel in Manila (TBD)
- Seminar Title: Introduction of the virtual internship
- Purpose: To share the experience of virtual internship and receive feedback for institutionalization
- Attendants: 50-80 in total
- JICA: 3, BOI: 3, CHED: 15 (including 5 technical panels), Model universities: 10, Model company: 3, Guests from universities: 30, guests from companies: 20

Time	Session	Presenter
8:30-9:00	Registration and networking	-
9:00-9:10	Open remarks	CHED, BOI, JICA
9:10-9:20	Project briefing	JICA team
9:20-9:40	Experience sharing from university	Mapua/Batangas
9:40-10:00	Experience sharing from students	Mapua/Batangas
10:00-10:10	Experience sharing from company	Denso/Japanese company
10:10-10:30	Coffee break	-
10:30-11:15	Feedback session	JICA team
11:15-11:30	Upcoming event	JICA team
11:30-11:50	Q & A	JICA team
11:50-12:00	Closing remarks	CHED

Source: JICA Team

(3) Action Plan

The Action Plan for Pilot Activity 1 is expected to take the following steps: 1) institutionalization, 2) expansion to universities, and 3) expansion to other industries. The pilot activity was implemented in the automotive industry and the R4A region, and a hybrid internship model case between Denso Philippines and Batangas State University was created. Once institutionalized, the program will be expanded to other universities to increase the number of universities that can implement the program. Finally, if it becomes possible to implement virtual internships in non-engineering departments, internships with companies involved in other industries will become possible. The following is a diagram that describes the path of the action plan.



Source: CHED (Note: HEIs stands for Higher Educational Institutions)

Figure 5-1: Image of Action Plan for the Pilot 1

In order to institutionalize and promote virtual internships, indicators have been set for 1) short-term, 2) medium-term, and 3) long-term goals. 1), the short-term goal will be implemented in 2024-2025, with the goal of institutionalizing virtual internships within CHED. The medium-term goal (2) is set for 2025-2026 and includes the number of universities that offer virtual internships and the number of MOUs between universities and companies that offer internships. The long-term goal (2026-2027) is set as the percentage of students who will be employed by companies that have implemented virtual internships in 2026-2027. The action plans and indicators are shown in the table below.

Table 5-3: List of the Action Plans and its Indicator

#	Indicators for evaluation by JICA	Example of the indicators	Timeline
1	Activities by industry-government-academia partnerships on industrial human resource development	<ul style="list-style-type: none"> ✓ Qualitative: Institutionalize Virtual Internship in CHED Activities: <ul style="list-style-type: none"> ✓ Revisit / Update SIPP and SIAP <ul style="list-style-type: none"> ➢ Explore Hybrid and Virtual Internship ➢ Identify priority programs/industry sectors ➢ Student selection process <ul style="list-style-type: none"> ▪ Equity Dimension ➢ TNHE/IZN ✓ Revisit CHED-DTI/BOI Agreement <ul style="list-style-type: none"> ➢ Industry Readiness for Hybrid/Virtual Internship <ul style="list-style-type: none"> ▪ Who will assess industry readiness (BOI?) ➢ Explore Internship to Employment Program <ul style="list-style-type: none"> ▪ Equity Dimension 	Short term 2024-2025
2	Activities by industry-government-academia partnerships on industrial human resource development	<ul style="list-style-type: none"> ✓ Quantitative: Number of HEIs implementing Hybrid/Virtual Internship (Target: Ten (10) HEIs) Activities: <ul style="list-style-type: none"> ➢ Orientation of updated policies ➢ Academia-Industry Expo <ul style="list-style-type: none"> ▪ Networking/Matchmaking 	Medium term 2025-2026
3	Activities by industry-government-academia partnerships on industrial human resource development	<ul style="list-style-type: none"> ✓ Quantitative: Number of MOUs between HEIs and Industries for conducting hybrid/virtual internship (Target: Ten (10) MOUs) Activities: <ul style="list-style-type: none"> ➢ Academia-Industry Expo <ul style="list-style-type: none"> ▪ Networking/Matchmaking 	Long term 2026-2027
4	Evaluation of the human resources supplied by the program by industry	<ul style="list-style-type: none"> ✓ Quantitative: At least 70 % of “student interns” employed by relevant industry ✓ Qualitative : Evaluation by the industry of the readiness of “student interns” for employment (c/o BOI and Industry) <p><i>Note: Student interns are those who participated in hybrid/virtual internship.</i></p>	Long term 2026-2027

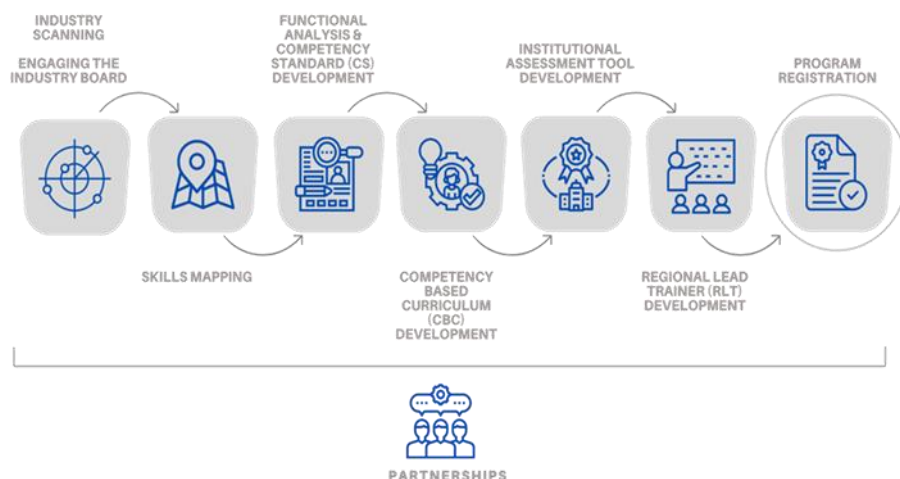
Source: CHED (Note: HEIs stands for Higher Educational Institutions)

5.1.2 Pilot Activity 2: Implementing training courses based on local business needs (Area-Based and Demand-Driven TVET (ABDD))

(1) Model

In Pilot Activity 2, the Area-Based and Demand-Driven TVET (ABDD TVET) framework, which is a model for developing industrial human resources in line with regional needs, was established within TESDA in April 2021. Therefore, the ABDD TVET itself will serve as a model. Pilot Activity 2 adopted the approach of implementing QCD as a case study according to the model described in the picture, picking up the issues and lessons learned, and considering the action plan for the use and dissemination of the ABDD TVET model. The flow of the ABDD TVET model is shown again in the figure below. The details of each step of the ABDD TVET and the guidelines are described in Chapter 4

ABDD TVET FRAMEWORK



Source: TESDA

Figure 5-2: The ABDD TVET Model

(2) Activities to Disseminate Models (Workshops, Seminars)

The Workshop

An internal workshop was held online on November 16 to share experiences of QCD implementation in case studies among TESDA, industry experts (P. IMES), and QCD experts. Each participant simultaneously filled out a sheet to describe the challenges, opportunities, learnings, and recommendations they faced during each step of the pilot activities. The facilitators from TESDA, industry experts, QCD experts, and RLT participants also provided multiple opinions. These reflections were compiled as basic information to be presented at the seminar.



Source: JICA Team

Figure 5-3: Participants in Activity Workshop

The Seminar

A seminar was held on November 20, 2023, inviting the automotive industry and academia to share their experiences with the pilot activities. The experiences and lessons learned from the pilot activities collected at the internal workshop served as a starting point for discussion. Several discussions were held on how to implement the ABDD TVET to develop QCD human resources that are highly needed in the region, collaboration with industry, and the basic policies that will lead to future actions by the TESDA.

- Proposed major activities to be undertaken in the future for implementation of ABDD TVET
The following activities were discussed as the most recent actions to be taken for the way forward when implementing the QCD program under ABDD TVET.
- ✓ The regional office shall provide technical assistance on the registration of the program of TESDA.
- ✓ There is a need to promote the ABDD TVET to increase awareness of stakeholders.
- ✓ How QCD can be incorporated in existing and future training programs of TESDA will be studied.
- ✓ The outcomes and outputs of this pilot will be considered in the improvement of the ABDD TVET process.
- ✓ Relevant policies, such as micro-CS and Adapt Adopt policies will be developed.

The above are important issues for future action and were reflected in the evaluation indicators and the action plan for their achievement.



Source: JICA Team

Figure 5-4: Participants in Activity 2 Seminar

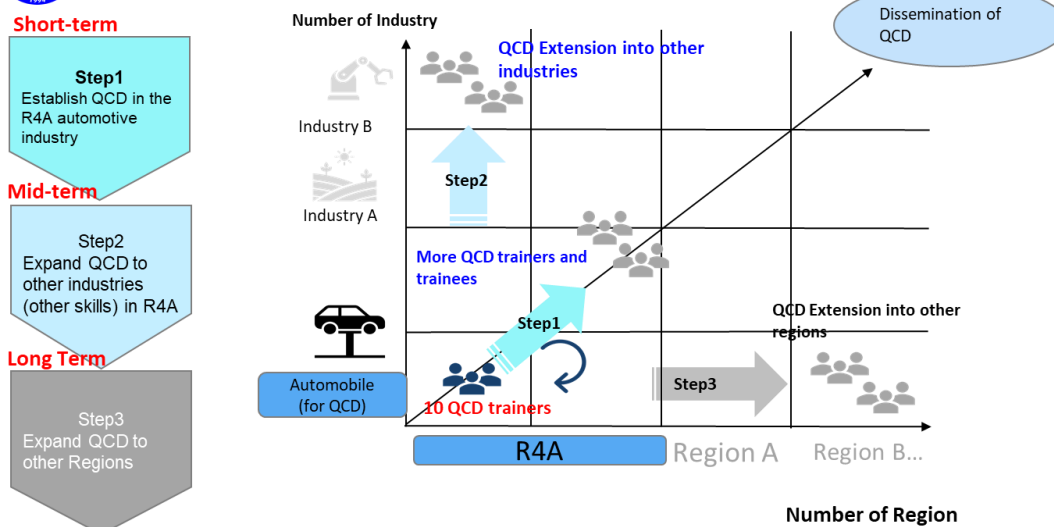
(3) Action Plan

In this pilot activity, the resources of experts from both the automotive industry and QCD, as well as the ABDD TVET navigators, were mobilized. As an output, a QCD program was developed and 10 QCD trainers were trained. The ultimate goal of the ABDD TVET is to develop QCD human resources that meet the needs of local industries and ultimately enhance the competitiveness of the entire Philippine industry.

To achieve this goal, step-by-step activities are necessary, starting from the output of the pilot activities. Therefore, the action plan for Pilot Activity 2 is to take the following steps shown as the figure: 1) implement the QCD program in R4A (in the automotive industry), 2) expand QCD to other industries, and 3) expand QCD to other regions.



Pathway to Disseminate Quality Cost Delivery



Source: TESDA

Figure 5-5: Pathway to Disseminate Quality Cost Delivery

The table below provides TESDA’s proposed evaluation indicators and specific proposed actions to measure the achievement of the short-, medium-, and long-term future paths as described above.

1) As a short-term goal (from 2024 to 2025), TESDA R4A regional office will monitor to ensure that active QCD programs are registered, while QCD training will be conducted to ensure QCD-trained personnel. (2) In the medium term (from 2025 to 2026), since QCD is a core skill that can be applied to other industries, awareness-raising activities will be conducted to ensure that QCD training is also provided to other industries in the R4A region. 3) In the long term (from 2026 to 2027), similar QCD promotion activities will be conducted to promote the increase of QCD human resources in other regions as well.

Table 5-4: Proposed Action Plan for ABDD TVET Implementation



Evaluation Indicators

No	Indicators for evaluation by JICA	Step	Indicators	Examples of activities	Timeline
1	Activities by industry-government-academia partnerships on industrial human resource development/supply/value chain enhancement	Short Term	<ul style="list-style-type: none"> ✓ Number of registered programs on QCD ✓ Number of trained individuals on QCD program by PIMES in Region IVA monitored (Target: at least 5 trained) 	<ul style="list-style-type: none"> • Monitor the number of registered programs • Monitor the reporting of enrollment and graduates of the program in the T2MIS 	Short term 2024-2025
		Medium Term	<ul style="list-style-type: none"> ✓ Number of industries where QCD program that used/applied within Region IV-A 	<ul style="list-style-type: none"> • TESDA to promote the QCD to other industries through awareness campaigns 	Medium term 2025-2026
		Long Term	<ul style="list-style-type: none"> ✓ % of Regions/Provinces adopted QCD program 	<ul style="list-style-type: none"> • TESDA to promote the QCD to other regions through awareness campaigns 	Long term 2026-2027

Source: TESDA

5.1.3 Pilot Activity 3: Establishing a mechanism for lead generation for regular investment in the Philippines

(1) Model

The model of Pilot Activity 3 is the establishment of a strategic business matching system. First, the fact that the Japanese side has created a website to promote investment in the Philippines like other ASEAN countries has made it possible to convey the attractiveness of investment in the Philippines to Japanese companies. Next, by spending time strategically preparing for business matching, companies were able to come to know the business meeting partner online before the business matching interview, and business could be concentrated on immediately in the face-to-face interview. Rather than conducting sales activities on an ad hoc basis, the know-how to spend time preparing to increase the accuracy of business negotiations was actively acquired by the pilot participating companies.

(2) Activities to Disseminate Models (Workshops, Seminars)

Since it was understood that Pilot Activity 3 would end the pilot near the end of the project due to the business matching event during the investment mission to Japan held in November-December 2023, it was agreed in advance that the workshop and seminar would not be held separately, but would be held together in December 2023, when the mission was over. On December 15, a workshop was held under the management of BOI to gather all concerned parties. First, the parties involved in the mission were divided into three teams: 1) government, 2) private sector (electrical and electronics), and 3) private sector (ICT/EV) and they presented the findings and results of the investment mission to Japan from their perspectives. They discussed how to continue strategic business matching in the future and discussed that the short-term goal is to increase contacts with Japanese companies by concluding an MOU between DTI and SME Support Center (SMRJ) and having private companies register on their business matching platform. In addition, since the investment mission to Japan included a site-visit of smart cities, two representatives from the Bases Conversion and Development Authority (BCDA), a government agency related to smart city development, was also invited to the workshop to give a report on the smart cities he observed in Japan. The workshop also included a debriefing session on the smart cities visited in Japan, and the participants discussed the possibility of incorporating the findings into the smart city plan for the Philippines in the future.

(3) Action Plan

Under Activity 3, the action plan includes: 1) continued participation in business expos in the Japanese market, 2) expansion of industries participating in the expos, and 3) strengthening of cooperation with public organizations for business matching in Japan.

(1) Continued participation in business expos in the Japanese market

BOI will take the lead in supporting companies to exhibit at the business expo every year. In the lead up to the exhibition, BOI will hold roundtable meetings with DTI Tokyo and Osaka to obtain information on the latest trends in Japan and business matching in order to formulate a strategy. The Export Management Bureau (EMB) and the Center for International Trade Expositions and Missions (CITEM) will also participate as part of investment promotion. As an indicator, the goal is to participate once each year.

(2) Expansion of industries participating in the expo During the pilot period of Activity 3, three industries (EMS, ICT, and EV) participated in the expo, and we aim to expand the number of industries participating in the expo. Specifically, the short-term goal is to add automotive parts, electricity, and agribusiness, and the medium- to long-term goal is to expand the scope to include renewable energy.

(3) Strengthening of cooperation with public institutions for business matching in Japan
When members of the investment mission to Japan visited SMRJ, it was confirmed that it had sought collaboration with DTI in the past, but issues were identified that were not properly followed up when the person in charge was changed. In order to ensure continued collaboration between the SMRJ and DTI even after the change of the person in charge, the action plan will include the signing of an MOU between the two institutions. The most recent meeting will be set for February 2024, so a draft of the MOU will be completed there, and the mid-term goal is to conclude the MOU. In the long term, the indicators will be set to promote specific activities such as registering Philippine companies in the SMRJ’s database.

The following table lists the action plans and indicators for Activity 3.

Table 5-5: List of Action Plans and Its Indicator

INDICATOR	IHRD MODEL (as conducted in 2023)	Proposed Action Plan		
		Short Term (1 Year)	Medium Term (3-5 Years)	Long-Term (5 Years onwards)
1. Number of Outbound Investments Missions	1	1 every year*		
		*One Outbound Mission to Japan is a BOI commitment. However, prior/after missions, DTI Tokyo/Osaka continues to conduct roundtable meetings with potential investors The Export Management Bureau (EMB) and Center for International Trade Expositions and Missions (CITEM) also regularly participate in exhibitions.		
2. Coverage of Sectors	Automotive Electronics ICT	<ul style="list-style-type: none"> • Automotive Parts and Components • Electronics • Agribusiness (Food and beverage manufacturing, cold storage) • High Value Services (ICT and Export Services) 	<ul style="list-style-type: none"> • Smart / High-tech Light Manufacturing (manufacture of equipment, parts and services, IoT devices, etc.) • Automotive Parts and Components • Electronics • Renewable Energy • Agribusiness (Smart Agri/Predictive Farming etc) • High Value Services 	
3. Improved engagement with Japanese institutions to strengthen B2Bs between PH-Japan	Initial meeting with SME Support Japan	Crafting of Memorandum of Understanding (MOU) between DTI/SMRJ. Meeting scheduled in February 2024	Signing of MOU	Implementation of activities/commitments to be outlined in the MOU

Source: BOI

5.1.4 Pilot Activity 4: Creating a mechanism for promoting and establishing Kaizen

(1) Model

The model of Pilot Activity 4 will be a Kaizen training package standardized by Japan experts during this project. While the conventional method of factory Kaizen by Kaizen experts aims to achieve high results through intensive instruction in a short period of time, the training method adopted by this project for lectures and exercises in which know-how is shared with local instructors can be expected to bring out more initiative among corporate trainees, and to have a better effect in terms of continuity, fostering corporate culture, and improving employee motivation.

It is hoped that these standardized training contents will be spread to more local companies and organizations through training programs provided by MIRDC, NWPC and DAP institutions through instructors trained in the project.

(2) Activities to Disseminate Models (Workshops, Seminars)

In order for the above training model to be used by a wider range of entities, in this project, in addition to the dissemination and publicity activities of the programs provided by MIRDC, NWPC, and DAP organizations, the BOI played a central role in establishing a regular dissemination event that connects MIRDC, NWPC, and DAP.

In this activity, a Kaizen promotion event was held as a trial in June 2023 and, at this time, Nuvali Steel, the pilot company of the project, took the stage and gave a presentation on in-house Kaizen activities as a best practice. At the trial event in June, three of the participating companies expressed interest in the fourth batch of pilot training, and the effect of dissemination through the introduction of local case studies in the Philippines was recognized. As a result, a general agreement was reached to hold regular Kaizen promotion events even after the project was completed, and to locate companies interested in Kaizen.

At the workshop held after the pilot training of the fourth batch, it was agreed that MIRDC, NWPC, and DAP training organizations will cooperate to hold a Kaizen dissemination event centered on the BOI, and that the first event will be held in November 2023 in the form of a further shift of initiative from the project to the Philippine side.

At the trial event in June, the BOI attracted customers from its automotive network and Nuvali Steel, a resource company for the project, gave a presentation. At the November event, MIRDC, NWPC and DAP held the seminar at Sta. The JICA Team prepared and invited a list of prospective clients in the Rosa area and, for presentations, the JICA Team asked them to select companies and organizations that are doing excellent work from among the existing clients of each institution and introduced them as best practices.

The table below shows the program of the Kaizen promotion event in November.

Table 5-6: Program of Kaizen Promotion Event (held in November)

Topic	Presenter	Time Allocation
Registration and Networking		8:30 – 9:00 (30 minutes)
Welcome Message and Program Run-through	Board of Investments	9:10 – 9:20 (10 minutes)
Project Overview	Board of Investments	9:20 – 9:30 (10 minutes)
Program Introduction from DAP	Mr. Samuel Rosal Development Academy of the Philippines	9:30 – 9:45 (15minutes)
Program Introduction from NWPC	Mr. Francis Atangan National Wages and Productivity Board	9:45 – 10:00 (15minutes)
Program Introduction from MIRDC	Mr. Adonis Marquez Metals Industry Research and Development Center	10:00 – 10:15 (15minutes)
Q&A Discussion		10:15 – 10:30 (15 minutes)
Coffee Break		10:30 – 10:50 (20 minutes)
Sharing of good practice from DAP network	Ms. Helen L. Navarro Social Security System	10:50 – 11:05 (15 minutes)
Sharing of good practice from NWPC network	Engr. Jaie Ador 3D Container Packaging Phils. Corp.	11:05 – 11:20 (15 minutes)
Testimonial from Nuvali Steel	AVP Presentation	11:20 – 11:30 (10 minutes)
Speech	Mr. Satoru Tajima Japanese Kaizen Expert	11:30 – 11:45 (15 minutes)
Closing	Board of Investments	11:45

Source: JICA Team

(3) Action Plan

In Pilot Activity 4, in order to make the Kaizen dissemination event a model dissemination framework a regular mechanism, the JICA Team is working on a proposal for finalizing the operation manual and budgeting by the end of 2024 for full-scale introduction after 2025.

In this pilot activity, four certified Kaizen instructors of the partner agencies, namely MIRDC, NWPC, and DAP, were trained and eight pilot companies were instructed on Kaizen activities.

In order to further disseminate and deepen Kaizen activities in the future, it is necessary to conduct advocacy (recommendation) activities to further spread the activities to local companies through the actual experiences of Philippine companies that are already conducting Kaizen activities, and to enhance training resources to provide guidance to companies that are interested.

Therefore, the BOI announced that they will work on the following as action plans for Activity 4.

- 1) Institutionalization of Diffusion Event led by the BOI in coordination with Partner Agencies
- 2) Enhancement of Kaizen-related training courses by Partner Agencies
- 3) Development of new Kaizen trainers by Partner Agencies and Relevant Agencies

Advocacy Activity

1. Institutionalization of Diffusion Event **led by the BOI in coordination with Partner Agencies**

Fulfillment of Training Resources

2. Enhancement of Kaizen-related Training Courses **By Partner Agencies**

3. Development of New Kaizen Trainers **By Partner Agencies and Relevant Agencies**

Source: BOI

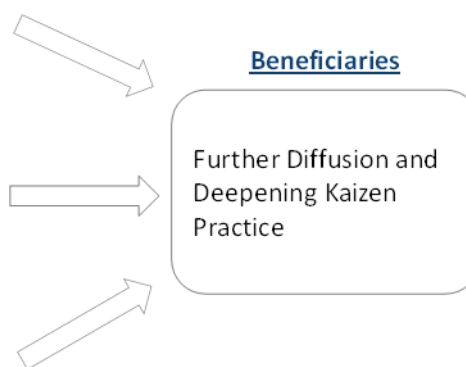


Figure 5-6: Action Plan for Model Dissemination (Pilot Activity 4)

In line with the action plans described above, evaluation indicators to measure achievement in the short, medium, and long term were presented by the BOI as shown in Table 5-7.

Input targets include 1) Institutionalization of Kaizen Diffusion Events as a short-term goal, 2) Establishment of new Kaizen-related training courses, and 3) Development of new training resources by partner agencies as mid-term goals.

It is also proposed to measure 4) the number of companies/organizations who participated in Kaizen-related training programs as a medium-term output indicator and 5) the number of companies have implemented Kaizen at their workplace as a long-term outcome indicator.

Table 5-7: Indicators for Evaluation of Kaizen Diffusion

#	Indicators for evaluation by JICA	Step	Indicators	Timeline
1	Advocacy	Step 1	✓ Qualitative: Institutionalization of Kaizen Diffusion Event Annual or bi-annual Kaizen Diffusion event led by the BOI in coordination with Partner Agencies	Short term 2024-2025
2	Training Resources	Step 2	✓ Quantitative: Number of New Kaizen-related Training Courses or Enhancement of Existing Courses with wider Kaizen topics (including Training for Trainers) 2-3 new or enhanced courses/modules related to Kaizen by Partner Agencies	Mid term 2025-2026
3	(same)	Step 2	✓ Quantitative: Number of New Internal Resource Persons developed under Partner Agencies 2-3 additional Filipino Kaizen experts trained through the new course developed or through training from JICA/Japan	Mid term 2025-2026
4	(same)	Step 2	✓ Qualitative: Development of qualifications or standards for Kaizen Experts	Mid term 2025-2026
#	Indicators for evaluation by JICA	Step	Indicators	Timeline
5	Output – Expansion in Beneficiaries of Kaizen Training	Step 2	✓ Quantitative: Number of Companies/Organizations who have been trained with Kaizen-related topics through MIRDC, NWPC, DAP Program 2-3 companies/organizations trained annually	Mid term 2025-2026
6	(same)	Step 3	✓ Quantitative: Number of Companies/Organizations who have implemented Kaizen in their workplace	Long term 2026-2027

Source: BOI

5.1.5 Pilot Activity 5: Implementing technical guidance on die and mold technology for pilot companies

(1) Model

The model nature of Pilot Activity 5 can be found in the provision of services to the industry by die experts. While MIRDC’s technical skills training will need to continue after this project, it is expected that MIRDC will be able to assume these functions independently and on an ongoing basis in the future.

Looking at the die manufacturers in the Philippines that participated in the pilot activities, it became clear that the business environment was quite different from that of Japanese die manufacturers. Die manufacturers in the Philippines may be contracted to develop dies from external clients but, in many cases, there is a job of mass production of die panels in-house or for clients, and then dies for in-house use are often developed. On the other hand, Japan’s die manufacturers receive orders from clients for the development of dies themselves and take on an

extremely great responsibility for the quality of dies. For example, when a Japanese die manufacturer contracts manufacturing from an automobile OEM, it must operate stably in the external environment of a press machine installed at the client’s factory, as well as meeting high accuracy requirements. In addition, there is fierce competition from die manufacturers in China, Korea, and Taiwan, and the JICA Team must be very careful about costs.

It can be said that the business environment of die companies in the Philippines is not as severe as that of the die industry in Japan, so the series of processes from product review to die manufacturing method is not strict, and there is a lot of room for improvement. Since the requirements of the standards and checklists of foreign die manufacturers such as Japan are very detailed, Philippine die manufacturers are not required to follow them from one to ten, but it is highly recommended that the Philippines learn and incorporate the use of standards and checklists and the concept of bills while referring to their know-how.

It is hoped that MIRDC will continue to provide capacity-building training to support the industry from a more technical standpoint in the future, starting with immediate efforts that do not require high technical skills, such as promoting these documentation practices to the industry.

(2) Activities to Disseminate Models (Workshops, Seminars)

A government training program is to be proposed after the project’s completion so that MIRDC will be trained to the same level of technical/consultation skills as foreign die experts.

Based on the current understanding of the Philippine die industry, the below figure is a proposed roadmap developed by the Project’s Japanese expert, which estimates that MIRDC will require at least two additional years of training starting from the simple die design and fabrication exercise conducted during the Project period, until it reaches the required technical level. The first year of the two-year additional training will focus on common problems encountered during the mass production process using dies and how to deal with them to develop practical consultation skills for the industry; the second year will focus on tryout techniques and design theory for various types of dies to develop the ability to advise on die making in the Philippines in the future.

	Round	Training Items	Technical Level Target
Additional Training Year 2	8	Fundamentals of die design (CAM-TRIM,PIERCE DIE/ CAM-FLANGE,RESTRIKE DIE/ PROGRESSIVE DIE)	<ul style="list-style-type: none"> ■ Able to design simple process plans, create die design specifications, and design flange and cam dies under guidance
	7	Fundamentals of die design (TRIM & PIERCE DIE/ FLANGE & RESTRIKE DIE)	<ul style="list-style-type: none"> ■ Able to design progressive dies under guidance
	6	Fundamentals of die design (BLANKING DIE/ DRAW, FORM DIE)	<ul style="list-style-type: none"> ■ Understand die manufacturing methods and tryout techniques under guidance
	5	Tryout technology (DRAW DIE/ TRIM & PIERCE DIE/ FLANGE & RESTRIKE DIE/ CAM-TRIM, PIERCE DIE/ CAM-FLANGE, RESTRIKE DIE)	
Additional Training Year 1	4	Factor analysis and countermeasures for product accuracy defects. (Poor surface position/ Defective trim line/ Poor hole position/ Poor bending line)	<ul style="list-style-type: none"> ■ Able to analyze factors and take countermeasures against panel accuracy problems under guidance ■ Able to analyze the causes of formability defects and take countermeasures under their guidance
	3	Main problems of FLANGE & RESTRIKE DIE (Scratch/ Wrinkle/ Crack)	
	2	Main problems of TRIM & PIERCE DIE (Burr/ Breakage of piercing punch)	
	1	Main problems of DRAW and FORM DIE (Wrinkle/ Crack/ Scratch)	
Present	0	Designing and manufacturing a simple die (DRAW DIE, TRIM&PIERCE DIE)	<ul style="list-style-type: none"> ■ Able to design and manufacture simple dies under guidance

Source: JICA Team

Figure 5-7: MIRDC's Leadership Capacity Enhancement Roadmap for the Future

(3) Action Plan

While this pilot activity is positioned as an important first step in strengthening MIRDC’s capacity to provide technical assistance in the future, there is still much to be learned for MIRDC. Pilot Activity 5 sees the dissemination proposition as the ability of the BOI and MIRDC to provide the necessary business and technical support to the Philippine die industry on an ongoing basis on their own in the future.

Therefore, MIRDC and BOI announced the following activities as the Action Plan for Activity 5.

- 1) Advocation activity for documentation practice by MIRDC – short term
- 2) Business matching between local die manufacturers and potential clients by BOI – short term
- 3) Updating roadmap for die industries by MIRDC and BOI – preparation phase
- 4) Submission of proposal for a follow-up training on die engineering by MIRDC – preparation phase
- 5) Development of training modules/programs on die engineering by MIRDC – long term
- 6) Upgrading of technical consultancy service to troubleshooting by MIRDC – long term

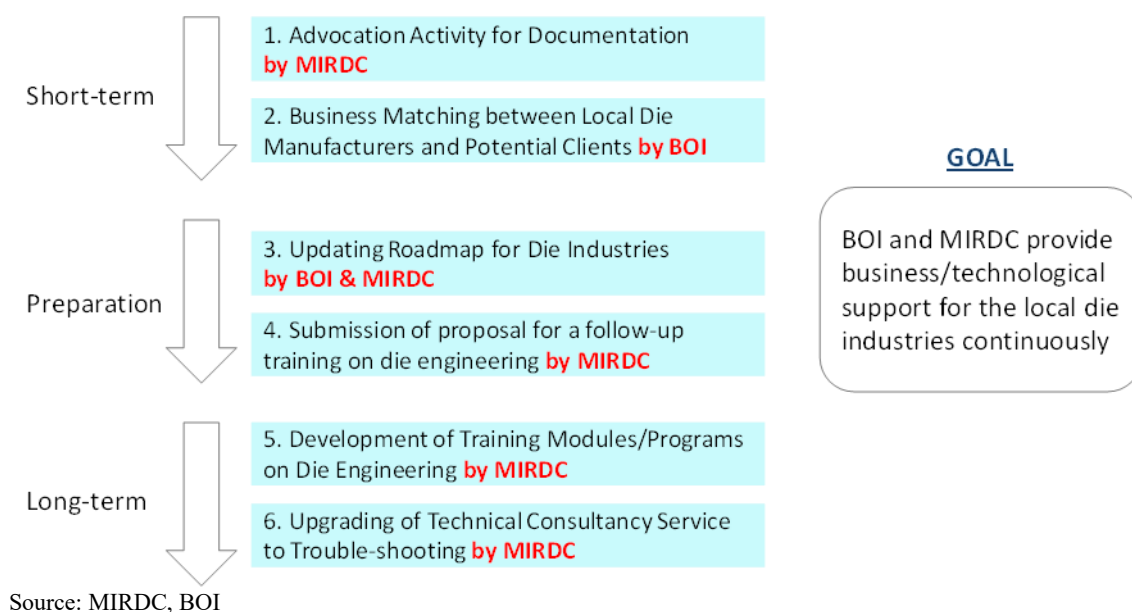


Figure 5-8: Action Plans for Model Dissemination (Pilot Activity 5)

In line with the action plans described above, evaluation indicators to measure achievement in the short, medium, and long term were presented by MIRDC and BOI as shown in Table 5-8.

The short-term goals include 1) Adoption and/or updating of checklists and standards introduced to 4 pilot companies, and 2) Realization of business matching between die manufacturers and local manufacturing industries. As the preparation for the long-term goals, 3) Updating Roadmap to include identification of new/potential markets for die manufacturers, 4) Approval/Submission of proposal for a follow-up training on die engineering for MIRDC trainees, and 5) Involvement of academe/association to the training program for MIRDC are set as mid-term indicators. The long-term goals are 6) Establishment of new training modules/programs on die engineering by MIRDC, and 7) Establishment of technical consultancy service for the companies, which includes troubleshooting.

Table 5-8: Indicators for Evaluation of Die Technical Guidance

#	Indicators for evaluation by JICA	Step	Example of the indicators	Timeline
1	Documentation Practice	Step 1	✓ Qualitative: Adoption and/or Updating of Checklists and Standards introduced to 4 Pilot Companies	Short term 2024-2025
2	Collaboration	Step 1	✓ Qualitative: Business Matching between Die Manufacturers and Local Manufacturing Industries	Short term 2024-2025
3	Development of Strategies	Step 2	✓ Qualitative: Updating Roadmap to include Identification of New/Potential Markets for Die Manufacturers	Mid term 2025-2026
4	Training Program	Step 2	✓ Qualitative: Approval/Submission of proposal for a follow-up training on die engineering for MIRDC trainees ✓ Qualitative: Involvement of Academe/Association to the Training Program for MIRDC ✓ Quantitative: Number of New Training Modules/Programs on Die Engineering by MIRDC	Mid term 2025-2026 Mid term 2025-2026 Long term 2026-2027
5	Technical Consultancy	Step 3	✓ Qualitative: Technical Consultancy Service for the companies (e.g. Documentation and trouble-shooting)	Continuing 2024-2027

Source: MIRDC, BOI

5.2 Achievement of Forum

After the completion of each pilot, internal workshop meetings were held to discuss modeling, along with a seminar to report the results and receive feedback on future activities. Toward the end of the project, a forum was held on January 24, 2024, to report the results of the five pilot activities. The forum was attended by 123 participants, including government officials and individuals from universities and private companies. Each pilot presented the results of its activities, followed by a question-and-answer session. The presentations were prepared by the relevant organizations in charge of each pilot activity and included video messages from the beneficiaries, such as universities and companies, so that the participants could witness the outputs of the project. Participants were asked how the project would be continued after its completion, and if it would be, how they would like to participate. Some also expressed that this project would be considered an industry-government-academia collaborative project, and that the government, educational institutions, and private companies would continue to meet regularly to sustain the activities of the project. The proposed program and photos of the forum are shown below.

Table 5-9: Program for the Forum

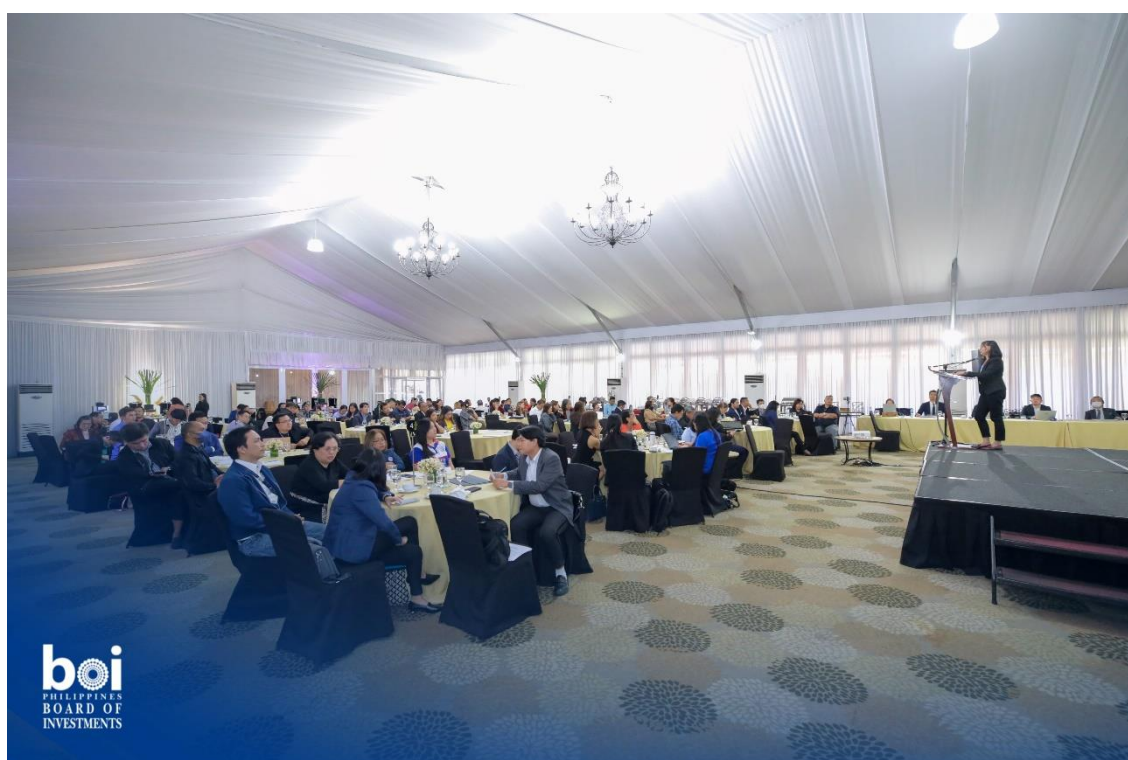
Title: The Forum - the results of the project and next steps

Date: 24 January 2024, 9:00 AM – 3:00 PM

Venue: Glass Pavilion at Dusit Thani, Makati City

Time	Session	Presenter/Facilitator
8:30-9:00	Registration	
9:00-9:15	Opening Remarks	JICA
9:15-9:30	Project briefing and results	JICA team
9:30-10:00	Presentation of Pilot 1	CHED
10:00-10:15	Q&A, Feedback session	CHED
10:15-10:45	Presentation of Pilot 2	TESDA
10:45-11:00	Q&A, Feedback session	TESDA
11:00-11:30	Presentation of Pilot 3	BOI
11:30-11:45	Q&A, Feedback session	BOI
11:45-13:00	Lunch (networking)	
13:00-13:30	Presentation of Pilot 4	BOI(MIRDC)
13:30-13:45	Q&A, Feedback session	BOI(MIRDC)
13:45-14:15	Presentation of Pilot 5	BOI(MIRDC)
14:15-14:30	Q&A, Feedback session	BOI(MIRDC)
14:30-14:45	Closing remarks	BOI

Source: BOI



Source: BOI

Figure 5-9: Forum Site

Chapter 6. Recommendations

This chapter provides recommendations to enable implementation of the action plans presented in each pilot. Then, looking beyond the action plans, the chapter presents a vision for how each activity can be organically linked and developed if the pilots implemented to date are modeled and implemented on an ongoing basis.

6.1 Recommendations for the Action Plan of Each Pilot Activity

This section provides specific recommendations based on lessons learned and findings during the project period to enable implementation after project completion for each of the pilot action plans presented in Chapter 5.

6.1.1 Pilot Activity 1: Implementing industry-academia collaboration activities (Virtual internship with Japanese companies by students from the Philippines)

(1) Recommendations for Institutionalizing Virtual Internships within CHED

As announced at the JCC on January 26, 2024, the division of roles within CHED has been considered, and it appears that the system is ready for institutionalization. The virtual internship was designed as a pilot project in which students could earn credits within the project by referring to Flexible Learning's guidelines in addition to the existing guidelines for face-to-face internships. By making effective use of these existing guidelines while incorporating the characteristics of virtual internships, such as the setting of assignments and periodic online progress meetings in the city, it is believed that virtual internships can be institutionalized quickly.

(2) Recommendations for Implementing Virtual and Hybrid Internships at Universities

If virtual internships are institutionalized within CHED, the next step would be to issue a circular to universities and conduct orientation sessions. Unlike face-to-face internships, it is important for companies to set an assignment task for students for the briefing sessions to the departments in charge of internships at each university. It is suggested that the task be set in such a way that students are not expected to be the labor force of the company, but rather to be problem-solving or research tasks that are commonly conducted by the company that will be a learning experience for the students. To this end, companies should set assignments with the intention of hiring actual or future graduating students, which will also increase the employment rate after the internship. In addition, since the virtual/hybrid internship program requires students to be autonomous and independent, it is recommended that each university establish criteria for selecting outstanding students based on their academic performance and interviews when the virtual hybrid internship program is implemented at the university.

(3) Recommendations When Collaborating with Companies

It is recommended that companies registered with the BOI and the Japanese Chamber of Commerce and Industry in Manila (JCCIPI) be approached when looking for a company to collaborate with. Since the event invited companies from BOI-registered companies and companies registered with JCCIPI, it is recommended that the university first introduce the companies that participated in the seminar on November 7, 2023, to the university.

6.1.2 Pilot Activity 2: Implementing training courses based on local business needs (Area-Based and Demand-Driven TVET (ABDD))

(1) Recommendations for Implementing QCD Training Based on ABDD TVET

TESDA has guidelines for ABDD TVET, and the platform and know-how to implement the existing training programs are accumulated within TESDA. Therefore, there will not be any particular hurdle in implementing QCD training as an extension of TESDA's existing training programs.

On the other hand, it is also important for the R4A office to actively monitor whether QCD training is being appropriately implemented in the private sector, as described in the Action Plan, and to flexibly adapt the training to the way of proceeding that is easier for the private sector to implement QCD trainings under the ABDD TVET guidelines.

One particularly important lesson learned from this pilot activity was how private companies can facilitate the participation of their employees in training for a certain period of time. When Japanese QCD experts provide QCD training to Japanese private companies, it is important to "practice QCD training once with a private company in a way that is less burdensome for the people involved".

If issues arise after the initial training that do not fit in with the actual situation in the private sector, it will be important for the lecturers and participants (private companies) to find a way to make it easier for both parties to proceed. For example, even if the basic policy of holding the RLT for six days as a whole remains the same, it could be spread out over several sessions instead of being held consecutively, so that both the lecturers and students can use the time for preparation. It is also important to be willing to make suggestions for improvements to ABDD TVET.

(2) Recommendations for Developing ABDD TVET in Other Industries Within R4A

As a mid-term action plan, it was indicated that other industries will also engage in activities to raise awareness about the importance of QCD human resources.

QCD has many aspects that can be applied to a wide range of industries and fields, such as the mindset of workers and customer awareness, and can be applied to other industries as well. In Japan, the importance of QCD human resources is recognized not only in the manufacturing industry, but also in the service industry and the public service sector of the government.

On the other hand, it is important not only to educate people that QCD is a highly versatile skill, but also to make training and management understand that, ultimately, QCD will lead to increased cost competitiveness and profitability in the private sector as a whole, when QCD-trained personnel are actually practicing QCD in the workplace.

In addition, as an approach to involve the private sector, the network of P. IMES, the first QCD implementation partner company, can be utilized to encourage partner companies to take the courses. TESDA may consider making specific target companies or approaching companies that have taken TESDA's training courses before.

As discussed at the JCC, the human resource needs of industry (demand side) are easily influenced not only by the domestic market but also by competing markets and industrial structures, and it is desirable to develop human resources that can respond to such needs at a suitable pace. For TESDA's part, continuous monitoring of the needs of the industry and daily cooperation with

BOI and other industry associations will be important to speed up skill mapping, the first step of ABDD TVET.

(3) Recommendations for the Development of ABDD TVET in Other Regions Beyond R4A

In the long run, it is assumed that expertise related to the implementation of ABDD TVET will be accumulated in the automotive and other industries within the R4A, and that collaboration with private companies in various industries will progress. Using the achievements and networks as a starting point, reaching out to private companies in other regions will become easier.

To accelerate this process, it is expected that TESDA will centrally collect the knowledge and networks related to the implementation of ABDD TVET that will be accumulated in R4A in the future and establish a mechanism for sharing empirical knowledge that can be horizontally deployed from R4A to the next region.

One approach is to involve the facilitators in charge of the department within TESDA who facilitated QCD curriculum development. They would participate in the initial orientation of each step as an observer and pass their experience to other facilitators who are not familiar with ABDD TVET. In addition, the TESDA Planning Office could compile a collection of case studies of ABDD TVET implementations and disseminate them to the relevant organizations as part of TESDA's awareness raising activities in the future.

6.1.3 Pilot Activity 3: Establishing a mechanism for lead generation for regular investment in the Philippines

(1) Recommendations for Continuation of Strategic Business Matching

As a mechanism to continue strategic business matching during the pilot period, it is recommended that sufficient preparations be made six months to one year prior to the date of the expo. Specifically, a list should be made of the types of companies that the Philippine participants would like to have business discussions with. The list may be selected from the list of companies held by DTI Tokyo and Osaka, or companies may be introduced through cooperation with Japanese public organizations.

(2) Recommendations for Cooperation with Japanese Public Organizations

As mentioned in the action plan, it is recommended to promote the signing of an MOU with SME Support Japan (SMRJ) and to set up regular meetings. It is also expected that Philippine companies register with their platforms called J-Good Tech and the CEO Network Enhancing Project managed by SMEJ and actively engage in business negotiations with Japanese companies. In addition to SMEJ, there was a visit to JETRO headquarters as a Japanese public organization during the investment mission to Japan in November 2023, and it is recommended that JETRO Manila be visited on a regular basis to exchange opinions.

(3) Recommendations for the Website

The website launched by the project can be considered an effective form of digital marketing, but it is desirable that the cost-effectiveness and maintenance of the website be examined by the organizations concerned, and that information about the companies and the attractiveness of the Philippines be disseminated in Japanese, if possible. If it takes time to discuss the continuation of the website, it is expected that there will be a certain period of time when the website will not be used. Although it was not possible to determine how many visitors came to the Business EXPO by referring to the website, there were many walk-ins on the day of the event without reservations.

This is likely due to the fact that the booths of participating companies were grouped into the electronics, ICT, EV, and manufacturing/services sectors, which attracted a lot of attention.

(4) Recommendations for Regular Follow-up of Business Matching

The eight Philippine companies that participated in the November 2023 Business EXPO initially set a total of 30 meetings as a KPI indicator, but the total number of meetings reached 82. The purpose of the pilot activity was to focus on how many advance meetings could be set up through advance preparation before the Business EXPO, but contrary to expectations, more than half of the interviews were walk-ins on the day of the Business EXPO. If possible, it would be helpful to clarify the motives and objectives of the walk-in visitors, and for the government to regularly obtain information from companies on how many ongoing interviews each company had after the Business EXPO meetings, so as to be better prepared for the next Business EXPO.

6.1.4 Pilot Activity 4: Creating a mechanism for promoting and establishing Kaizen

(1) Recommendations for Effective Kaizen Retention

This has already been partially implemented during the pilot activity of the project, it is recommended that the Kaizen training textbook be flexible to incorporate and consider suggestions from instructors of the Philippines and update the content. For example, in this project, a game to convey the importance of “Seiri (Sorting)” and “Seiton (Setting-in-order)” was incorporated in response to the MIRDC trainees’ suggestions as the content of 5S exercises. In addition, during the actual kaizen training OJT, the style of communication between the instructor trainees in English and Tagalog worked well and appeared to be very helpful in promoting understanding and increasing motivation among the corporate trainees. As of now, all Kaizen materials are written in English, but it is recommended that efforts be made to incorporate Tagalog as appropriate and make the materials more accessible and easier to understand for the corporate trainees in the field.

(2) Recommendations for Development and Training of New Kaizen Trainers

Although it is expected and encouraged for partner agencies to develop new Kaizen trainers within their institutions, that activity was not covered in this project. Thus, this section provides a suggested approach. One of the approaches is mutual training among instructor trainees. One instructor trainee will give a model lecture and exercise on a Kaizen topic, with the other instructor trainees acting as students. After the model lecture and exercises, the student role-players write down good points and areas for improvement on a feedback sheet and hand it to the instructor role-players. By conducting these role-playing sessions by switching roles among each other, the ability to conduct lectures and exercises will be improved. Another important aspect of training resource development is to be able to actually go out to corporate training sites and talk about Kaizen as one’s own experience. For this purpose, it is recommended that the trainees experience the process from lectures and exercises to helping corporate trainees prepare their presentations and witnessing their presentations to management, as was done in the pilot activities.

(3) Recommendations for Successful Kaizen Implementation

One of the reasons why Kaizen has not spread autonomously among Philippine companies is presumed to be the difference in corporate culture and climate between the Philippines and Japan. In particular, the Kaizen activities addressed in this project are rooted in the workplace, and the motivation of workers to do Kaizen for the company is crucial. Therefore, it is important to create a relationship in which labor and management do not restrain each other but pursue common interests, and management support for Kaizen activities is indispensable for this purpose. Although it is sometimes difficult to coordinate schedules, it is advisable to request management

to be present at the beginning of the Kaizen training and at the presentation of the results at the end.

(4) Recommendations for Preparing Kaizen Diffusion Event

The main content of the Kaizen Diffusion Event will be the introduction of best practices in the Philippines. MIRDC, NWPC, and DAP will nominate outstanding practices from their respective trainee companies and organizations to speak at the event, but it is preferable that the purpose of the Kaizen Diffusion Event be properly communicated to them and that they prepare presentations from a perspective consistent with the purpose of dissemination.

(5) Recommendations for the Evolvement of Kaizen Practice

At this time, the Kaizen Diffusion Event is intended to provide a first step for companies that have no experience in implementing Kaizen or using the training programs of partner agencies. As the number of companies implementing Kaizen increases, the focus will shift to continuity and deepening the content. If the role of Kaizen Diffusion Event can evolve as a place for peer learning among Kaizen implementing companies, it will have a more desirable effect.

6.1.5 Pilot Activity 5: Implementing technical guidance on die and mold technology for pilot companies

(1) Recommendations for the Next Training Program

When proposing an upcoming training program on die technology, it is of utmost importance to design market-oriented training. It is necessary to clearly envision the success of the company or organization that will participate in the training program and design the training content accordingly. The most recent training program development has seen a technology-oriented approach that begins with a technology comparison between the Philippines and other countries to be benchmarked, and then the training is designed to close the technology gap. Such an approach that does not look at the market tends to fail, because the skills acquired are not utilized in the company to improve the company's performance or his/her compensation, and as a result, trainees leave for other countries in search of a place to put their skills to use. It is desirable to take the approach of first looking at how the company will grow after the trainees participate in the training program, and then having them acquire the necessary skills. Although additional research and verification are needed as this project has only four pilot companies, the Philippine die industry is mainly engaged in mass production of parts using dies, and the JICA Team believe that smooth mass production and supply are the key growth scenarios for the time being. The market for the fabrication of dies for external sales is not yet large, and a training program suitable for the immediate goals is recommended.

(2) Recommendations for the Training Indicator

Rather than thinking of the training as strengthening the capacity of individual trainees participating in the training, it is recommended that the approach be to think of the training as an organizational effort to strengthen the capacity of the organization. For example, it is desirable to promote the collective knowledge of the company by training trainees to introduce the checklists and various standards developed in this project to their own companies. By doing so, it is expected that the results of the training will remain with the organization even if the individuals who participated in the training leave the company. Post-training evaluation could also be a company certification, like the ISO certification conducted by MIRDC, rather than one for individual trainees.

(3) Recommendations for the Utilization of Raw Materials

In the process of conducting die development exercises at MIRDC, there were some cases where suppliers of steel and die structure items were suspected of having insufficient knowledge. In particular, the domestic supply of steel is set as a long-term goal in the roadmap, but the road to achieving this goal is far from over, and steel will remain a costly raw material for the foreseeable future. It is necessary to make the most effective use of existing resources, and for this purpose, it is recommended to organize a study group involving suppliers.

(4) Recommendations for the Practical Knowledge Development

The need to introduce the latest facilities, equipment, and software is often discussed for the development of the Philippine die industry. However, from the experience of the die development exercise at MIRDC, the JICA Team believes that it is more effective to accumulate wisdom to maximize the capacity of existing facilities and equipment before updating or upgrading facilities, which will require very large investments. It is like sharpening iron with iron. If the Philippine local companies can create a place or collaborate to sharpen each other's skills, they can easily improve their efficiency in terms of cost and speed, without the need to invest in new and latest equipment and facilities.

(5) Recommendations for the On-site Training

The exercises conducted as part of this pilot activity, which dealt with issues actually occurring at the pilot companies' sites, immediately contributed to the companies' business performance, and the learning element of dealing with familiar materials was also considered significant. Although there may be cases of refusal from the perspective of corporate information management, two of the three companies that responded to the project questionnaire indicated that they would be willing to accept trainees from other companies for on-site training, and it is recommended that such training be incorporated to the extent possible.

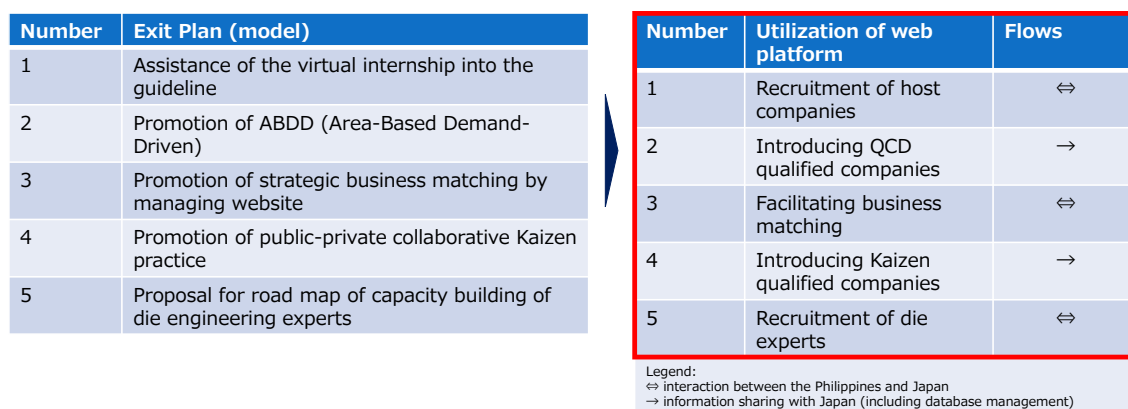
6.2 Direction of Policy Programs/Measures on Models Derived from the Pilot Activities

The importance, planning, and challenges of modeling in the pilot activities were mentioned in the previous chapter. In this chapter, a further direction will be discussed as a recommendation for utilizing models derived from the pilot activities to actually formulate and implement policy measures and programs. These can be broadly categorized into 1) further approaches using web media, 2) alignment with the policy directions of the Philippine Development Plan, and 3) strategic positioning within the smile curve of value chain.

6.2.1 Further Development to Model Pilots: Utilization of Web Platforms in Activity 3

In the project, the JICA Team built a web platform that promotes business matching between Japan and the Philippines through Pilot Activity 3. If BOI maintains the website, expanding the browsing functionalities is recommended. This means the creation of a mechanism for adding functions so that the web platform is not limited to Pilot Activity 3, but the model of other pilots is continued. For example, if the virtual internship of Pilot Activity 1 is institutionalized, there is a possibility that Japanese companies will become ones that accept students, so it is possible to add a matching function. In Pilot Activity 5, the Philippines needs more mold support and mold experts, so it may function like a recruitment site. In this way, there are functions such as exchanging information between the Philippines and Japan and, for example, companies that have received QCD and Kaizen training such as Pilot Activities 2 and 4 create a database and publish registration information, which leads to the management of the registration database and the dissemination of information. Although posting information on the website across ministries and

agencies requires many decisions to be made, including how to divide roles among ministries and how to operate the website, below is a diagram showing the model for each pilot activity and how it is integrated into the platform.



Source: JICA Team

Figure 6-1: Linking Pilot Activities Using a Web Platform

6.2.2 Direction of Pilot Activities in Line with the Policies of the Philippine Development Plan

Chapter 6 (Industrial Sector) of the Philippine Development Plan aims to revitalize industry by promoting industrialization based on science, technology and innovation. It is proposed that the pilot project implemented in this project be developed in a way that contributes partly to the content described in Chapter 6 of the PDP. The following is a proposal for each pilot divided into three groups.

(1) Pilot Activities 1 and 2

In Pilot Activity 1, CHED expressed interest in the importance of information sharing and mechanisms for collaboration with industry, especially in identifying industry needs. This shared interest was also relatively common in Pilot Activity 2, as indicated by TESDA. As mentioned in Chapter 6 of the PDP 2023-2028, leveraging this pilot activity is expected to lead to the institutionalization of mechanisms that further strengthen cooperation between industry, academia, and government, as well as initiatives to support startups and reskilling for incorporating new technologies. In the future, it is significance for the roles of CHED, TESDA, DTI, and other relevant government agencies to introduce initiatives to support the establishment of mechanisms to provide comprehensive and clear information sharing “menus” on “manpower goods and capital” and forms of possible collaboration with industry from the academic field, and to share the actual needs and requirements of industrial human resources and form of collaboration in R&D with the academic field for the next-generation automotive industry from the industry field.

As for the outline of the initial mechanism, incorporating policy measures such as “coordination meetings” within their frameworks, where relevant agencies periodically exchange information, or considering the implementation of “progress report meetings” on an annual basis, during which necessary information can be shared, would also be effective. In addition to this, the business matching platform (web platform) of Pilot Activity 3 can be used not only for future cross-industry business matching related to industrial human resource development and vocational training, but also for sharing needs and feedback from Pilot Activities 1 and 2. It can also be considered one of the viable mechanisms as a platform that can be utilized for further activities in cross-sectoral linkages that can be used to practically promote business matching among different industries and

academic institutions regarding the needs of industrial human resources and their development in the next generation.

(2) Pilot Activity 3

It is important to build a strategic matching platform with key features that facilitate cross-industry linkage, including complementary elements to other pilot activities. The design and operation of the platform is based on how timely and need-based resources (companies, human resources, information, supporting programs/schemes information, etc.) are gathered for strategic investment. The viability of the platform depends on whether it can be updated with information and can provide efficient matching coordination services. From the viewpoint of policy implementation or formulation, this coordination is vital as it could contribute by functioning as a driver for policy implementation and by directing platform users to the policy goals. The platform can be used as a mere information site for business matching but, at the same time, it can be utilized for strategical promotion of industrial human resource development and value chain development, and/or even for active promotion of strategic investment of SIPP. There is, at this stage, an open strategy for BOI on how the platform can be designed, institutionalized, operated, coordinated, and utilized in the future.

In relation to the PDP 2022-2028 strategy, since the focus of this pilot activity itself is business matching, it will be a pilot of a system that will directly lead to strategic outcomes such as the “activation of business networks across industries”, “linkages of industrial policy with trade and investment policy”, and the “enhancement of business-matching activities across regions”. Depending on the design and operation of the website, it can be an initiative that has potentially significant areas of contribution as a tool for other strategical outcomes in the PDP 2022-2028 such as industry-academia-government collaboration, human resource development, technological sophistication, digitalization, and innovation promotion.

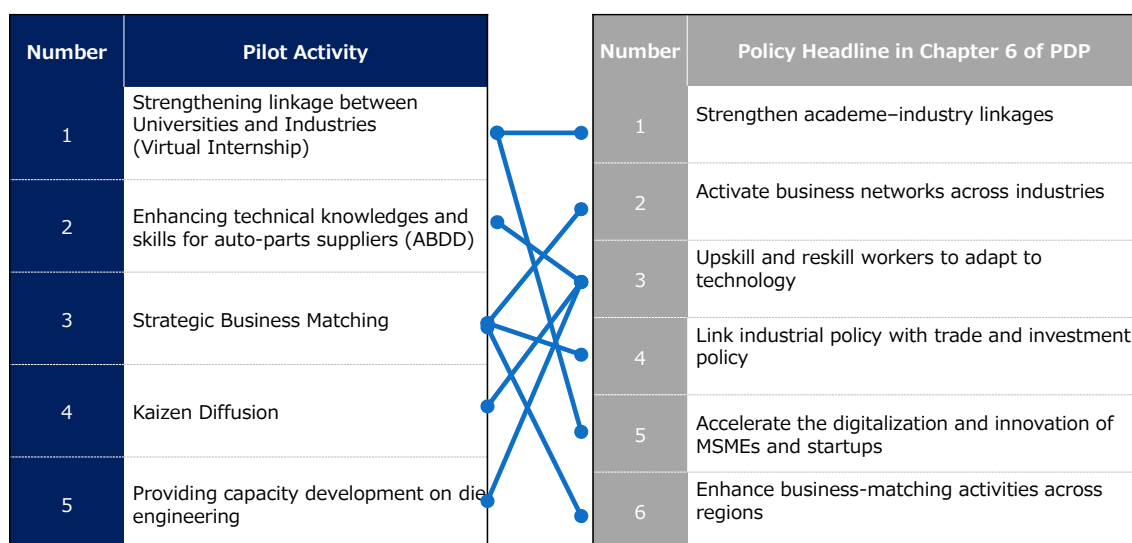
In order to establish a sustainable platform, it is important to consider the utilization of policy implementation tools, such as focusing on the operation of BOI’s strategic investment priority sectors under BOI’s initiatives in the future. This should involve adjustments of financial resources for operation and the establishment of mechanisms for cooperation and collaboration with relevant agencies (e.g., CHED, TESDA), including considerations for such arrangements. For example, including the possibility of establishing new working groups to consider potential mechanisms, there could be possible collaboration and cooperation through existing programs/systems (such as the “Livelihood Seeding Program-Negosyo sa Barangay” for MSME support by DTI) and/or advancing activities based on specific agreements like the memorandum of understanding (MOU) already signed between BOI and CHED.

(3) Pilot Activities 4 and 5

For these two pilot activities, the JICA Team worked with the die and mold sector with a view to “leaving room” for the development of new basic technologies (related to one of the BOI’s priority industry clusters, “Modern Basic Needs” (MBNs)), especially those needed for next-generation industries. In this field, it is difficult to concretize at this stage what kind of MBN can actually exist in the structure of the next-generation automotive industry. Therefore, in order to be able to respond to any MBN in the future, mold maintenance technology and production management methods (Kaizen, QCD) are used as on the basics.

While the PDP 2023-2028 does not offer a direct strategy for the die and mold sector, this pilot activity is aimed at “upskilling and reskilling workers to adapt to technology” in the PDP. In addition, HNRDA has proposed a roadmap for the promotion of the design and development of tools and molds in the automotive industry as a priority agenda in the “metals and engineering” section.

In order to pursue this policy direction, it is necessary not only to strengthen the programs provided by the current MIRDC, but also to leverage the pilot activities. It is important to improve MIRDC’s ability to function as a technical support provider, and it is important that DOST takes the initiative to strengthen its role in supporting MIRDC’s provider function in terms of technology maintenance, improvement and development, and to support it to play a central role in MBN clusters to prepare for the next-generation automotive industry. In addition, it is expected that a mechanism and system should be designed that will enable DTI/BOI to share information on MBN in the next-generation automotive industry with MIRDC and DOST. To this end, the establishment of a cooperative mechanism is vital among authorities and institutions to sustain its activities, including the continuous deployment of experts. This has to be paralleled with securing sustainable financial resources (e.g., including support funds from the private sector, joint research funds, and joint financing with government grants).



Source: JICA Team

Figure 6-2: Possible Links between Pilot Activities and Policy-Strategy and R&D Agendas

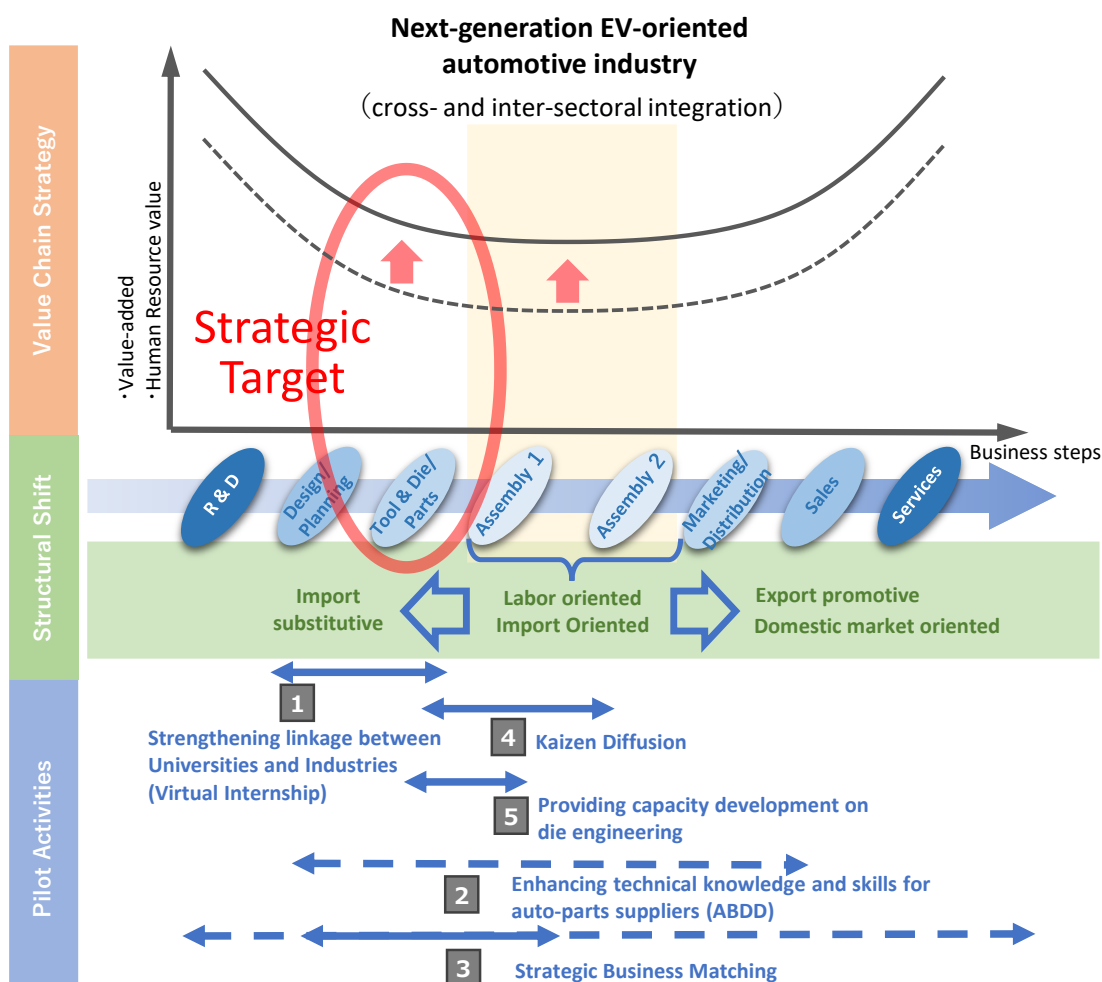
6.2.3 Policy Deployment Targeting Higher Value-added Segments in the Value Chain

What the structural changes in the industry have brought about is not only the review and adjustment of structurally mature supply chains and value chains, but also the restructuring of supply chains and the new optimization of value chains and, from a policy perspective, it can be seen as a timely opportunity for government supporting intervention efforts to be fully explored. However, the “reconstruction” does not mean the sudden changes or dramatic leaps experienced in previous industrial revolutions. This reconstruction process doesn’t abruptly change existing industrial structures; instead, it involves evolving them into new industrial platforms while leveraging their strengths. On the policy front, it is important not only to introduce new technologies through innovation but also to focus on the potential for growth through the application of existing technologies and collaboration or convergence across different existing industrial sectors. In other words, what is needed is a perspective that supports the “evolution of industries” rather than just an “industrial revolution.”

In this project, pilot activities have been carried out to contribute to the design of policy programs (measures) to support human resource development and the sophistication of SVCs through this “evolution”. In Phase II, the activities were designed with a greater emphasis on R&D in response

to the vigorous exploration of new technologies and innovations by suppliers, students, and educational institutions in the Philippines. Ultimately, the focus was on supporting value-added areas on the left side of the smile curve of the value chain. Pilot activities are only pilots of actual measures and, in terms of policy design, they only provide benchmarks and, in actual policy design, it is necessary to consider narrowing down the strategic focus.

In order to contribute to the development of the next-generation automotive industry, it is important to develop human resources who can play a role in the value-added part of the value chain and design policy measures/programs to support supply chain development, not as a target for outsourcing, but as a provider of new technologies and opportunities (in reality, this could be as a partner). In other words, for example, in business matching, rather than concluding a contract between a supplier and a buyer for parts, it is necessary to establish a sustainable cooperative relationship in which companies with different potential technologies in the same field can jointly work on entire products' development process from new technology development. It is expected that government authorities will design policy measures and programs that can contribute to such a mechanism.



Source: JICA Team

Figure 6-3: Position of Pilot Activities in the Value Chain Smile Curve

In terms of policy, the Philippines has a very good cooperation base among departments and governmental organizations securing legitimate transparency in the demarcation of authority,

which is very important as a strength of the investment environment. In the case of the recent development of EV promotion-related policies, the governmental coordination has been recognized as quite efficient– which is not often recognized as efficient coordination in, so to speak, the vertically segmented administrative system; the CARS program (BOI), the Public Utility Vehicle Modernization Program (PUVMP program) (DOTr), and CREVI (DOE) are all developed under the initiatives of different departments, but the cooperation of the relevant departments and institutions is ensured in all of them. In the light of policy coordination, as least in the area of EV promotion, the Philippines seems to be advancing in terms of a system in which the most suitable authorities take the initiative when necessary and the relevant organizations are willing to cooperate beyond the boundary of vertically divided administrations. It seems in the government policies that Government 4.0¹⁰ is already introduced in Philippines while promoting Industry 4.0. Rather than tax incentives for investors, this can be one of the most significant comparative advantage factors and more attractive investment climates to FDIs. In addition to the utilization of output models from pilot activities, this comparative advantage has to be actively emphasized through the enhanced human resource development and SVC development support measures and programs – which should effectively support the next-generation automotive industry.

¹⁰ Just as Industry 4.0 represents the evolution of industries over the sectoral boundaries through digital technologies, here, the term "government 4.0" symbolizes the transformation of government through digitization, transcending the boundaries between government Departments. It's worth noting that McKinsey defines "Government 4.0" as simple "the digitization of government." <https://www.mckinsey.com/de/publikationen/leading-in-a-disruptive-world/government-40-the-public-sector-in-the-digital-age>