Republic of the Philippines

Data Collection Survey on Industrial Human Resource Development in the Philippines

Final Report

February 2017

Japan International Cooperation Agency (JICA)

Ernst &Young Sustainability Co., Ltd.,
International Development Center of Japan Inc.

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Exchange Rate（As of February 2017）

（JICA Rate）

PHP 1 ＝ ￥2.3159

ABBREVIATIONS

ADB	Asian Development Bank
AEC	ASEAN Economic Community
AHRD	Association of Human Resource Development
AIAP	Aerospace Industries Association of the Philippines
AMI	Alliance Mansols Inc.
APACC	Asia Pacific Accreditation and Certification Commission
AQRF	ASEAN Qualifications Referencing Framework
ARMM	Autonomous Region of Muslim Mindanao
ASEAN	Association of South East Asian Nations
AUN/SEED-NET	ASEAN University Network, the Southeast Asia Engineering Education Development Network
BFAR	Bureau of Fisheries and Aquatic Resources
BLE	Bureau of Local Employment
BMBEs	Barangay Micro Business Enterprises
BOI	Board of Investment
BPO	Business Process Outsourcing
CAD	Computer-Aided Design
CAGR	Compounded Annual Growth Rate
CALABARZON	Cavite, Laguna, Batangas, Rizal, Quezon
CAMPI	Chamber of Automotive Manufacturers of the Philippines, Inc
CAR	Cordillera Autonomous Region
CARS	Comprehensive Automotive Resurgence Strategy
CCCI	Cebu Chamber of Commerce and Industry
CDA	Cooperative Development Authority
CEDFIT	Cebu Educational Development Foundation for Information Technology
CHED	Commission on Higher Education
CIDAMI	Cacao Industry Development Association of Mindanao, Inc.
CITE	Center for Industry Technology and Enterprise
CNC	Computer Numerical Control
CNIS	Comprehensive National Industrial Strategy
CPU	Central Philippine University
CTU	Cebu Technical University

DA	Department of Agriculture
DAR	Department of Agrarian Reform
DBM	Department of Budget Management
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DICCEP	Davao Industry Cluster Capacity Enhancement Project
DLSA	De La Salle University
DNSC	Davao Del Norte State College
DOE	Department of Energy
DOF	Department of Finance
DOLE	Department of Labor and Employment
DOST	Department of Science & Technology
DOST-MIRDC	Department of Science & Technology Metals Industry Research and Development Center
DTI	Department of Trade and Industry
DTS	Dual Training System
ECC	Employees Compensation Commission
EDB	Ease of Doing Business
EIAP	Electronics Industries Association of the Philippines, Inc.
FDI	Foreign Direct Investment
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GMP	Good Manufacturing Practice
GPCCI	German-Philippine Chamber of Commerce and Industry
GVC	Global Value Chains
HACCP	Hazard Analysis and Critical Control Point
HEIs	Higher Education Institutions
HEPP	Higher Education and Productivity Project
HERA	Higher Education Reform Agenda
HRD	Human Resources Development
IB	Inclusive business
ICT	Information and Communication Technology
IDEA	Innovative Development Through Entrepreneurship Acceleration Project
ILO	International Labour Organisation
IMF	International Monetary Fund

IP	Intellectual Property
IPP	Investment Priority Plan
IT-BPM	Information Technology and Business Process Management
JBIC	Japan Bank for International Cooperation
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
KEG	Key Employment Generating
K to 12	K to 12 Basic Education Programme
LCCI	Laguna Chamber of Commerce and Industry
LGU	Local Government Unit
LST	Life Skills Training
MCDC	Mindanao Coco Development Corp.
MIMAROPA	Mindoro, Marinduque, Romblon, Palawan
MinDA	Mindanao Development Authority
MIR	Manufacturing Industry Roadmaps
MRP	Manufacturing Resurgence Program
MSME	Micro, Small and Medium Enterprises
MSU	Mindanao State University
MSU-IIT	Mindanao State University Iligan Institute of Technology
NCR	National Capital Region
NEDA	National Economic Development Authority
NICCEP	National Industry Cluster Capacity Enhancement Project
ODA	Official Development Assistance
OFW	Overseas Filipino Worker
OJT	On the Job Training
OWA	Overseas Welfare Administration
PBL	Project Based Learning
PCA	Philippine Coconut Authority
PCCI	Philippine Chamber of Commerce and Industry
PDP	Philippine Development Plan 2011-2016
PESO	Public Employment Services
PEZA	Philippine Economic Zone Authority
PPP	Public-Private Partnerships
PQF	Philippines Qualifications Framework
PRC	Professional Regulation Commission

RA	Republic Act
RCA	Revealed Comparative Advantage
RDC	Regional Development Council
R&D&D	Research & Development & Design
RESPSCI	Rizal Experimental Station and Pilot School of Cottage Industries
SB Corp.	Small Business Guarantee and Finance Corporation
SEC	Securities and Exchange Commission
SEI	Science Education Institute, DOST
SEIPI	Semiconductor and Electronics Industries in the Philippines, Inc.
SET-UP	Small Enterprise Technology Upgrading
SEZ	Special Economic Zone
SHS	Senior High School
SKILLS	School of Knowledge for Industrial Labor, Leadership and Service
SME	Small & Medium Enterprise
SPAMAST	Southern Philippines Agri-business and Marine and Aquatic School of Technology
SPRCNHS	San Pedro Relocation Center National High School
STRIDE	Science, Technology, Research, and Innovation for Development
STVEP	Strengthened Technical Vocational Education Program
STVS	Subangdaku Technical Vocational School
SV	Senior Volunteer
TESDA	Technical Education and Skills Development Authority
TMC	Training Management Cycle
TMP TECH	Toyota Motor Philippines School of Technology
TRs	Training Regulations
TUP	Technical University of the Philippines
TVET	Technical Vocation Education and Training
TWC	TESDA Women's Center
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UP	University of the Philippines
UP-ITDC	University of the Philippines Information Development Center
UPLB	University of the Philippines Los Banos

USAID	United States Agency for International Development
USM	University of Southern Mindanao
UTPRAS	Unified TVET Program Registration and Accreditation System
WB	World Bank
WEF	World Economic Forum

EXECUTIVE SUMMARY

1. Survey Outline

Since 2012, the Philippines has maintained a high economic growth rate among major ASEAN countries, but for this growth to continue, the development and promotion of domestic industry is an issue which must be urgently addressed. The Philippine government has set out growth strategies including the "Comprehensive National Industrial Strategy (CNIS)," "Manufacturing Resurgence Program (MRP)," and "Comprehensive Automotive Resurgence Strategy (CARS)."

While industrial human resource development (IHRD), is necessary as foundation in order to develop and promote industry, young people account for half of the unemployed population and many young graduates of secondary and higher education take a few years to ensure their employment. Consequently, resolving the mismatch of vocational skills and technologies has become a problem.

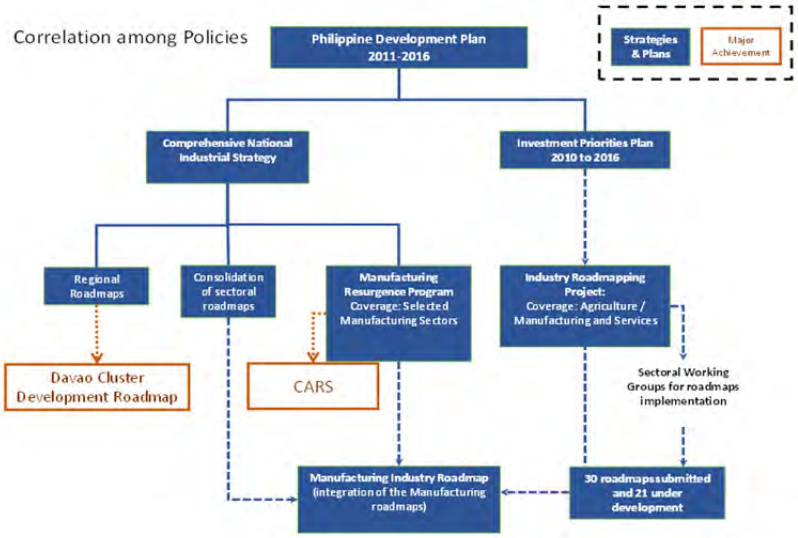
In light of this, considering the 10-Point Socioeconomic agenda by the newly-formed Duterte administration and the "industrial human resource development cooperation initiative" by Japanese Prime Minister Abe, the need to promote cooperation is growing for IHRD, which contribute to the expansion of employment opportunities in the Philippines, to support industrial development through human resources, and also to contribute to the fulfillment of the human resource demands of local subsidiaries of Japanese companies in the Philippines.

This survey aims to examine and propose the Japan International Cooperation Agency's (JICA) medium and long-term cooperation program (idea) and potential project concepts (idea) on IHRD which contribute to industrial development, based on JICA's previous cooperation results along with analyzing development agenda in the advancement of industrial human resources in the Philippines. The cooperation program will provide a basis for future implementation of JICA's cooperation in this field in the Philippines for next 10 years.

Target areas are throughout the Philippines. However, target areas where surveys on the existing situation will be conducted are: Metro Manila, Cebu, Davao and Calabarzon. In addition, to handle cross-sectional issues of IHRD, the survey was conducted with a variety of agencies and organizations: the National Economic and Development Authority (NEDA), the Department of Trade and Industry (DTI), the Philippine Economic Zone Authority (PEZA), the Department of Education (DepEd), the Committee on Higher Education (CHED), the Department of Labor and Employment (DOLE), the Technical Education and Skills Development Authority (TESDA), the Department of Science and Technology (DOST), the Department of Agriculture (DA), the Professional Resources Committee (PRC), and the Department of Finance (DOF).

2. Philippine Industry/Economic Development Strategies/Plans

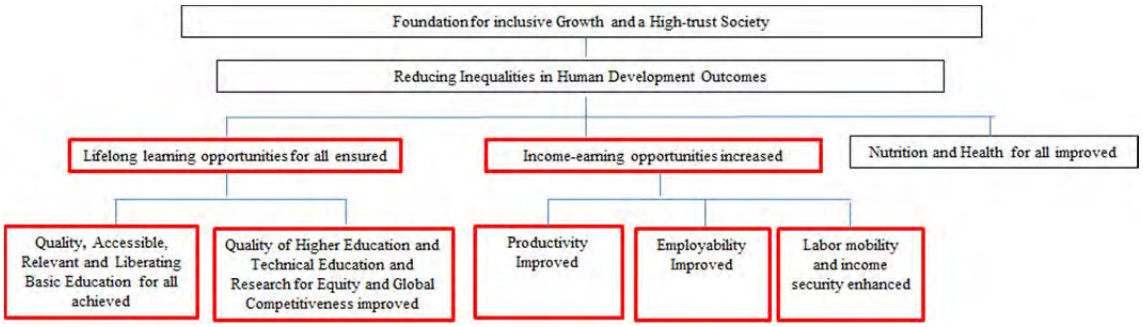
The Philippines has established a variety of policies and programs to fulfill sustainable economic growth. These frameworks are organized into the diagram below.



Source: Prepared by the JICA Survey Team

3. Industrial Human Resources Development Strategies/Plans

The survey analyzes the position of IHRD in socioeconomic strategies and plans at the national level such as the "10-point Socioeconomic Agenda", the draft version of the "Philippine Development Plan (2017-2022)" and the Midterm Update of the "Philippine Development Plan (2011-2016)"[1]. At the same time, the survey summarizes the trends of IHRD strategies and plans in the relevant sectors which are available at present. Then, it also summarizes some of the initiatives, programs and projects implemented by the Philippine government regarding development of industrial human resources.



Source: Prepared by the JCA Survey Team based on the "Philippine Development Plan (2017-2022)" (draft)

[1] As of January, 2017, the NEDA published parts of the Philippine Development Plan (2017-2022) (draft) on its website for public comments. However, no sector-by-sector development plan for 2017-2022 has been disclosed yet.

In addition, the Philippine government is implementing various initiatives, programs, and projects in IHRD. The one of the initiatives is the "National Human Resource Development Roadmapping Initiative". The Comprehensive National Industrial Strategy (CNIS) and the creation of the Industrial Roadmap encouraged recognition of importance of skillful human resources in promotion of productive, innovative and competitive industries, causing many industry participants to consider human resource development as a cross-sectoral major issues in addition to infrastructure development and research and development.

At present, the DOLE is taking the lead in forming technical groups and promoting the creation of industry-specific human resource development plans. Each of the human resource development plans analyzes (i) Industry profile, (ii) Status quo of human resource development (labor supply, labor demand, demand-supply balance), and (iii) Strategies and goals of human resource development.

4. Situation and challenges at educational institutions, and technical and vocational training institutions for IHRD

The JICA survey team visited related agencies, universities, colleges, technical and vocational training schools and senior high schools and analyzed their situation and challenges. The following table summarizes challenges each institution has faced.

Education Level	Faculty	Equipment & facilities	Curriculum & teaching method	Student Training	Industry-Academic Collaboration
High School (TVL Track)	Especially at former ordinary schools that started technical tracks from 2016, technical instructors are in shortage. Instructors themselves require company training.	Especially at former ordinary schools that started technical tracks from 2016, materials and facilities are in shortage.	Company needs (basic academic knowledge and technical/soft skills [2]) are not adequately reflected.	Especially for former ordinary schools that started technical tracks from 2016, it is difficult to find a company that accepts its employment experiences.	Especially difficult for high schools with poor geographic conditions such as agriculture and fishing high schools, high schools in mountainous areas, and formerly ordinary schools and started technical tracks in 2016.

[2] Soft skills include so-called work ethics and professionalism, and includes not being late, communications in English such as reporting, consulting and making contact, keeping company rules, and thinking for yourself etc.

Universities and Junior Colleges	Few instructors with master's or PhD degrees. Instructors themselves require company training.	Noticeable aging of facilities, and lack of facilities and equipment at public universities.	Company needs (basic academic knowledge and technical/soft skills) are not adequately reflected.	Training of engineers and technicians with the academic ability and skill level desired by companies, especially soft skills are insufficient.	Establishing a deep cooperation over OJT acceptance and equipment donations is an issue.
Technical Education Institutions	It is difficult to secure experienced trainers. Trainers themselves require company training.	Noticeable aging of facilities at public institutions. Equipment is available to a certain extent.	Company needs (basic academic knowledge and technical/soft skills) are not adequately reflected.	Training of engineers and technicians with the academic ability and skill level desired by companies, especially soft skills are insufficient.	There are many inadequate DTS institutions for industry partnering

Source: Prepared by the JICA Survey Team

In addition, public-private partnerships will be vital for IHRD. The successful examples of public-private partnership models in the Philippines have been classified and summarized in the table below.

Type	Good Practice Outline	Deployability
DTS (Dual Training System) as a core of human resource development and clearly defining the division of roles between private technical vocational training institutions and companies	・ At the Dualtech Center of the Calabarzon Region, which was highly appraised by companies, a DTS is employed where six months of basic training is received at school after which 18 months of practical training is received from the company. Since the company provided training is in a five day on-site and one day at school style schedule, the companies are not solely responsible for this training period and school instructors can monitor and follow-up on the students. At the school, only basic equipment is available, but since the facilities and equipment varies by company, company training can cover the practical training. The traits that companies desire in trainees are, to not be late, can communicate in a report/contact/discussion, can follow company rules, can think for themselves, etc. In other words, they have good labor ethics and work values. The school is in frequent consultation with the companies and engaged in improving the course.	・ This is thought of as having a moderate level of deployability. The main points being how thoroughly can the school instill soft skills such as labor morals and work values, and if the school can frequently consult with the company and apply company comments onto the course itself. Although similar programs to Dualtech Center's, such as Cebu's Center for Industrial Technology and Enterprise (CITE) etc. have receive high appraisals, mid-course management policy shifts

		have led to lowered evaluations from companies. ・ Public technical vocational training institutions may be able to deploy such a system, but there are few staff with the business mind necessary for interacting with companies.
Human resource development through strengthening collaboration between private universities and companies (OJT for students with lectures and teacher training given by company lecturers)	・ From an educational point of view, for universities no wage occurring OJT is more favorable than wage occurring DTS. ・ PATTS College of Aeronautics, like Dualtech Center, has clearly defined division of roles between itself and companies and has ample discussions with companies as to not overlap study content at the university and in-house training after hiring. Additionally, it emphasizes company wishes and comments, such as strengthening English language education by quickly responding to them. The main reasons for being able to quickly arrange self-study English equipment and materials were being a private university with an abundance of funds as well as having programs limited to aviation for which the necessity of acquiring English ability is high. ・ At the University of San Jose-Recoletos, lecturers from separate private companies were invited to give lectures on elective courses over multiple years. Being able to quickly accept the offer from the first company was a key factor in its success (at neighboring universities the inability to make a prompt decision lead to companies shelving their offer). The necessary equipment for the lecture were donated by the companies, but laboratory for the lecture was readied by the university. The improved continuality from carrying out teacher training as well is an important point.	・ Deployability is moderate. ・ Even among private universities, tuition is relatively expensive. Suitable for universities with money to spare for equipment expenses. ・ Necessary to have the management ability to make decisions and respond quickly to company offers and comments. ・ Deployable even at public universities if a management system that has the decisiveness to quickly respond to budget and man power issues is in place.
Human resource development through strengthening collaboration between public universities and companies (systemization of student OJT and construction of a management system)	・ Most ofindustrial technology colleges at public universities interviewed have very long OJT periods. Since companies have time to monitor students' qualifications and students can acquire ample skills, the hiring rate is high. Through its experience of managing training for many students each year, the Technological University of the Philippines in the City of Manilla has systemized the process from its OJT orientation to its post event follow-up and has organized its management system.	・ Highly deployable ・ For small scale universities, OJT management is not that difficult, but for large schools and technical vocational training institutions, follow-up is necessary to effectively manage a large number of OJT students.

Establishing funds through public and private partnerships	・ The Cebu Education Development Foundation for Information Technology is a fund founded by the Cebu Chamber of Commerce & Industry, Cebu Investment Promotion Centre, private companies, universities, and government agencies (DepEd 、 DTI 、 DOLE、TESDA etc.), ・ Discussions were held regarding the human resources needed for ICT industries and put into practice. Private companies also made certain contributions and could participate with an awareness of the involved parties.	・ By having companies participating in the project and bearing some of the expense, there may be an increase in companies' ownership, and it may lead to sustainability.

Source: Prepared by the JICA Survey Team

5. Human Resources Needs of Private Companies

When considering IHRD support, it is vital to grasp the needs of industry as to what industries require in their human resources. Therefore, to ascertain the human resources needs and associated challenges of private companies, as well as the measures companies undertake to secure and develop their human resources, the JICA survey team conducted document reviews and interviews with 32 companies, mainly in the electronics/electric and automotive industries. The following table summarizes the survey results.

Job type	Current status	Ideal employee	Future approach
Unskilled laborer (general workers or operators)	• Work on production lines • Lack basic knowledge and soft skills • Trained through OJT after joining the company • Tend to transfer out once they gain the necessary skills • Positions can be filled easily via recruitment	• Can carry out work according to procedures • Has basic knowledge • Is honest, dutiful, and follow instructions • Can work as part of a team	• Continue training via OJT • Improve soft skills
Technician	• Handle operations and management at production sites • Sometimes have little knowledge of machines • Employment linked to participation in OJT programs for students • Trained via OJT after joining the company • Tend to transfer out once they gain the necessary skills • Positions can be filled relatively easily via recruitment	• Understands basic machine operation • Has knowledge and skills related to drawings and welding • Has the basic skills needed to perform the work • Is proactive and flexible • Has communication skills and is cooperative	• Continue training via OJT • Improve soft skills • Prioritize accomplishments at university and vocational training institutions

Engineer	• Handle development, design, and production engineering • University education focuses on classroom instruction, lack practical skills • Employment linked to participation in OJT programs for students • Trained via OJT after joining the company • Tend to transfer out once they gain the necessary skills • Difficult to fill positions via recruitment, talent drain is a problem	• Can carry out development and design work • Has advanced IT skills • Thinks logically • Can provide guidance to technicians • Is proactive, flexible, responsible, curious, and cooperative	• Continue training via OJT • Improve soft skills • Prioritize accomplishments at university and vocational training institutions • Develop the ability to generate new ideas through creativity and innovation
Middle management	• Promoted from engineer and similar positions or hired from the outside • Middle managers who have worked their way up from the bottom are very rare • Retention rate is high after fifteen years of service • Difficult to fill positions	• Has a head for business and decision-making skills • Knows company products well and is concerned about customer satisfaction • Can make proposals to cut costs and improve quality • Can supervise employees	• Improve management ability • Enhance leadership training • Improve soft skills

Source: Prepared by the JICA Survey Team

6. IHRD Support from Japan and Other Development Partners

A review was made of ten projects[3] among JICA's completed and in-progress projects related to IHRD through project reports, related materials, interview with counterparts or responded to questionnaire, and interview with JICA experts. It grasps the current status and issues, and extracted the lessons learned from the project. Major lessons learned are listed below.

- **Significance of human resource development that meets the needs of industry**

  A clear definition and understanding of what kinds of human resources projects want and what kinds of work projects are training beneficiaries for enhances the understanding of both Philippines side and Japanese side involved in projects. Eventually this helps projects to become a success.

[3] 1) Project for enhancing vocational training of the Institute (PEVOTI), 2) Gender Responsive Employability and Training (GREAT), 3) Project for Supporting Senior High School(SHS) Program in Technical Vocational High Schools 4) AUN/SEED-Net, 5) Saitama-Cebu Comprehensive HR Monozukuri Project II, 6) Advanced IT Human Resource Development Project, 7) Study on the Supply Chain of the Philippine Electronics Industry, 8) Davao Industry Cluster Capacity Enhancement Project (DICCEP), 9) National Industry Cluster Capacity Enhancement Project (NICCEP), 10) Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology

- **Commitments of the stakeholders**

  The motivation, commitment, and leadership of all counterparts have a big impact on the success or failure of the project. It is necessary to make the results of projects be visible and to have the counterparts and participants experience practically as much as possible so that they can commit to the project more deeply and actively based on their realization.
- **Coordination among related organizations and stakeholders**

  It is critical to breed coordination and trust with all stakeholders who involved in projects, such as governmental organizations, local administrative organizations, industries, and other private enterprises.
- **Sustainability of a project result**

  It is necessary to internalize the result of the project into the government system through placement of personnel, budget allocation, placement of responsible Division/section etc. so that it would be sustainable.
- **Training via On the Job Training**

  In projects that aim to enhance capacities and skills, it is thought that not only lectures and seminars, but actual capacity development and technology transfer through OJT via practical experience are also effective.
- **Upgrading equipment**

  In projects related to industrial human resource development, the provision of the necessary equipment and facilities are thought of as essential. It may directly connect to the success of a project.

In addition, other development partners' activities were reviewed. The following table summarizes points to be considered in terms of coordination and cooperation with other development partners' activities for JICA to support IHRD in the Philippines in future.

Development Partner	Project Name	Relationships with JICA's Potential Support
Multilateral Development Partners		
Asian Development Bank (ADB)	Support for the Nationwide Rollout of JobStart Philippines (under preparation: 2017-2021, implementing agencies: local government units)	Sharing and exchanges of information on demand and supply sides in IHRD with the captioned support contributes to erasing the mismatch between the supply side and the demand side and promoting youth employment.
	Senior High School Support Program (on-going:2014-2019, implementing agencies: DepEd)	In cases where JICA supports senior high schools (technical and vocational track), the progress review report of the captioned program should be utilized as basic information.

	Facilitating Youth School-to-Work Transition Program(under preparation: 2017-2023, implementing agencies: DOLE, its attached agencies such as TESDA, the Department of Tourism and NEDA)	Depending on policy reforms on labor market programs and access to technical and vocational trainings and so on the captioned program will support, there is a possibility that JICA's support for individual schools may be affected, so the contents of policy reform should be monitored.
International Labor Organization (ILO)	The ILO was scheduled to support the establishment of DOLE's next employment and labor plan (2017-2021), but they are still waiting for the newly-formed Duterte administration to make preparations, and the support had not begun as of November 2016.	
World Bank (WB)	Skills Towards Employability and Productivity Study (on-going: 2015-2016)	The results of the captioned study will be utilized as basic information when JICA supports IHRD in the Philippines[4].
Bilateral Development Partners		
Germany	K to 12 PLUS Project(phase II) (on-going: 2016-2019, major Philippine partners: Philippine Chamber of Commerce and Industry, Cebu Chamber of Commerce and Industry, Bankers' Association of the Philippine)	In cases where JICA supports senior high schools (technical and vocational track), target pilot schools and occupations for the captioned project should be confirmed, and overlap should be avoided, or, in case of overlap, partnership strategies should be considered. Knowledge and experiences from the captioned project will be utilized in terms of ways of cooperation with commercial associations and industry groups.
United States Agency for International Development	Innovative Development Through Entrepreneurship Acceleration Project (completed: 2013-2016)	Knowledge and experiences from the captioned project will be utilized in terms of ways of promoting dialogue between /business and the education sector such as organizing round table meetings and exchanges of human resources.
	Higher Education and Productivity Project (completed: 2012-2015)	Knowledge and experiences from the captioned project will be utilized in terms of ways of promoting dialogue between /business and the education sector such as organizing round table meetings and exchanges of human resources.
	Science, Technology, Research, and Innovation for Development (on-going: 2013-2018)	Knowledge and experiences from the captioned project will be utilized in terms of promotion of joint research between businesses and universities, and promotion of dialogue between the industrial and education sectors such as organizing round table meetings and exchanges of human resources.

Source: Prepared by the JICA Survey Team

7. Development Opportunities and JICA's IHRD Cooperation Programs for Industrial Development

(1) Issues and Opportunities on Demand Side and Supply Side

Based on analysis of the demand side (human resources needs of private companies) and the supply side (educational, technical and vocational institutions), the development issues and opportunities which both governments will jointly work for to develop IHRD for industrial

[4] As of December 2016, the results were being finalized.

development are sorted out below.

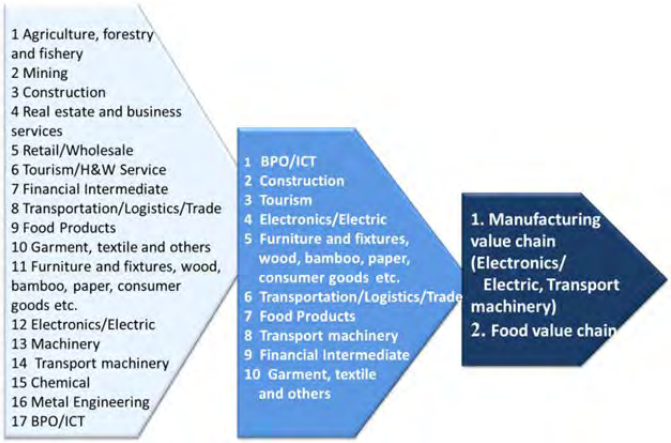
Issues and Opportunities on Demand Side	Issues and opportunities on the supply side
・ Recruitment difficulties in government-supported growth sectors ・ Learning practical skills for on-site use ・ Clarification of skills by educational level ・ Information sharing ・ Importance of soft skills such as work ethics, attitudes and interpersonal communication skills ・ Promotion of understanding of industry -specific corporate culture and career paths ・ Standardization of on-the-job training in educational and training institutions ・ Industrial development and human resource development in rural areas	・ Deepening dialogue with industry and companies ・ Reflection of the needs of industry in education content ・ Provision of opportunities and incentives for teachers/trainers to update their knowledge ・ Securing facilities and equipment in both quality and quantity ・ Strengthening career guidance and employment support services

Source: Prepared by the JICA Survey Team

(2) Analysis on the focal areas for JICA's Cooperation Program on IHRD for Industrial Development (idea)

Focal industries were narrowed down using three filters (consistency with Philippine national industry/economic development strategy/plan, necessity for support, comparative advantages of Japan's support) to support IHRD to spur industry development in the Philippines. The first filter selected 17 industrial sectors, and the second filter reduced the number of industrial sectors to 10 based on the necessity of support (potential for growth, demand for labor, need for higher degree of skills and boosting local industry). Following this, the third filter selected 2 value chains (manufacturing value chain such as electronics / electric and transport machinery, and food value chain) from the 10 industrial sectors remaining based on the comparative advantages of Japan's support (consistency of Japan's ODA policy and Japan's strength).

This survey is aimed at development of the industrial human resources necessary to spur industrial growth to strengthen competitiveness and promote entry into the global supply chain, so there will be a need to provide necessary support for the value chain of target industry sectors. Therefore, to support development of industrial human resources for the development of the Philippines industry, the suggested support areas are the manufacturing value chain (electronics/electronic, transport machinery) and the food value chain.



Source: Prepared by the JICA Survey Team

(3) Proposal of JICA's Cooperation Program on IHRD for Industrial Development (idea)

Based on the results of the analysis and discussions with the related agencies and organizations, the following JICA's medium and long-term IHRD cooperation program for industry development (idea) is proposed as below.

1) Policies and measures on development issues and opportunities

The cooperation program will pursue a two-sided approach through development of advanced human resources for high-growth industries in urban areas, and development of human resources who will contribute to sustained regional development aimed at expanding decent work in rural areas.

2) Tentative name

The JICA's medium and long-term IHRD cooperation program for industrial development is tentatively entitled Industrial Development and Human Resource Development Program.

3) Objective

The Industrial Development and Human Resource Development Program (tentative name) will support development of human resources which will contribute to the development of important industries from the perspective of boosting competitiveness and promoting participation in the global supply chain.

4) Outline

At the present time there is a mismatch in the Philippines between the content and level of education and training for development of human resources, and the labor market

situation and industry needs, and the human resources necessary for industrial development, therefore, have not been supplied. Under the Industrial Development and Human Resource Development Program (tentative name), the quality and skills of human resources required in high growth industrial fields will be specified, cooperation with key relevant institutions will be strengthened and a strategic demand-led human resource development model will be developed and supported.

5) Expected outcomes and approaches

The following approaches are proposed to achieve these outcomes.

Expected outcome	Approach to achieve the outcome
1. Establishing and dissemination of industrial human resource development models based on cooperation with the private sector that appropriately reflect labor market situation and industry needs	(1) The skills and level of human resources required in Special Economic Zones with high-potential industries and high concentration of advanced human resources will be clearly defined. To satisfy the human resource needs, an advanced human resources vocational training model will be formulated, tested and disseminated with the strategic participation of companies (and industry organizations) that will be the employers, universities and technical education institutions that will cultivate the human resources, and students who will pursue a career in growth industries. Promotion of dialogue with industry, companies, universities and technical education institutions and improvement of education content can be expected through this process.
	(2) Opportunities for industry-university interaction will be increased aimed at improving the mismatch of skills, and promotion of diverse industry-university cooperation activities will be supported, such as participation by companies in reviews of the engineering curriculum in universities, courses endowed by companies and acceptance of company visits. As well as cultivating human resources with a high degree of expertise who will play a role in technical innovation and technical R&D, development of human resources with knowledge of both technology development and business management who possess advanced management skills and can make appropriate decisions for the organization will be pursued.
2. Enhanced employability of the youth[5]	Capacity-building of school principals and teachers through high school programs (Technical Vocational/Livelihood track) in collaboration with local industry, and development of technical and vocational training course curricula (including local industry surveys, factory visits and work experience) to meet the needs of local industry will be supported. Counselling, aptitude testing and job guidance will also be provided in addition to vocational training to enhance employability. Knowledge and experience gained from prior projects will be leveraged at this time.

[5] Targets are assumed senior high school students.

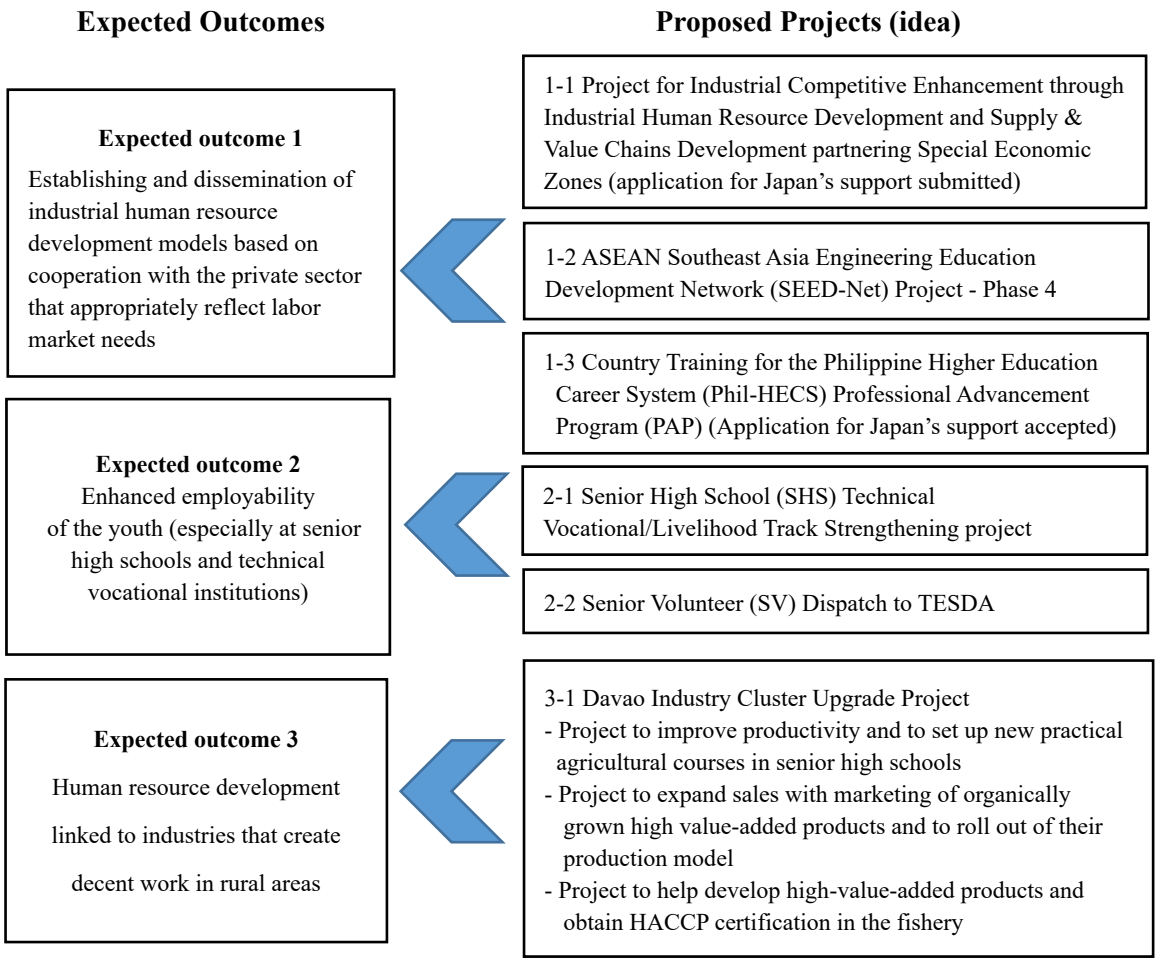
3. Human resource development linked to industries that create decent work in rural areas	Industrial promotion activities platformed on industry clusters developed and strengthened through initiatives so far will be implemented, contributing to further development of the industry clusters. Participation in the global value chain will be supported through improved productivity, human resource development and creation of high value-added products, leading to job creation and promotion of exports and FDI by contributing to improved competitiveness of industry, and contributing to industrial development in rural areas.

Source: Prepared by the JICA Survey Team

8. JICA's Potential Project Concepts for Industrial Development through Human Resource Development (idea)

(1) Expected outcomes under JICA's Cooperation Program on IHRD and potential projects

The following section presents the JICA's potential project concepts (idea) needed in order to attain the expected outcomes under JICA's Cooperation Program on IHRD. The connections between the expected outcomes and proposed projects are as shown in the chart below.



(2) JICA's Potential Project Concepts (idea)

The JICA's potential project concepts (idea) are proposed in the table below.

1-1 Project for Industrial Competitive Enhancement Through Industrial Human Resource Development and Supply & Value Chains Development Partnering Special Economic Zones (application for Japan's support submitted)

Project purpose	Effective Models of IHRD and SVCD are developed through pilot projects at targeted SEZ.
Outputs	1. Specific needs for IHRD and SVCD in targeted SEZs are identified through dialogues with private sector and a series of JICA surveys. 2. Better operational models of TESDA training programs in partnership with companies at target SEZ are developed with addressing job-skill mismatch between TESDA graduates and companies in target SEZs. 3. Better operational models including "immersion" and curriculum adjustment of State Universities and Colleges (SUGs) related higher-education programs to address job – technology mismatch between universities graduates and in target SEZs are developed by support of CHED 4. Linkage between large/foreign companies in targeted SEZ and local suppliers are promoted through a series of intervention measures including, but not limited to, TESDA/CHED training and education programs. 5. Recommendation of future programs for IHRD and SVCD are made based on the lessons learned in the pilot projects,

Source: Project application form for Japan's technical cooperation (DTI, September 19th, 2016)

1-2 ASEAN Southeast Asia Engineering Education Development Network (SEED-Net) Project - Phase 4

The introduction of a new program, "Industrial Human Resource Development program" is to be considered in the SEED-Net Project Phase 4. This program could be considerable to include 1) internship program, 2) Project-Based Learning (PBL), 3) sponsored program by industry, 4) visit and training program for university teachers in private companies, etc. for its' effective implementation and to respond to the demand for the support in the higher education (in the engineering field) in the Philippines.

Also, when the program will be designed and implemented, it is desirable to establish a function (the third person) that play a role in deepening understanding between education and industry based on the practice of the USAID projects described above.

1-3 Country Training for the Philippine Higher Education Career System (Phil-HECS) Professional Advancement Program (PAP) (application for Japan's support accepted)

Project purpose	1. To expose participants to the various issues, styles, practices and paradigms involving leadership and governance to enhance their capability and competence as leaders of Philippine Higher Education Institutions. 2. To provide opportunity for the participants to benchmark their standards vis-à-vis the standards of leadership and governance in Japan. 3. To allow CHED to evaluate the Phil-HECS PAP through the conduct of an individual performance evaluation of participants during the pilot run of PAP. 4. To allow CHED to determine the practicality of incorporation foreign visits into the program. 5. To use the results of the assessment to be conducted by JICA on the participants to complement efforts to evaluate the foreign learning visit.
Outputs	1. Plan of action to improve respective SUCs based on knowledge gained from the study visit. 2. An end of project report that will thoroughly discuss the results of the implementation of the proposed project.

Source: Project application form for Japan's technical cooperation (CHED, July 28th, 2016)

2-1 Senior High School (SHS) Technical Vocational/Livelihood Track Strengthening Project

Project purpose	To enable SHSs (target schools) to operate the high quality "technical vocational/livelihood" track based on the needs of local industries
Outputs	1. To conduct surveys on local industrial needs and SHS in the region and select target schools for the project. 2. To develop and implement the "technical vocational/livelihood" track standard package. 3. To strengthen the skills of the project-target principals, teaching staff members, and schools in the region to be able to operate courses based on the standard package. 4. To share the standard package used in the target schools with other SHSs in and out of the region and to have the DepEd utilize the case examples of the target schools to revise various guidelines. 5. To strengthen the collaboration with the local industries.

Source: Prepared by the JICA Survey Team

2-2 Senior Volunteer (SV) Dispatch to TESDA

Instead of assuming JICA (SV) to cover all the following support areas 1-3 (tentative), SV shall be dispatched on TOR (Terms of Reference) to support the areas designated by TESDA as the least satisfactory in terms of manpower, knowledge, and experience.

[Support area 1 (tentative)] Development support for TESDA qualification Training Regulation(NC III, NC IV, diploma)	Advices shall be given based on the knowledge and experience accumulated in Japan to develop higher-level Training Regulations for TESDA qualifications (NC III, NC IV, and diploma) in response to the needs. The assumed areas include automotive-, electronics/electrics-, and agriculture/forestry/fisheries-related areas.

[Support area 2 (tentative)] Support bundling of mutually-related multiple TESDA qualifications into a package.	Advices shall be given to TESDA agencies in concern, based on the knowledge and experience accumulated in Japan when bundling mutually-related multiple TESDA qualifications (Example: bundling of NC I to NC IV in the same course, bundling of mutually-related but different courses, such as the ones for painting and repair of automotive) into a package, in response to the needs. The target areas will be automotive, electronics/electrics, and agriculture/forestry/fisheries related areas.
[Support area 3 (tentative)] Train trainers to teach TESDA qualification courses （NC III, NC IV, diploma).	Advices shall be given based on the knowledge and experience accumulated in Japan when TESDA is developing trainers to teach the courses developed and packaged in Support areas 1 and 2 (tentative).

Source: Prepared by the JICA Survey Team

3-1 Davao Industry Cluster Upgrade Project

This project is made up of three sub-projects: “Project to improve productivity and to set up new practical agricultural courses in senior high schools”, “Project to expand sales with marketing of organically grown high value-added products and to roll out of their production model”, “Project to help develop high-value-added products and obtain HACCP certification in the fishery”. Shared purpose and outputs are shown in the table below.

Project purpose	・ To contribute to the further development of industry clusters through industrial promotion activities, utilizing the existing clusters developed and strengthened in the “Davao Industry Cluster Capacity Enhancement Project (DICCEP)” and “National Industry Cluster Capacity Enhancement Project (NICCEP)”. ・ To contribute to the local industry development by creating more employment and promoting export/FDI ・ To roll out the approach of the successful model to other clusters.
Outputs	1. Develop human resources necessary for the growth of the cluster through the public-private-academia collaboration. 2. Create activity cases of dynamic industry clusters through contributing to the improvement of industries' competitiveness by supporting them in productivity improvement, human resource development, and participation in the global value chain. 3. Establish a platform and approach which allow the clusters to share information with each other, promote corporation, and overcome common challenges.

Source: Prepared by the JICA Survey Team

Chapter 1 Survey Outline

1-1 Survey Background

The population of the Republic of the Philippines (hereinafter, "the Philippines") has been on the rise since 1903 when the nation took their first census, marking 100 million people in 2015. Since its median age of the population is just 24.2 years old (2015), which is one of the third youngest among the ASEAN countries[6], and its productive age population ratio (2015) is high[7], the demographic bonus period during which the labor force boosts economic growth, is expected to continue for the time being. This has become an important and positive element for the future economic growth of the Philippines.

On the other hand, the unemployment rate (2010) in the Philippines is higher than in neighboring countries[8], which is contrary to the economic growth expectations that take advantage of the population bonus, and new job creation has not caught up to the working age population increase. Since 2012, the Philippines has maintained a high economic growth rate among major ASEAN countries, the largest contributor is private consumption (5.3%)[9] on the demand side. What supports this strong economy is firm consumer spending propped up by remittances from Overseas Filipino Workers (OFW) which amounts to 29.7 billion US dollars in 2015[10] equivalent to 10% of GDP and the IT-BPO (Business Process Outsourcing) brought 21.2 billion US dollars in 2015[11], which are not necessarily the result of the development and promotion of domestic industry. Among these factors, the proportion of investment (gross fixed capital formation) accounting for gross domestic production (GDP) is extremely low even among neighboring countries, and the downturn in foreign direct investment (FDI) related to the manufacturing industry is remarkable. Compared to IT-BPO to which mainly graduates of higher education are subject, the manufacturing industry, which supports significant domestic job creation, has not matured. Consequently, this industrial composition has pushed the unemployment rate up in the Philippines and the development and promotion of domestic industry has become an urgent issue.

For all of the manufacturing sectors above, the government of the Philippines specifies the development and promotion of domestic industry as development agenda in the "Philippine Development Plan 2011-2016" and formulated a roadmap through the "Manufacturing

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[6] Brunei Darussalam: 30.6 years old, Cambodia: 23.9 years old, Indonesia: 28.4 years old, Loa: 21.9 years old, Malaysia: 28.5 years old, Myanmar: 27.9 years old, Singapore: 40.0 years old, Thailand: 38.0 years old, Vietnam: 30.4 years old. Source：「World Population Prospects: The 2015 Revision」（Department of Economic and Social Affairs, Population Division, United Nations）

[7] Brunei Darussalam:72.3%, Cambodia: 64.2%, Indonesia: 66.9%, Loa: 61.1%, Malaysia: 69.4%, Myanmar: 66.7%, Philippines: 63.3%, Singapore: 73.1%, Thailand: 71.9%, Vietnam: 70.3%, Source：「Key Indicators for Asia and the Pacific 2015」（Asian Development Bank (ADB)）

[8] Brunei Darussalam: 2.9%, Cambodia: 0.4%, Indonesia: 7.1%, Lao: 1.9%, Malaysia: 3.3%, Myanmar: 4.0%, Philippines: 7.3%, Singapore: 2.8%, Thailand: 1.0%, Vietnam: 2.7%, Source：「Key Indicators for Asia and the Pacific 2015」（Asian Development Bank (ADB)）

[9] JETRO Manila、2016 年 9 月

[10] https://psa.gov.ph/content/total-number-ofws-estimated-24-million-results-2015-survey-overseas-filipinos

[11] http://www.mb.com.ph/it-bpm-revenue-seen-hitting-3b-in-2016/

Resurgence Program (2015-2025)", and is undertaking job creation through domestic manufacturing industry development. On the other hand, there is a more imminent challenge in the expansion of employment opportunities in rural areas and further advancement of industrial development and promotion policy, with a focus on manufacturing and major regional industries, is essential to promote employment in order to achieve "inclusive growth" listed as a target by the government of the Philippines, where every year about 1 million graduates enter the labor market, and also for the future.

In addition, while industrial human resource development (IHRD) is necessary as foundation in order to develop and promote industry, young people account for half of the unemployed population and many young graduates of secondary and higher education take a few years to ensure their employment. Consequently, resolving the mismatch of vocational skills and technologies has become a problem. For that reason, the industrial development/promotion policy of the government of the Philippines and human resource development, that reflects industry's needs, has become an urgent task in educational institutions, and technical and vocational training institutions.

For the sake of economic growth through Foreign Direct Investment (FDI) promotion, the sophistication of industrial human resources in the Philippines is also important. In countries such as Thailand and Indonesia, by accepting foreign investment, the manufacturing base of the automotive and electronics industries has been developed, cultivating human resources with advanced skills at the same time, and those countries have come to be assessed as good investment destinations. There are also delays in the investment environment and infrastructure development of the Philippines, which has been lagging behind other ASEAN countries whose manufacturing industries were strengthened, starting in the 1980s, through the introduction of foreign capital. However, in the Aquino government after 2010, the strengthening of FDI acceptance and manufacturing has been actively promoted, so FDI is on the rise with the annual growth rate of the manufacturing industry also rising to about 6%. Thus, the ratio of the manufacturing industry to GDP has had a slight increase in recent years. From now on, to raise the competitiveness to enhance and improve the productivity of technical capabilities even more, the development of high quality human resources has become an urgent issue.

Japan is the largest investor country in the Philippines and many local Japanese subsidiaries realize that the greatest benefit of investment in the Philippines is "having an abundant labor force that is inexpensive and can speak English". Thus, investment promotion in the Philippines is expected to contribute to economic growth even further through the development of high quality industrial human resources.

The "industrial human resource development cooperation initiative" for the purpose of establishing and upgrading the core industries was presented by Prime Minister Abe in the Japan/ASEAN summit meeting in November 2015, in order to sustainably boost comprehensive growth and further ASEAN integration.

Furthermore, the newly-formed Duterte administration has adopted, as one of the important issues in its 10-Point Socioeconomic agenda, investment in the development of human capital including in the health and education systems through the provision of vocational and educational training to meet the needs of the industrial sector.

In light of this, the need to promote cooperation is growing for the development of industrial human resources, which contribute to the expansion of employment opportunities in the Philippines, to support industrial development through human resources, and also to contribute to the fulfillment of the human resource demands of local subsidiaries of Japanese companies in the Philippines.

1-2 Survey Outline

1-2-1 Survey Purpose

The main objective of this survey is to examine and propose JICA's medium and long-term cooperation program (idea) in the industrial human resource development which contribute to industrial development, based on JICA's previous cooperation results along with analyzing development agenda in the advancement of industrial human resources in the Philippines. The cooperation program will provide a basis for future implementation of JICA's cooperation in this field in the Philippines for next 10 years.

Firstly, development agenda for the medium to long-term industrial human resource development in the Philippines will be analyzed. The tasks include gathering and analyzing information related to the national or industrial development policies or strategies in the Philippines, and also information related to the achievements and issues of the relevant on-going and completed projects with the Japanese government/JICA. After compiling these results, the directions for the JICA's medium and long-term IHRD cooperation program for the next 10 years will be proposed.

Secondly, necessary information is collected to examine and propose JICA's potential projects' concepts in line with the development agenda and directions of the proposed JICA's medium and long-term IHRD cooperation program which is analyzed above. The JICA's potential projects' concepts will be proposed, considering the utilization of various cooperation schemes, such as ODA loans, grant aid and technical cooperation.

1-2-2 Target Areas

Target areas are throughout the Philippines. However, target areas where surveys on the existing situation will be conducted are: Metro Manila, Cebu, Davao and Calabarzon.

1-2-3 Related Agencies and Organizations

National Economic and Development Authority (NEDA), the Department of Trade and Industry (DTI), the Philippine Economic Zone Authority (PEZA), the Department of Education (DepEd),

the Commission on Higher Education (CHED), the Department of Labor and Employment (DOLE), the Technical Education and Skills Development Authority (TESDA), the Department of Science and Technology (DOST), Department of Agriculture (DA), the Professional Regulatory Commission (PRC) and the Department of Finance (DOF)

1-3 Structure of the Report

The report consists of 8 chapters. Chapter 1 outlines the survey; to present the circumstances surrounding IHRD, the following Chapters 2 and 3 will review industry and economy of the Philippines as well as trends in the labor market while outlining strategies and programs for the expansion of industry, economy and IHRD. In Chapters 4 and 5 an analysis of the current situation and issues will be made relating to the supply side and the demand side respectively of industrial human resources. In Chapter 4, an analysis of the current situation and issues will be made with the focus placed on the educational institutions and technical and vocational training institutions that play a major role in the supply of industrial human resources. In Chapter 5, the focus will be on the efforts of companies to secure industrial human resources and the issues they face, based on a document review and interview surveys. Since many of the development partners of the Philippines, including Japan, are engaged in IHRD and the problem of employment for the younger generation, in Chapter 6 the relevant assistance by development partners including Japan will be reviewed and instructive experiences and lessons deduced. In Chapter 7, following classification of the development issues and opportunities in the field of IHRD and an analysis of the industrial sectors that are potential candidates for support, the JICA's medium to long-term IHRD cooperation program (idea) will be proposed, based on an analysis of Chapters 1 to 6. In Chapter 8, a detailed project concept plan will be proposed, based on the proposed JICA's medium and long-term IHRD cooperation program.

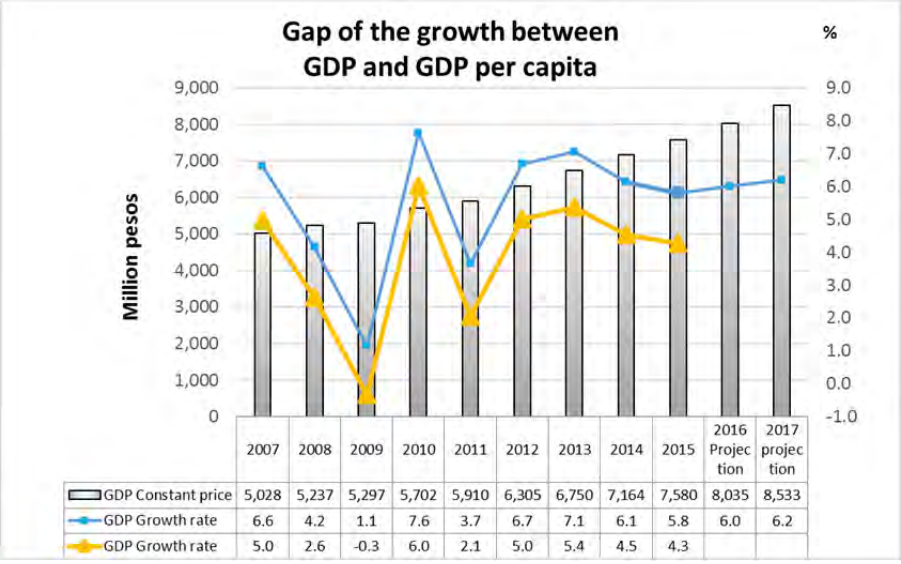
Chapter 2 The current status and issues of the social and economic development in the Philippines

2-1 Current status of Philippine's industry and economy

2-1-1 Overviews of industry trend in Philippines

Since 2014, Philippine's economy is growing steadily. IMF predicts its GDP will grow to 8,035 billion pesos in 2016 from 7,590 the previous year, and to 8,533 in 2017, with the growth rate from 5.8% in 2015, and predicted to grow up to 6% in 2016 and 6.2% in 2017, thanks mainly to strong consumer spending and capital investment. This strong growth is underpinned by the service industries such as trade & repair, finance intermediates, real estate as well as construction and the manufacturing industry[12].

However, although the national GDP grows steadily in the Philippines, the growth rate for GDP per capita is much lower, meaning that the household income has not been increasing as much as it should.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 Projection	2017 projection
GDP Constant price	5,028	5,237	5,297	5,702	5,910	6,305	6,750	7,164	7,580	8,035	8,533
GDP Growth rate	6.6	4.2	1.1	7.6	3.7	6.7	7.1	6.1	5.8	6.0	6.2
GDP Growth rate	5.0	2.6	-0.3	6.0	2.1	5.0	5.4	4.5	4.3		

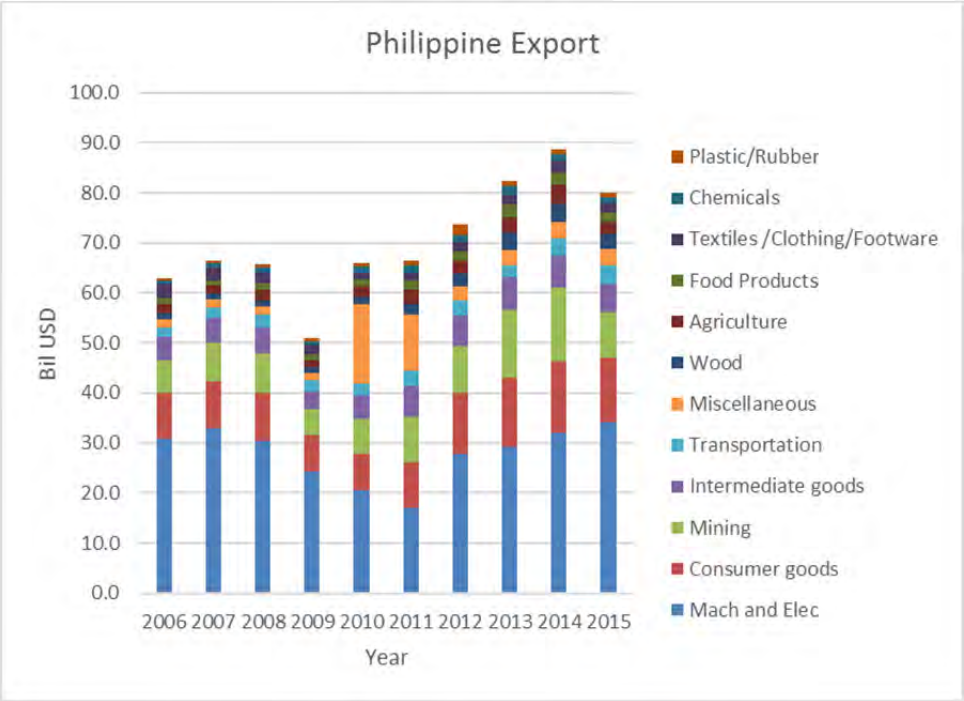
Source: Prepared by the JICA Survey Team based on the data from IMF World Economic Outlook Database, April 2016 on GDP, and WB（http://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG?locations=PH） on GDP Per capita growth rate

Figure 2-1 Transition of GDP

Looking at export in 2015, the total value was down from the previous year mainly because of agri-produce's decrease by 23% due to the damage caused by El Niño, and plunged Mining by 30% because of the fierce price competition against China, Indonesia and others on nickel and iron ore. However, the export of manufacturing products remained strong, with only 2% down,

[12] As can been calcurated in Table 7-2 below, CAGR for 2012- 2015 is 6.26% for Trade/Repair, 8.5% for Financial Intermediation, 8.27% for Real Estate Services, 8.08% for construction and 9.69% for manufacturing, which is higher thatn GDP Growth in 2015.

supported by the export increase of electronics products, up by 15%, as well as wiring sets, by 4.5% and consumer products.



Source: Prepared by the JICA Survey Team based on the data from WB WITS

Figure 2-2 Transition of total export value

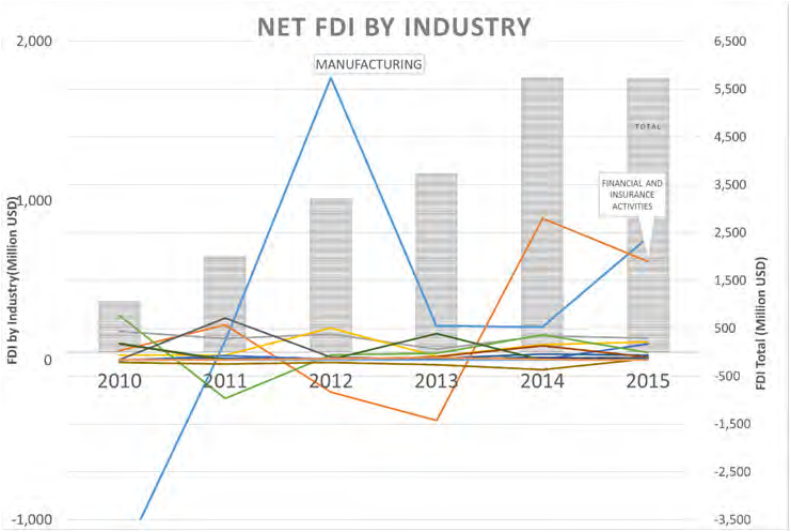
Table 2-1 Transition of Value on Major Export Items

EXPORTS OF Major GOODS (current prices, in M pesos)	2010	2011	2012	2013	2014	2015	14-15 growth rate
Electronic components	1,402,444	1,019,512	954,479	872,172	988,076	1,145,337	15.9%
Principal Agricultural Products	96,317	140,007	108,857	127,887	148,034	105,418	-28.8%
Principal Fishery Products	17,298	15,088	18,441	29,946	22,232	14,722	-33.8%
Articles of Apparel and Clothing Accessories	76,759	82,074	66,496	68,129	83,060	64,891	-21.9%
Basketworks	2,025	2,059	1,955	2,429	3,099	2,745	-11.4%
Cathodes & Sections of Cathodes, of Refined Copper	35,280	54,197	18,332	27,024	18,587	14,303	-23.0%
Ignition Wiring Sets	49,931	48,022	61,070	69,224	85,184	89,034	4.5%
Metal Components	34,930	34,184	87,110	73,617	73,760	60,306	-18.2%
Petroleum Products	16,599	31,231	18,730	35,853	18,815	13,270	-29.5%

Source: Prepared by the JICA Survey Team base on the data from DTI-BOI
（http://industry.gov.ph/exports-by-major-sector-goods/）

The total FDI inflow to the Philippines has also been steadily growing, with 3,737 million USD

in 2013, increased to 5,740 in 2014 and slightly down to 5,724 in 2015[13]. However, looking at the value by industry, manufacturing FDI has been highly fluctuating, plummeted to 200 million USD in 2013 from 1,770 in the previous year, remained low till 2015. Though it was recovered to 773 million USD in 2015, it still has not come back to the previous level yet. It might be because Philippine's FDI tends to flow into the export industries such as auto parts (ex. wire harness) or electronics (ex. semiconductors), which are highly influenced by the international market prices and the price down for these products can negatively influence the investors' go/no-go decision making.



Source: Prepared by the JICA Survey Team base on the data from PSA NET FOREIGN DIRECT INVESTMENT (http://data.gov.ph/catalogue/dataset/foreign-direct-investment-statistics-2015/)

Figure 2-3 Total FDI Inflow to the Philippines

2-1-2 The Philippines in the ASEAN 5

In China's transition from the manufacturing to service industry based economy, high labor cost and uncertainty of the future growth due to the rapidly aging population, have contributed to the slowdown of the Chinese economy[14]. This has brought both positive and negative effects on the ASEAN economies.

Against the backdrop of the Chinese economy, the competition for China+1 position among ASEAN 5 has been getting fierce. The World Bank "Ease of Doing Business (EDB)"and "World Economic Forum Global Competitiveness Index (GCI)" ranks of 2016-2017 are as shown in the table below.

[13] http://www.bsp.gov.ph/statistics/spei_pub/Table%2010.pdf
[14] Asian Development Outlook 2016: Asia's Potential Growth

Table 2-2 The Rank for EDB and GCI 2016-2017

Rank	EDB	GCI
Malaysia	23	25
Thailand	46	34
Vietnam	82	60
Philippines	99	57
Indonesia	91	41

Source: Prepared by the JICA Survey Team based on the information from WB, World Economic Forum

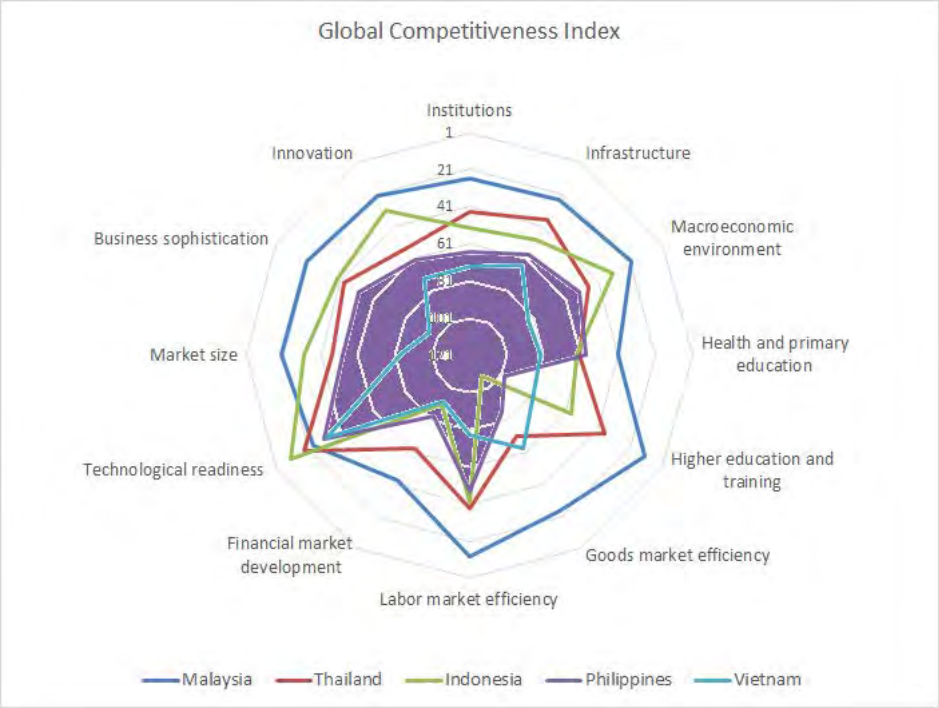
As can been seen in Figure 2-4, Philippine's score (purple part) is rather imbalanced and highly varied across individual indicators.

Philippine is the 4th place among 5 in EDB and 5th in GCI. The country has the lowest score in "Getting Credit[15]" and "Protecting Minority Investors[16]" which are fundamental to establish companies or corporations in the country, while the lowest in "Higher Education and Training[17]" in GCI, which are the prerequisites for decision making matrix for overseas and domestic investors. Its rank at GCI has improved from the 52nd to 47th in 2015, but own to the 57th in 2016, with rank among ASEAN 5 unchanged. It can be also perceived that Philippine's score is rather imbalanced.

[15] This indicates that the collateral and bankruptcy laws are not well organized and the public credit registry system is not established in the Philippines, and therefore failed to protect the rights of borrowers and lenders and thus facilitate lending

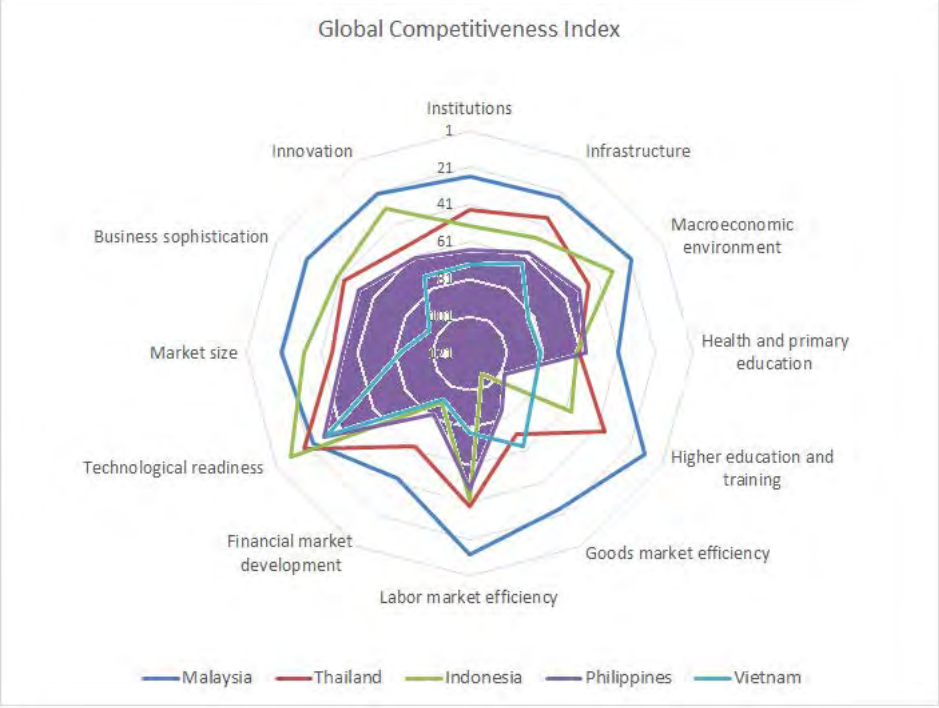
[16] This indicates that the conflict of interest regulation and shareholder governance as well as the laws and regulation on disclosure and shareholder suits are not well established.

[17] Among the assessment criteria, i.e., 1) Secondary education enrollment rate gross,2) Tertiary education enrollment rate gross, 3) Quality of the education system, 4) Quality of math and science education, 5) Quality of management schools, 6) Internet access in schools, 7) Local availability of specialized training services, 8) Extent of staff training, the score was down in 3, 4, 5, 8. Especially, down in 3) Quality of the education system was the biggest.



Source: Prepared by the JICA Survey Team based on the data from WEF

Figure 2-4 GCI for ASEAN 5

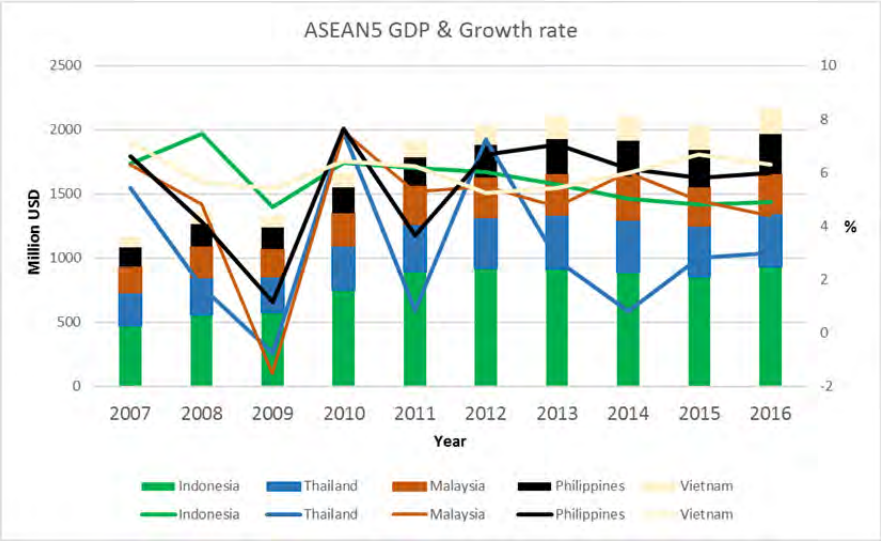


Source: Prepared by the JICA Survey Team based on the data from WB and WEF

Figure 2-5 EDB for ASEAN 5

2-1-3 ASEAN Economy

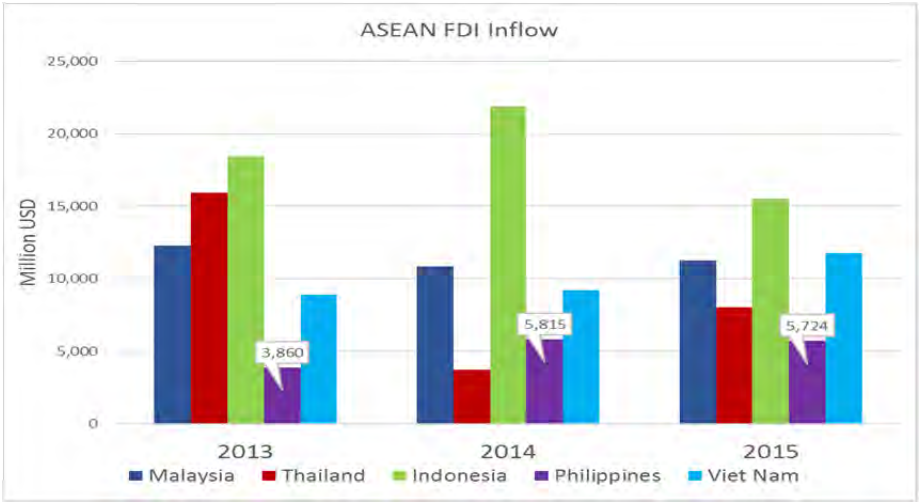
Philippine's GDP value is the 4th below Malaysia and above Vietnam among ASEAN5, its growth rate is the 2nd highest, following Vietnam in 2015. The GDP of Indonesia with its largest population is the top, followed by highly industrialized Thailand.



Source: Prepared by the JICA Survey Team based on the data from IMF, World Economic Outlook Database, April 2016

Figure 2-6 Transition of GDP for ASEAN5

As with FDI, Philippines had been the least recipient except 2014 when Thailand was badly affected by the flood. Looking at the total FDI since 2013, Indonesia has earned the most, due to its aggressive investment promotion policies. FDI has grown steadily for Vietnam where the labor cost is the lowest among 5.

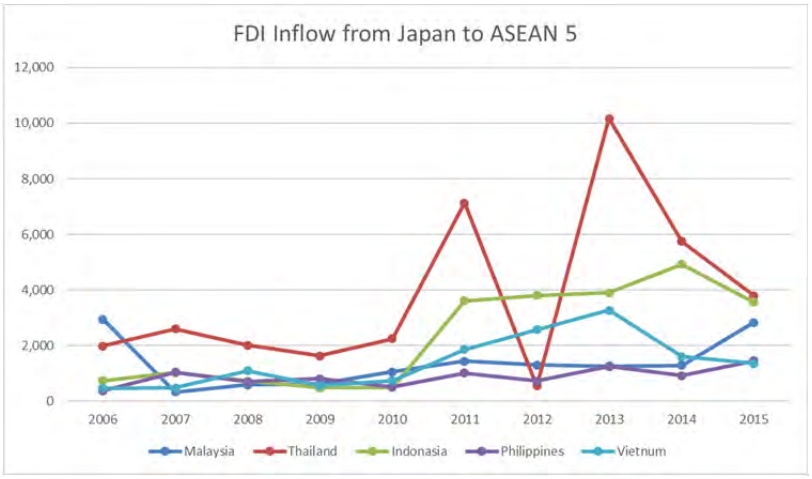


Source: Prepared by the JICA Survey Team based on Asean.Org
(http://asean.org/storage/2015/09/Table-251.pdf)

Figure 2-7 Transition of FDI inflow for ASEAN5

As for FDI from Japan, the Philippines has been earning steadily, and took over Vietnam and became the 4th in 2015 for the first time since 2009[18]. It is expected to grow due to the establishment of ASEAN Economic Community (AEC) and its incentives such as the Comprehensive Automotive Resurgence Strategy (CARS).

According to JETRO's survey[19], however, the next destination for Japanese companies to invest, Vietnam is the top in 'Iron/Nonferrous metals/Metals', 'Chemical /Pharmaceutical' and 'Electric machinery', and India in 'Motor vehicles/Motorcycles'. Philippine is not listed in any of these industries. The same survey found that the issues for Japanese companies to face when entering the Philippine market are: "Difficulty in local procurement of raw materials and parts" as the 1st, followed by 'Difficulty in quality control' and "Quality of employees" comes the 3rd, which demonstrates its inadequate human resources development.



Source: Prepared by the JICA Survey Team based on JETRO

(https://www.jetro.go.jp/world/japan/stats/fdi.html)

Figure 2-8 FDI from Japan

One of the strengths Philippines can offer is its cheaper labor cost. Although it is ranked at the 3rd among ASEAN5, the difference between the Philippines and Indonesia, the 4th is almost negligible. Taking the monthly salary of 'Worker (general)' in Manila, it is 268 USD, while 252 in Jakarta, but once the bonus is taken into account, the annual salaries are 3,682 and 3,573 respectively, with only the balance of 110 USD.

[18] Thai FDI's decrease due to the flood is not considered

[19] 2015 JETRO Survey on Business Conditions of Japanese Companies in Asia and Oceania

Table 2-3 Monthly Base Salary in ASEAN 5

USD/Month		Kuara Lumpor (Malaysia)	Bangkok(Thailand)	Manila (Philippine)	Jakarta (Indonasia)	Cebu (Philippine)	Ho Chi Ming (Vietnam)	Hanoi (Vietnam)	Phnom Penh (Cambodia)
Manufacturing	Worker(general)	418	363	268	252	234	185	173	113
	Engineer(mid-level)	924	669	386	408	340	351	396	323
	Mid management(Managerclass)	1,715	1,461	1,077	974	795	783	859	668
Non-manufactring	stuff (general administration)	915	651	501	411	514	477	441	434
	Manager(Managerclass)	1,877	1,530	1,274	1,153	1,788	1,202	1,048	965
	shop stuff (aparell)	424	339	259	291	189	165	n.a.	110～150
	shop stuff (restaurants)	311	339	259	230	189	122～141	n.a.	90～120
Minimum wages set by law		(1)254 (2)226	9.09 (per day)	10 (per day)	214	7.60 (per day)	146	146	128
Bonus(fixed+fractuated) (months of the basic salary)		1.98	3.11	1.74	2.18	1.22	1.59	1.66	0.98

Source: Prepared by the JICA Survey Team based on JETRO Investment Cost Comparison data

Unemployment rate of the Philippines in 2015 is the highest in ASEAN5, 6.3%, which could be one of the reasons why about 10 million Filipinos and their families have left the country for better opportunities abroad[20]. Indonesia's 6.18% and the ones for Malaysia and Vietnam are much lower at 3.15% and 2.4% respectively. Remarkably, it was 0.88% in Thailand, lower than 1%. In the same year, the GDP growth rate is 5.8% for the Philippines, while 4.8% for Indonesia, 5% for Malaysia, 6.7% for Vietnam. It was 2.8% for Thailand, which is the lowest among 5, nonetheless, Thai FDI inflow remains strong, up by 2.1% from the previous year, and the one for Chemical/Paper increased grew 2.5 times, its Service/Infrastructure increased by 2.8%. This explains that the industries which generate employment are developing steadily, causing the chronical scarcity of human resources at the same time. The industry growth in Malaysia demonstrated well balanced growth, with its agriculture grew by 1.2%, mining 4.7%, manufacturing 4.9% and the service 5.1%, thanks to its government support for the low income communities and strong domestic consumption demand. By the same token, all industry sectors in Vietnam showed strong growth, the agriculture, forestry and fishery 2.4%, industry/construction 9.6%, service 6.3%. The export by the FDI manufacturers of mobile phones, home electronics and others were growing strongly, which contributed 10.6% growth to the manufacturing industry and drove the Vietnam's overall economic growth. Though the GDP growth in Indonesia went down below 5 % for the first time in the past 6 year and shows some uncertainty, the manufacturing which accounts for 21% of the nominal GDP grew by 4.3% from the previous year, among which notable was ICT (10.0%). Finance and insurance services (8.5%), Construction (6.7%), Transport and storage (6.7%). In all countries except the Philippines, the industry development underpinned by the government support and private investment and drives the growth of the industries and generates employment[21].

[20] Mitsubishi UFJ Research and Consulting, "The current status and prospects of the Philippine economy: The reason for its constant growth, and the possibility of the further growth", March 2015

[21] JETRO World Trade & Investment Report

2-1-4 Poverty reduction

Philippine employs two indicators in terms of poverty assessment: 'Food Threshold' and 'Poverty Incidence'. The former is the minimum income required to meet basic food needs and satisfy the nutritional requirements to measure extreme or subsistence poverty, while the latter includes basic non-food needs such as clothing, housing, transportation, health, and education expenses.

Poverty Incidence in 1Q of 2015 was estimated at 26.3 %, down from 27.9 % in the same period of the previous year and the proportion of Filipinos whose incomes fall below the Food Threshold was estimated at 12.1 % slightly down from 13.4%.[22] However, when looking at the figure in two-decade duration period from 1991 to 2012[23] among ASEAN5, Malaysia and Thailand almost eradicated 'Poverty', and the number of people categorized as living under the poverty line in Indonesia reduced to about a third, in Vietnam to a tenth, while it reduced only by less than a third in the Philippines from the figures as of 1991.

Table 2-4 Poverty Headcount Ratio at $1.90 a Day (2011 PPP) (% of population)

Philippines		1991	1994	1997	2000	2003	2006	2009	2012
	No	**17,400,000**	**17,100,000**	**12,900,000**	**14,300,000**	**14,000,000**	**14,400,000**	**11,000,000**	**12,600,000**
	%	**27.5**	**25**	**17.7**	**18.4**	**16.8**	**16.5**	**12**	**13.1**
Indonesia		1990	1993	1996	1999	2002	200505	2008	2010
	No	103,900,000	108,900,000	91,700,000	83,400,000	50,900,000	48,900,000	50,100,000	38,400,000
	%	57.3	57.1	45.9	40	23.4	21.6	21.3	15.9
Vietnam		1992	1993	2002	2004	2006	2008	2010	2012
	No	33,700,000	0	30,800,000	22,100,000	18,300,000	13,800,000	4,200,000	2,900,000
	%	49.2		38.8	27.1	22	16.2	4.8	3.2
Thailand		1990	1992	1997	2000	2002	2006	2009	2012
	No	5,300,000	3,800,000	100,000	1,600,000	700,000	500,000	100,000	0
	%	9.4	6.7	0.4	2.6	1.1	0.7	0.2	0.1
Malaysia		1992		1998	2004			2009	
	No	200,000		26,300,000	1,100,000			100,000	
	%	1.3		34.8	4.4			0.3	

Source: Prepared by the JICA Survey Team based on the WB poverty data

The poverty reduction in the Philippines is remarkably slow.

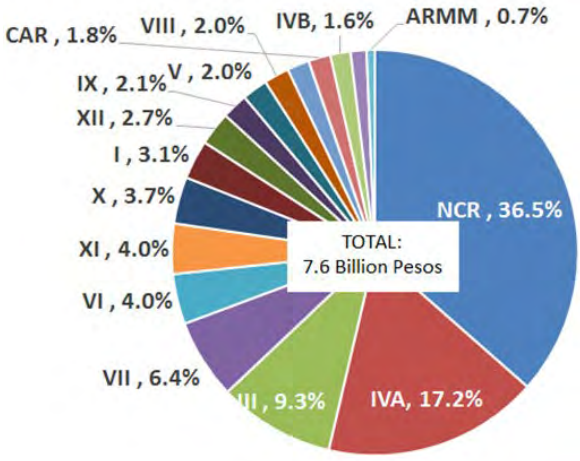
2-1-5 The gaps among regions.

There is a big gap between the urban and rural areas in terms of the regional domestic product.

National Capital Region (NCR) occupies 37% of the total GDP, and the three urban regions, NCR, Calabarzon (IVA) and Central Luzon (III) account for 63% of the total GDP. By the same token, there is a wide gap in terms of the wage. Inevitably, NCR has the highest annual income, 375,000 pesos, followed by Calabarzon's 243,000 and Central Luzon's 211,000. The rest of 15 regions have lower-than-the-average income, 193,000 pesos. The gap is wide between NCR, the highest, and Region IX Zamboanga Peninsula, which is the lowest at 122,000 and a third of NCR's.

[22] https://psa.gov.ph/sites/default/files/Press%20Release%20final_0.pdf

[23] The years to be measured are one or two years different due to the data availability



Source: Prepared by the JICA Survey Team based on PSA REGIONAL ACCOUNTS OF THE PHILIPPINES

Figure 2-9 Gross Regional Domestic Product 2015 (2000 constant price)

Table 2-5 Household Average Income (thousand pesos)

Region	2006		2009		2012	
	Average Income	Average Expenditure	Average Income	Average Expenditure	Average Income	Average Expenditure
Philippines	173	147	206	176	235	193
National Capital Region	311	258	356	309	379	325
Cordillera Administrative Region	192	151	219	174	257	188
I - Ilocos Region	142	124	186	152	204	159
II - Cagayan Valley	143	118	181	141	195	140
III - Central Luzon	198	170	221	189	259	211
IVA - CALABARZON	210	186	249	213	284	243
IVB - MIMAROPA	109	93	141	121	179	138
V - Bicol Region	125	110	152	137	162	144
VI - Western Visayas	130	116	159	143	202	163
VII - Central Visayas	144	124	184	152	209	164
VIII - Eastern Visayas	126	104	160	128	166	132
IX - Zamboanga Peninsula	125	99	144	116	162	122
X - Northern Mindanao	142	117	165	139	190	143
XI - Davao Region	135	115	166	142	194	156
XII - SOCCSKSARGEN	114	96	154	132	163	140
XIII - Caraga	118	100	149	125	180	142
Autonomous Region in Muslim Mindanao					130	114

Source: Prepared by the JICA Survey Team based on the data from PSA and NCB,
2006 and 2009: http://www.nscb.gov.ph/secstat/d_income.asp
2012: https://psa.gov.ph/sites/default/files/attachments/hsd/article

Table 2-6 Unemployment Rate by Region as of 2016

	Total Population 15+	Employment Rate	LF Participation rate	Unemployed (%)	Under employed (%)
IX - Zamboanga Peninsula	4,029	62.3	94.7	5.3	33.1
Caraga	1,815	62.8	93.5	6.5	30.6
VII - Central Visayas	3,153	60.3	95.3	4.7	27.2
IVB - MIMAROPA	2,072	65.6	95.9	4.1	26.1
Cordillera Administrative Region	1,194	67	95.7	4.3	25.4
X - Northern Mindanao	3,172	64.2	94.6	5.4	24.9
XII - SOCCSKSARGEN	2,833	63.8	96.1	3.9	23.8
VIII - Eastern Visayas	2,326	63.3	96.1	3.9	22.7
IVA - CALABARZON	8,680	65.1	92.5	7.5	20.4
XI - Davao Region	3,205	64	94.9	5.1	20.1
Philippines	67,153	63.3	94.2	5.8	19.7
V - Bicol Region	5,436	63.7	95.2	4.8	18.4
VI - Western Visayas	5,148	64.8	94.3	5.7	17.6
I - Ilocos Region	3,613	62	93.2	6.8	17.4
II - Cagayan Valley	2,362	65.9	97	3	16.2
III - Central Luzon	7,361	63	92.5	7.5	15
Autonomous Region in Muslim Mindanao	2,440	51.9	96.3	3.7	14.3
National Capital Region	8,314	63.7	93.1	6.9	9.8

Source: Prepared by the JICA Survey Team based on PSA January 2016 Labor Force Survey

In terms of the unemployment rate, these three regions occupy top 3, Calabarzon and Central Luzon share the top unemployment position, 7.5%, followed by NCR's 6.9%. On the other hand, NCR scores the lowest in the underemployment rate 9.8%, Central Luzon the 16th, 15%, and Calabarzon the 9th, 20.4%. It could be construed that these urban regions, in relative terms, tend to have more young, well-educated and rather wealthy unemployed, but not many 'prime aged, uneducated and poor' underemployed.

Table 2-7 Labor Force Participation, Employment, Unemployment, and Underemployment Rates, by Region: Jul 2013 and Jan 2016

	Unemployed (%)			Under employed (%)		
	July 2013	Jan 2016	Balance	July 2013	Jan 2016	Balance
Philippines	7.3	5.8	-1.5	19.2	19.7	0.5
V - Bicol Region	6.3	4.8	-1.5	38	18.4	-19.6
VIII - Eastern Visayas	5	3.9	-1.1	29	22.7	-6.3
VI - Western Visayas	7.5	5.7	-1.8	22.5	17.6	-4.9
I - Ilocos Region	8.5	6.8	-1.7	21.6	17.4	-4.2
X - Northern Mindanao	6.1	5.4	-0.7	26.4	24.9	-1.5
National Capital Region	10.9	6.9	-4.0	11.2	9.8	-1.4
III - Central Luzon	9	7.5	-1.5	15.4	15	-0.4
Caraga	5.5	6.5	1.0	29.9	30.6	0.7
IVA - CALABARZON	9.1	7.5	-1.6	19.3	20.4	1.1
XI - Davao Region	6.5	5.1	-1.4	18.3	20.1	1.8
Autonomous Region in Muslim Mindanao	4.3	3.7	-0.6	10.5	14.3	3.8
XII - SOCCSKSARGEN	5.7	3.9	-1.8	19.9	23.8	3.9
II - Cagayan Valley	3.7	3	-0.7	12.1	16.2	4.1
IVB - MIMAROPA	3.9	4.1	0.2	19.5	26.1	6.6
Cordillera Administrative Region	5.1	4.3	-0.8	13	25.4	12.4
IX - Zamboanga Peninsula	3.1	5.3	2.2	18.2	33.1	14.9
VII - Central Visayas	6.5	4.7	-1.8	12.2	27.2	15.0

Source: Prepared by the JICA Survey Team based on PSA January 2016 Labor Force Survey

As shown in the table 2-6, between July 2015 and January 2016, the underemployment rate increased in 10 out of 18 regions. Among these, in three regions, CAR, Zamboanga Peninsula and Central Visayas, it increased by 12.4%, 14.9% and 15.0%, respectively. The unemployment rate increased only in 3 regions, i.e., Zamboanga Peninsula, Carga, MIMAROPA(IVB).

2-2 Labor Market Trends

2-2-1 Industrial Structural Transformation

As explained in the World Bank's report, "MOVING FULL SPEED AHEAD: ACCELERATING REFORMS TO CREATE MORE AND BETTER JOBS", most of industrial developed countries have passed through the development path, that is, starting from primitive agriculture, developing to productive agriculture, being transformed to the manufacturing and finally to the service sector, which led to the more diversified and intricate industry structure.

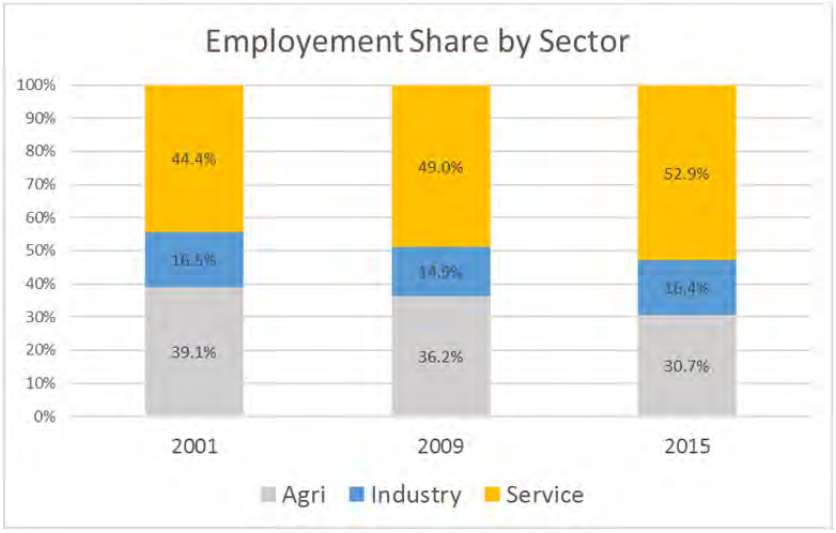
> *Agricultural productivity growth keeps food prices relatively low, thereby keeping wages internationally competitive while also allowing consumers to spend more on non-food items. This further boosts the manufacturing sector and allows it to absorb excess agricultural workers created by agricultural productivity growth. As agriculture and manufacturing provide more jobs to the poor, poverty can go down faster. Continued growth in manufacturing productivity and increased aggregate demand then opens up the economy to a new stage: growth led by a high-skilled services sector.* [24]

Workers from primitive agriculture production would not have the simplest but necessary knowledge to engage in the wage-based works such as following orders/rules, keeping the time, working in a team, and communication/language within the corporations. The manufacturing industry, at its earlier stage of development, could have provided the opportunity for the workers to acquire the said knowledge. The countries, especially emerging economies, who leaped from primitive agriculture to the service industry, might not have had the opportunities to raise the standard of their labor force at the very first step of the development.

In the Philippines, the share of labor force by sector i.e., the agriculture, industry and service was 39.1%, 16.5% and 44.4% in 2001 respectively, and 30.7%, 16.4% and 52.9% in 2015. The employment ratio for the agriculture decreased by nearly 8.4% in these 15 years, while the one for the service increased by 8.5%, indicating that the labor force might be simply transferred from the agriculture to the service, thanks to the rapidly growing BPO. The size of BPO industry, now called BPO/ICT, grew by 19.5% from 2006 to 2015 (Compound Average Growth Rate: CAGR), created 1.2 million jobs. Its revenue is expected to surpass that of the remittances by 2018. The one for the industry shrunk to 14.9% in 2009 but recovered to 2001 level, 16.4% in 2015. It was because of the acutely plunged export to the US in 2009 caused by bankruptcy of

[24] P24, MOVING FULL SPEED AHEAD: ACCELERATING REFORMS TO CREATE MORE AND BETTER JOBS, the World Bank, April 2016

Lehman Brothers in the previous year. The US import went down in November 2008 below the one in the same period in the previous year, and 30% less in 2009. The Philippine export immediately decreased by 40% in December 2008 onwards and Philippine's export oriented manufacturing industries were damaged badly[25]



Source: Prepared by the JICA Survey Team based on PSA data

Figure 2-10 Employment Share by Sector

This direct transition has caused issues in two areas, that is, quality of employment and the infrastructure. The development path mentioned above can give opportunities for unskilled workers to acquire new skills and knowledge during the work transition from the agriculture to the manufacturing. However, without this stage, unskilled workers remain unskilled and the only a few who are lucky enough to receive education can somehow climb the ladder to the skilled workers.

The other issue is inadequate infrastructure for industries, i.e. physical infrastructure and supporting industries. The former includes shortages of ports, inadequate road connections as well as utility systems which cause high production costs, the ones of the biggest obstacles for any industries. The latter can be the major cause of the vicious circle, i.e., stagnant growth of the manufacturing industry, lagging behind in participation into the global supply chain and undeveloped domestic industry. This resulted in the limited supply of the skilled workers in the manufacturing sector[26].

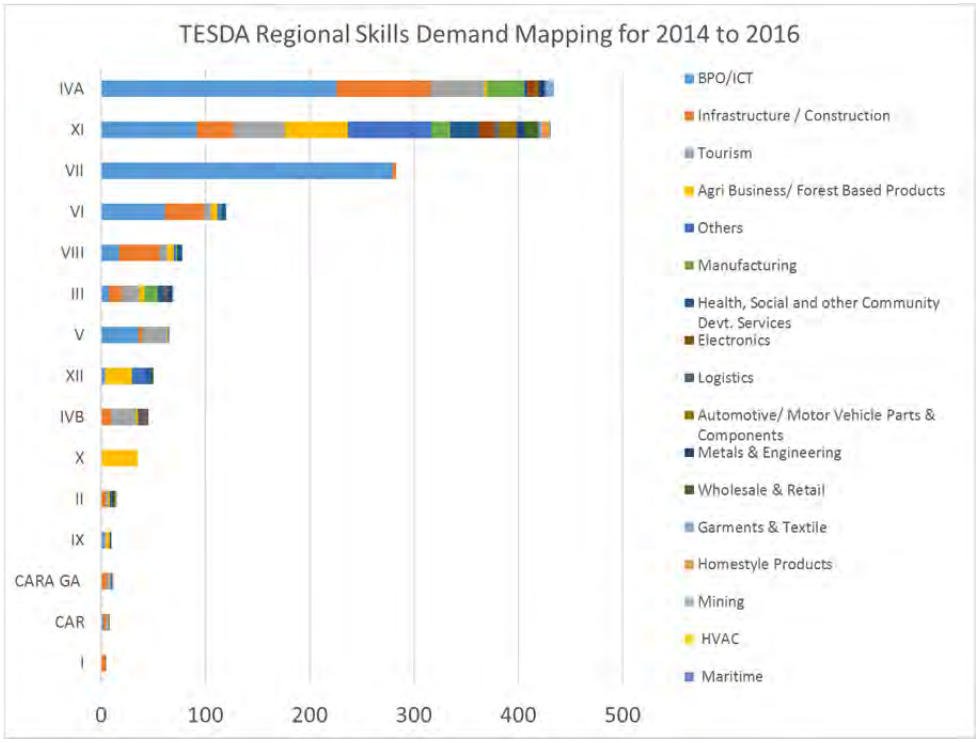
[25] The World Finance Crisis and ASEAN 5 Economies: Koichi Ishikawa. Asia University Research Institute, International Trade and Investment (Winter 2009/No.78)
[26] P19, ibid.,

2-2-2 Labor demand by Region

Through the Project Jobs Fit of DOLE and the consultations of the TESDA regional offices, the projected labor demand per region per sector for three years from 2014 to 2016 was calculated.[27]

Among all regions, Calabarzon demands the most headcounts 433k, followed by Davao Region, 431k. These two regions accounts for a half of the total workforce demand in the country. Region VII Central Visayas follows with 283k.

The biggest demand is for 'ICT/BPO', 727K headcounts followed by 'Infrastructure /Construction' 246k headcounts. The strongest demand for the former comes from Central Visayas while the one for the latter from Calabarzon. Tourism is at the 3rd with 208k, mainly from Calabarzon, followed by Davao. One hundred and fifty thousand (150k) headcounts are demanded for Agribusiness, the biggest is from Davao. The manufacturing excluding Electronics industry recorded at the 6th, 69k, and Electronics the 8th with 25k, both the strongest demand in Region IVA and XI.



Source: Prepared by the JICA Survey Team based on TESDA Labor Market Intelligence Report: Skills Demand and Supply Mapping data

Figure 2-11 HR Demand in Regions by Industry

[27] Labor Market Intelligence Report, Skills Demand and supply Mapping, TESDA, December 2013

Table2-8 HR Demand by Industry

INDUSTRY	Manufacturing	Health & Wellness)	Electronics	Automotive/Motor Vehicle Parts	Metals & Engineering	Wholesale & Retail	Garments & Textile	ICT/ BPO	Infrastructure / Construction	Tourism	Agri Business/ Forest Based Products	Others	Logistics	TOTAL
JOB Demand (thousands)	69	48	25	20	20	18	12	727	246	208	150	102	21	1,679

Source: Prepared by the JICA Survey Team based on TESDA Labor Market Intelligence Report: Skills Demand and Supply Mapping

2-2-3 Labor Demand by Occupation

The Philippine Statistics Authority conducted a survey[28]. The main survey topics includes (i) top hard-to-fill vacancies by occupation groups, (ii) reasons why vacancies were difficult to fill, (iii) duration of recruitment.

The survey is a nationwide sample survey covering 8,399 establishments with 20 or more workers. The reference period covered the months from January 2013 to June 2014. According to the survey, during the period, the number of job opening was posted at 753, 092 while job openings which were difficult to fill was 131,471.

The table below shows hard-to-fill vacancies by major occupation groups[29].

Table2-9 Hard-to-Fill Vacancies by Major Occupation Group

	Major occupation group	Number	Percent
	All Occupations	131,471	100.0
1	Corporate executives, managers, managing proprietors and supervisors	8,713	6.6
2	Professionals	38,214	29.1
3	Technicians and associate professionals	32,285	24.6
4	Clerks	28,222	21.5
5	Service workers and shop and market sales workers	6,248	4.8
6	Farmers, forestry workers and fishermen	305	0.2
7	Craft and related trades workers	6,240	4.8
8	Plant and machine operators and assemblers	7,532	5.7
9	Laborers	3,712	2.8

Source: Philippine Statistics Authority, "Job Vacancies: 2013-2014…hard-to-fill occupations in focus (Second of a three-part series)", LABSTAT Updates, March 2016.

According to the table above, the following three occupation groups (professionals (29.1%), technicians and associate (24.6%) and clerks (21.5%)) occupied 74.7% of hard-to-fill vacancies.

- Professionals (systems analysts and designers, college and university teaching professionals,

[28] Philippine Statistics Authority, "Job Vacancies: 2013-2014…hard-to-fill occupations in focus (Second of a three-part series)", LABSTAT Updates, March 2016.

[29] Hard-to-fill vacancies are defined as vacancies for which establishments found difficulties in recruitment.

accountants and auditors, civil engineers, personnel and human resource development professionals, electrical engineers, mechanical engineers and so on)

- Technicians and associate (technical and commercial sales representatives, administrative secretaries, safety, health and quality inspectors, technical engineering technicians and so on)
- Clerks (customer service representative (call center agents), accounting and bookkeeping clerks, receptionists and so on)

The survey also asked the reasons for difficulties in recruitment. “lack of needed competency/skill” (29.9%), “no/few applicants applied for the job” (26.0%), and “lack of years of experience” (16.8%) were listed up as top three reasons for difficulties in recruitment.

The establishments took an average of 4.3 months to fill hard-to-fill vacancies. Clerical positons had the longest hiring period at 5.6 months followed by managers and supervisors (4.5 months) and professionals (4.4 months).

According to DOLEs ROADMAP 2022 SUMMARY RRPEOR (draft), in 2022, occupations of workers’ and technicians’ levels such as “Laborers in Mining”, “Construction, Manufacturing and Transport Office”, ”Metal, Machinery and Related Trades Workers”, ”Machine Operators and Assemblers”, and ”Drivers and Mobile Plant Operators” is estimated to have a surplus of 1.64 million people. On the other hand, middle management such as “Supervisors”, ”Corporate Executives and Specialized Managers”, and “General Managers or Managing-Proprietors” is estimated to have a shortage of 2.34 million people.

2-2-4 Unemployment and underemployment in the Philippines

Definition of the unemployment and underemployment in the Philippines is as follows[30];

- Labor Force: Population 15 years old and over who are either employed or unemployed
- Employed: 15 years and over and are reported either at work,
  1) even for one hour during the reference period for pay or profit,
  2) work without pay on the farm or business enterprise operated by family or relatives
  3) with a job but not at work,
- Underemployed. all employed persons who express the desire
  1) to have additional hours of work
  2) an additional job,
  3) a new job with longer working hours.

*Visibly underemployed persons are those who work for less than 40 hours during the reference period and want additional hours of work.

- Unemployed: 15 years old and over who have no job/business and actively looking for work.

The Philippines demonstrated its strong growth since 2012 when the growth rate recorded at 6.7%, up by 3 point from the previous year, partly because of its robust private consumption

[30] https://psa.gov.ph/content/technical-notes-labor-force-survey-lfs

generated by overseas remittances and jobs created by the service industry. It has also improved the unemployment rate to 5.8% as of Jan. 2016 from 6.6% in the same period of the previous year. However, in fact, although the number of the unemployed decreased by 301k, the fully employed also decreased by 1%, 48k headcounts and instead, the underemployed increased by 1.8%, equivalent of 837k headcounts, mostly coming from the agricultural sector badly damaged by El Nino.

Table 2-10 Employment Status

Results from the January 2016 Labor Force Survey (LFS)

Philippines	January 2015	%	January 2016 (estimate)	%	Balance
Population 15 years and over	64,591,000		65,665,000		1,074,000
Labor Force	41,144,000		41,632,000		488,000
Fully Employed	31,063,000	75.5%	31,015,000	74.5%	-48,000
Under- or unemployed	10,081,000	24.5%	10,617,000	25.5%	536,000
Unemployed	2,716,000	6.6%	2,415,000	5.8%	-301,000
Underemployed	7,365,000	17.9%	8,202,000	19.7%	837,000

Source: Prepared by the JICA Survey Team based on APEC Report on Employment Trends and Data Availability in the Philippines (original data from PSA)

The agriculture still accounts for a third of Philippine's labor force, and its three-quarters are the poor working in rural areas[31]. As long as it remains fragile, the economic growth cannot really improve the unemployment and underemployment. It also has to be noted that these figures above do not include allegedly 10 million[32] Overseas Filipino Workers (OFW)[33] who contributes 29.7 billion USD, 10% of total GDP in 2015.

The population aged 15 and above is projected to grow by 2.1% between 2015 and 2020, and its population bonus will continue till 2030 and onwards. The problem is how to provide job opportunities for the growing labor force.

Table 2-11 Population Projection by Age Group, 2015-40

Population projection by age group, 2015-40 (in thousand)

	2015	2020	2025	2030	2035	2040
Total	102,965	111,785	120,225	128,110	135,301	141670
0-14	32,682	33,834	34,383	34,386	34,012	33360
15-24	19,303	19,995	21,107	22,086	22,650	22,773
25-54	39,391	43,855	47,843	51,862	55,527	58,767
55+	11,592	14,099	16,893	19,776	23,113	26,771
CAGR for 15+ population		2.1%	1.9%	1.8%	1.6%	1.3%

Source: Prepared by the JICA Survey Team based on ILO Philippine Employment Trends 2015: Accelerating inclusive growth through decent jobs(Original Source PSA)

According to the WB report[34], "Republic of the Philippines Labor Market Review Employment

[31] *Ibid,*
[32] https://psa.gov.ph/content/total-number-ofws-estimated-24-million-results-2015-survey-overseas-filipinos
[33] 2.4 million in April to Sep along in 2015; https://psa.gov.ph/statistics/survey/labor-force/sof-index
[34] Republic of the Philippines Labor Market Review Employment and Poverty, Jan 2016

and Poverty", socio-economic profile of the unemployed tend to be young, well-educated, and mostly come from well-off families while the underemployed are prime age workers with less than secondary education completed, and come from poor families, 70 percent of whom living in rural areas. Therefore, the problems stemming from each of these two are different; the one for the former tends to be more on skills mismatch and that they "cannot easily find jobs that match their skills and meet their professional aspirations[35]", that leads to lack of job opportunities and OFW issues, while for the latter, it is the delay of the poverty reduction.

2-2-5 Economic growth leads to create "better jobs"?

The term 'better jobs' is "defined primarily as those with higher wages for wage workers and lower poverty levels for the self-employed and secondarily as jobs that reduce the risk of low and uncertain income for the most vulnerable group of workers"[36], that is to say, impartial income distribution and job security. As explained above, the opportunities for better jobs are constrained in terms of the regions, skills and education and industry sectors.

As mentioned above, the job opportunities in the Philippines are constrained by various factors such as the geographical conditions, skills, education levels and industry sectors

Firstly, despite the steady economic growth in the country, the growth for GDP per capita is constantly 2% below the one for GDP per se. One of the strengths Philippine can offer is its relatively cheaper labor cost. In other words, the wage increase in the Philippines has been modest in comparison with other ASEAN countries, which also means the household income has not been increased as much as it should. It means that the income distribution is not fully functioning, which can be one of the reasons why Philippine's pace for poverty reduction is the slowest in the region.

As for the second factor, job security, the underemployment, typically insecure employment, increased by 0.5% from July 2015 to January 2016 at national level, and more than 10% in some regions.

In conclusion, the economic growth failed to create better jobs adequately in the Philippines.

2-3 Philippine's industrial and economic development strategies and plans

2-3-1 Framework of the industrial and economic development strategies

As described below, the Philippines has issued policies and programs to support the growth of the economy. Starting with the Philippine Development Plan, followed by Investment Priority Plan (IPP), Comprehensive National Industrial Strategy (CNIS), Manufacturing Resurgence Program (MRP), Manufacturing Industry Roadmap (MIR) and others. It also has implemented K-12 program for HRD and has been investing in its public infrastructure through PPP.

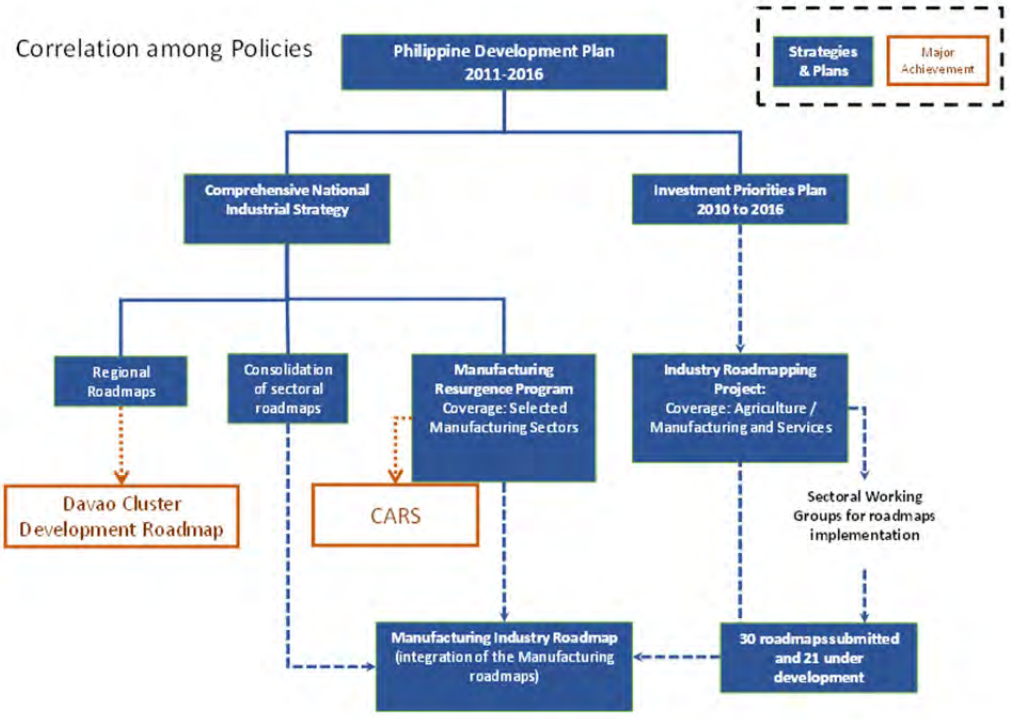
[35] P33, *Ibid,*
[36] More and Better Jobs in South Asia, The World Bank

For MSME support, it has been implementing SSF program, SME Roving Academy and setting up Negosyo Centers throughout the country. Enhancing competitiveness through developing industries is essential to attain inclusive growth and to take advantage of AEC opportunities and globalization. The new industrial policies obliged the government to be more pro-active in addressing the most binding constraints for the industry development.

The PDP is a 6-year industry policy and outlines the holistic economic plan from 2011 to 2016, formed by National Economic Development Agency (NEDA).

However, these policies and strategies are partly overwrapping or complementing to each other and generated many 'Focused issues'. For example, there are Board of Investment's (BOI) investment promotion focused industries, Key Employment Generating (KEG) industries, DTI's cluster focused industries and so on, which could divulge the collective effort to develop Philippine industries. Also, there are neither 'implementers' explicitly named for individual programs nor specific timelines for the implementation for each strategy, that could obscure the effectiveness of each.

The correlation among policies is as below.



Source: Prepared by the JICA Survey Team

Figure 2-12 Correlation among Industrial/Economic Development Strategies

2-3-2 Outlines of each strategies and plans

This section explains the outlines of each strategies and plans.

(1) The Philippine Development Plan (PDP)

'The Philippine Development Plan 2011 to 2016' was finalized by the former President Benigno Aquino to "pursue rapid and economic growth and development", to take over the Medium-term Philippines Development Plan 2004-2010, and subsequently endorsed by the new Deturte administration. The DTI and the BOI were in charge of implementation of the PDP through the Investment Priority Plan (the IPP) from 2011 to 2016, which spun off from Chapter 3 of the PDP. In response to the development arising from the ASEAN integration and the necessity to boost foreign investments, DTI was also requested to form the CNIS to achieve 'Inclusive Growth', the main goal of the PDP.

Its key strategies are (i) massive investment in infrastructure, (ii) transparent and responsive governance, (iii) human development and improved social services, (iv) competitiveness to generate employment, and (v) access to financing, to achieve quantitative targets such as; reduction of poverty incidence to 16.6% in 2015 from 33.1% in 1991; employment creation of 1 million average annually; GDP growth rate of 7 to 8% per year; Growth of investment/GDP of 22% in 2016 from 15.6% in 2010

The plan's goal is three-phased;

- Phase I (2014-2017) aiming for further development of existing industries such as automotive/aerospace parts, electronics, garment, food, resource based industries, chemical, furniture, tool & die, that is, labor-intensive industries
- Phase II (2018 -2021): a) transfer to higher value-added industries, by promoting investment to up-stream industries, b) development of SMEs, and innovative R&D, to form the industry clusters.
- Phase III (2022-2025) making transport, electronics and chemical industries technologically advanced, promote the Philippines to be the international and regional hub for the supply chain of manufacturing industries such as automotive, electronics, machinery, garment and food industries

(2) Investments Priorities Plan (IPP) 2011 to 2016

The IPP was formed by BOI, focusing on the following;

(i) Preferred Activities that include 4 broad sectors (manufacturing, agribusiness and fishery, services, and infrastructure and logistics) and 4 specific activities (energy, housing, hospitals and PPP projects);
(ii) Export Activities that cover the production and manufacturing of export products, services exports and activities in support of exporters;
(iii) Activities with Special Laws that provide either the mandatory inclusion of the activity in

the IPP and/or the grant of incentives under E.O. 226[37]

(iv) ARMM List, which encompasses priority investment areas that have been determined by the Regional Board of Investments of the Autonomous Region in Muslim Mindanao (RBOI-ARMM) in accordance with E.O. 458[38].

The IPP emphasizes the need to concentrate in the manufacturing sector, and led to formulation of the roadmaps through the 'Industry Roadmapping Project' and the drafting of the Manufacturing Resurgence Plan (MRP), in order to achieve growth in the sector.

It identified specific sub-sectors to which fiscal incentives are granted in investments. The incentives are given only to the listed sectors. Although the list is still long and not very focused, this was a notable progress. However, the policy measure for investment promotion is currently limited to the fiscal incentive while it is not the only factor for investors' decision making. More holistic approach such as build-up of industrial clusters, to promote investment will be needed. 'Cluster-based industrial strategy' is one of the main pillars of CNIS and the IPP is expected to contribute to it.

(3) The Comprehensive National Industrial Strategy (CNIS)

In 2014, CNIS was formed as an industrial strategy to achieve 'Inclusive Growth', the main goal of the PDP[39].

Based on the examination of external and internal conditions, the strategy indicates three major concepts, namely;

- Globally competitive industries, strong domestic and global linkages,
- Three major channels: Competition, Innovation and Productivity,
- Cluster-based industrial strategy to build strong and competitive regional economies.

<u>Linkage between industries</u>

The goal of the CNIS is to strengthen all sectors to become globally competitive by making a linkage between industries. Despite the fact that there are many local agricultural or mining products, they are not well utilized by the manufacturing sector. Even though there are some

[37] Article 2 provides that; industry, agriculture, forestry, mining, tourism and other sectors of the economy which shall: provide significant employment opportunities relative to the amount of the capital being invested; increase productivity of the land, minerals, forestry, aquatic and other resources of the country, and improve utilization of the products thereof; improve technical skills of the he people employed in the enterprise; provide a fountain for the future development of the economy; meet the tests of international competitiveness; accelerate development of less developed regions of the country; and result in increased volume and value of exports for the economy.

[38] "The RBOI Incentives" stipulates that the industries eligible for the incentives are: 1. Registered operation/s is located in a government industrial estate, 2. Projects that will engage in service type activities listed in Part 1 (I) of the IPP, 3. Export-oriented projects, 4. Modernization projects, 5. New and Expansion projects in support to export-oriented jewelry enterprises engaged in electroplating, gemstone appraisal certification, assaying and hallmarking.

[39] Rafaelita M. Aldaba, "Strengthening Competitiveness, Facilitating Industrial Upgrading: Key elements & processes in crafting a strategic industry roadmap" (presentation, Philippine Services Coalition Services Industries Roadmap Training Workshop, SGV Hall, Makati City 20 August 2014).

higher value added service sectors such as IT, they are not connected closely with the manufacturing sector. As the electronics industry exports its products and is integrated in a global value chain, other sectors must be included in such value chain. Therefore, making a linkage between sectors is essential.

Cluster-based industrial strategy

There are many large PEZA approved companies in the country, but industrial sectors have not been developed as a "cluster". The industry cluster can be defined as "the phenomena where the industry agglomeration continuously expands horizontally as well as vertically centered around the industries with strong competitive advantages in the business environment which facilitates new businesses to emerge[40]" in collaboration with the SMEs, universities as well as research institutes in vicinity. In the Philippines, the industry linkage is not well established. For example, the operation of the export manufacturing companies can be completed within SEZs without any transactions with domestic companies since there is no regulation on local procurement. If the country can establish industrial clusters, the agglomeration will lead to further concentration of companies and relevant organizations in a virtuous circle.

It also required all regions to compile their own roadmaps, and the Davao Cluster Development Roadmap was formulated in response to the CNIS' call for industry strengthening at the regional level.

Issues

CNIS is a conceptual strategy and does not include concrete measures to achieve the goal, nor any leading agencies designated to implement the strategy. In CNIS, the government is supposed to be only a coordinator or facilitator. However, upgrading the industry of the Philippines needs a great deal of efforts, initiatives from both industry and government sides.

The Industry Development Council

The Industry Development Council (IDC)[41] was revived by DTI in 2015. It is chaired by the DTI, with the listed members of the Office of the President, NEDA, BSP, Department of Finance, DA, Department of Foreign Affairs, DOST, DOLE, DE, Department of Environment and Natural Resources, Department of Interior and Local Government, Department of Public Works and Highways, DepEd, CHED, National Competitiveness Council, as well as representatives from private sector, civil society/NGOs and research institute /think-tanks.

The IDC is mandated to perform the following powers and functions

1. Recommend approval of the Comprehensive National Industrial Strategy (CNIS), which shall be consistent with the Philippine Development Plan (PDP);
2. Coordinate, monitor and assess the implementation of the sectoral roadmaps and the CNIS;

[40] METI definition: http://www.meti.go.jp/policy/local_economy/tiikiinnovation/industrial_cluster.html
[41] Created in 1996 during the presidency of Fidel V. Ramos, but dormant for long years

3. Review periodically and assess the performance, problems, and prospects of the country's industries;
4. Recommend legislation that would contribute to industry development;
5. Formulate policies and recommend measures to improve industry competitiveness;
6. Grant and review the accreditation of Philippine industry associations/organizations[42]

The Comprehensive Automotive Resurgence Strategy (CARS) program was formed under the agreement of IDC. Currently, however, its activities are not yet full-fledged and further effort is required to enhance its roles and responsibilities.

(4) Manufacturing Resurgence Program (the MRP) 2014-2025

The MRP was formed by the former President Benigno Aquino administration to support the priority programs under National Budget Memorandum N.o.118 (2013), and subsequently endorsed by Deturte Administration. The key goal of the MRP is to enhance the competitiveness of manufacturing industries to be integrated in the higher value-added, global value chains (GVC). DTI leads the implementation of the MRP in coordination with key government agencies, i.e., DOST, TESDA, CHED, DOE, DA, NPC, NEA and PCA.

It is a 12-year, three phased program[43];

- Phase I: 2014-2017
  Rebuild capacity of existing industries, strengthen emerging industries, maintain competitiveness of industries with comparative advantages
- Phase II: 2018-2021
  Shift to high value added activities, investments in upstream industries
  Link & integrate industries - Crucial industrial linkages between SMEs & large enterprises
- Phase III: 2022-2025
  Deepen participation in regional/global production networks
  Become hubs in auto, electronics, machinery, garments, food

[42] http://industry.gov.ph/industry-development-council/
[43] http://industry.gov.ph/manufacturing-resurgence-program/

Manufacturing Resurgence Program (MRP) Projects and Activities by Implementing Agencies

DTI	Comprehensive Automotive Resurgence Strategy (CARS)	Die and Mold Making and Design Training (MIRDC and PDMA)	Philippine Rubber Investment and Market Encounter	Enhancing the competitiveness of Philippine coffee	Aerospace Quality Management Systems Project	Revival of key industries in the 6th district of Quezon City with UP-SRUP	Cottage Industry Technology Center Transformation Project	Sectoral Value Proposition for Development
	Industry Roadmapping Project	Localization of industry roadmaps	Regulations review of priority sectors	SME Roving Academy	Shared services facilities	Negosyo Centers	HR gap analysis	Smuggling mitigation
DA	Highvalue Crops Development Program (for coffee growers)	Rice processing centers for farmer associations	IREAP Component	Farm to Market Development Program				
PCA	Kaanib Coco Hub Project	Development of coconut roadmap with industry players						
DOLE	HR gap analysis	Amendment of the Labor Code	Single Entry Approach (SEnA)	Labor Law Compliance and Incentivizing System				
TESDA		Industry training						
CHED								
DOST	Institutionalization and strengthening of program on the development of innovative food products from local raw materials		National R&D Program for Natural Rubber Processing and Rubber Products Manufacturing		Establishment of Advance Materials Testing Lab (ADMATEL) Phase 2 Operations STARLABS		Food Safety and Quality Programs for MSMEs	S&T Program for Responsible Mining in Mindanao
DOE	Detailed Wind Resource Assessment of selected lowenergy geothermal areas		Rural electrification and barangay level enhancement program (NEA/NPC)					

Source: Prepared by the JICA Survey Team based on DTI data

Figure 2-13 Individual Projects and Activities Set under the MRP and Their Responsible agencies

(5) Manufacturing Industry Roadmap (MIR)

In response to the IPP's emphasis on the need to concentrate in the manufacturing sector, roadmaps were formulated by various industry associations through DTI-BOI's 'Industry Roadmapping Project' started in 2014. Currently 27 roadmaps are publicized[44], and others such as the ones for shipbuilding and jewelry, are still in making. Its aim was to make the manufacturing industry contribute to the total value added by 30% and generate 15% of the total employment. The long-term vision of the MIR is to develop the globally competitive manufacturing industry supported by strong backward and forward linkages with both domestic and global supply chains.

Roadmap Formulation[45]was done in the following order.

(i) Identify the existing & future growth potentials of the industry in both domestic and export markets, as well as dynamically growing tradable industries

[44] Processed Fruit, Cacao, Natural Health Products, Condiment, Processed Shrimp, Carrageenan, Processed Meat, Furniture, Electronics, Aerospace, Automotive, Auto Parts, Motorcycle, E-vehicles, Metal casting, Tools and Die, Petrochemicals, Plastics, Chemicals, Paper, Ceramic Tiles, Iron an Steel, Copper, Biodiesel, Rubber, IT-BPM and Housing

[45] The Philippine New Industrial Policy for More Competitive Regional Economies, Rafaelita M. Aldaba DTI-BOI, August 2015

(ii) Develop and enhance the private sector in these industries
(iii) Find the obstacles preventing firms from upgrading the quality of their products and new firms from coming in
(iv) Take action to remove the constraints

Issues

The roadmap implementation is supposed to be led by the private sector "while the government acts as facilitator to encourage producers to take risks, correct market and government failures and address changes in policies and institutions." It is uncertain if the private sector can take such heavy responsibilities by themselves.

(6) Regional Manufacturing Industry Roadmaps (RMIR)

The RMIR is also the private sector-led and the government acts as facilitator & coordinator, and shares the same goal and strategies with the MIRs but not necessarily corresponding to the national industry roadmaps in terms of the priority sectors. Local Government Units (LGU) have authorities to address their own local issues.

2-3-3 Focused Industries

Agriculture, forestry and fishery

In the PDP, the processed fruits, coconut products, coffee, cacao can be categorized as focused industries, same as '(wood) furniture /fixture' and fisheries/seaweed. The other industrial policies have identified many categories in this sector and made it uncertain which are the priority product areas.

Manufacturing

'Mining' is categorized as manufacturing and constantly listed as the focus industry. 'Shipbuilding' is taken as the priority industry in the PDP and in the MIR. 'Automotive/ Autoparts' industries are the focused industry in the PDP as well as the MIR, but not in the IPP. It should be strongly interested by the investors. 'Logistics' is regarded as an important industry by the PDP and NEDA's focused industries, but not in the MIR. 'Electronics' is listed in the PDP and the IPP, but not included in the KEG. This lack of rationality and comprehensiveness makes the strategies rather ambiguous. Although it is perceived that 'Electronics', 'Automotive/Autoparts', 'Logistics', 'Construction', 'Iron & steel/mining', 'Rubber', 'Garment' and 'Tourism' are commonly identified as the priority, further effort is required to make it more focused.

Source: Prepared by the JICA Survey Team

Figure 2-14 Focused Industries Designated by Each Strategies and Plans

Service industry

BPO/ICT covering BPO as well as its support industry, has been commonly named as the high-priority industry. BPO which contributed 22 billion USD to the country's GDP in 2015 and currently employs 1.2 million will remain the first priority for the government for the years to come. 'Tourism', categorized as manufacturing industry in the MIR, is selected as the priority industry in most of these development policies.

2-3-4 Development Programs and Services for Micro, Small and Medium Enterprises (MSME)

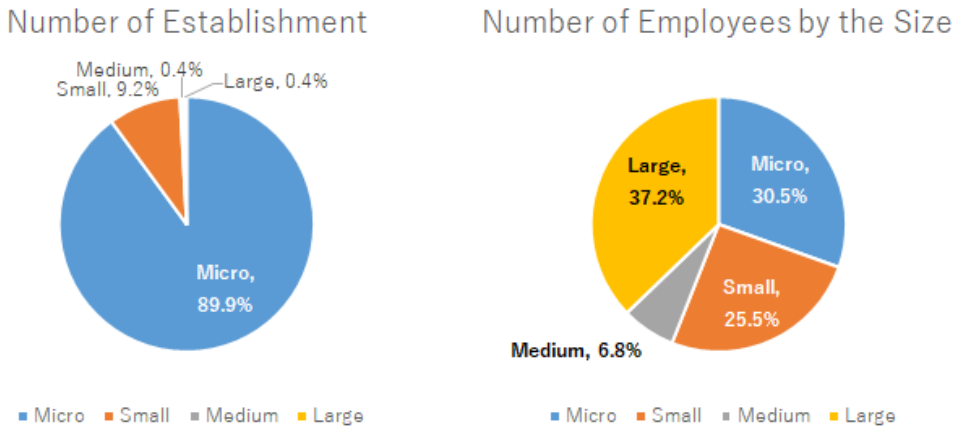
According to the Magna Carta for Micro, Small and Medium Enterprises（hereinafter, Magna Carta for MSME）, the definition of MSMEs are as follows

Table 2-12 Definition of MSMEs

	Total Asset
micro	not more than P3,000,000
small	P3,000,001 - P 15,000,000
medium	P15,000,001 - P100,000,000

Source: Magna Carta for Micro, Small and Medium Enterprises, SEC3

MSMEs occupies 99.6% of the total business establishments, employs 63% of the total labor force in the Philippines. Among these, micro enterprises occupy nearly 90% in terms of the number of establishment and employs 30.5%. Therefore, it is imperative for the Philippine government to address the issues and challenges MSMEs are facing. For the purpose, the following legal and financial supports are offered to MSMEs.



Source: Prepared by the JICA Survey Team based on DTI Number of Establishments and Total Employment by Industry, Region and Employment Grouping (MSMEs), Philippines: 2014

Figure 2-15 Current Situation of MSMEs

[Laws and Regulations]

- Magna Carta for Micro, Small and Medium Enterprises (RA 6977, as amended by RA 8289, and by RA 9501, and further amended by RA 10644) provides the definition, principles and policies on the support for MSMEs, emphasizing on addressing the issues stemming from financial access.
- Improvement of the Financial Access: Creation of the Small Business Guarantee and Finance Corporation (SB Corp.). The SB Corp. takes the primary responsibility of implementing comprehensive policies and programs to assist MSMEs in all areas, including finance and information services, training and marketing.
- Mandatory Allocation of Credit Resources to MSMEs.
- Preparation of the MSME Development Plan

- The Barangay Micro Business Enterprises (BMBEs) Act of 2002 (RA 9178, as amended by RA 10644). The BMBEs Act provides the support for the establishment and sustainability of small businesses established in barangays (villages). Various incentives and other benefits are provided to BMBEs or micro enterprises in order to its establishment and growth. To lessen their tax burden and solve their credit issues which encourages the formation and growth of BMBEs, or the micro enterprises, by granting them incentives and other benefits, providing;
- Income tax exemption from income arising from the operations of the enterprise;
- Exemption from the coverage of the minimum wage law (BMBE employees will still receive the usual social security and health care benefits)
- Priority to a special window set up specifically for the financing requirements of BMBEs
- Technology transfer, production and management training, and marketing assistance programs for BMBE beneficiaries.

- Go Negosyo Act (RA 10644) mandates for the establishment of “Negosyo Centers” in all provinces, cities and municipalities and provides;
- Provide unified and simplified business registration process, in coordination with the respective LGU and liaising with concerned government agencies to process the duly accomplished forms submitted by the MSMEs, in order to alleviate their burden.
- Issue the Certificate of Authority for BMBEs
- Provision of information and services in training, management guidance and assistance; financing, grants and other forms of assistance; and marketing, market linkages.
- Coordination with the respective LGU and liaising with concerned government agencies to process the duly accomplished forms submitted by the MSMEs
- Support the development of youth and women entrepreneurship through coordination with schools and concerned organizations

[Financial Support]

i. Lending by DTI SB Corp
ii. Landbank of the Philippines (LBP) and Development Bank of the Philippines (DBP): developing MSMEs financing support programs
iii. The Microfinance Program: Provided by the Foundation for a Sustainable Society, Inc、GSIS LBP、National Livelihood Development Corp (NLDC)、People's Credit and Finance Corporation、Opportunity Microfinance Bank、Philippine Enterprise Development Foundation and SB Corp[46] in order to address the financing needs of entrepreneurs who fall within the poverty threshold.
iv. Access of Small Entrepreneurs to Sound Lending Opportunities (ASENSO) Program: DTI, the Department of Social Welfare and Development, SB Corp, the Land Bank of the Philippines (Landbank) , the Development Bank of the Philippines (DBP) , the Government Service Insurance System (GSIS) , the Social Security System (SSS) , the Philippine Export-Import Credit Agency (PhilExim) , People's Credit and Finance Corp.、Quedan and Rural Credit Guarantee Corporation (Quedancor) , National Livelihood Development Corp (NLDC) , the National Anti-Poverty Commission provide in collaboration to lower the effective cost of borrowing by SMEs and liberalize requirements, create a wider financing system.
v. Obligation to financial institutions: the Magna Carta for MSMEs obligates all public and lending institutions to set aside at least 8% of their total loan portfolio for MSMEs and at least 2% of their total loan portfolio for MEs.
vi. Credit increase:
   - BMBEs Act obligates government financing institutions to set up a special credit window that will service the financing needs of BMBEs.
   - The Agri-Agra Reform Credit Act of 2010 amended Presidential Decree 717 to facilitate increased credit to farmers and spur productivity.
   - Credit Surety Fund Program (CSF) is a credit enhancement scheme developed by the Bangko Sentral ng Pilipinas to increase the credit worthiness of MSMEs

[Productivity Enhancement Support]

In order to improve the productivity of the MSMEs', the following services are provided.

(i) Shared Service Facilities (SSFs): Established as common service facilities or production centers to give MSMEs access to better technology and more sophisticated equipment.
(ii) Entrepreneurship Training: Provided by the DTI for existing and potential entrepreneurs to acquire the necessary skills and knowledge to become competitive players in the local or global market.

[46] Institutional Loan Department, "Financing Program for Micro, Small and Mideium Enterprises", http://www.philexport.ph/barterfli-philexport-file-portlet/download/assistance/FinancingPrograms.pdf

(iii) DTI SME Roving Academy: Provide lectures designed to promote entrepreneurship and networking, improve access to credit and markets, and increase productivity and efficiency of MSMEs.

(iv) DTI Go Negosyo Kapatid Program: To link micro and small enterprises (MSEs) to the medium and large enterprises as their suppliers and distributors in the supply chain. It has three components, namely, Mentor ME Program, Adopt-An-SSF, and Inclusive Business.

- Mentor ME Program –the weekly coaching and mentoring by business owners and practitioners on different functional areas of entrepreneurship to be held in the Negosyo Centers nationwide to train entrepreneurs.
- Adopt-an-SSF is to get business owners and corporations (Cooperators) to provide facilities as well as know-hows as partners for MSMEs to maximize the use of SSF.
- Inclusive Business (IB) is a business initiative to contribute to poverty reduction through the inclusion of low income communities in its value chain.

(v) DOST Small Enterprise Technology Upgrading (SET-UP): To provide information and direct assistance including trainings and support for the production, aiming at the productivity enhancement to improve their livelihood.

(vi) DOST Technology Business Incubator Program: To provide common service facilities for main SME industries where DOST rents/sells equipment/utilities until the new firms are able to establish their own.

(vii) TESDA Technical Vocational Education and Training (TVET): skills training for various qualifications to prospective and existing workers.

2-3-5 Narrow the gap between/among Regions

PDP puts its importance on to address the gap of social and economic development among Regions in the Philippines.

The quality of life and level of access to the social services highly vary depending on the region. Economic activities tend to concentrate on particular regions such as National Capital Region (NCR) where industries are agglomerated and skilled human resources are easily available. As a result, Philippine's social and economic development has ended up with further widening the gap among the regions.

As mentioned in 2.1.5, the Gross Regional Domestic Product demonstrates the gap between regions near NCR and the rest. NCR occupies 37% of the total GDP of all 18 regions, and with two other urban regions, Calabarzon (IVA) and Central Luzon (III), the sum accounts for 63% of the total. The ratio of "Food Threshold among Population" is the lowest in these three regions. By the same token, there is a wide gap in terms of the wage. Inevitably, NCR has the highest annual income, 375,000 pesos, followed by Calabarzon's 243,000 and Central Luzon's 211,000. The rest of 15 regions have lower-than-the-average-income, 193,000 pesos.

To achieve inclusive growth, the government should make greater effort to address these gaps among the regions. The PDP, therefore, clarified the definition and index of poverty and

designate ‘Poverty Areas’ in the country, in order to address the issues. The PDP use more multifaceted and relative indices such as vulnerability against natural disasters, in addition to the conventional economic/numerical indicators, i.e., the number and level of the poor households and population ratio living under the poverty line etc. It designated top 10 regions with the highest scores in each poverty index. Most of these poor regions are located in Mindanao or Visayas.

Chapter 3 Strategies and Plans for Industrial Human Resource Development in the Philippines

3-1 Framework of Strategies and Plans for Industrial Human Resource Development

In the Philippines, the newly-formed Duterte administration started in June 2016 and announced a 10-point Socioeconomic Agenda. As of January 20, 2017, the NEDA publish parts of the Philippine Development Plan (2017-2022) (draft) on its website for public comments. However, no sector-by-sector development plan for 2017-2022 has been disclosed yet.

This chapter summarizes the position of industrial human resources in the "10-point Socioeconomic Agenda", the draft version of the next five years development plan and the current five years development plan (Midterm Update of the "Philippine Development Plan (2011-2016)", and the trends of strategies and plans specialized for the industrial human resources development which are available at present. Then, it also summarizes some of the initiatives, programs and projects implemented by the Philippine government regarding development of industrial human resources.

3-1-1 Position of Industrial Human Resources in 10-point Socioeconomic Agenda

The newly-formed Duterte administration released the Socioeconomic Agenda consisting of the following 10 points: The seventh point of the Agenda is the development of industrial human resources, which is proposed as one of the priority issues.

(i) Continue and maintain current macroeconomic policies, including fiscal, monetary, and trade policies.
(ii) Institute progressive tax reform and more effective tax collection, indexing taxes to inflation. A tax reform package will be submitted to Congress by September 2016.
(iii) Increase competitiveness and the ease of doing business, and pursue the relaxation of the Constitutional restrictions on foreign ownership, except as to regards land ownership, in order to attract foreign direct investment.
(iv) Accelerate annual infrastructure spending to account for 5 percent of GDP, with Public-Private Partnerships playing a key role.
(v) Promote rural and value chain development toward increasing agricultural and rural enterprise productivity and rural tourism.
(vi) Ensure security of land tenure to encourage investments, and address bottlenecks in land management and titling agencies.
(vii) Invest in human capital development, including health and education systems, and match skills and training to meet the demand of businesses and the private sector.
(viii) Promote science, technology, and the creative arts to enhance innovation and creative capacity towards self-sustaining, inclusive development.
(ix) Improve social protection programs, including the government's Conditional Cash Transfer program, to protect the poor against instability and economic shocks.

Strengthen implementation of the Responsible Parenthood and Reproductive Health Law to enable especially poor couples to make informed choices on financial and family planning.

3-1-2 Position of Industrial Human Resources in Philippine Development Plan

(1) Philippine Development Plan (2017-2022) (Draft)

Based on materials available in public, under the establishment of "Foundations for Inclusive and Sustainable Development", the development plan is considered to achieve the goals by four policies. They include "Enhancing the Social Fabric", "Reducing Inequality in Economic Development Opportunities", "Increasing Potential Growth", and "Enabling and Supportive Economic Environment". The industrial human resources development is linked as a measure to "Reducing Inequality in Opportunities for Human Resource Development" for "Reducing Inequality in Economic Development Opportunities". The table shows outcomes and strategies to reduce inequality in opportunities for human resource development which is related to the industrial human resources development.

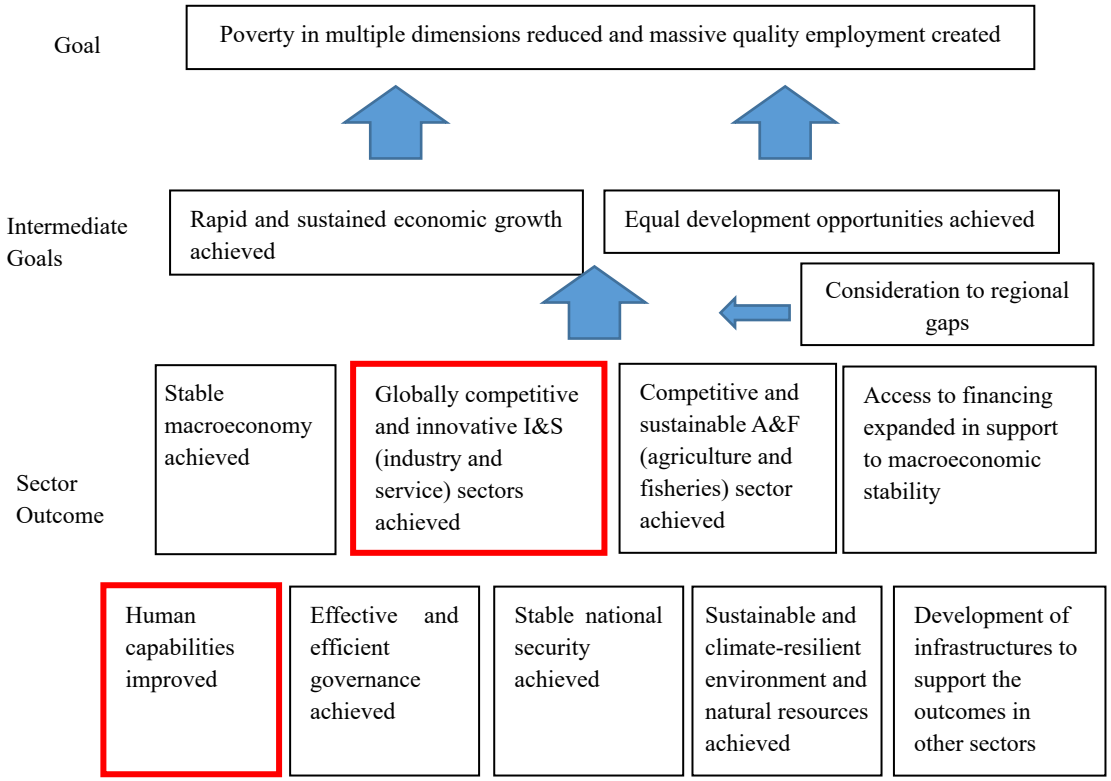
Table 3-1 Outcomes and Strategies in the Philippine Development Plan (2017-2022) (draft) Related to IHRD

Outcomes	Strategies
Quality, Accessible, Relevant and Liberating Basic Education for All	・ Pursue full implementation of K to 12
Quality of Higher and Technical Research Improved for Equity and Global Competitiveness	1. TVET for Equity ・ Enhancing community-based training for special groups. ・ Provide access to quality and relevant TVET opportunities. 2. TVET for Global Competitiveness ・ Ensure globally competitive TVET programs. 3. Higher Education as a Force for Social and Cultural Transformation ・ Expand access to higher education. ・ Integrate 21st century competencies. ・ Promote creative arts. 4. Higher Education as Accelerator of Innovation and Inclusive Economic Prosperity ・ Strengthen quality assurance mechanism. ・ Improve research and innovation, extension. ・ Expand government-academe-industry collaboration. ・ Promote excellence among HEIs.
Employability Improved	・ Encourage skills development and retooling through continuing education and training ・ Strengthen employment facilitation services. ・ Strengthen and expand internship, apprenticeship and dual training programs that facilitate school-to-work transition. ・ Implement programs that encourage women to participate in the labor market.

Source: Prepared by the JICA survey team based on the Philippine Development Plan 2017-2022 accessed on NEDA's website on January 20, 2017

(2) Philippine Development Plan (2011-2016) Midterm Update

The "Philippine Development Plan (2011-2016) Midterm Update" stipulates the final and intermediate goals and the outcomes expected to be attained in respective sectors in order to achieve these goals as shown below. Among the outcomes expected to be achieved in respective sectors, the capacity enhancement of human resources directly affects the development of industrial human resources. However, the development of human resources is indirectly required to achieve global competitiveness and innovation in the industry and service sectors.



Source: Prepared by the JCA Survey Team based on the "Philippine Development Plan (2011-2016) Midterm Update"

Figure 3-1 Position of Industrial Human Resources in "Philippine Development Plan (2011-2016) Midterm Update"

To achieve the outcomes in these sectors, the Plan stipulates the strategies and the directions in which to implement the strategies. The following table shows the strategies and the strategy implementation directions in relation to industrial human resource development.

Table 3-2 Strategies and Strategy Implementation Directions to Achieve Capacity Enhancement of Human Resources

Strategies	Government Orientation/Directions
Provide complete and quality basic education to prepare the youth for further education and the world of work	1. Ensure that every Filipino has access to complete basic education 2. Ensure that every Filipino graduate of complete basic education is prepared for higher education, employment and entrepreneurship 3. Ensure effective, efficient and collaborative delivery of basic education service

Develop workforce competences and life-skills through TVET	1. Strengthen the Technical Education and Skills Development Authority (TESDA) and focus on development planning, resource allocation, standard setting and quality assurance 2. Encourage LGUs and industries to directly participate in the delivery of TVET skills development programs 3. Expand enterprise-based training (EBT) (Strengthen linkages with industry) 4. Train agricultural workers to develop new skills
Make higher education competitive and responsive to national development goals	1. Support the cross-mobility of students between higher education and middle-level skills development 2. Expand enterprise-based training (EBT) (Strengthen linkages with industry) 3. Align higher education institution (HEI) programs with national development goals and industry needs 4. Fast-tracking the restructuring of public HEIs 5. Upgrade higher education quality standards to internationally comparable levels and strengthen quality assurance systems

Source: Prepared by the JICA Survey Team based on the "Philippine Development Plan (2011-2016) Midterm Update"

Table 3-3 Strategies and Strategy Implementation Directions to Achieve Global Competitiveness and Innovation in the Industry and Service Sectors

Strategy	Strategy implementation direction
Enhance competencies of labor	1. Pursue market-driven education and training to address the needs of the industry and service sectors 2. Develop curricula that put more emphasis on science and technology, entrepreneurship, agribusiness, software and vocational skills in the senior years (years 11-12 of the K to 12 years) 3. Encourage colleges/universities to participate in technology parks and business incubator facilities and introduce entrepreneurship training in their curricula to inspire students to take research from the academe to firms. 4. Strengthen the competency of Filipino workers and professionals to prepare for regional and global integration through (i) Philippine Qualification Framework, (ii) competitiveness roadmaps of different professions; (iii) outcome-based education and the use of learning outcomes, and (iv) continuing professional development

Source: Prepared by the JICA Survey Team based on the "Philippine Development Plan (2011-2016) Midterm Update"

In addition, to achievement of competitiveness and sustainability in the agriculture, forestry, and fisheries sectors, the development plan specifies the necessity of enhancing and developing the competency of farmers and fishers in the fields of appropriate technologies and innovations, the development of agribusinesses, value chain management and so on.

Furthermore, the "Philippine Development Plan (2011-2016) Midterm Update" is aimed at eliminating regional gaps between the Manila metropolitan area including its suburbs and other regions as an important theme. The Plan proposes the following approaches regarding promotion of regional industries and development of industrial human resources required for it as a strategy to be applied to underdeveloped regions in comparison with the Manila metropolitan area including its suburbs.

- The regions, depending on the superiorities owned by them, should pursue the possibilities of agribusiness, food processing, tourism, and commodity distribution. IT-BPM is also a promising industry for some places and regions. The engagement of the poor in these promising industries not only expands the possibilities of growth of these subsectors but also creates tremendous employment opportunities.
- The Philippine government should focus on development of human resources to allow the present and future workers to acquire appropriate knowledge and skills for the needs of these promising industries. Companies are recommended to participate in creation of programs for higher education and vocational skill training/education to improve the employability of workers.
- It is recommended to achieve development in which small agriculture-based companies can have connections in the supply chain with the suppliers of products and services in more developed regions. As a result, the employment opportunities and income are expected to increase.

3-1-3 National Strategies and Plans for Industrial Human Resources in the Philippines

(1) Philippine Labor & Employment Plan 2011-2016

The Philippine Labor & Employment Plan 2011-2016 indicates strategic directions for labor and employment in the mid-term and was prepared by the DOLE. The plan stipulates objectives and strategies on (i) employment, (ii) rights on work, (iii) social protection and (iv) social dialogue. The objectives and strategies on employment, which is related to IHRD, are summarized in the table below.

Table 3-4 Objectives and Strategies on Employment in the Philippine Labor & Employment Plan 2011-2016

Objectives	Strategies
Improve employment levels	・ Generating an average one million local employment per year. ・ Formulating a national industry policy. ・ Focusing policies and programs on key job generating areas toward increasing productivity and employment. ・ Formulating through social dialogue sectoral, trade and investment policies that promote employment-rich growth. ・ Promoting better business environment. ・ Promoting employment-intensive undertakes through infrastructure. ・ Promoting entrepreneurship. ・ Promoting productive investment and entrepreneurship among overseas Filipinos (OFs) and their families. ・ Developing and harmonizing green programs.
Improve access to employment opportunities	・ Adopting reforms in employment facilitation. ・ Addressing the job and skill mismatch. ・ Enhancing human capital through education and training.

Source：Prepared by the JICA Survey Team based on「The Philippine Labor & Employment Plan 2011-2016」

(2) Draft Education Summit Statement

As described earlier, there is not yet any revealed development plan in the basic education,

technical and vocational training, and higher education fields after 2017. However, during the Education Summit held at SMX Convention Center, Mall of Asia Complex, Pasay City on November 3 and 4, 2016, the Draft Education Summit Statement was released jointly by three organizations (DepEd, CHED and TESDS) as their commitment. The Declaration includes the following 10 points:

(i) Even as we endeavor to sustain the increase in the education budget at all levels, it is equally important to ensure that budget execution is effective, timely and efficient.
(ii) Promote professional development and certification of faculty, teachers, trainers, learning facilitators, assessors, as well as non-teaching personnel.
(iii) Expand and intensify programs that promote access, such as: Alternative Learning Systems (ALS), Expanded Tertiary Education Equivalency and Accreditation Program (ETEEAP), as well as the full implementation of Republic Act No. 106871 or the Unified Student Financial Assistance System for Tertiary Education (UniFAST)
(iv) Accelerate the full implementation of the Philippine Qualifications Framework (PQF) and mobilize stakeholders for its further substantiation and implementation.
(v) Promote Science, Technology and Innovation, alongside the strengthening of courses in the Arts, Culture, and Humanities.
(vi) Enhance 21st Century Skills and Responsible Citizenship Education among learners
(vii) Convene a high-level Government –Industry –Education Sector Council or consortium to strengthen the collaboration among government, schools, and industry in the areas of curriculum development, research and extension, and student internships, among others.
(viii) Ensure greater coordination and collaboration among the three education agencies, other government agencies, local government, and non-government organizations in pursuit of education goals.
(ix) Enhance the capacities of agencies to ensure that education policies are data-driven, evidence-based, and where data and information are proactively shared with all stakeholders.
(x) Promote government and private sector partnerships in order to achieve quality and sustainable learning at scale, at all levels and settings, through technology. In this connection, we look to the ICT agencies of government to set the ICT framework and governance in consultation with all stakeholders.

Most of the points the statement mentioned are reflected in the Philippine Development Plan 2017-2022 (draft).

(3) Higher Education Reform Agenda (HERA)[47]

The Higher Education Reform Agenda (HERA) was developed by CHED to reform weaknesses of the Philippine Higher Education and to align the entire Higher Education system to an advanced accountability of outcome and impacts.

[47] Referring to "Data Collection Survey for Higher Education Sector in the Philippines" (May 2015, JICA)

The CHED has identified three fundamental and long-running weaknesses of Philippine Higher Education. These three weaknesses are as follows:

- Lack of overall vision, framework or plan for higher education
- Deteriorating quality of higher education
- Limited access to quality higher education by those who need it most and who have the potential to maximize its benefits

The HERA provides the following strategic directions in developing the higher education sector:

- Higher Education Institutions by amalgamation among regional systems and specified institutions
- Developing and implementing a typology of HEIs and an incentives scheme to support quality assurance
- Rationalizing programs through moratorium/phase-out of oversubscribed, inefficient, duplicative programs and channeling more support of priority programs
- Leveling the playing field in higher education through harmonization between public and private HEIs
- Institutionalizing and strengthening partnerships with Basic Education
- Reviewing organizational structures and rationalizing resources for higher education
- Strengthening quality assurance
- Upgrading qualifications of faculty
- Achieving excellence and global competitiveness
- Enhancing institutional governance through an executive development program
- Strengthening student financial assistance programs
- Optimizing roles in poverty alleviation and social development

(4) National Technical Education and Skills Development Plan 2011-2016

The National Technical Education and Skills Development 2011-2016 aims to develop a 21st century Filipino skilled workforce. To achieve the target, the plan stipulates three objectives and enabling strategies shown in the table below.

Table 3-5 Objectives and Strategies in the National Technical Education and Skills Development Plan 2011-2016

Objectives	Strategies
Increase training participation	1. Apply precision in clientele targeting ・ Develop a service delivery rationalization scheme. ・ Focus TVET interventions based on identified priorities ・ Expand and promote agri-fishery related programs 2. Offer wider programs offerings and access ・ Enhance and intensify career advocacy, coaching and counseling in the

	TVIs. ・ Expand and intensify employment facilitation services ・ Sustain promotion and advocacy of TVET
Improve training responsiveness and relevance	1. Pursue positive perpetual collaborations ・ Pursue public private partnership in TVET ・ Expand enterprise-based training (EBT) ・ Strengthen link-up with public and private employers in the hiring TVET graduates 2. Incentivize industry exemplars and participation ・ Provide incentives and rewards to generate wider industry support and commitment ・ Expand and purposively direct scholarships and other training assistance to critical and hard-to-filled skills and higher technologies and use the program to incentivize the TVIs
3. Achieve effective training management	1. Enhance service delivery processes ・ Increase and build up TVET capacity, both horizontally and vertically ・ Institutionalize and strengthen coordination and convergence between and among government agencies concerned with skills development ・ Develop the capacity of LGUs to ultimately assume the responsibility of providing community-based TVET opportunities ・ Strengthen the integrity of assessment and certification system processes ・ Improve and strengthen the monitoring TVET graduates. ・ Pursue the establishment of coordinative mechanism for the three educational agencies ・ Institutionalize quality management system in TVET ・ Strengthen TESDA as the Authority in TVET 2. Mobilize quality resource inputs ・ Conduct periodic review pf training regulations and curricula ・ Develop and quality trainers for TVET based on the Philippine Trainer Qualifications Framework. ・ Implement models and pilot for new and higher technologies ・ Intensity implementation and promotion of assessment and certification ・ Pursue comparability and harmonization of skills and qualifications towards recognition arrangements ・ Diversify sources of financing for TVET ・ Develop and implement programs intended for green jobs 3. Sustain research & development ・ Intensify gathering, analysis and dissemination of labor market information ・ Strengthen research and development in TVET

Source : Prepared by the JICA Survey Team based on "The National Technical Education and Skills Development Plan 2011-2016"

(5) K to 12 Program

The K to 12 program is the important initiative in the basic education sector which also affects the development of industry human resources. Under the program, the Philippine government is implementing the expansion of the basic education system to one year of kindergarten, six years of primary education, four years of Junior High School, and two years of Senior High School (SHS) instead of the former 10-year system. The details of the program are explained in Section 3-2 and 4-1-3.

3-2 Initiatives, Programs, and Projects of Philippine Government

The Philippine government is implementing various initiatives, programs, and projects in the field of industrial human resource development. The outlines of initiatives, programs, and projects are described below.

(1) National Human Resource Development Roadmapping Initiative

The Comprehensive National Industrial Strategy (CNIS) and the creation of the Industrial Roadmap encouraged recognition of importance of skillful human resources in promotion of productive, innovative and competitive industries, causing many industry participants to consider human resource development as a cross-sectoral major issues in addition to infrastructure development and research and development. Thus, the DTI started to take the initiative in creating a Human Resource Development Plan that complemented the Industry Roadmap in collaboration with the DOLE. According to the DTI, the problems pointed out so far in human resource development are insufficiency and mismatch of skills and difficulty of access to high-quality training programs, which are the disincentives to improvement of productivity.

At present, the DOLE is taking the lead in forming technical groups and promoting the creation of industry-specific human resource development plans (see the table below). Each of the human resource development plans analyzes (1) Industry profile and (2) Status quo of human resource development (labor supply, labor demand, demand-supply balance, and (3) strategies and goals of human resource development).

Table 3-6 Organization Responsible for Establishing Industry-specific Human Resource Development Plans

Main industry category	Sector	Subsector	Responsible organization
Agriculture/Agribusiness	Agribusiness	Food processing, Bamboo, Biodiesel	Bureau of Workers with Special Concerns
Agriculture/Agribusiness	Agribusiness	Coco coir, Rubber products	National Reintegration Center Office
Industry	Manufacturing	Automotive Automotive parts	Bureau of Labor Relations
Industry	Construction	Mass housing	
Industry	Manufacturing	Tool and Die	Technical Education Skills Development Authority
Industry	Manufacturing	Electronics, Semiconductor	
Industry	Manufacturing	Chemicals, Petrochemical	Bureau of Working Conditions
Industry	Manufacturing	Plastics, Cement	National Conciliation and Mediation Board
Industry	Manufacturing	Ceramic Tiles, Furniture	National Wages and Productivity Commission
Industry	Manufacturing	Copper and Copper Products, Iron and Steel, Metal casting	Institute for Labor Studies

Industry	Mining	Jewelry	
Industry	IT-BPM	IT-BPM Creative design	Bureau of Labor Employment
Industry	Transport and logistics	Aerospace, Electric Vehicles, Motorcycles	
Services	Health and Wellness	Natural Health Products, Retirement	Professional Regulation Commission

Source: Administration Order No.358 (Series of 2015, DOLE)

(2) K to 12 Program

The Philippine government expanded its basic education from the 10-year system to the 13-year system (kindergarten (one year), primary education (six years), Junior High School (four years), and Senior High School (SHS) (two years)). The addition of the SHS years is aimed at raising the basic education system of the Philippines to an international level and providing SHS graduates with domestic and international competitiveness. The addition of schooling years requires the reform and modernization of basic education curricula through the K to 12 program (kindergarten to the 12th year) that is expected to give positive impact on the quality of the Philippine labor force in the long run. The extension will influence the primary and secondary educations greatly, as well as the subsequent qualifications as Senior High School graduates. It is expected that, after graduation from a Junior High School, some students go on to higher education while others start working. The Philippine government will make tremendous investment and the development partners have provided assistance in order to support this reform.

(3) Industrial Human Resource Development Program by Department of Science and Technology

The DOST targets at development of science and technology according to the socioeconomic development strategies and plans. The scholarship project for science and technology applies to any undergraduate and postgraduate students who at least meet the academic requirements and pass the test for the scholarship project of DOST. The science and technology programs are comprehensive programs consisting of various scholarship initiatives that cover different target fields and recipients and consist of the following: 1) R.A. 7687 Undergraduate S&T Scholarship, 2) DOST-SEI Merit Scholarship, 3) Government Initiatives on Fellowships for the Talented in the Sciences for the Disadvantaged (GIFTS), 4) Accelerated S&T Human Resource Development Program (ASTHRDP), 5) Science Education Consortium Component of the Accelerated Science and Technology Human Resource Development Program, 6) Engineering Research and Development for Technology Program (ERDT), 7) Science and Mathematics Teaching Scholarship, 8) Junior Level Science Scholarship-Merit, 9) Ladderized Program, 10) Bridging Education in Science and Technology for Indigenous Peoples, 11) Bridging Program, and 12) Project Grant for Educational Assistance on Technology and Science Teaching Courses in Mindanao (GREAT-M).

One of the priority initiatives among these programs is the Accelerated Science and Technology

Human Resource Development Program (ASTHDRDP). This program is aimed at providing support in acquiring graduate school degrees to students who are expected to graduate from a university. This is a scholarship system for Masters and Doctors of Science aimed at developing high-level human resources and applied to persons who are expected to fill the gaps of science and technology; it constitutes a unified innovative human resource development program.

(4) JobStart Philippines Program

The JobStart Philippines Program, one of the major projects in the skill development field, is initiated by DOLE. This program has the aim of helping the youth take the first step in their career and get paid employment. This program is intended to enhance the youth's vocational abilities and skills required in the labor market at schools and in vocational training. Additionally, it provides support to job seekers in their life, perceptiveness and social skill acquisition to ensure that the youth achieve better success in their careers. This program also contributes to capacity enhancement for the Public Employment Security Office (PESO) to supply the regular employment facilitation service.

Typical young Philippine recipients of this program are as follows: (1) 18 to 24 years of age, (2) High school graduates or higher, (3) Currently unemployed and not going to school or training institute, and (4) Having work experience of less than one year or none. This Program shall be implemented by the Bureau of Local Employment (BLE) and the DOLE Regional Office (RO) that have reached an agreement with the Local Government Unit (LGU). PESO seeks to set up and register JobStart Partners and establish an internship program. The trainees, after registering themselves as JobStart candidates, are evaluated for their skills online and receive Career Guidance and Life Skill Training (LST). PESO also recognizes the importance of job matching and coaching. Only if a Partner creates a training plan with considerations to target trainees, the youth can start their training and internship. During the training period, the JobStart trainees can receive allowances. For a trainee who cannot get a job, the skill enhancement training can be extended for another three months.

3-3 Roles of Organizations Related to Industrial Human Resource Development

Industrial human resource development, a cross-sectoral issue, is implemented by many organizations that play various roles. The table below summarizes the roles of major relevant organizations in industrial human resource development or industrial promotion.

Table 3-7 Roles of Major Relevant Organizations in Industrial Human Resource Development or Industrial Promotion

Agencies	Roles
NEDA	The National Economic and Development Authority (NEDA) serves as the oversight agency of official development assistance (ODA). NEDA reviews and appraises proposed ODA projects and monitors and evaluates the implementation and impacts of the projects. Interagency committees such as the Development Budget Coordinating Committee and the Investment Coordination Committees under the NEDA Board have

	specific roles in the programming, implementation, and monitoring and evaluation of ODA. Given its key role in coordinating the preparation and/or upgrading of the Philippine Development Plan, NEDA has also coordinated various analytical and research agenda of the government, and responded to the pressing development needs in the various sectors.
DTI	The Department of Trade and Industry (DTI) is the primary coordinative, promotive, facilitative, and regulatory arm of the Philippine Government with the country's trade, industry, and investment activities. DTI has taken initiatives of preparing industry policies/strategy such as the Comprehensive National Industrial Strategy and sectoral industrial roadmaps and is a leading agency of implementing the Manufacturing Resurgence Program.
PEZA	The Philippine Economic Zone Authority (PEZA) – attached to the Department of Trade and Industry – is the Philippine government agency tasked to promote investments, extend assistance, register, grant incentives to and facilitate the business operations of investors in export-oriented manufacturing and service facilities inside selected areas throughout the country proclaimed by the President of the Philippines as PEZA Special Economic Zones.
DepEd	The Department of Education (DepEd) formulates, implements, and coordinates policies, plans, programs and projects in the areas of formal and non-formal basic education. It supervises all elementary and secondary education institutions, including alternative learning systems, both public and private; and provides for the establishment and maintenance of a complete, adequate, and integrated system of basic education relevant to the goals of national development. Currently, it covers 6 years of elementary education and 6 years of secondary education. Major reforms in this sector through the introduction of the K to 12 program – that is, increasing the number of years of basic education from 10-12 and making Kindergarten mandatory – are underway.
CHED	The Commission on Higher Education (CHED) is responsible for managing higher education. Specifically, it shall (i) promote relevant and quality higher education (i.e. higher education institutions and programs are at par with international standards and graduates and professionals are highly competent and recognized in the international arena), (ii) ensure that quality higher education is accessible to all who seek it, particularly those who may not be able to afford it, (iii) guarantee and protect academic freedom for continuing intellectual growth, advancement of learning and research, development of responsible and effective leadership, education of high level professionals, and enrichment of historical and cultural heritage, and (iv) commit to moral ascendancy that eradicates corrupt practices, institutionalizes transparency and accountability and encourages participatory governance in the Commission and the sub-sector.
DOLE	The Department of Labor and Employment (DOLE) is the national government agency mandated to formulate and implement policies and programs, and serve as the policy-advisory arm of the Executive Branch in the field of labor and employment. It engages in the JobStart Philippines Program and also leads the National Human Resource development Roadmapping Initiative.
TESDA	Middle level education managed by the Technical Education and Skills Development Authority (TESDA) focuses on post-secondary technical-vocational education and training for middle-level learners. TESDA formulates manpower and skills plans, sets appropriate skills standards and tests, coordinates and monitors manpower policies and programs, and provides policy directions and guidelines for resource allocation for the TVET institutions in both the private and public sectors.

DOST	The Department of Science and Technology (DOST) is the premiere science and technology body in the country charged with the twin mandate of providing central direction, leadership and coordination of all scientific and technological activities, and of formulating policies, programs and projects to support national development. DOST provides various financial support programs and scholarship programs to harness the country's scientific and technological capabilities to spur and attain a sustainable economic growth and development.
DA	The Department of Agriculture (DA) is the government agency responsible for the promotion of agricultural development by providing the policy framework, public investments, and support services needed for domestic and export-oriented business enterprises.
PRC	The Professional Regulation Commission (PRC) is responsible for the administration, implementation and enforcement of regulatory policies on the regulation and licensing of various professions and occupations under its jurisdiction. The PRC serves more than 3.9 million professionals from 43 various regulated professions and the hundreds of thousands of aspiring professionals who take the licensure examinations every year.

Source: Prepared by the JICA Survey Team based on the Web pages of listed organizations

Chapter 4 Education System, Current Status and Challenges in terms of Industrial Human Resource Development

4-1 Outline of Education System

4-1-1 Trifocal Education System in the Philippines

The Congressional Commission on Education (EDCOM) report of 1991 recommended the division of Department of Education, Culture and Sports (DECS) into three parts. On May 18, 1994, Congress passed Republic Act 7722, the Higher Education Act of 1994, creating the Commission on Higher Education (CHED), which assumed the functions of the Bureau of Higher Education, and supervises tertiary degree programs. On August 25, 1994, Congress passed Republic Act 7796, the Technical Education and Skills Development Act of 1994, creating the Technical Education and Skills Development Authority (TESDA), which absorbed the Bureau of Technical-Vocational Education plus the National Manpower and Youth Council, and supervises non-degree technical-vocational programs. DECS retained responsibility for all elementary and secondary education. This threefold division became known as the trifocal system of education in the Philippines. In August 2001, Republic Act No. 9155, otherwise called the Governance of Basic Education Act, was passed renaming DECS to the Department of Education (DepEd) and redefining the role of field offices, which include regional offices, division offices, district offices, and schools. All responsibilities in the hand of DECS by 1994 were divided into three agencies, namely CHED, TESDA, and DepEd.

4-1-2 A Mismatch between graduates of trifocal education system and those in demand among employers

It has been pointed out for a long time in the Philippines that there are skills gap and skills mismatch between graduates of basic education, higher education and technical-vocational education system and those in demand among industries.

According to the Labor Force Survey[48] by the Philippine Statistics Authority, the average unemployment rate of the Philippines from 1994 to 2016 was 8.63 percent, about 30 percent of the unemployed persons were high school graduates, and the half of the unemployed persons were aged 15 to 24 years old through the period. The Unemployed rate in October 2016 was estimated as 4.7 percent and the number of unemployed persons was 2.04 million. Of the total unemployed, the age group 15 to 24 years comprised 47.6 percent, while the age group 25 to 34, 30.1 percent. By educational attainment, 20.5 percent of the unemployed were college graduates, 13.8 percent were college undergraduates, 32.9 percent were high school graduates, and 10.5 percent were high school undergraduates.

Other studies find that there are over 500,000 college graduates every year and only 40 percent will land a job a year after graduation[49], and that only around 10 percent of science graduates

[48] Philippine Statistics Authority, Labor Force Survey, October 2016.
[49] Philippine Institute for Development Studies, “Are Higher Education Institutions Responsive to Changes in the Labor Market?”, Discussion Paper Series No. 2016-08.

and postgraduates find jobs in the manufacturing sector, while almost half end up working in trade, real estate, and other service subsectors that are less related to their fields of study[50].
2013/2014 Integrated Survey on Labor and Employment[51] by the Philippine Statistics Authority finds that the bulk of job vacancies which the establishments found difficulties in recruiting were from the group of professionals (systems analysts and designers; college, university and higher education teaching professionals; accountants and auditors; civil engineers; personnel and human resource development professionals), technicians and associate professionals (technical and commercial sales representatives; administrative secretaries and related associate professionals; safety, health and quality inspectors; mechanical engineering technicians; computer equipment operators), and clerks (customer service representative (call center agents); accounting and bookkeeping clerks; receptionists and information clerks).

Numerous studies have been conducted by prominent domestic and foreign institutions have conducted on the skills gap and skills mismatch in the Philippines[52]. Commonly cited reasons why fresh graduates of high schools, colleges, universities and Technical-Vocational Institutions (TVIs) end up lining the unemployment line are the following:

- A mismatch between graduate skills and those in demand among employers
- Lack of academic competencies of an average graduate
- Lack of technical/specialized skills of an average graduate
- An oversupply of graduates in several fields and/or a shortage of employment opportunities in their field of specialization
- Lack of information for both job seekers and employers
- Entry-level position may pay wages lower than what the graduates are expecting
- Job vacancies are not suitable for the graduate competencies (Some of domestic industries are not developed yet.)
- The high school students (of 10-year basic education) was 16 years old at their graduation and did not reach to the age of adult in the Philippines, i.e., 18 years old. This 2 years gap was the biggest cause of high unemployment rate among high school graduates who did not go to universities or TVET.[53]。

In order to deal with these issues, CHED, TEDA and DepEd tried to enhance quality assurance through Outcomes-based Education, developed Philippine Qualification Framework, prepared

[50] World Bank, “Philippine Development Report 2013”.
[51] Philippine Statistics Authority, “Job Vacancies: 2013-2014…hard-to-fill occupations in focus (Second of a three-part series)”, LABSTAT Updates, March 2016.
[52] For example, Department of Labor and Employment, “JOBSFIT Final Report”. World Bank, “Skills for the Labor Market in the Philippines”, 2010. Philippine Institute for Development Studies, “Are Higher Education Institutions Responsive to Changes in the Labor Market?”, Discussion Paper Series No. 2016-08.
[53] The eligible age in the Philippines is 15 years old. However, there were many incidents in the past where malignant employers were indicted because of their exploitation of child labor, taking advantage of their poverty, and now companies are rather reluctant to employ the youngsters from 15 to 17 years old. The labor at the factories could be regarded as physically dangerous, though it is acceptable to work for agriculture or self-employed under the permission ad supervise by the family. Youngsters under 18 years old cannot be self-employed because one of the conditions for self-employment permission is that the applicant is older than 18 years old.

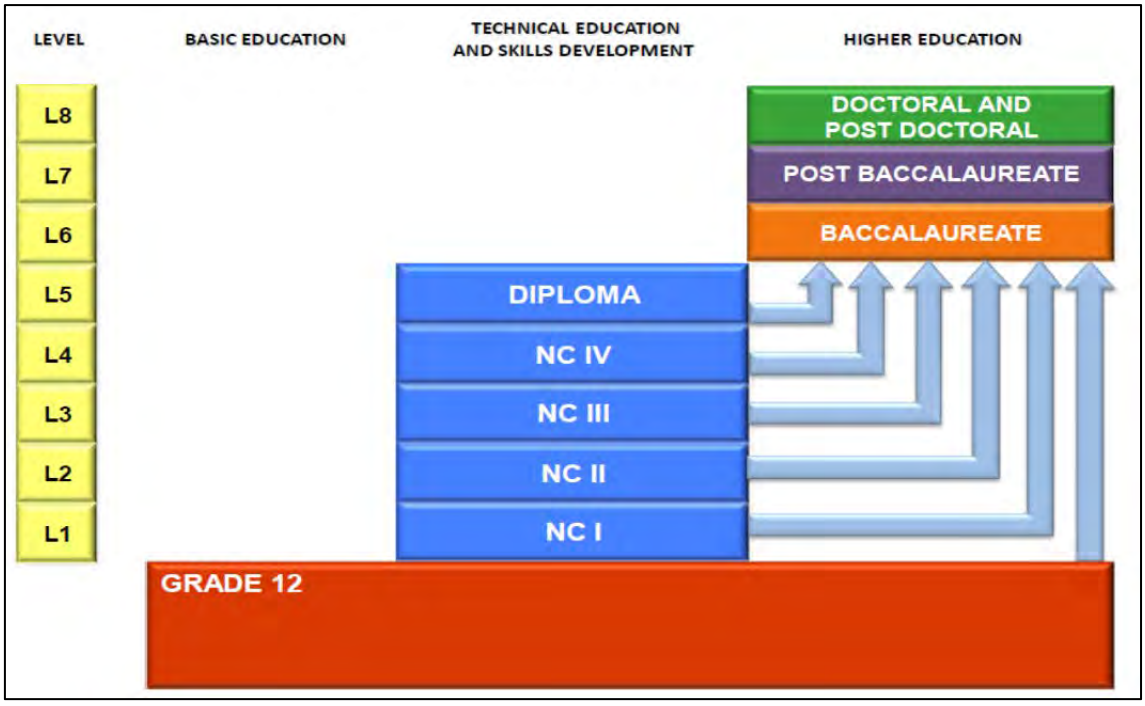
the implementation of ASEAN Qualification Reference Framework, and introduced the K to 12 program.

4-1-3 Changes in Education System

(1) Institutionalization of the Philippine Qualifications Framework (PQF)

In 2010, former President Aquino issued his Social Contract with the Filipino people that reflects the government's commitment to education and expresses the transformation objective as "From relegating education as one of the many concerns to making education as the central strategy for investing in our people, reducing poverty and building national competitiveness."

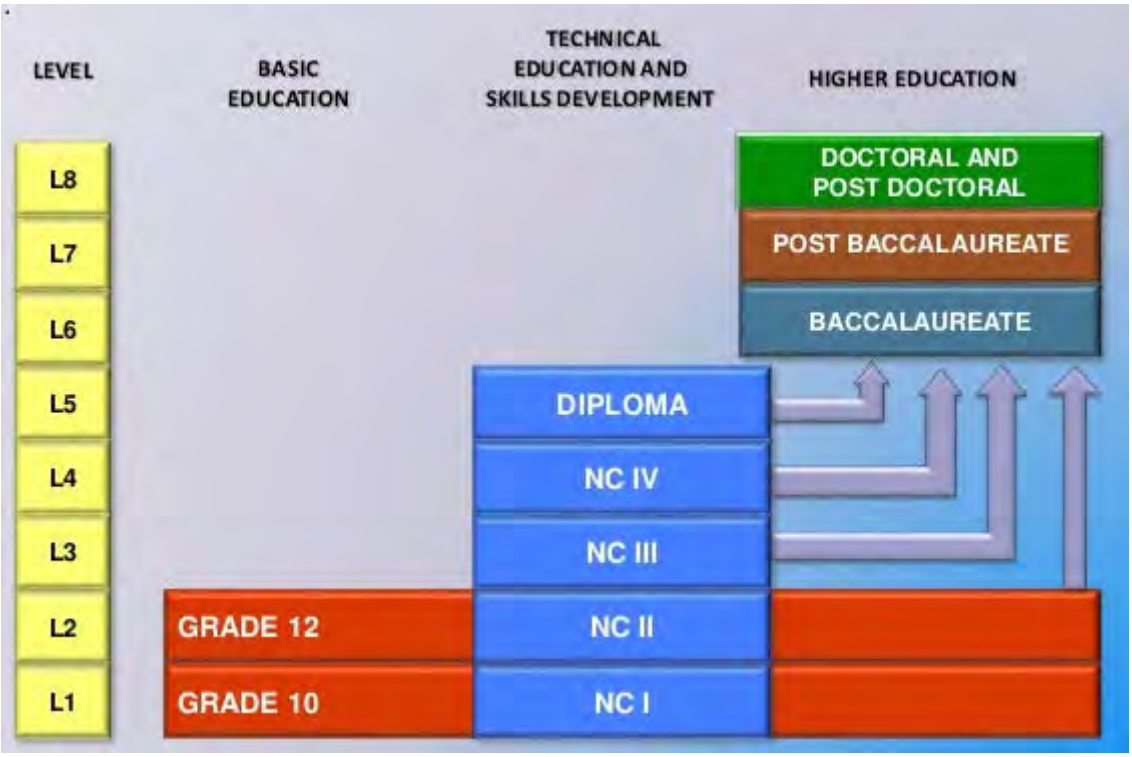
Executive Order 83 s. 2012 brought about the institutionalization of the Philippine Qualifications Framework (PQF). It is a national policy describing the levels of educational qualifications and sets the standards for qualification outcomes. It is also a quality assured national system for the development, recognition and award of qualifications based on standards of knowledge, skills and values acquired in different ways and methods by learners and workers. The PQF, a tool that can better prepare Filipino students into the labor force, harmonizes basic education, technical-vocational education and higher education into a nationwide schedule of skills and competencies. Discussion on the PQF is still on-going. The PQF as per PQF-NCC Resolution No. 2014-03 adopted on December 11, 2014 is shown as below.



Source: PQF National Coordination Council

Figure 4-1 Philippine Qualification Framework

Discussion on the revisions of PQF is still on-going. According to the stakeholders, issues being raised are as follows: whether the diploma programs, which have been offered by Higher Education Institutions (HEIs), are going to be offered by TVIs only or not; effective modes of transfer from NC I-IV, which do not include academic units at all, to Baccalaureate; whether NC I and II should be included in basic education as well or not, and so on. Recently discussed PQF, which indicates NC I and II can be obtained in Grade 10 and 12 respectively, is shown below.



Source: TESDA

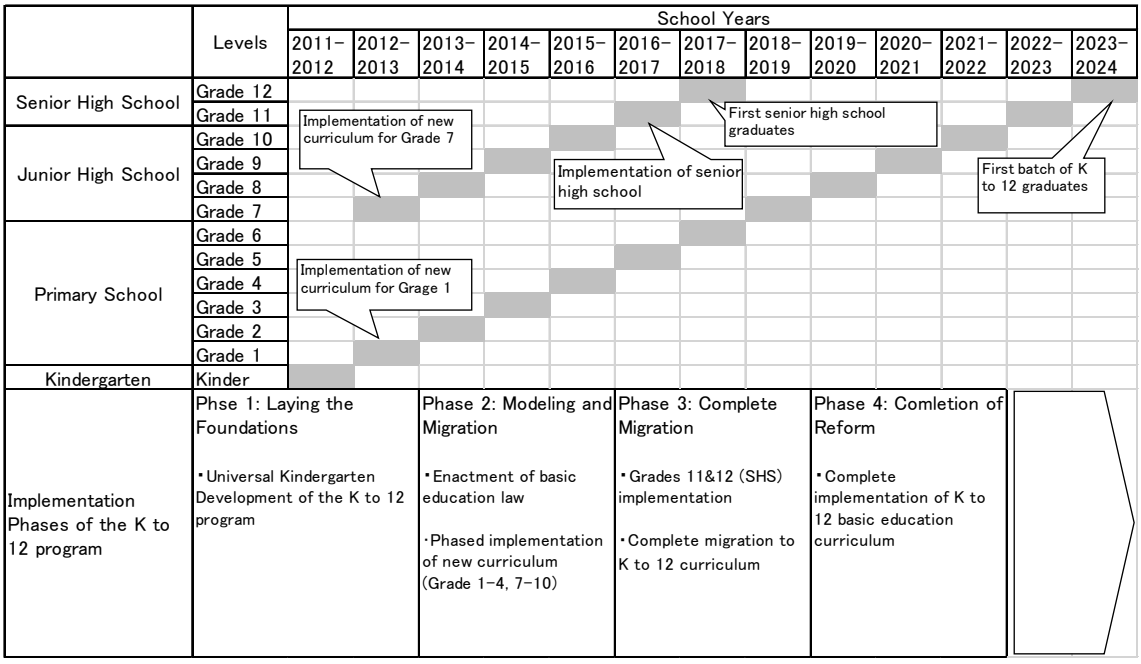
Figure 4-2 Philippine Qualification Framework in Discussion

There are five agencies involved in the implementation of PQF: namely, Department of Education (DepEd), Commission on Higher Education (CHED), Technical Education and Skills Development Authority (TESDA), Department of labor and Employment (DOLE), and Professional Regulations Commission (PRC). The ASEAN Qualifications Referencing Framework (AQRF) will serve as a common reference framework that provides a system to enable comparison of qualifications across ASEAN countries. Agencies have been working on operating PQF and AQRF in conjunction. Among ASEAN member countries, a mutual recognition agreement on 8 professional services; engineering, nursing, architecture, surveying, accountancy, medicine, dentistry, and tourism has been signed. It is necessary to unify the qualification contents at the practical level for increasing mobility of professionals in ASEAN.

(2) K to 12 Program[54]

When Aquino administration decided to implement the K to 12 program in 2010, compulsory education in the Philippines, which was six years of primary education and four years of secondary education, was one of the shortest in the world. The Philippines was the last country in Asia and one of only three countries worldwide with a 10-year pre-university cycle (Angola and Djibouti are the other two). In 1999 the Bologna process aimed to promote a mutual recognition of the degrees and qualifications among countries. Philippine students encountered difficulty to enter universities immediately after their high school graduation (10-year basic education) in European countries. The Washington Accord established an international accreditation system for professional engineering academic degrees between the bodies responsible for accreditation in its signatory countries. Gradually, the number of cases that Philippine engineering graduates are not considered equal to those in other countries are increased. Such disadvantages boosted extension of the Philippine basic education period.

RA 10533 or the Enhanced Basic Education Act of 2013 was signed into law in May 2013. The K to 12 program covers 13 years of the basic education, that is, 1 year of kindergarten, 6 years of primary school, 4 years of junior high school, and 2 years of senior high school. Senior High School "completes" basic education by making sure that the high school graduate is equipped for work, entrepreneurship, or higher education. This is a step up from the 10-year cycle where high school graduates still need further education (and expenses) to be ready for the world.



Source: Based on the data of DepEd created by the JICA Study Team

Figure 4-3 Implementation of the K to 12 Program

[54] The K to 12 program covers 13 years of the basic education, that is, 1 year of kindergarten, 6 years of primary school, 4 years of junior high school, and 2 years of senior high school.

In June 2016, Senior High School program was officially introduced nationwide. In Senior High School, students will go through a core curriculum and subjects under a track of their choice such as academics, arts and design, sports and technical-vocational-livelihood (TVL) education. SHS graduates of TVL are expected to be equipped with National Certificates II in their selected areas such as ICT and Industrial Arts.

The new K to 12 curricula in basic education will inevitably impact higher education in the Philippines. First, K to 12 makes it necessary to adjust the college curriculum, to make sure that college subjects build upon it in the best way. Due to the K to 12 program, the College General Education curriculum was reduced from 51 units to 36 units. Subjects that have been taken up in Basic Education was removed from the College General Education curriculum (CHED Memorandum Order No. 20, series of 2013). Currently, CHED technical panels for each course/field are reviewing the college curriculum and fine-tuning the courses not just for General Education, but for each specialization. By the time the first batch of K to 12 graduates enter college in 2018, these revisions will also be in place.

The number of HEI graduates from AY 2019-2020 to AY 2020-2021 will be significantly decreased and this may cause a negative impact on the labor market in filling vacancies of managers and supervisors, professionals, technicians and associate professionals.

4-2 Basic Education

4-2-1 Basic Education System

(1) Former and Current Basic Education System

Basic education system has been changed before and after the implementation of the K to 12 program as below.

School	Grade	Age
High School	4th Year	15
	3rd Year	14
	2nd Year	13
	1st Year	12
Elementary School	Grade 6	11
	Grade 5	10
	Grade 4	9
	Grade 3	8
	Grade 2	7
	Grade 1	6

Basic Education
Before the K to 12 program

School	Grade	Age	Starting Year of New Curriculum	Compulsory Status
Senior High School	Grade 12	17	SY2017	New
	Grade 11	16	SY2016	New
Junior High School	Grade 10	15	SY2015	Retained
	Grade 9	14	SY2014	Retained
	Grade 8	13	SY2013	Retained
	Grade 7	12	SY2012	Retained
Elementary School	Grade 6	11	SY2017	Retained
	Grade 5	10	SY2016	Retained
	Grade 4	9	SY2015	Retained
	Grade 3	8	SY2014	Retained
	Grade 2	7	SY2013	Retained
	Grade 1	6	SY2012	Retained
	Kindergarten	5	SY2011	New

Basic Education
After the K to 12 program

Source: Prepared by the JICA Study Team based on the data of DepEd

Figure 4-4 Basic Education System Before and After the K to 12 Program

The features of the K to 12 program are the following:

- In Kindergarten to Grade 3, the child's dominant language is used as the language of learning. Filipino and English language proficiency is developed from Kindergarten to Grade 3 but very gradually.
- Basic concepts/general concepts are first learned. More complex and sophisticated version of the basic/general concepts are then rediscovered in the succeeding grades. This strengthens retention and enhances mastery of topics and skills as they are revisited and consolidated time and again. (Spiral Progression)
- Develop appropriate Specialization Subjects for the Academic, Sports, Arts and Design, and Technical Vocational Livelihood Tracks. Integrate TVET skills, competencies and qualifications in TLE in Junior High School and Technical Vocational Livelihood (TVL) track in Senior High School.

(2) Lower Secondary Education（Junior High School）System

General Secondary Schools

More than 90 percent of all junior high school students enroll the general secondary school.

Special Secondary Schools

There are vocational secondary schools, science secondary schools[55] for students who have demonstrated a gift in science, art schools and schools with special curricular such as music, dance and sports.

As for vocational secondary schools, DepEd launched the “Strengthened Technical-Vocational Education Program (STVEP)” in 2007. A total of 282 technical-vocational secondary schools (mostly earlier converted through legislation from general high schools) in 16 regions started the enforcement using the competency-based curriculum (NC I and II) developed by TESDA. Of the 282 tech-voc institutions, 157 are classified as arts and trade schools, 80 as agricultural institutions and 45 as fishery learning centers. Curricular offerings of a school of arts and trade include automotive technology, building construction, drafting, electronics, machining, PC hardware servicing, plumbing, welding, beauty care, food trades, and garments. On the other hand, school of agriculture offers crop production, vegetable production, animal production and food processing while school of fisheries presents fish culture, fish processing and fish capture.

Choosing Senior High School Specialization

It is compulsory for all Grade 9 students to take the National Career Assessment Examination (NCAE). Students will undergo assessments to determine their strengths and interests. These will include an aptitude test, a career assessment exam, and an occupational interest inventory

[55] Special science high schools like those of Philippine Science High School System (administered by DOST) and Regional Science High School (administered by DepEd) have biology, chemistry, and physics at every level and or exclusive and advanced science and math subjects as well as subjects in technology, pre-engineering, and research. Selected students are beneficiaries of scholarships and obligatory to study science and math related fields in universities and colleges.

for high schools. Career advocacy activities will also be conducted to help guide students in choosing their specialization or track.

(3) Upper Secondary Education (Senior High School) System

Senior High School Program was implemented nation-wide in June 2016. Senior High School covers eight learning areas as part of its core curriculum, and adds specific tracks based on four disciplines: Academic, Technical-Vocational-Livelihood, Sports, Arts & Design. Students may pick a track based on how he or she want to proceed after high school graduation.

1) Academic Track

Academic Track ensures college readiness. There are four options.

Accountancy, Business & Management：ABM
Humanities & Social Sciences：HUMSS
Science, Technology, Engineering & Mathematics：STEM
General Academic Strand：GAS

2) Technical Vocational Livelihood Track

Students may select competency/qualifications from courses of arts and trade, agriculture, fishery. Any Grade 10 finisher and all Grade 12 TVL graduates are eligible for TESDA competency/qualifications assessments (i.e. Certificate of Competency, NC I or NC II).

3) Sports Track

Sports track will prepare students with sports science, sports-related, physical education-related, health-related, and movement-related courses.

4) Arts and Design Track

Arts and Design Track will prepare student for the creative industries in various creative and artistic fields such as music, dance, creative writing and literature, visual arts, media arts, broadcast arts, film and cinema, applied arts, architecture and design, theater, entertainment, etc.

According to the CHED, basically all high school completers can take entrance exams of universities and colleges. However, due to lack of core subject units, graduates of TVL, Sports, Arts and Design may need to complete a Bridge Course (one year) before proceeding to the university/college program.

<u>Voucher Program</u>

Upon the commencement of the high school program, it was necessary for the Philippine government to secure additional class rooms and teaching staff to accommodate two years of high school courses. However, because of the budget and land constraint, it had to allow and promote private and public universities in addition to private high schools to offer the high

school program to compensate the lack of class rooms and teaching staff at the public high school. The voucher program was established in order to encourage the graduate from public junior high schools to enter the program at private high schools and private/public universities[56]. The Government has not made it clear until when the system would continue.

(4) Academe-Industry Collaboration

As a support for the basic education, private partners can donate through the Adopt-A-School program. A 150% tax incentive will be provided for every contribution. DepEd and partners may enter into an agreement for 1) contextualization of the curriculum and/or design of the Work Immersion Program to make the program more relevant to the needs of the local community, 2) joint planning for the 80-hour work immersion program, and 3) teacher training and capacity-building. Work Immersion refers to the part of the SHS Curriculum consisting of 80 hours of hands-on experience or working simulation which the Grade 11 and 12 students will undergo to expose them to the actual workplace setting and to enrich the competencies provided by the school under supervision of the School Head and the designated personnel of the partner.

4-2-2 Current Status of Upper Secondary Education

(1) Implementation of High School Program

The number of students enrolled in grade 11 in FY2006 was about 1.52 million. Approximately 60% of the students selected Academic Track, about 40% selected the Technical Vocational Livelihood (TVL) Track. In many cases, one high school provides multiple tracks.

There were 4,441 public high schools that provided TVL Truck. Considering that there were only 282 technical vocational high schools as of 2011, many of the 4,441 high schools could not be helped to receive the 11th grade students without sufficient preparation in terms of facilities and equipment, technical teachers, teaching materials, industrial collaboration and course guidance.

[56] The upper limit of the face value of the voucher is set in each region. (22,50 0pesos in NCR, 20,000 pesos in urban and17,500pesos in rural regions). The voucher is provided for all students who completed 10-year public junior high schools and wish to take a high school program at private high schools, public universities and etc., 100% of the tuition fee for the program at private high schools and 50% at public universities are provided. For the students who took the Education Service Contracting (ESC) at private junior high schools, 80% is provided in case they wish to enter the private universities, 50% in case they take the program at public universities, while 50% is provided if the private high school graduate take the program at public universities. When the tuition fee exceeds the support provided by the voucher system, the surplus must be borne by the students. For the details, see the DepEd website (http://www.deped.gov.ph/k-to-12/shs-voucher-program). According to DepEd report, 523,525 students in total received the voucher as of august 2016. Among them, 384,058 enter private high schools from public junior high school, 71,043 took the program at public universities from private junior high schools, 68,424 are the ones who took the ESC at private junior high schools and entered the program at private high schools and public universities.

Table 4-1 Number of Grade 11 Students by School Type and Track（SY2016）

Program	No. of Enrollees				
	Public	Private	SUC/LUC	Total	
Academic Track	410,631	476,791	27,014	914,436	59.89%
Accountancy, Business, and Management	64,965	145,704	8,620	219,289	14.36%
General Academic Strand	222,788	99,875	4,459	327,122	21.42%
Humanities and Social Sciences	69,470	68,466	7,955	145,891	9.55%
Science, Technology, Engineering, and Mathematics	52,353	160,105	16,100	228,558	14.97%
Pre-Baccalaureate Maritime	81	2,853	0	2,934	0.19%
Arts and Design Track	2,659	3,071	353	6,083	0.40%
Sports Track	1,730	1,280	260	3,270	0.21%
Technical-Vocational-Livelihood Track	389,432	200,053	13,905	603,390	39.52%
Total	804,452	681,195	41,272	1,526,919	100.00%
	52.68%	44.61%	2.70%	100.00%	

Source: Based on the data of DepEd created by the JICA Study Team

Table 4-2 Number of Schools Offering High School Program（by track）（SY2016）

Program	No. of SHS in SY2016			
	Public	Private	SUC/LUC	Total
Accountancy, Business, and Management	1,186	2,754	128	4,068
General Academic Strand	4,081	3,026	72	7,179
Humanities and Social Sciences	1,183	2,003	148	3,334
Science, Technology, Engineering, and Mathematics	903	1,851	154	2,908
Pre-Baccalaureate Maritime	2	33	1	36
Arts and Design Track	107	205	16	328
Sports Track	86	178	24	288
Technical-Vocational-Livelihood Track	4,441	2,766	181	7,388
Total	5,961	4,401	226	

Source: Based on the data of DepEd created by the JICA Study Team

For high schools offering TVL Track, it is necessary to find partner enterprises to accept Work Experience (Work Immersion), and it is urgent to strengthen industry-university cooperation. The DepEd proposed to install a teacher in charge of industry-academe collaboration at each school, but the budget was not approved by the government. In addition, the DepEd implemented two-week trainings for high school principals and teachers in charge of G 11 during FY 2015, but the principals and teachers have expressed some concerned on whether the trainings were sufficient for performing their new roles. The DepEd predicts that it is difficult to find companies that cooperate with high schools in remote areas away from major cities.

According to the DepEd order, Work Immersion is stipulated up to 80 hours. As for the DepEd, a high school is a place of education and a high school student is a minor, therefore long-term training is not permitted to provide inexpensive labor force (on the part of the enterprise) and receive income (for students). On the other hand, many methodologies or number of the classes were tried and examined at the model high schools at which DepEd piloted the high school program since 2012, and the lessons leant will be applied for the improvement.

Many of the DepEd teachers have academic background of law, literature, and pedagogy. Especially high-ranking officers of the DepEd have many master's and doctorate degrees in pedagogy, and there are few officers with deep knowledge about technical vocational education. This is a problem common to principals of high schools that provide TVL Track. Due to the

transition to the trifocal education system in 1994, officers and trainers with knowledge of technical vocational education and field experience concentrated in TESDA, and mismatches occurred in manpower on education-related agencies.

(2) Current Status of Model High Schools[57]

We visited 3 public technical vocational senior high schools, which are pilot schools of the "Project for Supporting Senior High School Program in Technical Vocational High School", in Metro Manila, Calabarzon Region, and Cebu and gathered information as regards present states and challenges mainly from standpoints of (1) facilities and equipment, (2) collaboration with industries and (3) employment. Those with whom we interviewed were principals, and teachers.

Table 4-3 Senior High Schools Visited

Name of the SHS visited	Location
1) San Pedro Relocation Center National High School	San Pedro, Laguna
2) Subangdaku Technical Vocational School	Mandaue City, Cebu
3) Rizal Experimental Station and Pilot School of Cottage Industries	Pasig City, Metro Manila

1) San Pedro Relocation Center National High School：SPRCNHS

SPRCNHS offers Academic Track and TVL Track. TVL Track provides courses of Automotive Servicing, Dress-making, Technical Drafting, Cooking, etc. Since industries consider 80-hour Work Immersion is not enough, SPRCNHS signs MOA with the industries and conduct 300-hour Work Immersion.

The number of equipment is not enough for the number of students. DepEd allocates the same amount of budget to Academic Track and TVL Track, however it is not sufficient for the TVL Track, which requires twice or trice of budget of Academic Track.

SPRCNHS requested to increase 48 teaches in 2016, however only 11 teachers were newly assigned by the DepEd. TVL Track needs experienced and background in technical and vocational education in order to establish industry linkages as well.

SPRCNHS conducts a field trip for Junior High School students. Through the field trip, Grade 8-9 students are expected to familiarize with industries and consider which course they should take in TVL Track. Parents are allowed to accompany with students in order to understand students' future direction.

2) Subangdaku Technical Vocational School：STVS

TVL Track offers metal working, cooking, dress-making, etc.

10 out of 13 graduates of Sealded Metal Aarc Welding were employed be a company where they

[57] 1)-6) are all target schools of JICA "Project for Supporting Senior High School Program in Technical Vocational High Schools". Information of 1)2) are based on the interviews, and 3)-6) are based on Industry Summit in November 9-11.

conducted work immersion in 2015. The school signed a MOA with the companies and conduct 300-hour work immersion. The number of hours of work immersion was agreed between students and the school first and other subjects' schedule was adjusted. There are restrictions for the Food and beverage course that students cannot be sent to restaurants and companies which deal with Tabaco and alcohol. There are 81 Grade 11 students and the school needs to find partner companies that accept their work immersion. There is one Industry Linkage Officer who is also teaching classes, so one is not enough. It is expected that each course has one Linkage Officer, who is in charge of identifying and arranging partners who can offer the work immersion trainings.

One of the lessons learnt from the JICA project is the importance of monitoring students' progress and tracing graduates. The school has not traced the employment of the graduate (10-year course) so far. However, now it has become apparent that it is necessary to monitor the companies the graduates are employed, their job contents, and if they continue to work or not. Since almost all graduates from the STVS would not go to universities, but work, the school would collect and analyze the information on their courses, and use it for the improvement of the school management.

3) Rizal Experimental Station and Pilot School of Cottage Industries: RESPSCI (Pasig City)

RESPSCI offers courses for Housekeeping, Food and Beverage Service, Bartending, Refrigeration and Air Condition Servicing (RAC), and Bread and Pastry in TVL track. RESPSCI currently conducts work immersion in collaboration with about 20 companies. These companies were mainly introduced by Philippines Chamber of Commerce and Industry (PCCI). The companies highly evaluated RESPSCI graduates and they said that there were little skill differences compared with college graduates. It is a cheerful aspect that the evaluation of RESPSCI graduates is good, however, as the number of applicants who wish to enter SHS in RESPSCI increases, it is impossible for RESPSCI to accept all applicants for enrollment due to the lack of teachers and facilities. Also, as the number of students increases, more partner companies are needed, and it will be a problem whether to find such companies or not.

The principal is motivated to make it possible for graduates of RESPCI to acquire competitiveness that not only domestically but also abroad (especially in ASEAN countries). Also, since RESPSCI is responsible for extending learning from JICA projects to other schools and communities, the school take the initiative and try to strengthen cooperation with industries even after the project is over.

4) Buhig National Agricultural and Technical School (Iligan City)

With the support through JICA project, the Cassava production was started and 4x4 wheel tractor was rented and used for the production. It was very useful in that students can acquire skills and knowledge on agriculture technologies as well as earn some income.

Work immersion is important and student exposure is not enough. The program should be modified; Monitoring and evaluation of student performance is important; and Employ "earning

while learning" principle to augment student's expenses while in SHS; Intensify career guidance; and Identify an industry linkage coordinator. Bottle necks are lack of manuals, alignment of course offerings with the needs, establishment of industry linkages.

5) Rogongon Agricultural High School（Illigan City）

Horticulture and Agricultural Production courses are offered. School is located at a remote area with a bad peace and order situation. Main challenge was forming linkages with industries to partner with due to the location. Tracer study identified challenges like lack of electricity and importance of the association (formed in 2013) to develop the students' own farms for livelihood. Students are mostly indigenous people (IPs) and rebel returnees. Training was done in context of community building. Students dropped off because of pregnancies. Partners for industry immersion were other TESDA schools and Binaho Industry Farm

Lessons learned were: National government agencies should include industry linkages in their roadmaps; Localize roadmaps to identify specific crops to develop; Incentivize studying to encourage student's participation. Bottlenecks were early pregnancies and a need to study further the approach of community-based learning.

6) Bataan School of Fisheries

Courses offered are fisheries, aquaculture, food processing and garments.. It succeeded in establishing a strong industry linkage with the local industry with the support from the mayor and governor. The DA-BFAR in Region I accepted students for Work Immersion program. The school has not been able to catch up with the advanced technologies, it is essential for them to update the classes with every day-advancing technology used by the industry. The employment rate of the graduates was 57% in 2015.

7) Iligan City National School of Fisheries

The school established a large aquaculture laboratory in order to ensure that students can have practicum at the school and also receive financial support for the work immersion by income generation activities, for example by selling the fingerlings. Good practice is to establish strong industry linkage with local executives (mayor and governor). Bottleneck was caused by inadequate technology in the school. Lessons learned is that monitoring should be done in all steps.

4-2-3 Issues and assistance needs of the Secondary Education (Technical Occupation / Livelihood Track)

Based on the above survey results, possible challenges and assistance needs are as follows.

Table 4-4 Issues and Assistance Needs（Senior High School）

Issues	Assistance needs
Teaching materials and instruction manuals of the TVL courses do not adequately reflect the needs of the industrial side.	・ Secure opportunities for TVL teaching staff to receive comments from local companies and regional TESDA and to improve them. ・ Hold workshops among faculty members in the region, resolve doubts, help each other, and share good practices.
The quality and quantity of equipment and teaching materials are not sufficient.	・ Improve proposal making technology to request DepEd budget for principals. ・ Strengthen relationships with industries so that local companies can donate equipment. ・ If there are universities (College of Industrial Technology etc.) and TVET center in the vicinity, consider possibility to share equipment.
Teachers' abilities are not sufficient.	・ Build relationships with industries so that local companies, universities in the region (Faculty of Industrial Technology etc.), TVET centers etc. provide industry immersion to the teachers during the holidays.
The place to accept Work Immersion are not secured.	・ Strengthen collaboration with universities in the region (College of Industrial Technology etc.), TESDA, PESO etc. ・ Industry-academe cooperation reinforcement training for teachers. ・ Increase the opportunities such as entrance ceremonies and graduation ceremonies to invite local governments, local enterprises, and student families to make them fully understand the position of technical vocational high schools in local industrial human resource development, cooperate.
Students' academic ability (mathematics, physics, chemistry etc.) is not enough.	・ Strengthening science and mathematics subjects in primary and secondary education.
The English ability of the student is not sufficient.	・ Enhance student's English proficiency in primary and secondary education.
Students' Attitudes and motivation for work are not sufficient.	・ Have local companies review the contents of teaching materials to strengthen soft skills. ・ Incorporate "manufacturing spirit" into the curriculum as taught in Cebu manufacturing advice. ・ Incorporate content that can convey the enjoyment of manufacturing, thoroughly implementing 5S and time management for classes.

The system for supporting employment for students is not fully prepared.	・ Conduct career guidance training for teachers. ・ Establish a job search support corner in the school. ・ In the Philippines, OJT (Work Immersion in High School) is important to find a job. Share the model and know-how of universities that are using OJT for employment with the teachers of TVL Track. ・ Colleges in the region (College of Industrial Technology etc.), TESDA, PESO etc. are one step ahead of high school in terms of career guidance for students, employment support, corporate collaboration, etc. Create a system that enables the principals, teachers, and students of high schools to share the experience and knowledge of these institutions.
Incorporating of human resource development plan (including high school and university) in regional industry promotion and regional development plan is not sufficient.	・ When thinking about regional industry promotion and regional development plan, create a system to fully consider the human resource development that contributes to regional economy (what kind of human resources should be trained at high schools and universities).

BOX4-1: Types of corporate training

There are three main types of corporate training in the Philippines: Dual Training System (DTS), On-the-Job Training (OJT), and Apprenticeship.

1) DTS: A system introduced based on the German technical vocational training. For example, 40% of training are conducted in schools (universities, technical vocational training centers, and technical vocational high schools) and 60% are used for practical training at companies. The proportion of learning at school and practice at a company is determined by Memorandum of Agreement (MOA). Companies must pay 75% of minimum wages (wages are distributed to a school and students). http://www.chanrobles.com/republicactno7686.htm#.WB6aL-lPpes

2) OJT: Period and treatment (e.g. transportation cost and lunch fee are provided) are defined by MOA. It is unpaid, but wages are sometimes paid depending on the conditions of MOA.

3) Apprenticeship: the period is 4 to 6 months, 75% of the minimum wage is paid. There is preferential treatment concerning taxes for enterprises.
http://www.dole.gov.ph/fndr/bong/files/DO%2068-04.pdf

Technical vocational training institutions located in areas that are easy to find partner companies, such as Metro Manila and Cebu Metropolitan area, adopt DTS. On the other hand, TESDA-Region XI told that OJT was mainstream and DTS was not being implemented at technical vocational institutions in Davao. It seems that there are regional gaps (differences in the number of sponsored companies in the region) in corporate training.

As trainees in technical vocational training institutions are over 18 years, they are aiming to get jobs with a wage as soon as possible. Therefore, the technical vocational training institutions are actively looking for DTS partner companies.

In the case of OJT, companies only support for contents agreed between the school and the company by MOA (e.g. payment of transportation expenses, providing lunch), payment of wages does not need. Since OJT and work immersion are regarded as part of education, they are promoted in universities and tech-voc track in senior high schools. Actually, in the case of DTS, companies tend to regard trainees as cheaper labor.

In the apprenticeship, legally, the company are admitted rejecting trainees before the apprenticeship period expires. However, according to TESDA and some vocational training institutions, many companies recognize that the apprenticeship is almost same as provisional recruitment, and basically, they assume that trainees will be absorbed once the apprenticeship period has ended. Therefore, this system is hardly utilized in companies.

4-3 Higher Education

4-3-1 Higher Education System

(1) Higher Education System

Higher education provides a curriculum that is required for professional, vocational and academic degrees. The university basically offers four-year courses (five years for the college of engineering), then graduate courses in law, medicine and so on. Regarding higher education institutions, public and private higher education institutions provide programs, and the proportion of private universities is high in the number of institutions[58].

In some HEIs, which were initially established as secondary educational institutions and later upgraded to HEIs, there are cases where faculty members do not have postgraduate degrees and quality of education is questioned. In order to maintain and improve the quality of education, CHED has established the Centers of Excellence (COE) and the Centers of Development (COD) of Higher Education, and evaluates/accredits the degree programs.

(2) Academe-Industry Collaboration

In the Philippine higher education, addressing the jobs-skills mismatch situation has been a persisting issue. One of the key countermeasures is to align industry needs with education outcomes and increase industry-academe partnerships.

Among the industry-academe linkage activities involving undergraduate students are: on-the-job training (OJT), summer student apprenticeships, plant visits, industry scholarship grants to students, career talks, job fairs, student leadership camps, industry-sponsored design contests. Academe and industry collaborate in the formulation of undergraduate curricula occurs at two levels. At the inter-sectoral level, this linkage happens through industry representation in CHED's Technical Panels and at the level of dialogue between industry sector organizations and school associations. At the individual school level, there could be school committees, which go by names such as visiting committees or advisory committees. Through these committees, industry leaders, mostly alumni, are invited to give advice on curricular matters. Usually the

[58] In AY2014/15, there were 227 public HEIs and 1,708 private HEIs, in total 1,935 HEIs.

needs of industry are incorporated through the customization of the 12-credit-unit free electives provided for in the government-mandated curricula. These 12 units are designed as tracks that cater to industry needs and sometimes even to specific vendor-company needs, as is common in the IT sector. Some linkage activities involve senior-year and graduate students along with faculty members.

Industry may put up training laboratories in schools, sometimes for eventual donation, to have their own personnel trained by faculty members and to have students trained for eventual hiring by the company. The exchange of personnel is a form of knowledge transfer between industry and academe. It may be implemented through faculty immersion or internship programs, usually over the summer months, and by adjunct professorship programs. Secondment of faculty members to industry is also a mode of exchange. Schools can also sell products that contain technologies they have developed. Academe can also offer testing services to industry. Schools can also offer consultancy services institutionally or through individual faculty members.

4-3-2 Current Status of Higher Education

(1) Current Status of Higher Education

According to the 2010 Census of Population and Housing (2010 CPH), the educational attainment of the population in the country had improved since year 2000. College graduates increased from 4.3 percent in 2000 to 10.1 percent in 2010.

Programs on business and on education have consistently been the most popular among college students in the last two decades. Among college graduates under the age of 40 years, 23.5 percent had a degree on Business and Administration, 16.8 percent were graduates of Teacher Training and Education Sciences programs, and 13.6 percent were graduates of Health programs. On the other hand, among those college graduates aged 40 years and above, 32.5 percent finished a degree on Business and Administration, 23.5 percent graduated with a degree on Teacher Training and Education Sciences, and 15.8 percent were graduates of Engineering and Engineering Trades programs.

The most popular academic field for males was Engineering and Technology, with graduates of this program comprising 25.9 percent of the total male college graduates. On the other hand, the most common field for females was Business and Administration with 31.3 percent of the total female college graduates having a degree on this field.

The trend has been changing shown as the Table below. The number of graduates of Medical and Allied (Health programs including Nursing) is decreasing. On the other hand, Service Trades is rapidly getting popular.

Table 4-5 Higher Education Institution Graduates by Discipline Group

Discipline Group	SY 2010-2011	SY 2011-2012	SY 2012-2013	SY 2013-2014	SY 2014-2015 (Estimated)	Increase from 2010 Graduates (%)
Total	**496,949**	**522,570**	**564,769**	**585,288**	**648,752**	**34.8**
Business Administration and Related Courses	125,840	141,327	164,541	169,846	187,036	59.3
Education and Teacher Training	62,715	69,738	86,903	98,277	107,181	90.0
Information Technology Related Discipline	54,225	66,672	72,879	72,976	81,084	62.9
Medical and Allied	103,582	80,800	57,427	50,513	65,671	-43.6
Engineering and Technology	57,439	56,690	59,399	63,539	65,660	33.0
Maritime Education	14,430	19,515	23,506	23,401	27,156	88.1
Social and Behavioral Science	13,168	13,816	15,953	18,831	19,250	51.3
Service Trades	6,184	6,244	8,629	10,630	11,537	127.7
Mass Communication and Documentation	5,334	5,463	6,475	7,246	7,368	40.5
Natural Science	3,910	4,330	6,626	6,094	7,224	82.9
Other Disciplines	50,122	57,975	62,431	63,935	69,585	37.6

Source: 2015 Philippine Statistical Yearbook

For CHED, job-skill mismatch problems of college graduates are an urgent issue. With the needs and changes of domestic/overseas companies, universities are trying to review the curriculum and develop new courses, but it takes a lot of time. In USAID's Higher Education and Productivity Project (HEPP), various initiatives such as holding industry-academe dialogues and holding workshops were conducted with the aim of promoting industry-academe collaboration and supporting the revision of curriculum based on the needs of the industries. As a result, CHED has established Service Management Program and Business Analytic in Business Administration course and Information Technology (IT) course. Also, a concept of Technopreneurship was newly introduced in the College of Engineering. Likewise, based on the current state of technological innovation, we are studying the establishment of a design engineering course at the Faculty of Engineering. In addition, CHED reviews the general education curriculum based on the international environment, technological innovation, and the implementation of the K to 12 program.

As stated above, in the IT-BPO field where the expansion of foreign call centers is seen, the IT-BPO industry group was able to talk with universities since the needs of the industry were clear and the talk led to establishing a new university course that meets the needs of the industry side and to conducting the revision of the curriculum. In contrast, the manufacturing industry as a group has not been able to hold a dialogue with the universities on the contents of the curriculum.

After graduating from university, many will take the national licensure exams to acquire various

qualifications (engineering, nursing, etc.). Currently there are 43 national licensure exam boards (since the number of exams was 21 during the Marcos period, it doubled in the last 30 years). These committees are set up as legislation passes through the Congresses upon request from industry associations/organizations. A new committee (i.e., a new licensure examination) will not be set up in the initiative of the National Qualification Regulation Committee (PRC). The PRC only carries out the test according to the plan, in compliance with the law and regulations stipulated by each national licensure exam board. Implementation of the K to 12 program and the effect of the ASEAN unification may require PRC to review the coverage of national licensure exams. As the number of college graduates is expected to decline in the next 5 to 6 years by implementing the high school program, the number of national licensure exam takers may be decrease. As the curriculum of the basic education change, part of the curriculum of the higher education will also be changed, so there will be areas in which the scope and contents of the national licensure exam might be reviewed. These issues are negotiated at CHED's Technical Panel (consisting of universities, PRCs, representatives of industries), and are carried out by decisions of each national licensure exam board.

(2) Current Status of Higher Education

Focus group discussions were held in Manila City and Cebu City in order to know ①how higher education institutions recognized the causes of skills mismatch, and ②the common points and differences between public and private universities.

1) Results of Focus Group Discussion on analyzing the causes of skills mismatch[59]

From four public and private universities in the Metro Manila area and the Calabarson area, presidents, deans and faculty members of the college of Engineering are participated.

- The skills mismatch and lack of academic ability of university graduates are due to lack of facilities / equipment, lack of faculty capacity building (degree acquisition, industry immersion, etc.), and weak industry-university collaboration.
- One of the major causes of mismatch is that the curriculum is not able to reflect labor market and corporate needs quickly. Current curriculum of the university (compulsory at each undergraduate department)
- Curriculum are closely related to the contents of national qualification examination such as engineers. For example, despite the Philippine government promoting the creation of environment-related employment (green jobs), the subjects related to green jobs in university courses are not offered much since such subjects are not included in the licensure exams. This is because the university side is taking a second step towards changing the curriculum. In order to change the scope of the national licensure examinations, agreement

[59] It was organized by CHED on September 7, 2016 at Technical University of the Philippines. Participants were from Technical University of the Philippines (Manila Main Campus, Visayas Campus), Cavite State University, Polytechnic University of the Philippines, Southern Luzon State University, and CHED.

between industry, government and academia at a high level in the CHED Technical Panel is necessary. Change of curriculum cannot be done by a university.

2) Results of focus group discussion on common features and differences between public universities and private universities in Cebu[60]

From San Francisco University (private), San Jose Recolletos University (private), and Cebu Technical University (public), a dean and two faculty members are participated in the focus group discussion.

Commonalities between public and private universities

- Since the high school program (11th grade) started, the number of freshmen in fiscal 2016 has decreased.
- One of the examination conditions for national licensure exams such as engineers is that the exam taker should be a college graduate. Many of the engineering graduates in April, go to review schools (or self-taught) while studying for the exams at the same time to do job hunting activities and take a national examination around September. On the university side, although it is possible to grasp the acceptance / rejection of the student's national examination result, information on where the graduates are working has not been fully grasped.
- As a positive aspect of CHED's intervention in the university, granting of scholarships and R & D grants can be cited. As a negative aspect, CHED cannot guarantee the quality of the university because CHED is not able to fully inspect and evaluate all universities due to lack of personnel. Some universities are gathering many students with lower tuition fees but they are not actually able to offer courses promising to be offered on their websites. It is very annoying to the universities that are working diligently to improve the quality of the university

Differences between public and private universities

- The percentage of full-time faculty (master's degrees, doctoral degrees) varies from 50% for San Jose Recolletos University (private), 25% for San Carlos University (private) and 15% for Cebu Technical University (public). Students of San Carlos University are mostly from higher-income families, students of San Jose Recoletos University are from middle-income families, students of Cebu University are from lower-income.
- Currently, national and public universities are gradually increasing faculty salaries. Although there are differences among private universities, the difference between public and private is shrinking, and associate professors and others are expected to be higher in public in 4 years. The salary of the University of the Philippines (national) is different and originally high.
- Procurement of equipment and materials can be purchased at public universities though expensive as long as the request is accepted. However, it takes a lot of time before budget request actually procures equipment and delivers it to the university. For private schools, it is difficult to attract students unless they upgrade facilities and equipment to the speed of

[60] It was conducted on August 31, 2016.

international innovation and so the private schools make an annual business plan and purchase highly effective ones preferentially. If equipment cannot be purchased under the private university budget, the private university may approach companies to use advanced equipment in exchange of conducting water quality tests according to the company's request, or conducts classes using advanced equipment donated by the company.

(3) Current Status of Universities Visited

We visited 13 universities in Metro Manila, Calabarzon Region, Cebu, and Davao and gathered information as regards present states and challenges mainly from standpoints of (1) facilities and equipment, (2) collaboration with industries and other universities and (3) employment. Those with whom we interviewed were presidents, deans and staffs of colleges of engineering and industrial technology and college of agriculture, SPAMAST in Davao del Sur, staffs of placement, students and other pertinent offices, and those in charge of OJT, university-industry collaboration. The universities we visited were selected with reasons as mentioned below.

Table 4-6 Universities Visited and Reasons for Selection

Names of Universities Visited	Reasons for Selection
1) Technical University of the Philippines: TUP (public)	Strength in departments of engineering and of industrial technologies
2) Mapua Institute of Technology (private)	A progressive university with strength in engineering and IT related fields
3) PATTS University (private)	A university specializing in aviation. Referred in the hearings with DTI
4) University of the Philippines, 5) Los Banes (national)	Recommended by CHED and TESDA-Region 4a
6) Batangas State University (state)	Recommended by CHED and TESDA-Region 4a
7) Cavite State University, Rosario (state)	Recommended by CHED and TESDA-Region 4a. Suggested by the president of the main campus to visit Rosario located near Cavite Export Processing Zone
8) Laguna State Technical University, San Pablo (state)	Recommended by CHED and TERDA-Region 4a. It is equipped with an advanced Fablab facilities.
9) Systems Technology Institute (STI) Laguna (private)	One of the largest university system in the Philippines
10) Cebu Technical University: CTU (public)	Listed as a member of Saitama Cebu Monozukuri Project.
11) San Carlos University (private)	Listed as a member of SCITP. It is a reputable university in Cebu.
12) San Jose Recolestos University (private)	Listed as a member of SCITP.
13) University of Southeastern Philippines (public)	One of the representative public universities in Davao Region and it is highly evaluated for training and fostering suitable employees to industry. Strength in both agriculture and engineering/ industrial technologies.

14) Southern Philippines Agri-business and Marine and Aquatic School of Technology (SPAMAST) (public)	A university cooperating with DICCEP and researching the role of higher education in agriculture which is the major industry in Davao Region.

[Public Universities in Metro Manila]

1) Technical University of the Philippines : TUP

TUP was founded in 1901 as a technical vocational school and later raised to the status of a public university. TUP consists of 6 separate locations in Manila, Taguig, Cavite, Batangas, Visayas, and Quezon. The Manila campus is a large scale, holding department of engineering (3,299 students in 2015), that of industrial technologies (5,405 students in 2015), that of industrial training and that of architecture. At present TUP is planning to open a new campus in Pampanga, TUP Center for Industrial Development and Productivity, with facilities for technical demonstrations by partner companies and a hotel.

Facilities and Equipment

Although the school building and training facilities are dilapidated, facilities and equipment albeit old are taken good care of. The school building and the training equipment donated by Japan in the 1980's are well maintained and still on the active service. Many highly skilled technical teaching staff with on-site experience by manual work made it possible to keep the facilities and equipment in good condition. Teaching staff with overseas working experience are actively recruited but many are nearing retirement age. TUP is facing the challenges how to overcome the transit or how to move on to the next generation of competent teaching staff.

Collaboration with Industries and Other Universities

TUP has strong industry linkage and its International/Institutional Linkages and External Affairs Office has full-time teaching staff.

It is compulsory for engineering students to take an orientation program (54 hours of pre-training) and industry training (240 hours), which link class room learning with on-site skills. For students of industrial technology and architecture, it is required to have a long-term OJT training (Supervised Industrial Training – SIT) which consists of orientation program (54 hours of pre-training) and regular training (720 hours). The orientation program includes safety and securities control, insurance policies, outline of SIT, communication and manners in the work place, work ethics, labor and internship related laws, company visit and work flow inspection, holding a symposium inviting resource persons from partner companies. Graduates of TUP's College of Industrial Technology are often commented by other universities and TVIs that they can repair machinery by themselves and assemble from scratch due to the long hours of OJT.

Employment

Students' performance is evaluated during the OJT program and often employed by the partner companies.

[Private Universities in Metro Manila]

2) Mapua Institute of Technology (MIT)

The main campus in Manila City has Colllege of Engineering (chemical, civil, computer, electrical, environmental/ hygienic, industrial and mechanical engineering) and the Makati Campus offers mainly IT related courses (computer science and information technology). MIT is one of the top universities that produce passers of national licensure exams for engineers. By CHED its College of Engineering is designated as Center of Excellence. In order for those already graduated MIT with 10-year basic education not to be treated unfairly overseas, MIT took the lead in applying for Accreditation Board for Engineering and Technology (ABET) and, since 2008, it has been accredited by ABET. It offers high school Academic Track including STEM.

Facilities and Equipment

It is well equipped qualitative as well as quantitative with latest facilities for research and development. As scientific technologies advancing fast, MIT is doing best to make latest tools and materials available for the students. Many students are from wealthy families. Tuition is high but it provides state-of-arts facilities and equipment and high quality education.

Collaboration with Industries and Other Universities

Its linkage with multi-national companies such as Toyota, Emerson and others is limited, not involving those companies in reviewing contents of curriculums nor in commenting on the direction of education but only in providing equipment as donation and in receiving students for OJT.

The universities and technical schools of the Philippines patterned after the curriculums from those of the US. It makes easier for the Philippine universities to communicate with American companies. Especially, IT-BOP industry in which American companies have strength, is well aware of what is needed in IT-related university education. It has a clear vision in IT education so that as a solid interest group IT-BPO industry was able to reflect their needs into TESDA's and universities' technical training programs. Manufacturing sector has traditionally not been so strong in the Philippines and Japanese manufacturing companies have not much involved in curriculums of TESDA and universities. There is limited opportunities to have direct conversations with Japanese companies on insufficient basic education and the insufficient competency of engineering graduates. MIT suggested to have more direct dialogue with Japanese companies. And in reviewing curriculum of department of engineering, at present MIT listens only to domestic companies but it would be appreciated it if foreign companies could comment on its curriculum.

Employment

Mapua Institute of Technology has 4 sessions in its academic year so holds job fairs 4 times a year. Other than job fairs, it has other means such as its placement office receiving from

companies their request for students' names and academic records (records of national examination, transcripts of the Institute and evaluations of performance in OJT, etc.); companies contacting directly and interviewing with students; then companies notifying placement office of their decision, for example, we have decided to employ such and such 5 students. Companies compete hard to employ good students so they commit to hire competent students with good academic records before graduation.

3) PATTS University

PATTS University's predecessor was Aerospace Industries Association of the Philippines, the US-Japan joint company, which was founded in 1969 to manufacture aircrafts for training purpose and to train staffs for aviation field. It was raised in 1989 to the status of a university. PATTS focuses on aircrafts offering related courses (training pilots and air traffic controllers, assembling small aircrafts, aircraft maintenance work, etc.) It also offers a 2 year course for training technical skills (which is not under CHED but under Civil Aviation Regulation) while students under the 2-year course depending on academic records can transfer to 3rd year in regular program. Additionally, since 2016 it is offering high school STEM program.

Facilities and Equipment

Facilities and equipment are in good order. Materials and tools are sufficiently available to students. Especially it uses the newest navigation software for air traffic controllers which makes simulation based on realities possible.

In a class of aviation engineering, students carry out a project, by making use of CAD and 3D printer, drawing and assembling a vehicle running on the lunar surface. With such progressive measures, students acquire skills in problem solving and capabilities in creativity and time control.

Collaboration with Industries and Other Universities

PATTS becoming a member of Aerospace Industries Association of the Philippines (AIAP) in 2014. Its curriculum has been recognized by member companies of AIAP and an opportunity has risen in aviation industry to foster more high-quality manpower.

Airlines and aviation related companies such as Lufthanza and SIAEP or Singapore International Airlines Engineering Philippines and graduates working for those companies are represented in Curriculum Review Committee. PATTS is advised by companies not to overlap its class room training and on-site work with In-House training which companies offer graduates after employed. By mid-2017, a new curriculum corresponding with K to 12 program will be completed. Public Hearing will be held with participations of the government officials, students, industry etc. and comments from the Hearing will be made reflected in curriculum to be amended and revised every 4-5 years.

PATTS has already established a solid relationship with a major American aircraft manufacturer HEATCON, originally located in Subic but now on PATTS' campus. Having had trouble in its facilities, HEATCON wanted to leave Subic so PATTS provided HEATCON with a space within

the campus. Its materials are utilized for as well as engineers take part in teaching students. Or PATTS and HEATCON are in win-win relations.
PATTS students have access to the latest facilities of neighboring REF Marketing Co. (robot industry) where students are trained in computer and robot technologies under university-industry collaboration agreement.

Employment
3rd year students visit companies which they come across through courses and are given opportunities to think over where they like to work in the future. The OJT training for 4-5 year program is about 450 hours long with aviation-related companies. Nearly 70% of students pass national licensure examinations and PATTS' performance has never been less than national average. To take examination for air traffic controllers, 400 hours long OJT is required after graduation. OJT in aviation industry is very important and OJT often leads directly to employment.
A few years ago, 30 students were nominated by the school to a Middle Eastern airline but only 3 were employed with reason being students' poor English after interviewing. This has triggered entering students to take TOEIC and to be trained in special language laboratory. In 3rd year, students are required to take TOEIC again to elevate their English proficiency, suitable to job requirement.

[Public Universities in Calabarzon Region]
4) University of the Philippines, Los Banes (UPLB)
UPLB employs many outstanding experts on agriculture and bio technology and has high reputation as the leading research institution in the Philippines.

Facilities and Equipment
Facilities are not luxurious but suitable enough for research and development. Some of the equipment and materials required in agricultural engineering are costly and requires a long procedure. There's not enough budget to acquire new ones so existing ones with a good maintenance are still being utilized.

New Curriculums
New curriculums are currently under development with June 2017 as the target for completion. To the new one, the current curriculum will be shifted by August 2018. College of Engineering, currently 5 years, will become 4 years long from 2018 as units (or credits) required for graduation from college will be reduced by about 30-35 units as classes currently taught in 1st year students at college will be taught in 11th to 12th grade in senior high school. The curriculums will be revised once in every 5 years or so as not only a review of contents but procedural formality inside school will be required.
UPLB wishes to reduce units of Liberal arts such as History, Literature and other subjects unrelated to engineering and instead to increase core subjects (Mathematics, Physics, Chemistry

and others) and electric subjects. CHED has only a few directors with degrees in engineering so it won't be easy for CHED to understand the above intent for a new curriculum

OJT for engineering students in June-July is held for 240 hours (about 200 hours in industy and 40 hours for orientation, procedural formalities, succeeding follow-ups etc.). Considering that not technicians but engineers are trained, a longer (beyond 240 hours) on-site training should not be necessary. A new curriculum under development is due to introduce research-oriented elective course (6 units) out of which students will elect according to their interest out of ① thesis writing,②practical business seminar (industrial problem solving), ③innovation and entrepreneurship. For such objective in mind, UPLB will strengthen the university-industry collaboration.

How effective a new curriculum under senior high school (Academic Track) program will be known in outcome of college entrance examination in 2018. If not so effective or should basic scholastic ability not be acquired, then something like supplementary lessons will be given.

Collaboration with Industries and Other Universities

UPLB has strength in agriculture. Developing and selling agricultural machinery to companies and farmers, it is familiar with the concept of entrepreneurship, i.e. merchandizing and commercializing its research and investigation. UPLB is only one university in the Philippines carrying out education as well as research and investigation on sugarcane and paper. Both president and dean of college of engineering are engineers and they are very keen about collaborating with companies on joint research and development. In fact, they have received a number of offers from companies. However legal department of UPLB tends to be defensive and to be protective its copy and patent rights. So joint research and development with companies has not yet been materialized.

Employment

Students in engineering are doing well and they excel with a higher percentage in passing national licensure examinations. They appear finding jobs without receiving solid support from university's placement office.

5) Batangas State University

There are, in addition to 5-year college of engineering, 4-year college of industrial technologies and 2-year diploma course. In 2012 college of electrical engineering was selected as Center of Development (COD) while college of industrial technology was elected a in 2012 s Center of Excellence (COE) and in 2014 as COD. It is recognized as a progressive university to pursue, based on CHED's guidance, Outcome-Based Education by having students set up and aim at targets upon completion. And it receives more and more delegates of observation from other universities. For its engineer graduates with 10-year basic education not to be treated unfairly overseas, it is applying for Accreditation Board for Engineering and Technology (ABET)[61] for

[61] For 3 years after accreditation, engineers graduated from corresponding
3 years will be treated equally with those with 12-year basic education. It costs $8,000 per program to call in an American examiner to the Philippines. As such, according to Batangas State University, it is said that Batangas is the

its 6 programs.

Facilities and Equipment

Under the leadership of former and present president of the University, it has aggressively secured enough budget to proceed with constructing new school building and purchasing teaching materials and equipment, etc.

Research and Development

It attempts to secure more budget by applying for many research and investigation programs under CHED and DOST. Hard work is required to prepare proposals but such hard work is shared among the teaching staff. It has recently applied for STRIDE program under USAID.

Collaboration with Industries and Other Universities

Interfaces with companies are donation of teaching materials and tools, OJT etc. On a ceremony for donation and during a local event, there's a chance to come in touch with managements of foreign companies. Not taken an advantage of such a chance to meet and discuss with but there's limited only to exchange greetings with the companies. Especially those in Export Processing Zones are not so open. Their personnel and general affairs sections are usually in charge of OJT so a chance to hear their official opinion on the University is limited.

There is the Curriculum Review Committee in which 4 local companies (including Ebiden and others) and graduates (working in manufacturing companies) are represented but almost of attendees are Filipinos and the staffs of personnel and general affairs sections (or managements and those in charge of manufacturing are not be represented). For example, Japanese companies' managements and engineers are welcome if they are given a chance to involve in reviewing the curriculum.

Liberal arts units could be reduced while basic subjects (Mathematics, Physics, Chemistry and others), required and electric subjects be increased in class room hours. Elective subjects were introduced a few years ago, and all were required subjects before. Even at present so-called elective subjects are not so elective in view of limitations in teachers, class room spaces, and teaching materials etc. Students can choose only 3 out of 4 elective subjects. Industries' requirements becoming more and more specific and diverse, elective subjects should be increased and diversified and class room teaching be more specified.

Since 2015, signing MOA with companies, Batangas invites resource persons and asks outside source to commence assessment of students' technical skills and to hold training sessions for its teaching staff. Met Murata Manufacturing but with Murata it has not signed MOA. Batangas' teaching staff is made diverse by its aggressive hiring policy, with some of the staff having worked and taught overseas and with others employed by and worked with companies.

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first state university to apply for ABET.

Employment

OJT in other colleges of engineering is mostly held for 240 hours (including orientation on campus and joint seminar thereafter) but at Batangas State, OJT is even longer at 500 hours with making use of summer vacation etc. OJT in its college of industrial technologies is even longer. It is said that 'engineer graduates of Batangas with long OJT, unlike many who can take a look at drawings, understand on-site work.'

6) Cavite State University, Rosario（CSUR）

The main campus of Cavite State University is vast and it offers various programs comprising, in addition to colleges of engineering, information technology, education, management, agriculture, and other subjects, kindergarten, elementary/ junior high/ senior high schools, technical vocational school, etc. It has 5 satellite colleges in Cavite State, among which CSRU located in Rosario town has college of industrial technologies (4 year and 2-year diploma courses) and those of industrial education, management and other subjects. CSRU has a small-size, but neighboring with Cavite Export Processing Zone (EPZ), its college of industrial technology is closely linked with companies in EPZ and is training technicians matching companies' needs.

Facilities and Equipment

Facilities and equipment are rather old but well maintained and utilized for a long time.

CSRU took an advantage of its visit to Fablab in Bohol which JICA is assisting, by submitting to DOST and CHED a proposal for constructing same Fablab on its own campus. As a result it has secured a budget for Fablab and plans to set up, together with its small-size CNC (computer numerical control) device, suitable facilities, wherewith it aims to assist small to medium size local companies to manufacture high quality parts and supply them to EPZ. With such aim, CSRU wants to receive technical training by and/or at neighboring companies and DOST/MIRDC. DTI and DOST focus on assisting small to medium size companies and recommend a college of engineering to construct and share Fablab with neighboring small to medium size companies and to extend technical assistance to them[62].

Collaboration with Industries and Other Universities

In Region 4a, a sectional committee of Region Development and Planning Committee is driving forward to strengthen university-industry collaboration and NEDA acting as its secretariat.

In industry, it is already commonplace that 3D drawing is made by computer based on which machinery parts are manufactured by CNC. As such it is important to train and foster those who understand IT and computer engineering.

Technologies advancing fast, the teaching staff attend the company-sponsored training (and

[62] In Region 4a, DOST-Region4a supports the establishment of the Ideation, Design and Development Laboratory (IDD Lab). The workshop was held in June 2016.
http://region4a.dost.gov.ph/news/833-dost-calabarzon-pushing-for-more-innovation-venues-through-idd-lab

seminars) in summer in order to catch up such technological advancement, as well as enrolling in some of programs the details of which the teaching staff, together with the companies receiving them, decide in accordance with their needs. Many of the teaching staff of college of industrial technologies are graduates of Cavite State University and have working experiences. They take courses on metal processing by using CNC etc. at DOST-MIRDC whereat latest equipment is available. In college of engineering, a student in his last school year is required for 1,700-1,800 hours of OJT. In 2016, those receiving students for OJT were 43 in number (in and outside EPZ).
There is the Curriculum Review Committee in which local companies and graduates (working in manufacturing companies) are represented.

Employment
Students performing well in OJT receive job offers before graduation from companies and a percentage in their passing a state (or a national) examination (as master electronic and electrical technicians) is high.
Graduates already in high positions often contact teachers of their Alma Mater, asking for good candidates for employment and specifying 'we want to hire urgently 2 technicians in such and such field' Also companies (including Japanese in EPZ) with which long associated contact directly asking for students in required number and posts. It is said that graduates of CSUR's College of Industrial Technology are well trained long time on site so can repair machinery by themselves and assemble from scratch.

7) Laguna State Technical University, San Pablo
Luguna State Technical University has, aside from its main campus in Santa Cruz, 3 satellite campuses (San Pablo, Los Banos and Siniloan) in Luguna State. San Pablo and Santa Cruz Campuses have strength in colleges of industrial technologies and engineering. All campuses there are colleges of education and IT related subjects while in Los Banos there's a college of fishery and in Sinioan there is a college of agriculture which are considered as distinctive characteristics of Laguna State as compared to other universities. It also offers high school programs (technical vocational/living track, academic-preparatory for higher education-track).
In San Pablo and Santa Cruz Campuses, there are two (4 year and 2 year) courses in a college of industrial technologies. Those students scored well in their entrance examinations enter 4 year course while all students are required to take again examinations at the end of 2nd year. Those in 2 year course can transfer to 4 year course if qualified. Students in 2 year course while in college are recommended to get TESDA qualification. It is likely that, in and beyond 2018, 2 year course would be closed.

Facilities and Equipment
Like Cavite State University, Rosario, visited Fablab in Bohol and set up its mind to install

Fablab on its campus. It has already Fablab equipped with metal cutter, 3D printer and CNC and has started students innovation club. When not in use by students, Fablab is released locally to small to medium size companies and community for their use.
On manufacturing site, nearly all companies have already integrated, i.e. there is no more fragmentation such as machinery is machinery (Mechanical Engineering) nor electronics is electronics (Electronics). In integration, machinery parts are manufactured by CNC based on 3D drawing by PC. Therefore, Mathematics is becoming more and more important. CNC is available in nearly all factories so that, while in college, students must learn basic subjects and experience in drawing by PC (CAD and CAM) and in manufacturing based on drawing by CNC.

Collaboration with Industries and Other Universities

DTS is currently not in operation. In college of industrial training, a student in his last academic year is required for 1,200 hours of OJT (600 hours x 2 quarters). Laguna is always looking for partnering with new companies for collaboration. Existing companies with partnership with Laguna on OJT are from Laguna, Cavite and Batangas States. There are many Japanese companies.
Since last year, OJT program (about 1 month) with a Malaysian company introduced by chance has been in practice. The program providing students with good experience is well received but it is found that students apparently lack their English skills. As such improving their English will be a pressing task.
The teaching staff are encouraged to attend the company-sponsored training (and seminars). In 2017, Toyota invited 5 teachers to attend its training over summer vacation. Toyota receives also many students for OJT.
There is the Curriculum Review Committee in which local companies and graduates (working in manufacturing companies) are represented.

Employment

Graduates of 2-year course from college of industrial technologies are employed by companies as low-rank technicians. 4-year course is for high-rank technicians who bridge low-rank technicians to communicate with engineers graduated from college of engineering who often find it difficult to talk with low-rank technicians on drawings and technologies.
The recent trend is the following setup. The students section receives companies' request to provide them in writing with names of graduates with respective academic lists (transcripts including evaluation of OJT performances etc.); companies contact students directly and interviews with them; and later the students section is notified by companies that for example out of 20 students, 'we have decided to hire such and such 5.'
There is a job fair, inviting companies in and out of Laguna State, in March every year.

[Private Universities in Calabarzon Region]

8) Systems Technology Institute (STI) Laguna

STI was opened in 1989 originally as a technical/vocational training institution. Afterwards it was raised to the status of a university. As a higher educational institution, STI currently holds 83 schools on a franchise basis all over the Philippines. Its students are totally about 100 thousand in number. STI, Laguna has 4 year and 2 year courses in which 2,500 students are currently enrolled. Since 2016, it is offering high school (Technical Vocational/Living Track) program under which about 1,000 students are learning computer, food and beverage, electricity, housekeeping etc.

Linkage with Industry

STI is closely linked in strong partnership with industry holding 'after education, immediately employed' as its objective. Laguna belonging to the Chamber of Commerce of the Philippines and Industrial Associations including Semiconductor, IT business and others, it always aims to build up net-work.

STI Laguna carry out Dual Training in manufacturing fields (automobile, electronics, etc.) Dual Training is offered to students in technical/ vocational course (usually 2 years). Followed after learning for one year, students go to companies technically cooperated with for 5 to 6 months long OJT. Students under technical/vocational course will either be employed in 2 years later or transferred to 4 year college program. Those under regular course also have OJT training at their 4th school year. Some of companies cooperated with are Panasonic and Fujitsu in SEZ. In Dual Training, students are required to do simple work so they don't learn technically so much. But in a standpoint of companies, it cannot be helped, as students are not their employees but only temporarily on OJT. But students in OJT frequently receive jib offers and 80-90% of Laguna students get jobs.

[Public Universities in Cebu]

9) Cebu Technical University: CTU

It has strength in college of engineering and that of industrial technologies. As of 2016, students at college of engineering (5 year) are 2,400 in number and those at college of industrial technologies (4 year and 2 year courses) about 10,000 with a large enrollment. CTU's campus located in downtown Cebu is overcrowded. It also offers high school ('Academic Track') program.

Facilities and Equipment

In recent years hit by a typhoon and by an earthquake in succession, part of the school building is now under reconstruction.

Colleges of engineering and industrial technologies have new tools but teaching materials are not enough for a large number of students. In college of engineering, CNC was recently purchased.

Collaboration with Industries and Other Universities

The curriculum of college of industrial technologies is reviewed every year with feedback from students after OJT to be reflected. In the Curriculum Review Committee, 10 or so represented by companies and about 5 graduates working in companies are participating.

Elective subjects are also occasionally reviewed based on information on companies students get from OJT.

In college of engineering, 400 hours and in college of industrial technologies, 1,800 hours of OJT are required. About 15 students are delegated to Malaysian and Singaporean companies. OJT hours in college of engineering are longer than those in other universities. Such longer hours were decided by following up opinions of companies:'240 hours guided by CHED as suitable are not enough.' Summer vacation is made use of. In college of industrial technologies, OJT hours are long enough for students to acquire practical skills but worrisome is that some of them are employed by companies before OJT is over or not come back to college. Many students of CTU are from poor families so they are willing to work in whatever jobs given – even in dirty jobs which is highly evaluated by local manufacturers. Families want them to earn money but it is important in long term for capable students to get higher degrees and to pass national qualification based on which they should look for higher positions.

The teaching staff attend the company-sponsored training. About 2 weeks for those in college of engineering and about one month for those in college of industrial technologies. Training are executed alternately over summer and many companies accept willingly the teaching staff.

Employment

On campus, there is PESO (Public Employment Service Office) which has been commended several times for holding job fairs, supporting students for securing jobs, and aggressively researching job opportunities for them.

In PESO, space is made available for companies to execute examinations and to interview with students. PESO on campus is very rare in the Philippines. Job fairs are held twice a year and Japanese companies such as Canon and Komatsu are attending such job fairs.

In college of industrial technologies, there has been a strong back-up on a review class for aiming at a state (or a national) examination and as a result, many students could pass the Electrical Engineers examination in April 2016 at a high successful rate. Many companies including Japanese Tuneiahi Shipbuidlding, MITSUMI, Taiheiyo Cement etc. are willing to receive students for OJT and to provide them with on-site experiences.

CTU's college of industrial engineering having courses on management and personnel affairs, there were cases for some graduates to receive high appraisal by their employers.

[Public Universities in Cebu]

10) San Carlos University

A reputable school in Cebu. It has many students from the wealthy families. Colleges of architecture and engineering are known for many students' passing national licensure examinations. In 2011 college of engineering was accredited by ABET.

Facilities and Equipment

Facilities are somewhat old. Relative to laboratories of hydraulic power and mechanical engineering, machinery and materials are old but well maintained, and are still in use. Materials in use at engineering are costly but must be replaced by those currently in use by manufacturers, which will improve the quality of teaching. To do so, yearly business plan must be prepared and, to secure a budget, management of college must be persuaded that such investment is necessary to keep attracting good students. The college has a small-size CNC so intends as the next step to purchase 3D printer or programmable logic controller (which is an automated control device at a manufacturing plant).

Collaboration with Industries and Other Universities

College of mechanical engineering is already accredited as Center of Excellence (CEO). In order to contribute as CEO, it holds a seminar (3 days) once a year. For this year, it plans a demonstration by making use of the materials of college of engineering's laboratory.

At the suggestion of an office equipment company Lexmark, since about 5 years ago, in every term, 6 students with good academic records (3 teams with 2 students each) challenge to tackle given tasks by Lexmark. Concretely, for example, assuming paper jam in printer, students identify a cause and submit a solution. From this task, students learn skills in problem solving and foster creativity.

Materials tests are often conducted. Research and investigation is also requested. At the request of a Korean company through DTI, a joint research for waste disposal in Bantayan Is. was conducted. However, such joint research case is rare as companies usually don't want to share outcome of such joint research with outside.

OJT in college of engineering is for 240 hours beyond which will give an impact on students' preparing for a state (or a national) examination (all kinds of engineering). Manual-based skills are for technicians to acquire while problem solving – identify and solving – is what engineers are required for.

San Carlos University is one of the counterpart universities of Saitama Cebu Monozukuri Project and a Monozukuri mind as work ethics beyond knowledge if engineering by good guidance is what will be essential to students' starting to work.

Employment

Companies visit the University, offer examinations/ skill tests to and interviews with students, and employ them. Students with good academic records are often employed

before graduation. They are hired as technicians and some of them studying while working, and after passing the national licensure exams, they are promoted to become engineers. During OJT some students get commitment from companies for employment after graduation. In Cebu, it is not so common for the companies to request for lists of graduates including their academic records.
Job fairs are held and job guidance sessions are conducted periodically.

11) San Jose Recolestos University

It is a medium-size private university in Cebu and its college of engineering (Mechanical, civil, electrical, electronic, industrial and computer) has produced many graduates since its founding in 1958 who are taking an active part in local companies.

Facilities and Equipment

Laboratories related to engineering are gathered in a part of campus in downtown Cebu. Facilities are somewhat old but are maintained well and used in good order. The teaching materials are enough to the number of students while facilities and equipment are kept new by donation of companies and a nearly full of them is available. Those materials donated by companies cannot be shared with other companies and universities, according to the agreement between San Jose Recolestos and companies.

Curriculum

CHED is currently reviewing the curriculums of colleges of engineering and some staff of San Jose Recolestos University are members of the Review Committee. Its college of engineering intend to reduce liberal arts units and wants to increase class room hours of core subjects (Mathematics, Physics, Chemistry and others), and varieties of elective subjects. It is observed that entering students in recent years are lacking basic knowledge in Mathematics, Physics, and Chemistry.

Collaboration with Industries and Other Universities

MITSUMI (electronics), Tsuneishi (shipbuilding) and some other companies in Cebe Region send their staff as visiting teachers and giving practical lessons. Taking advantage of the program, the teaching staff trained beforehand at companies attend class to acquire practical skills. By the end of term, the teaching staff will be able give a lecture with the same contents.
An impact of Saitama Cebu Monozukuri Project is substantial. Prof. Yoshida's teaching on work ethics was superb and its contents was most suitable for students to prepare themselves to work in the real world. It is important not only to teach knowledge of engineering but to provide students with mental guidance in the Morozukuri sprit. Through the Project, students have deepened their understanding on Japanese companies and the value of the Monozukuri spirit. In last year, more than 10 out of graduates were employed by Japanese companies in Cebu and in Japan. The governor of Cebu State is taking a positive attitude to cooperation for

industrial education with Japan in Cebu and to enhance such cooperation.
In October 2016, the office of the Monozukuri Institute was set up in one room on the campus of San Jose Recolestos University. Activities under the Project are to expand by; having the staffs of San Jose Recolestos, San Carlos, and Cebu Technical Universities serve as lectures (paid) at internal trainings of companies; inviting the engineering teaching staff from Mindanao and Negros Is. and conducting seminars; etc. But there are time and budgetary constraints. Those in the Philippines are all full-time teachers so cannot spare so much time for the activities of the Project. In the meantime, Philippine counterpart universities have budgetary constraints at the time of absence of Japanese universities. Further support from the Japanese Government is expected on the occasion of asking Japanese companies in and outside of the Philippines to participate in activities of the Project.

Employment
Many students on OJT are employed by partnering companies. Companies recruit students for their job requirements.

[Private Universities in Davao]
12) University of Southeastern Philippines
Many students are from economically unprivileged families. So tuition is kept low. Those on scholarship are at a high percentage. School of agri-culture is designated for Center of Excellence. It has strength in agriculture, forestry, agricultural engineering, etc. and is also offering technical vocational training courses.

Facilities and Equipment
The school building, the Technical/Vocational Training Center, and facilities related to engineering are all dilapidated. Tools and equipment are old and teaching materials are not sufficient at all for the number of students.

Collaboration with Industries and Other Universities
It has given good records, contributing to improve the quality of banana with resistivity against red fungus, a cause of so-called damping off. It is currently developing an apparatus for harvesting mango at low cost and is doing best in spreading agricultural technology benefiting farmers for their practical use.
College of engineering is offering courses in wider scope. Especially mining courses were opened at the request of industry and good students are supplied to mining industry. Students in mining courses pass at a high percentage a state (or a national) examination in geology, mine engineering, and electrical engineering. Companies visit the University to recruit students with high potential and make commitment to employ them before their graduation.
College has concluded agreements in partnership with universities and companies, domestic and foreign.

13) Southern Philippines Agri-business and Marine and Aquatic School of Technology (SPAMAST)

Many students are from unprivileged families so tuition is kept low. A high percentage of those are on scholarship. There are courses on agri-business, agricultural engineering, agriculture, fishery, marine biology, farming and forestry, education and IT. It offers MBA and masters in agriculture, fishery and other subjects. Also agriculture courses acknowledged by TESDA accredited courses (Agriculture NC II, Agriculture NC II) are being offered.

Collaboration with Industries and Other Universities

It has close tie with local agricultural and fishery-related companies and is aggressively providing the agricultural cooperative and the agricultural organization with technical services.

It receives fund/grant from CHED and other donors and carry out many R&D projects.

SPAMAST, after completion of DICCEP (Davao Industrial Cluster Capacity Enhancement Project), keep participating in activities of seaweed and mango clusters. SPAMAST, equipped with tools and materials supplied by Ministry of Agriculture, carried out value-added products development such as seaweed noodle and seaweed cracker.

SPAMAST with some of its teachers has guided farmers in increasing their earnings in seaweed and mango and it will be able to contribute in promoting local industry in marketing, products development, and quality control by utilizing its experience in teaching and guiding in agricultural technology and businesses.

4-3-3 Challenges and Assistance needs of Higher Education

Based on the collected information, challenges and assistance needs of higher education are analyzed as follows.

Below are conceivable issues and support needs based on the survey results above.

Table 4-7 Issues and Assistance Needs

Issues	Assistance Needs
University (engineering and industrial technology colleges) curriculums do not sufficiently reflect the needs of companies.	・ In order for curriculum guidelines set by CHED to reflect the requirements of industrial associations, it is necessary to continue to conduct high-order collective industry-academic dialogue. To reduce the gap between industries' way of thinking and universities' way of thinking there is a need for explaining and facilitation from an outside party. ・ While there are currently company representatives participating as members on

	each school's curriculum review committee, it is not clear if the opinions of managers from each company are being represented. For example, in order for the opinions of Japanese company managers to be adopted in specific university curriculum revisions, it is necessary to facilitate the opportunities for Japanese companies to give specific remarks. Universities have a positive attitude towards receiving comments from foreign companies.
Universities and companies share the points of interest such as equipment contributions (companies simply participating in events), student OJT (on-the-job-training) (HR and general affairs divisions of companies as a contact point), representative delegates on university curriculum review committees (unclear if opinions of management are represented), etc. but it is limited to superficial industry-academic collaboration	・ Universities would especially like to strengthen collaborations with multinational corporations in export processing zones, but the threshold is high and universities say that there is limited opportunity for detailed dialogue. There is a need for some facilitation by an outside party to gather comments from involved companies regarding OJT substance and university curriculum revision.
The buildings of engineering college and industrial technology colleges are becoming too old to use. The quality of equipment and teaching materials is not sufficient.	・ In the case of state public universities, surveys are being conducted on inadequate equipment and universities that are continuously working to write proposals are receiving budgets from CHED, DOST etc. to rebuild buildings and secure equipment, and teaching materials of good quality and sufficient quantity. For private universities as well, by creating investment plans and gaining approval from their board of directors, the necessary budget can be secured. It is necessary for underdeveloped public universities to inspect the situation at top universities and to be provided the opportunity to learn the knowhow of proposal writing.
The capability of faculty members at engineering and industrial technology colleges is insufficient. (few have obtained a Master's or PhD degree)	・ It is necessary to provide scholarships and opportunities for research and training at foreign universities and research institutions to secure academic degrees.

The opportunities for engineering and industrial technology faculty to continue learning up-to-date techniques is insufficient.	・ In order to increase the quality of students and to reflect the needs of companies in the curriculum, first, it is necessary to increase opportunities for dialogue between faculty and companies and to provide more opportunities for faculty to inspect companies and receive training.
There are few results of collaborative research between other colleges and companies.	・ In regards to cost and intellectual property rights issues, other countries (for example Japan) may be effective case studies. ・ It is necessary to match the collaborative research needs between universities and between universities and companies. To advance this matching, mediator facilitation between universities and between universities and companies is necessary.
The practical abilities and ability to apply skills (problem solving ability, initiative, creativity, time management) of engineering and industrial technology college graduates is insufficient.	・ Support for incorporating approaches to increase practical ability and the ability to apply in primary and secondary education levels is necessary. ・ Support for establishing a Fablab at universities and efforts to advance invention clubs and graduation research are needed. ・ Provide opportunities to inspect and train at Japanese research institutions and companies.
The academic ability (mathematics, physics, chemistry, etc.) of engineering and industrial technology college graduates is insufficient.	・ Support for strengthening math and science subjects at the elementary and secondary levels is necessary.
The English ability of industrial technology college graduates is insufficient.	・ Support for strengthening English ability at the elementary and secondary levels is necessary.
The work attitude and desire to work among engineering and industrial technology graduates is insufficient.	・ Support for implementing a “Monozukuri-no-Seishin” (Manufacturing Spirit) curriculum like in the Cebu HR support project is needed. ・ During OJT, support to thoroughly teach 5S and time management and to convey the joy of producing things is necessary.

Universities' employment support systems for students are not fully prepared.	・ It is necessary to verify whether practical career guidance substance is being provided. ・ In the Philippines, OJT also performs some job hunting aspects, so it is necessary to promote the sharing of models and knowhow of universities that successfully use OJT with developing universities.

BOX4-2：teaching material "Smart Lecture"

Currently, JICA is supporting "Survey on improvement of academic achievement of mathematics by using paper and digital composite teaching material "Smart Lecture"" leading by Japanese private companies. In this survey, research on mathematical academic ability is conducted for Grade 9 and 10 in Cagayan de Oro City of Mindanao, and the result will be compared with Japanese students' in order to grasp the current state of academic achievement of mathematics in the Philippines.

Also, in this survey, a study targeting teachers and the workshops with stakeholders will be conducted for further investigation of introducing of "Smart Lecture" into the Philippines.

"Smart Lecture" is a teaching material that combines text and digital teaching materials such as animation. The user can learn by using the materials based on their learning pace. Also, as its file size is light, it is relatively easy to download even if IT environment is not good.

This teaching material has been introduced as a test-preparation software for technical examination for IT engineers in Bangladesh, and there was a track record that the pass rate has increased to 90%.

However, in the Philippines, unlike the case of Bangladesh (used for test-preparation), "Smart Lecture" might be introduced into formal education at schools in order to improve students' basic academic ability of mathematics. Therefore, in this survey, further investigation for effective use of "Smart Lecture" in schools is important from educational aspect.

(Source: Prepared by the JICA Survey Team based on the interview)

4-4 Technical - Vocational Education and Training (TVET)

4-4-1 TVET System

(1) TVET System

TESDA has been mandated through Republic Act No. 7796 or the TESDA Act of 1994 "to provide relevant, accessible, high quality and efficient technical education and skills development in support of the development of high quality Filipino middle level manpower responsive to and in accordance with the Philippine development goals and priorities."

Under the law, TESDA is tasked to perform the following functions:

1) Developing of national Technical Education and Skills Development plan;
2) Research on TVET;
3) Providing information on the supply and demand for middle-level skills;
4) Certification of skilled workers;
5) Registration and accreditation of training establishments (TESDA's mandate does not

include the provision of direct training);

6) Development of industry based standards;
7) Training of trainers;
8) Advocacy to all clientele including enterprises; and
9) Capacity building

TESDA introduced the Unified TVET Program Registration and Accreditation System (UTPRAS) in order to maintain the quality of TVET programs. For developing their TVET programs, all TVET providers are required to comply with the standards of UTPRAS to meet the TESDA's Training Regulations and pre-set competencies. They are also obligated to consider in advance whether all necessary items including course planning, trainers' qualification, tools, equipment and materials are following the standards. TESDA issues the registration confirms a TVET provider satisfies all conditions.

TVET providers are offering TESDA-registered programs through various delivery modes such as institution-based, enterprise-based, community-based and online programs. This study mainly focused on institution-based and enterprise-based programs.

The major target of institution-based and enterprise-based programs are as follows[63]:

- High school Graduates who do not proceed to higher education
- High school dropouts
- College dropouts
- College graduates who aim to obtain specialized skills
- Employees or unemployed persons who aim to obtain higher skills or other skills

(2) Academe-Industry Collaboration

TESDA partners with companies across the country in the implementation of enterprise-based programs. A total of 422,700 graduates were produced from 2010 to May 2016. TESDA also accredited 708 companies under the Dual Training System (DTS). The general and occupation-related theoretical instruction provided by the school is complemented by on-the-job training in the workplace. Trainees under the DTS spend at least 40 percent of the training/learning time in school and 60 percent for practical training in the company. Through DTS, students are given hands-on training and actual work exposure to improve the level of their skills and their employability. The DTS subsidy shall be 75% of the current minimum wage per day of duty mandated by law.

TESDA-Industry collaboration is seen in the improvement of the training facilities. A few examples are as follows. Isuzu Philippines Corp. donated over a hundred million pesos for the establishment and operation of the Automotive Training Center offering Automotive Servicing NC I to IV in Tacloban, Leyte. The training center graduated and certified 135 technicians in seven batches of which 131 are employed. Samsung Electronics Philippines Cop. donated equipment and allocated funds amounting to 12.43 million pesos for the training of women in

[63] High school undergraduates could be targeted if the training program does not require academic units or degrees as precondition.

Consumer Electronics Servicing. There were 413 new apprenticeship and learnership programs registered nationwide while 319 were registered in 2015.

4-4-2 Current Status of Technical-Vocational Education and Training (TVET)

(1) Current Status of TESDA

With the over-all implementation of quality management system for continuous improvement and quality assurance in the delivery of its programs and services, TESDA acquired nationwide ISO 9001:2008 in 2014. Industry-led Training Regulations (TRs) and competency assessment tools (CATs) are reviewed every three years. The TESDA Board has promulgated 112 out of 258 TRs during the last six years. Thirty two qualifications with low utilization of TRs and CATs, in terms of registered programs and assessed workers/graduates, were referred to concerned industry sectors for updating or amendment if necessary. Amendments and updating were undertaken and completed for a total of 35 TRs and CATs. New TRs and CATs were developed for 9 qualifications. Among the 258 qualifications, the following were identified as the 10 top most utilized: 1) Food and Beverages Services NC II, 2) Computer Hardware Servicing NC II, 3) Housekeeping NC II, 4) Commercial Cooking NC II, 5) Shielded Metal Arc Welding NC II, 6) Consumers Electronics Servicing NC II, 7) Bartending NC II, 8) Programming NC II, 9) Contact Center Services NC II, and 10) Automotive Servicing NC II.

As of May 2016, a total of 18,075 TVET programs were registered. TVET delivery is private sector-dominated as more than 90% are privately managed. As of June 2016, a total of 4,315 TVET providers (3,886 private and 429 public institutions) are offering TESDA-registered programs through various delivery modes such as institution-based, enterprise-based, community-based and online programs. The most number of TVET providers are located in NCR (22%), Region IV-A (14%) and Region III (11%).

Figures in assessment and certification doubled in six years. From 716, 220 assessed in 2010, it increased to 1,424,814 in 2015. The certification rate had also risen from 83% in 2010 to 90.7% in May 2016. In total, 6,800,930 individuals were assessed while 6,002,843 individuals were certified from 2010 to May 2016. In a span of six years, the certification rate averaged to 88.3%.

The employment rate of TVET graduates is steadily on rise. From 48.5% recorded in 2005, it reached 65.4% in 2014. The key employment generating sectors include: Agri-Fishery; Construction; Processed Foods and Beverages; Decorative Crafts; Metals and Engineering; and IT-BPM. The positive results were seen particularly for Training for Work Scholarship Program (TWSP) graduates. 71.9% employment rate was achieved among the TWSP scholars in 2014, the highest in its history. IT-BPM industry graduates had an employment rate of 70.9% while the electronics and semiconductor program recorded 91.4% employment rate. Many college graduates and career shifters go to TVET. A sizable number of TVET graduates were college undergraduates and college graduates with 13.8% and 16%, respectively (2014 TESDA Impact Evaluation Study).

As for trainers, the creation of the Philippine TVET Trainers Qualification Framework (PTTQF) set a four-level framework which establishes a structure of that will ensure the systematic and purposive development of TVET Trainers. Both public and private TVET trainers underwent

training programs from 147 registered training providers of Trainers Methodology (TM) Level 1. From 2011 to 2015 there were 29,318 graduates of TM Level 1.

(2) Current State of Technical Vocational Institutions (TVIs)

We visited 12 TVIs in Metro Manila, Calabarzon Region, Cebu, and Davao and gathered information as regards present states and challenges mainly from standpoints of (1) facilities and equipment, (2) collaboration with industries and (3) employment[64]. Those with whom we interviewed were administrators, trainers and staffs of TVIs. The TVIs we visited were selected with reasons as mentioned below.

Table 4-8 TVIs Visited and Reasons for Selection

Names of TVIs Visited	Reasons for Selection
1) TESDA Women Center（public）	Built with a Japanese grant. Former counterpart of JICA Technical Assistance Projects.
2) TESDA-Region 4a Training Center (public)	Recommended by TESDA-Region4a.
3) Jacobo Z. Gonzales Memorial School of Arts and Trade（public）	Recommended by TESDA-Region4a.
4) TESDA Cavite Provincial Training Center (public)	Recommended by TESDA-Region4a.
5) Municipal Training Center, Los Banos, Laguna (public)	Recommended by TESDA-Region4a.
6) Toyota Motor Philippines School of Technology (TMP TECH) (private)	TVI established by a Japanese company.
7) Dualttech Center (private)	Mentioned by companies in Region 4a during interviews.
8) TESDA-Region 11 Training Center (public)	Recommended by TESDA-Region7.
9) Center for Industrial Technology and Enterprise (CITE) (private)	Recommended by TESDA-Region7.
10) School of Knowledge for Industrial Labor, Leadership and Service (SKILLS) (private)	Recommended by TESDA-Region 7.
11) United Global for Professional and Technical (private)	Recommended by TESDA-Region7.
12) Assumption University Affiliated Technical Vocational Training Center (private)	Recommended by TESDA-Region11.

[Public Technical Vocational Training Institutions in the Manila Metropolitan Area]

1) TESDA WOMEN'S CENTER (TWC)

TWC was built in 1998 with a grant from Japan. TWC is Philippine's only vocational training institution for women, and fulfills the function of serving as a model for the whole country.

[64] This information is based on the interview with TESDA-Region11.

Various courses are offered including dressmaking and tailoring, cooking and housekeeping, as well as automobiles, electronics, welding and plumbing etc. Since TWC was established, it has graduated 6,734 people. The employment rate is about 60%. Men are also accepted as trainees (up to about 10% of each course). There are generally about 300 trainees at a time.
The issue is the lack of trainers. TWC wants to employ female trainers as much as possible, but given the difficulty in finding suitable candidates there is a need to strengthen trainer training. Trainers are employed on a job-order basis, and are not full-time employees. Currently TWC has a staff of 18 people.
We are currently carrying out DTS in cooperation with Samsung, where trainees spend two months in classes at TWC and then go to work for three months at the Samsung plant. While they are working at Samsung, they receive an allowance for transportation expenses etc. We have also concluded several other partnerships, in addition to Samsung, with companies in relation to other courses.

[Public Technical Vocational Training Institutions in the Calabarzon Area]

2) TESDA-Region 4a Training Center

The school building was built in the 1980s with Japanese support. While the building is aging, it is well maintained, as are the classrooms and work rooms.
A number of manufacturing related courses are provided, with tuition around 4,000 pesos per course. Since 2005, we have provided training courses matched to corporate needs, actively investing in equipment, such as with the introduction of a number of CNC with loans.
There are a number of corporate OJT partners, including Mitsubishi, Hitachi, Toyota, Nissan and Ford etc. DTS has partnered with three companies, Mariwasa Ceramics Inc., F-TECH (automobile parts company), and RYONAN (electronics), on a 70%-30% basis for the companies and the vocational training center. The employment rate is 65% (national average is 61%). The attitudes of students are strictly evaluated on an everyday basis, on clothing and punctuality etc.
Every year, around November, a DTS Congress is held for Region 4a, in which not many corporations participate. Contact with companies is generally limited to the donation of automobile engines (Honda) and inviting OJT/DTS companies to graduation ceremonies. We would like to strengthen our cooperation with companies in order to master the latest technologies, but it is difficult to cultivate relationships, and is also difficult to approach companies in the area of export processing. It may necessary to create such a mechanism to motivate companies in the Philippines in order to encourage companies to collaborate further.
Throughout the year, trainers can participate in company training for about a week, and this is encouraged.

3) Jacobo Z. Gonzales Memorial School of Arts and Trade (Province of Laguna)

This school offers a number of different courses, including electronics, tourism, construction, automobile services and mechanics etc. Each course is short, at 3-5 months, with DTS adopted, teaching 40% at school and 60% at companies. In the case of DTS, companies pay 75% of

minimum wage to the school. 15% of this is received by the school for equipment maintenance etc. The remaining 85% is paid to the student.
There are about 9 companies that work closely with us as DTS partner companies, with many of these Japanese companies such as Suzuki and Fujitsu. It is often difficult to maintain good relationships with OJT-receiving companies, and relationships can sour with companies if the attitudes of dispatched students are poor and complaints are made to the school. And given that we only have 1-2 industry cooperation coordinators, it is also a struggle from a man-power perspective.
Companies are asked to instruct in basic technologies and basic attitudes (punctuality, following the instructions of superiors), and 5S and morning assemblies are introduced into regular classes at school. Also, based on the comment from companies that students receiving OJT and DTS training have poor communication skills (unable to write reports after the completion of work, unable to converse appropriately with superiors and colleagues.), at the recommendation of our valued corporate partners we have added stronger English proficiency to the achievement objectives of our training program, and have established a course for writing simple technical reports in English.
TESDA promotes the bundling of multiple related training courses. This school is also in the process of consulting with companies on an electronics and mechanical engineering course (12 months) bundling electronics, mechanical engineering and mechatronics.

4) TESDA Cavite Province Technical Vocational Training Center

This school offers courses in mechatronics, electrical equipment and maintenance, sewing, shield metal arc welding, and solar power system installation. As well as training courses, the school also conducts traveling training courses, in response to requests from the community within the province.
The school has geographical advantages from being located within the Cavite Export Processing Zone, but given that the land was provided through PEZA, for small scale facilities, it cannot expand any further, which hampers the school to increase the number of trainees, even though there is demand.
At the present, given the limited number of trainees, it has been able to find places for OJT candidates without having to search for them. The technical skills and work attitudes of students placed with companies for OJT have been well received, so the reputation of the training center has spread by word of mouth, without the need for much publicity or advertising. Virtually all of our graduates find employment with one of several companies in the export processing zone.

5) Laguna Province Los Banos Technical Vocational Training Center

This is a small vocational training center which is run by the Los Banos Public Employment Service Office (PESO) in Laguna Province. 16 courses are offered, including welding, plumbing, sewing, call center training, massage and cooking etc. It also has an English language skills program, since this is necessary for call centers.
The staff are all employees of PESO, and given that the Center is run under the town office

budget the course fees are quite cheap, at about 1,500-3,000 pesos. Trainees are townspeople, aged 15 to 50 years of age, and there are also programs particular catered to the poor. There are issues with the lack of facilities and teaching materials, and the difficulty of securing full-time trainers due to the shortage of funds.
The school also provides career guidance, coaching, and job placement services, which are the main activities of PESO. The employment rate is 60-65%, which is comparable with the national average. It also looks for unpaid OJT placements to gain experience if employment cannot be found immediately.

[Private Technical Vocational Training Institutions in the Calabarzon Area]

6) Toyota Motor Philippines School of Technology (TMP TECH)

TMP TECH is a TESDA certified technical vocational training institute. Only five schools nationwide offer TESDA certified automobile maintenance courses NC 1 through IV, and TMP TECH is one of these. TMP TECH has a capacity of 700 students, and a dormitory for 200 people.
In addition to the course to train domestic dealers, there is the one for dealers to work in the Middle East. Courses are decided at the time of enrollment. About 1,000 people have been trained up until now. From 2017, the school plans to begin new one year courses in repair painting and auto painting, with the purpose of training people to work domestically in the Philippines. Work in the Middle East is on five year contracts, and some people return home to the Philippines after the completion of their contracts, although many work overseas.
The TESDA Training Regulations (TR) do not include the latest technologies, and use car engines from the 70s for practical training. But since it is not currently possible to get hold of such an engine, it was necessary for TMP TECH to obtain two engines from TESDA because they needed engines from the 70s to teach foundations.
In the high school program started this year (technical professional/livelihood tracks), at best they could acquire the skills corresponding to the lowest level (Mechanic) under the Toyota qualifications (TEAM21). Therefore, even if students complete the high school auto service course, they will not be of a level where they can work right away. TMP TECH is currently in the process of preparing MOA, and plans to start accepting high school students in the future.

7) Dualtech Center

In 1982, with the support of a German Foundation, this Center was established and the Dual Training System was introduced into the Philippines. The majority of student tuition and school equipment costs are covered with donations from companies and foundations and with scholarships.
This school offers a single two-year course, in electro-mechanics (electrical, mechanical, electronics). Our acceptance criteria is young high school graduates (10 years), aged 17 to 22 years. Students study at our school for 6 months, and then receive 18 months of training at a company. While training at the company, students train for 5 days a week at the company and one day a week at the school. Companies say that they want to teach technical skills and

knowledge through training at the company, so the school focuses on acquiring basic skills and attitudes. For this reason, there is only basic equipment at the school. Attitude involves so-called work ethics and professionalism, and includes not being late, communications such as reporting, consulting and making contact, keeping company rules, and thinking for yourself etc. Frequent discussions are held with the companies to improve lessons.
We have relationships with about 150 companies, with half of these Japanese companies such as Fujitsu, Yamaha, Panasonic, Honda and Suzuki etc. Training at companies is created on an individual company basis, through consultation between the company and the Center. Training is focused on technicians, maintenance engineers, electrical engineers, and welding workers. Virtually 100% of students have employment decided when they graduate. 60% of these are employed by the companies that they were trained by.
The lack of teachers relative to demand is an issue. Most of our teachers are graduates of our school. Between 2010 and 2015, the school accepted 1,200 students per year, but in 2016 this was 1,000 as a result of the K to 12 program. There are about 2,000 applicants each year.

[Cebu Public Technical Vocational Training Institutions]

8) District 7 (Cebu) TESDA Training Center

This school offers 16 courses, including electrical equipment and maintenance, machinery maintenance, CNC operation, plumbing, automobile servicing, and sewing etc. It also offers language courses in English, Spanish and Korean. Currently it is not possible to offer the courses permanently due to the difficulties to retain lecturers with experiences.
An officer in charge of industry-academia collaboration has been deployed, who is also in charge of other duties such as researches on the needs for carrier counseling and training courses.
Students can take cruces including orientates newly new entrants, preparation seminars for job hunting including how to write CVs, how to behave at the job interviews as well as right attitudes at the office, etc. The lectures on 5S and communication techniques in the office are provided in the training courses. The name of partners for OJT are listed with the information on the conditions such as the duration, wages and the availability of commutation allowance. Each has different conditions and the reference letters for OJTs are prepared in correspondence to the students' preferences.
Since SHS program was introduced in 2016, public junior high schools in Cebu were requested to provide carrier guidance for the students. In response, they provided the useful information based on which students can decide which track they should take at the SHS for which carrier path. The information on the courses offered at the TESDA Training Center was also introduced.

[Cebu Private Technical Vocational Training Institutions]

9) Center for Industrial Technology and Enterprise (CITE)

This is a non-profit organization founded in 1990 with the support of an Italian Christian church and a Manila metropolitan foundation. In addition to a three-year course (technician training)

for boys from poor families that have finished high school (10-year), short-term courses are also offered for students regardless of gender. A high school program (technical professional/livelihood tracks) was also started from 2016.
In the three-year course, students mainly learn technology such as mechatronics, electrical equipment assembly and maintenance and wiring equipment etc., and obtain TESDA qualification. During training, students study under a DTS, studying at school for 40% of the time, and receiving training at the company for 60% of the time, with revenue from the companies being divided between the students (student's parents) and the school. Part of the tuition and living costs of students is covered by various scholarship programs from donations by individuals and companies. Much of the cost of school building construction and equipment purchases is also covered by donations.
About 1,000 people apply every year for the three-year course, with about 150 people accepted. From our establishment until July 2016, 4,125 had graduated from the three-year course (93% of enrollees graduated). The employment rate of CITE graduates is high at 92%, with many employed in the Visayas and Mindanao areas. Many graduates also go to work overseas after several years of work experience domestically. The school's training meets the needs of industry. The number of corporate partners is 57, among which 6 are Japanese affiliated companies in 2016

Opinions of CITE from Japanese Companies in Cebu

We started accepting CITE students in 1999. We accepted 15 students a year from mechanics and electronics courses, because they have basic knowledge in basic machinery operation and drafting as compared with regular high school (10 year) graduates. We hired nearly 100% of the trainees, and they were employed as technician class employees, one level above regular workers. The education in discipline, such as greetings and attitudes towards seriously working etc. was provided when students returned to the school once a month for lectures. Due to the change in the management about 5-6 years ago, a lot of people started to leave part way through.

10) School of Knowledge for Industrial Labor, Leadership and Service (SKILLS)

This technical vocational training institution was created in 2008 as a non-profit organization by a Cebu construction company in response to a shortage of workers in the construction industry. Women are actively accepted as trainees (of 5,357 trainees, 1,044 are female).
In addition to construction related courses such as welding, painting, masonry and heavy equipment operation etc., courses are also offered in massage, housekeeping and teacher training, as well as an English program. This is also a testing center for TESDA certification. And because it is a school which was established by companies, the curriculum is fully tailored to reflect the needs of the industry. There are six full-time teachers, and 20-30 part time (on call). Equipment is in very good condition, with the latest and sufficient quantities of equipment available. Practical experience is gained through OJT with the parent company and related companies. 30% is allocated to school lectures, and 70% to OJT at the company. Many graduates are employed by the parent company or related companies (including hotels).

Through the Cebu Construction Company Association, of which the parent company is a member, graduates are introduced to other construction companies and hotels for employment. The employment rate is high, at 83%.
Many workers in the construction industry never enrolled or dropped out of high school or elementary school. For this reason, there is also a focus on technical vocational training as part of non-formal education or to support workers returning to school. The school also offers a high school program (technical professional/livelihood tracks) where a private high school on the same site as SKILLS teaches major academic subjects, while SKILLS teaches technical and professional subjects (construction related, housekeeping).

11) United Global for Professional and Technical

This is a small scale private TVET training center in Cebu. It was established by a French engineer with business connections in Saudi Arabia, together with a Filipino partner. It is also combined with a staffing agency. Demand is high both domestically and in the Middle East, and just two NC II courses are offered, shield metal arc welding (35 days) and plumbing (25 days).
It was planned that talented individuals would be dispatched to countries in the Middle East, but demand in the Middle East is falling. It was also planned to accept about 300 trainees per year as part of the Department of Social Welfare technical vocational training program for the poor, but this program was suspended with the change of government in 2016.

[Davao Private Technical Vocational Training Institutions]

12) Assumption University Affiliated Technical Vocational Training Center

Offers a two-year hotel and restaurant service course (six NC II courses including bartending, cooking, housekeeping etc.) since 2005, and a two-year ITC service course (computer systems maintenance NC II and graphic design NC III) since 2011, in response to labor market needs. Short courses for each TESDA training course are also offered on an individual basis. 10% of trainees are graduates of Assumption High School (10-year), and 90% are accepted from outside.
Facilities and equipment are well maintained and are kept clean. Tuition is relatively high, but at other schools cooking courses collect additional fees for ingredients, making it impossible to practice using expensive ingredients and wine tasting etc., while Assumption includes the cost of high grade ingredients and wines etc. in the tuition cost, allowing a broad range of technologies and experiences to be learned.
The Assumption education system is found throughout the Philippines, and has a reputation for girl's education. Many of the students are daughters of the wealthy class. On the premises are an elementary school, junior high school, high school, technical vocational training institution and university, all existing together. However, given that the governing agencies differ, with the Department of Education for basic education, TESDA for technical vocational training, and CHED for university, so there is not necessarily a lot of sharing of information between the schools.

[Davao Public Technical Vocational Training Institutions]

13) District 11 TESDA Training Center

Offers 38 courses. Recently constructed, with the support of the Korean government, having all of the latest equipment. The training center has restaurant facilities for training, reproducing actual conditions on site.

DTS is not used, due to the difficulty in finding partner companies in Davao. TESDA certification is recognized as an important qualification in Davao, for finding overseas employment or enhancing employment opportunities in Manila etc., and is highly valued by trainees.

(3) A Case of Education and Training Program by Private Company

Currently, Alliance Mansols Inc. (AMI), an electronics company and a part of the EMS Group, is providing three training programs; Electronics Production Line Back-end Operation, Engineering Program, and CREOTEC Learning System. All trainers for three courses are full-time employees of EMS Group.

Training Prorams

1) Electronics Production Line Back-end Operation Training

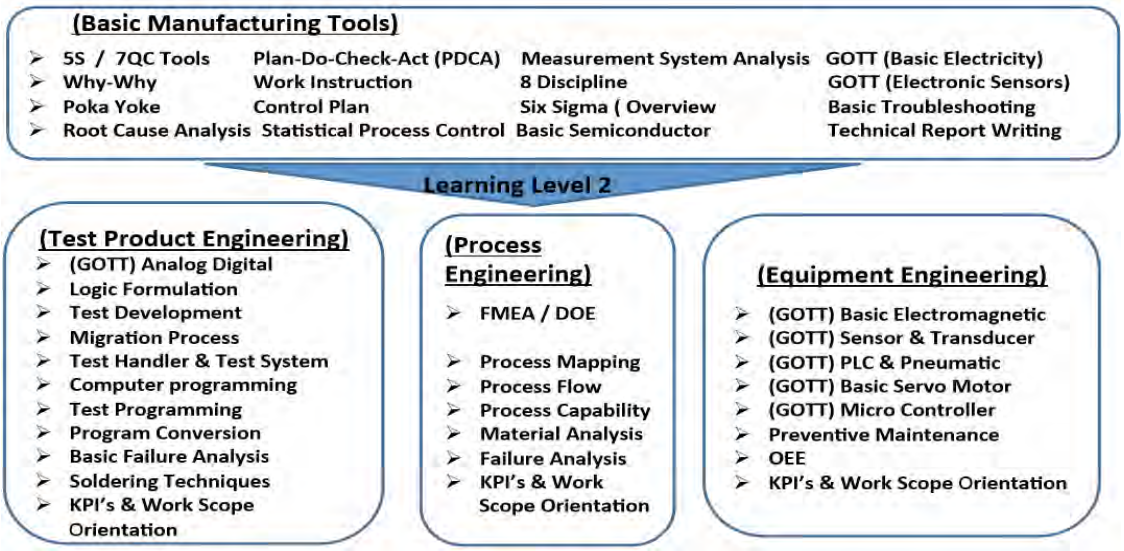
Electronics Production Line Back-end Operation started in 2013, and it aims to train operators to gain technical skills necessary for production, assembly or inspection. This training course is accredited by TESDA, and tied up with Semiconductor and Electronics Industry of the Philippines Inc. (SEIPI). Around 10 to 15 % are working for SEIPI outside of EMS Group. On the other hand, most of the graduates are employed by EMS. Some of the graduates are assigned to work for other companies located within EMS/AMI premises. By doing so, AMI received administration fee. TESDA subsidized the fee under TSWP[65], with which 5,000 graduated while other 50,000 self-financed.

2) Engineering Program

Engineering Program started in 2015, and it aims to train process engineers, equipment engineers, and test products engineers. All trainees are university graduates with the degree in electronics. Only 20 % of the applicants can be accepted due to their capabilities. All trainees will start with the learning level 1 training at which they learn the basics of manufacturing tools and then trainees will learn specific topics according to their specialties at the learning Level 2. In this Engineering Program, MOUs are in place with some universities, with its terms and conditions including employment conditions, seminars, visiting of companies, OJTs, as well as participation

[65] TSWP: Training for Work Scholarship; this program provides immediate interventions to meet the need for highly critical skills. The program has two-fold objectives:
1) to purposively drive TVET provision to available jobs through incentives and appropriate training programs that are directly connected to existing jobs for immediate employment, both locally and overseas,
2) to build and strengthen the capacity and capability of TVET institutions in expanding and improving the delivery of quality, efficient and relevant training programs that meet job requirements, including programs for higher levels of technology. (http://www.tesda.gov.ph/About/TESDA/1279)

in the job fair. When EMS/AMI bears the cost, the trained engineers will be exclusively employed by EMS Group. In such case, contracts are signed with the trainees. So far, all graduates of this course are employed by EMS Group. No government subsidies are available.



Source: EMI

Figure 4-5 Engineering Program

3) CREOTEC Learning System

CREOTEC Learning System is a semester or annual program for high school and college students, and it has just started in 2016. It aims to improve their education level in technical topics like electricity and electronics, sensors, communications, etc. High school and college teachers undergo 3-5 day training on the use of the equipment and the methodology through the program, and they implement the program at their schools and colleges. No government subsidy is available.

4-4-3 Issues and Assistance Needs in Technical Vocational Education

Below are conceivable issues and support needs based on the survey results above.

Table 4-9 Issues and Assistance Needs (Technical Vocational Education)

Issues	Assistance Needs
Develop higher order TESDA (Technical Education and Skills Development Authority) qualifications Training Regulation (NC III, NC IV, diploma) in response to industry needs.	・ Based on the needs of companies and labor market trends, it is necessary to specify the required course for higher order TR development. ・ It is necessary for industries to check and confirm if there are any excesses or deficiencies in the TR contents.

	・ In the case of diploma course establishment, including placement within PQF's (Philippine Qualifications Framework) diploma course, it is necessary to receive sufficient cooperation from DepED and CHED.
Developing trainers for teaching high level TESDA qualification courses.	・ In the case that investment in equipment is required, there is a high possibility that at the trainer development stage company training will be necessary.
Create multiple TESDA qualifications in a bundled package in response to industry needs	・ When creating packaged qualifications, it is necessary to identify TESDA qualifications with high bundling effect based on company needs and labor market trends.
Improve facilities and equipment, and teaching materials to implement higher level TESDA qualification courses	・ If a government budget cannot be procured, it will likely be necessary to receive financial support from donors.
Strengthen cooperation with cooperation industry. Establish an Industry Board/Industry Training Council and carry out reactivation.	・ It will be necessary to not just review and revise packaged TR but to develop higher level TR and strengthen industry-academia collaboration when creating packaged TESDA qualifications (Conversely, looking from the companies' perspective, if Japanese companies have an interest in TR development and packaging of specific fields it is necessary to have them participate in discussions to have their opinions adopted.)
In response to an increase in examinees of TESDA qualification examinations, increase the number of reviewers, standardize the review process and systemize the process of issuing qualification certificates.	・ Need to qualify reviewers and train them. ・ Need to standardize review process. ・ Need to systemize process of issuing qualification certificates to proceed more efficiently.

4-5 Success Story of Human Resource Development by a Public-Private Partnership Model

Based on the survey results above, we know that companies desire human resources who have good work attitudes and have firmly acquired basic academic abilities and techniques. Companies are not looking for perfect workers, but those that can grow as professions and members of society through in-house training. They want trainable workers with foundations that can be expanded by cultivation. The public-private partnership model success story is classified and organized as below.

Table 4-10 Public-Private Partnership Good Practices

Type	Good Practice Outline	Deployability
DTS (Dual Training System) as a core of human resource development and clearly defining the division of roles between private technical vocational training institutions and companies	・ At the Dualtech Center of the Calabarzon Region, which was highly appraised by companies, a DTS is employed where six months of basic training is received at school after which 18 months of practical training is received from the company. Since the company provided training is in a five day on-site and one day at school style schedule, the companies are not solely responsible for this training period and school instructors can monitor and follow-up on the students. At the school, only basic equipment is available, but since the facilities and equipment varies by company, company training can cover the practical training. The traits that companies desire in trainees are, to not be late, can communicate in a report/contact/discussion, can follow company rules, can think for themselves, etc. In other words, they have good labor ethics and work values. The school is in frequent consultation with the companies and engaged in improving the course.	・ This is thought of as having a moderate level of deployability. The main points being how thoroughly can the school instill soft skills such as labor morals and work values, and if the school can frequently consult with the company and apply company comments onto the course itself. Although similar programs to Dualtech Center's, such as Cebu's CITE etc. have receive high appraisals, mid-course management policy shifts have led to lowered evaluations from companies. ・ Public technical vocational training institutions may be able to deploy such a system, but there are few staff with the business mind necessary for interacting with companies.
Human resource development through strengthening collaboration between private universities and companies (OJT for students with lectures and teacher training given by company lecturers)	・ From an educational point of view, for universities OJT is more favorable than wage occurring DTS. ・ PATTS College of Aeronautics, like Dualtech Center, has clearly defined division of roles between itself and companies and has ample discussions with companies as to not overlap study content at the university and in-house training after hiring. Additionally, it emphasizes company wishes and comments, such as strengthening English language education, by quickly responding to them. The main reasons for being able to quickly arrange self-study English equipment and materials were being a private university with an abundance of funds as well as having programs limited to aviation for which the necessity of acquiring English ability is high. ・ At the University of San Jose-Recoletos, lecturers from separate private companies were invited to give lectures on elective courses over multiple years. Being able to quickly accept the offer from the first company was a key factor in its success (at	・ Deployability is moderate. ・ Even among private universities, tuition is relatively expensive. Suitable for universities with money to spare for equipment expenses. ・ Necessary to have the management ability to make decisions and respond quickly to company offers and comments. ・ Deployable even at public universities if a management system that has the decisiveness to quickly respond to budget and man power issues is in place.

	neighboring universities the inability to make a prompt decision lead to companies shelving their offer). The necessary equipment for the lecture were donated by the companies, but laboratory for the lecture was readied by the university. The improved continuality from carrying out teacher training as well is an important point.	
Human resource development through strengthening collaboration between public universities and companies (systemization of student OJT and construction of a management system)	・ Many industrial technology colleges at public universities have very long OJT periods. Since companies have time to monitor students' qualifications and students can acquire ample skills, the hiring rate is high. Through its experience of managing training for many students each year, the Technological University of the Philippines in the City of Manilla has systemized the process from its OJT orientation to its post event follow-up and has organized its management system.	・Highly deployable ・ For small scale universities, OJT management is not that difficult, but for large schools and technical vocational training institutions, follow-up is necessary to effectively manage a large number of OJT students.
Establishing funds through public and private partnerships	・ The Cebu Education Development Foundation for Information Technology is a fund founded by the Cebu Chamber of Commerce & Industry, Cebu Investment Promotion Centre, private companies, universities, and government agencies (DepEd,DTI, DOLE, TESDA etc.), ・ Discussions were held regarding the human resources needed for ICT industries and put into practice. Private companies also made certain contributions and could participate with an awareness of the involved parties.	・By having companies participating in the project and baring some of the expense, there may be an increase in companies' ownership, and it may lead to sustainability.

Source: Prepared by the JICA Survey Team

Additionally, in Region IV-A (Calabarzon), under the Regional Development Council (RDC) the Academe- Industry Linkages Committee was organized to strengthen industry-academic collaboration and currently the president of the National College of Science and Technology is serving as its chairman. Committee members include DOLE, DTI, TESDA, CHED and the DepEd of Region IV-A as well as state universities, chambers of commerce, industry organizations, companies, etc. At the first committee held in October of 2016, there were 370 participants from affiliated organizations. At this meeting, manifestos were announced by government agencies, the private sector, education and training institutions, etc. and an action plan was also created. The committee is scheduled to be held quarterly. As it is still a new initiative it is unknown what kind of results it will produce, but it is expected to bring activity to public and private partnerships/

4-6 Issues on the Supply Side of Industrial Human Resource Development

Issues for each institution have already been mention. Here is a simple summary.

Table 4-11 Issues for Each Institution

	Faculty	Equipment & facilities	Curriculum & teaching method	Student Training	Industry-Academic Collaboration
High School (TVL Track)	Especially at former ordinary schools that started technical tracks from 2016, technical instructors are in shortage. Instructors themselves require company training.	Especially at former ordinary schools that started technical tracks from 2016, materials and facilities are in shortage.	Company needs (basic academic knowledge and technical/soft skills) are not adequately reflected.	Especially for former ordinary schools that started technical tracks from 2016, it is difficult to find a company that accepts its employment experiences.	Especially difficult for high schools with poor geographic conditions such as agriculture and fishing high schools, high schools in mountainous areas, and formerly ordinary schools and started technical tracks in 2016.
Universities and Junior Colleges	Few instructors with master's or PhD degrees. Instructors themselves require company training.	Noticeable aging of facilities, and lack of facilities and equipment at public universities.	Company needs (basic academic knowledge and technical/soft skills) are not adequately reflected.	Training of engineers and technicians with the academic ability and skill level desired by companies, especially soft skills are insufficient.	Establishing a deep cooperation over OJT acceptance and equipment donations is an issue.
Technical Education Institutions	It is difficult to secure experienced trainers. Trainers themselves require company training.	Noticeable aging of facilities at public institutions. Equipment is available to a certain extent.	Company needs (basic academic knowledge and technical/soft skills) are not adequately reflected.	Training of engineers and technicians with the academic ability and skill level desired by companies, especially soft skills are insufficient.	There are many inadequate DTS institutions for industry partnering

The issues of institutions related to industrial human resource development as a whole are organized below.

- With the K to 12 program, educational institutions were required to reorganize into a system of three focuses: basic education, higher education and technical vocational education. In high school there is a shortage of instructors teaching major subjects, but instructors teaching these subjects have been teaching the general education curriculum at universities. High school programs (technical profession track) with shortages of technical instructors, and facilities and equipment are in TESDA. Until now, universities have mainly provided the substance of the NC III – IV diploma course that TESDA must now develop. In this way, the placement of people and goods has not kept pace with the system as new institutions have been introduced in a short time and as a result the teaching contents, and instructors and school locations do not match the new education system.
- The DepEd, CHED, and TESDA headquarters cannot necessarily grasp the current on-site situation and issues. Additionally, schools have not received sufficient and accurate information regarding the policies and programs under implementation.
- Although other institutions already have knowledge and experience, this is not being utilized due to a lack of communication and coordination. For example, due to the start of the new high school program, high schools under the previous system (10-year system) are directly faced with having to implement career guidance and work experience programs they have never dealt with before. Regional PESO, TESDA, vocational training institutions, and universities possess this knowledge and experience. And local governments can offer support in various ways. However, the knowledge and experience that physically exists around the schools, are not being sufficiently utilized.
- The industrial human resource development plan is closely tied to the industrial promotion and development plans, as well as the domestic and overseas socioeconomic environment. On a national level planning has begun, but it is also necessary to start collaboration between regional developments plans and human resource development plans. In particular, the central ministries influence on development plans at the region level is being felt, but it is necessary to pay attention to the strong influence of the local governments at the state, city and town levels. For high schools, universities and technical vocational training institutions, it is necessary to localize the curriculum based on regional industrial policy and company needs and to strengthen collaboration with local companies through work place experience, OJT, and DTS etc.

Chapter 5 Industry's Human Resources Needs

5-1 Interviewing companies

5-1-1 Survey overview

When implementing projects related to industrial human resource development, it is critical to understand exactly what kind of human resources industry needs. For this reason, the survey team visited 28 private companies primarily working in the electronic and automotive industries and interviewed them to find out what the private sector is looking for in terms of human resources, what companies are currently doing to secure/train human resources, and any problems they are facing. Table 5-1 gives a list of the companies visited.

Location	Investment country	Company name	Industrial sector	Number of employees	address	Cooperation with IHRD institutions
Cebu	Japan	Philippine Makoto Corporation, Makoto Metal Technology, INC.	Metal processing	2,000	Mactan SEZ	Before, they had accepted the graduates from CITE, but it was stopped because the quality of the students became poor.
	Japan	TAIYO YUDEN (PHILIPPINES), INC.	Electrical/electronics	5,500	Mactan SEZ	
	Japan	Ricoh Imaging Products (Philippines) Corp	Electrical/electronics	2,000	Mactan SEZ	Workers are temporary staff. If it will be illegal in future, they will stop hiring temporary staff.
	Japan	Cebu Microelectronics, Inc.	Electrical/electronics	1,000	Mactan SEZ	Not any particular cooperation
	Japan	EXAS Philippines, Inc.	Electrical/electronics	250	Mactan SEZ	Not any particular cooperation
	USA	TERADYNE Philippines Ltd.	Electrical/electronics	800	Mactan SEZ	There was an exchange program between TERADYNE and UCLM(University of Cebu LapuLapu and Mandaue Campus) that the teacher from UCLM visited TERADYNE to learn their products and technologies, then return to UCLM and gave lectures.
	Philippines	Allied Technologies, Inc.	Watch assembly	80	Mactan SEZ	Accepting university students as intern from neighboring universities. Sending employess to TESDA for taking technical cource
	Philippines	REI HANDI INT'L., INC.	Manufacture of interior accessories	100	Lapu Lapu City	Accepting university students as intern from neighboring universities. Sending employess to TESDA for taking technical cource
	Philippines	PEBA TRADING & MANUFACTURING CORPORATION	Manufacture of garden accessories	210	Lapu Lapu City	Accepting university students as intern from neighboring universities. Sending employess to TESDA for taking technical cource
	Philippines	Flux Engineering Services	Component repair	10	Lapu Lapu City	Not any particular cooperation
Calabarzon	Japan	KANEPACKAGE PHILIPPINE INC.	Manufacture of packaging materials	35	Light Industry Science Park II	
	Philippines	Alliance Mansols, Inc.	Electrical/electronics	8,000	Laguna Technopark	They have assembling plant. Also, providing TESDA accredited course, engineering course, and course for high school teachers
	Philippines	EMS COMPONENTS ASSEMBLY, INC.	Electrical/electronics	1,400	Laguna Technopark	Recruiting the graduates from the course provided by Alliance Mansols, Inc.
	Japan	Enomoto Philippine Manufacturing, Inc.	Electrical/electronics	1,800	Gateway Business Park	
	Japan	ISUZU AUTOPARTS MANUFACTURING CORP.	Automotive	500	Laguna Technopark	They have TESDA accredited school. Accepting high school students (grade 10) as intern Not any particular collaboration with universities

Location	Investment country	Company name	Industrial sector	Number of employees	address	Cooperation with IHRD institutions
Calabarzon	Japan	Toyota Motor Philippines School of Technology	Automotive	-	TOYOTA SEZ	Providing TESDA accredited course and TOYOTA dealer course
	Japan	Denso Techno Philippines, inc	Automotive	1,800	Carmelray Industrial Park I	Accepting university students as intern from neighboring universities.
	Japan	ITO-SEISAKUSHO PHILIPPINES CORPORATION	Automotive (metal production, stamping)	115	Carmelray Industrial Park II	
	Japan	ATMAK Corporation	Metal production, welding assembly	100	Cavite Economic Zone	Accepting students from Cavite state university as intern, ATMAK employee deliver lectures at the university
	Philippines	IMI	Electrical/electronics	4,200	Laguna Technopark	Accepting students from UP, DLSA, and Ateneo as intern
	Japan	Futaba Corporation of the Philippines	Electrical/electronics	1,600	Laguna Technopark	Not any particular cooperation
	Philippines	Tao light management	Manufacture of LED bulbs		Laguna Technopark	
	Philippines	Rollmaster Machinery and Industrial Services Corp.	Metal stamping	60	San Pedro, Laguna	Accepting SHS students for work immersion
	Philippines	Carino & Sons Agri-Dev., Inc.	Food processing	550	San Jose, Batangas	Accepting students from Batangas state university as intern
	Japan	GOSHI Philippines Corporation	Metal production	276	Laguna Technopark	Collaboration with TESDA accredited shools for DTS
	Philippines	Innovatronix	Imaging products for digital image	600	Antipolo, Rizal	Not any particular cooperation
	Philippines	KEA Industrial Corporation	Parts production for automotive and motorbike	110	Bacoor, Cavite	
	Philippines	Micrologic Systems, Inc.	Production of highway toll collection system	30	Antipolo, Rizal	Offering faculty immersion of Holy Angels School (Pampanga) and Far Eastern University
	Philippines	2M Industrial Solution	Component manufacture	25	Malvar, Batangas	Accepting students from STI(one of the private university) as intern, recruiting students from Don Bosco Technical School
	Philippines	Centertronics Power Corporation	Manufacture of voltage regulators	30	Cainta, Rizal	Majority are hired from TESDA schools Not any particular cooperation with universities
	Philippines	Star Communications Holding Corporation	Manufacture of electronic devices	20	Quezon City	Not any particular cooperation
Japan	Japan	NISSHIN FOOD MATERIAL CO., LTD.	Food processing	-	-	-

The above companies were selected for visits based on introductions from PEZA and other government organizations (such as TESDA and DTI) as well as from people involved with the companies or with JICA projects. Interviews were actually requested from another ten or fifteen companies as well, but the 32 listed here are those who agreed to participate in the survey and completed interviews within the survey time frame.

Grouping the interviewed companies by investment country gives us 15 Japanese firms, 16 Philippine firms, and one American firm.

Table 5-2 Number of Interviewed Companies by Investment Country

	Philippines	Japan	US	Total
In SEZ	5	14	1	20
Outside SEZ	11	0	0	11
In Japan	0	1	0	1
Total	16	15	1	32

Interviews primarily covered the following five topics. They were typically conducted with representatives from the company's human resources department, and sometimes with executives as well.

1) Description of work carried out, materials suppliers, on-site operations
2) Duties, educational background, and required skills for each job type
3) Status of human resource development and expectations for employees
4) Efforts to secure human resources
5) Collaboration/cooperation with universities, vocational training centers, or other educational institutions

5-1-2 Companies inside and outside SEZs

In order to get a better grasp of the current situation at manufacturing companies in the region, our survey also targeted eight companies located outside the special economic zones (SEZ) of Cebu and Calabarzon. The survey team was able to find local companies in the electric/electronics and automotive sectors by speaking with PEZA, DTI, LGU, and industry associations, but those companies weren't quite manufacturing companies, so we ended up visiting eight companies in sectors like component manufacturing, home goods manufacturing, interior accessories manufacturing, metal stamping, welding/repair plants, and food processing.

The manufacturing companies located within SEZ are set up to business with and import their raw materials from companies overseas (Japan, China, Europe, the US, Thailand, Indonesia, etc.), while purchasing components from companies inside SEZs. When the survey team asked companies within SEZs about local manufacturing companies during the interviews, there was typically response. On the other hand, these companies were purchasing indirect materials (those unrelated to manufactured goods, such as cardboard, office supplies, or other consumables) from Philippine companies.

In any case, it was revealed the lack of depth in the manufacturing industry, as both government institutions and companies currently have hardly any information on local Philippine companies that could serve as suppliers.

According to Japanese companies in SEZs, there are often reasons that local companies cannot be used. For example, unlike indirect materials, manufactured goods clients often issued detailed specifications for raw materials, or the authority to make decisions about suppliers rests with the head company of the group. Selecting or changing a supplier of raw materials or parts also affects manufacturing processes, and thus requires that numerous conditions be met before a decision can be made. The time and effort required for companies to change suppliers was therefore confirmed.

5-2 Securing and human resource development: Current status and issues

5-2-1 Defining job types for industrial human resources

First, the job types of industrial human resources are defined by taking the information obtained during the survey. It was able to organize the information as shown in the table, primarily based on required educational background. These categories will be used below as well.

Table 5-3 Job Types for Industrial Human Resources

Job type	Educational guidelines	Duties
Unskilled laborer (general workers or operators)	Basic education or less	Assembly work not requiring special skills
Technician	High school graduate (basic education) or college graduate (two-year technical college or four-year university)	Production line operations and management, handling problems and defects
Engineer	College graduate (university with a five-year engineering program)	Production engineering, designing/developing production, technical design work
Middle management	College graduate (four-year university)	Managerial duties

Source: Prepared by the JICA Survey Team based on survey results

5-2-2 Human Resource Development: Current status and issues

(1) Developing human resources through OJT

Almost all of the 28 companies said that on-the-job training was the primary method of human

resource development they used after hiring employees for any job type. Below are the reasons they gave as to why OJT is so necessary and effective.

- University knowledge does not give them practical skills, so OJT is essential when new hires join the company. (Japanese company)
- We don't really expect new hires to have the skills they need when they first join the company. Nobody knows what they are doing at first—that is only natural. The important thing is refining the minimum knowledge they come in with through OJT, giving them more experience, and eventually training them to stand on their own two feet. (Japanese company)
- Educational institutions overemphasize theory, and students immediately forget what they learned because they have no actual hands-on experience with machines. Schools don't have the basic machines, tools, and equipment that companies use. (Japanese company)
- Manufacturing worksites and plants are not something that are typically exposed to the public, so students who come to the company for practical training are seeing a lot of things for the first time. It is common for students who come for training to be overwhelmed when they see the worksite. (Japanese company)
- We don't require that new hires have any special skills before joining the company—they pick up the knowledge and skills they need through OJT. Certain manufacturing processes require special skills that are unique to our company, so these cannot be learned in a school. OJT is the best way to learn. (Philippine company)

Also of note is that in the Philippines, university students are required to have practical training experience at a company in order to graduate. This means that universities and companies work together in order to offer this training. The number of hours of company-based practical training required can vary widely (anywhere from 240 to 1400 hours, for example), but in many cases, the practical training that companies provide to the students ends up serving as their OJT experience, and leads directly to employment with that company. One company told that because their orientation alone takes a month, the minimum number of hours stipulated by the university (240) is nowhere near enough. Instead, they've teamed up with five or ten universities in the area to bring students in for a ten-month internship program. The majority of the company's new hires are then those who have completed those ten months of OJT.

Although OJT is carried out for every job type once a person joins the company, none of the companies seemed to be experiencing problems with OJT itself. At manufacturing worksites, it is typical for operators on each production line to form into teams. This setup allows OJT to be handled systematically, with the team leader guiding and monitoring new hires. Employees whose productivity does not increase are retrained in order to improve their work. Engineers and those working in general administrative divisions are also trained and guided by senior employees. One Japanese company in particular, which has been operating in the Philippines for twenty years, already has Filipino employees that have been working for it for fifteen years or more, so it has established a workplace culture where these senior employees train look after

and train junior members. These local employees are deeply trusted by the Japanese employees.

In terms of technical guidance regarding special processes, the Japanese companies handled this by sending their employees to Japan to train there for several months.

(2) In-house and outside training

As mentioned earlier, OJT was important to every company which were interviewed, and is currently being placed at the center of their human resource development efforts.

Companies differed, however, in terms of the types of in-house training they provided apart from OJT. Japanese firms told us that they set up and implemented detailed training programs, sent employees to Japan to make use of technical internship programs, created and executed an annual training plan, and so on. One automotive company had begun expanding and strengthening its training department starting in April 2016, and was now motivated to put more effort into post-training monitoring and technical training. One Japanese company, however, told that while resources are allocated to employee training when business is good, it inevitably becomes a lower priority when sales begin to drop—despite the fact that the company knows it is important.

A Philippine company outside of the SEZ (one with about 200 employees) also has someone in charge of training in their administrative department. When the training plan calls for it, they invite outside instructors to come in and give training on safety management, sanitation management, handling emergencies, and so on. As expected, Philippine companies also make OJT the center of training related to product manufacturing, but when it comes to areas such as ISO or other management topics, or Program Control in advanced technologies, outside instructors are used. These instructors may be invited to the company, or employees may be sent outside the company for short-term seminars. In general, outside instructors are brought in for training on topics like safety management (in-house training), while private training providers are used for programs in ISO or accounting (outside training). For technical training, it is common for companies to bring in an instructor referred by DOST for in-house training. Both Japanese and Philippine companies also sometimes send their employees to TESDA for outside technical training.

(3) Lack of soft skills

As mentioned above, companies are training their employees in-house through OJT, while also carrying out special training in technical or management-related topics as needed.

All companies are actively engaging in OJT efforts, and there do not seem to be any major issues associated with the system itself. At the same time, however, employees who only get technical training during OJT end up without the so called “soft skills” they need. Here, soft skills are defined as the social skills needed to function effectively on the job in addition to basic knowledge and expertise—things like sincerity, a hardworking attitude, a sense of responsibility, willingness to cooperate with others, communication skills, and so on. Regarding

the issues about lack of soft skills, companies pointed out that all job types—worker, technician, engineer, middle management need improve soft skills and firstly they are required sincerity and hardworking attitude. Along with becoming higher position, more sense of responsibility, independence, and leadership are necessary (refer to Table 5-4).

Both Japanese and Philippine companies were aware that their employees lacked soft skills, all of them seeing boosting these skills (something that cannot really be done through OJT) as a key issue. "We can teach them the skills they need," they told, "but we can't change their attitudes." The Enterprise Survey (2016) conducted by the World Bank also found that more than 50% of companies surveyed said that it was more difficult for them to secure human resources with management ability, leadership, good work ethic, commitment to the job, and communication skills that it was for them to find people with the required technical skills for the job. Soft skills and social skills are becoming increasingly important.

Finally, in the opinion of one Japanese company, a lot depended on personal qualities when it came to engineers' creativity and ability to innovate—and since these qualities couldn't really be taught by the company, the employees didn't have them. This challenge is made even more difficult by the fact that resolving it will likely require a long-term, multifaceted approach that starts as early as primary school.

(4) Lack of technical skills

As stated earlier, technical training is handled through OJT for each job type, with all companies using OJT to give their employees the technical skills they need. At the same time, Japanese companies were rather critical in their evaluations of Filipino employees' technical skills.

For example, in a survey about Japanese companies conducted by the Embassy of Japan in the Philippines in April 2016, interview participants cited poor skills among Filipino technicians (e.g. a lack of basic knowledge of science and mathematics, both practical and applied skills) and a lack of systematic knowledge, familiarity with equipment, advanced technical skills among Filipino engineers.

An automotive Japanese company that the survey team interviewed hires graduates from an auto mechanics' school certified by TESDA. Because of its TESDA certification, the school provides vocational training in line with TESDA's training regulations—and yet, the company still cannot put these new employees on the job immediately due to content not being included in the TESDA regulations and the fact that the schools are not teaching students about the latest technologies. The company has had to address the shortcomings by setting up its own course to supplement the TESDA material, since even TESDA graduates currently lack the technical skills they need.

With the Philippines' recent introduction of the K to 12 program, it is expected to see companies hiring more senior high school graduates as workers or technicians in the future. Still, there are companies (in the automotive sector) that have serious doubts about the level of technical skills these schools can be expected to develop in students given the current state of their equipment. Enhancing the Technical-Vocational-Livelihood (TVL) track offered at senior high schools will

likely be a key challenge going forward.

5-2-3 Securing human resources: Current status and issues

(1) Hiring

Most companies focus their hiring efforts students who participated in OJT or TESDA graduates. Japanese companies in particular put new employees (all job types) through a probational period lasting five or six months after they are hired, during which time they are taught about company rules, how to work with the machines, and so on. Once that period is finished, the company makes a decision whether to hire them on permanently based on an evaluation of their performance and attitude towards work. One Japanese company places tremendous importance on the probational period, hiring only after thoroughly evaluating qualities like attitude towards work, willingness to cooperate, flexibility, how fast the person picks up new information and skills, honesty, and so on. Companies were unanimous in their belief that any job first required an assessment of the person's attitude, saying that although interviews couldn't tell you everything, they made it a point to look at the person's character and attitude—since these weren't something the company could change. When OJT for university students was involved in the hiring process, these assessments had already been made during that time.

One Filipino company told that they hire personnel from a university that has sent them good people in the past, and that they don't think that graduates of top-tier universities make good employees. Top-tier university graduates, they said, tend to have their sights set on working overseas or are eager to jump into management or entrepreneurial positions right away—so they often don't have the right mindset for the manufacturing industry. They felt it was the state colleges and universities that consistently turned out human resources suited to manufacturing. There is also the fact that human resources don't move from Manila to Cebu, which the company (located in Cebu) actually feels is to its benefit, since it keeps labor costs down and means that its employees are more firmly rooted in the local community. They told that it's the graduates of the local state schools who are looking to get hired on at Japanese manufacturing firms. Going forward, it does appear that targeting graduates of the Philippines' relatively successful state colleges and universities rather than its top-tier institutions will be the right approach to securing the talented human resources that will be able to make their mark in the manufacturing industry.

Meanwhile, at a smaller company of around 100 employees located outside the SEZ, OJT programs for students are not leading to new hires, even though they offer the same training as the major corporations. Because today's students tend to want to work in call centers or companies inside SEZ, it has become difficult for small and medium-sized enterprises to secure the human resources they need.

(2) Career advancement

Japanese companies that have been operating in the Philippines for many years promote Filipinos into local management positions, which are typically open to Filipino employees who have been working at the company for fifteen years or more. It is the people originally hired on

as engineers or administrative workers who become management, meaning that even at Japanese companies, working one's way up from the very bottom is almost unheard-of in the Philippines. In rare cases, an ordinary worker with the required educational background may become a manager, but it all depends on the culture and regulations of that particular company.

There are companies, on the other hand, who are working to create new positions and laying out a clear path to advancement as a way to motivate their employees. Is was also heard that initiatives to offer clearly defined growth opportunities in order to give personnel a chance to earn better positions (along with pay raises) as a way of increasing their drive to succeed.

(3) Scholarships

In the Japanese Embassy interviews mentioned earlier, there was one Japanese company that provided scholarships to promising high school students so that they would come work for the company after graduation. This is one example of efforts to secure talent early on.

(4) Turnover

Every interviewed company reported an overall turnover rate of around 5–8%. No matter what the job type, employees tended to transfer overseas or to other companies once they acquired the necessary job skills—as long as they were promised even a small pay increase. One Japanese company had a turnover rate of 1%, but still struggled with people transferring to European and US companies despite their high retention rate. Even a smaller Philippine company (around 60 employees) located outside the SEZ expressed disappointment that technicians at small and medium-sized enterprises tended to transfer to big name companies or overseas once they had developed their skills.

The outflow of engineers was particularly problematic for the interviewed companies, since it is more difficult to find good engineers than it is to find good general workers. Overcoming this challenge has been hard, since companies make decisions about raising salaries based on business performance, and labor costs have a tremendous impact on corporate profit. On the other hand, one Philippine company described the reality of the situation by saying that losing people to companies with higher salaries and better working conditions was just a fact of life, and that increasing wages would do nothing to stop it. Also of note is that some employees don't want to be paid more than minimum wage, because it means they are required to pay taxes on their earnings. Some companies address this by supplementing wages with commuter bus allowances, meal subsidies, parties, and so on.

(5) Demand and supply for IHRD

As mentioned above, workers, technicians, engineers tend to change their jobs to gain better salary and/or go abroad. The attrition rate is around 5 to 8 percent. Japanese companies told that it is more difficult to find talented engineers than workers. It seems that the number of engineers

who can meet companies' demand has been insufficient.

(6) Recruiting

Regarding technicians and engineers, companies recruit human resources via website, social media and other online channels, PEZA bulletin boards, sending recruiting information to colleges and universities, running newspaper advertisements, participating in job fairs, and so on. General workers can often be quickly recruited through existing employee networks. One Japanese company even ran into problems because of the number of family members on its workforce, and now prohibits hiring through close family introductions. A Philippine company outside the SEZ, however, welcomes close family members—so whether this is a good or bad idea can only be determined by the company itself. Some of the companies within SEZ hire employees via recruiting companies.

5-3 Tie-ups with training organizations for industrial human resources

As mentioned earlier, many companies accept university students as interns. This is the most firmly established example of tie-ups with training organizations.

Other examples include a Japanese firm owns a school for auto mechanics in collaboration with TESDA, and one that carries out the human resource development it needs by working with training institutions certified by TESDA.

Another Japanese company has offered classes at a university, while in an opposite initiative, an American company set up a program to bring in college professors to teach them technical skills that they could then take back to the university. That company told that it is currently welcoming opportunities for similar programs in the future, since companies and industry need to build stronger bridges with universities to be ready for increasingly advanced manufacturing industry. The American company has also joined a Philippine industrial association, whose activities are giving the firm opportunities to communicate with government organizations.

5-4 Expectations for employees

It came up with a chart to indicate what companies expect of their employees based on the findings described so far. Table 5-4 lists these expectations for each job type, based on the results of this survey as well as those from the survey of Japanese companies carried out by the Japanese Embassy. Expectations are categorized into three areas: basic knowledge/skills, expert knowledge/skills, and soft skills.

Table 5-4 Expectations for Employees

Job type	Basic knowledge/skills	Expert knowledge/skills	Soft skills
Unskilled laborer (general workers or	• Can read and write • Can do arithmetic • Can understand	• Can carry out work according to procedures • Can carry out work while	• Honest and dutiful • Communication skills, cooperative

operators)	instructions	considering upstream and downstream processes. Meets deadlines.	
Technician	• High school or university knowledge (two-year or four-year program) • Basic skills	• Can perform basic mechanical operations • Can operate robots • Knowledge of drawings • Welding and similar skills	• Hardworking • Proactive and flexible • Communication skills, cooperative
Engineer	• University knowledge • Engineering qualifications • Has the innovativeness and creativity to come up with new ideas	• Can analyze problems and logically explain them • Can develop drawings • Can use CAD and other advanced information technologies • Can analyze the root cause of defects and malfunctions when they arise based on basic and practical logic, and take steps to prevent recurrence • Can offer guidance to technicians • Knows company products well	• Hardworking • Proactive and flexible • Responsible, curious • Communication skills, cooperative
Middle management	• University knowledge or higher • Strong analytical skills for social and economic trends	• Has expert knowledge of industry • Knows company products well • Has the desire and capability to improve existing methods in order to cut costs and improve quality	• Leadership • Responsible • Decision-making skills • Head for business • Concerned about customer satisfaction • Employee supervision

Source: Prepared by the JICA Survey Team

The higher the position, the more autonomy the company demands, and it becomes increasingly important that the employee be lean on their own as well as think and act for themselves. Once a person hits the middle management level, they are expected to come up with their own proposals for boosting company profit, and need to be able to implement cost reduction strategies.

Incidentally, one Japanese company sends employee who have been trained through OJT and who have twenty years on the job to be stationed at plants in other countries as a manager. Although the plants originally wanted to get the technical transfer from Japanese experts, they have now realized that the Filipino employees have the same level of technical skill as the Japanese. The

plan is now incredibly popular and a great success. They told that the secret is valuing their employees and making their development a priority. Building trusting relationships between companies and employees may therefore be the key to effective human resource development.

5-5 Problems with industrial personnel training organizations

(1) TESDA

As already discussed so far, Japanese companies think that the TESDA curriculum is out of date (for example, it does not teach plastic welding techniques and only has the kinds of engines used by cars in the 1970s) and uses equipment for its practical training that is incompatible with the latest technologies. They also mentioned problems with the quality of TESDA trainers. Also, because employees are taught the required skills during OJT at the company, TESDA qualification is not particularly necessary—so although companies do have tie-ups with TESDA-certified schools, the two are not really going in the same direction when it comes to job training. Of course, TESDA national certificates still serve as a general evaluation criterion, but they are not necessarily valued very highly—particularly by Japanese companies. TESDA is formulating its training regulations in response to industry feedback, but what kinds of companies they are listening to and what kind of experience or background the people giving them advice have are important questions. Furthermore, because technology is always evolving, there needs to be a system in place that allows companies to communicate their needs in a timely manner. The TESDA training requirements cannot be frequently updated, so industry players should ideally be working to create an environment that is conducive to improving upon them. TESDA itself also needs to go out to worksites to ensure that it has a sufficient understanding of current industry situations.

(2) Colleges and universities

Regarding colleges and universities, according to the survey result of interview by this survey as well as Japanese Embassy, educational standards tend to be low—with current programs focusing on classroom education and offering no hands-on practical training with machines. Lack of experimental installations are also an issue. Since companies are expecting particularly state universities and local colleges to generate human resources for manufacturing, it is important to work towards improving the level of their educational programs overall.

(3) Primary/secondary education

Many Japanese companies pointed out the issues about basic education in the Philippines. For this reason, improving primary and secondary school curriculums, developing facilities and equipment (eliminating classroom shortages, enhancing textbooks, building libraries and science labs, etc.), providing moral guidance, and ensuring discipline in schools are all important considerations. If schools want to educate industrial human resources to work in the manufacturing sector, they will also need to foster interest and curiosity that makes students

want to go into science and technology fields later on.

In addition, though companies are not currently very optimistic about the recent addition of senior high school to compulsory education, they do build upon the basic education described above and ideally, will eventually be able to give students the basic skills they need to succeed as industrial human resources in the future.

(4) Miscellaneous requests

1) Organizations for human resource development

Because there is no human resource development organizations in the Cebu-Mactan SEZ, Japanese firms requested that one be established. One company had planned to get introductions from a private organization at one time, but this ended up in conflict. The company now says that it wants to see a public institution established, as it feels it would be more trustworthy.

2) Required training content

Companies carry out technical training in-house through OJT, but had the following requests regarding the next level of training.

- Leadership or motivational training for management
- Product testing, inspection, and QC training for engineers
- Plastic welding
- Microcontroller programming
- Training in SOLIDWORKS (CAD software)

Small and medium-sized enterprises also requested a training program that would feed some of the experience and technologies at major companies back to them.

3) Trainer training programs

A Japanese company in the automotive sector expects the auto industry to continue to develop in the Philippines, and pointed out the need for further training in light of the lack of mechanics and dealers. The companies are training mechanics on its own and taking other measures, but the lack of trainers is a problem. It is therefore looking for support from Japan in the form of a tie-up with the Japanese auto industry where Filipino trainers are trained by Japanese trainers. If this kind of initiative works in the automotive sector, the company eagerly stressed, similar programs could be rolled out in other sectors as well, contributing to the development of Philippine manufacturing as a whole.

4) Securing employees for general administrative work

The survey focused on unskilled laborers, technicians, and engineers, but companies also told that there is a lack of employable talent for general administrative positions in areas like accounting and human resources. Because students who excel in law or accounting typically go after professional qualifications in these areas, they said, regular companies have difficulty attracting good talent in these areas. While lawyers and accountants are

available, they cost too much for companies to easily bring them on board.

5-6 Conclusion

Table 5-5 provides a brief overview of the survey findings.

Table 5-5 Human Resource Needs

Job type	Current status	Ideal employee	Future approach
Unskilled laborer (general workers or operators)	• Work on production lines • Lack basic knowledge and soft skills • Trained through OJT after joining the company • Tend to transfer out once they gain the necessary skills • Positions can be filled easily via recruitment	• Can carry out work according to procedures • Has basic knowledge • Is honest, dutiful, and follow instructions • Can work as part of a team	• Continue training via OJT • Improve soft skills
Technician	• Handle operations and management at production sites • Sometimes have little knowledge of machines • Employment linked to participation in OJT programs for students • Trained via OJT after joining the company • Tend to transfer out once they gain the necessary skills • Positions can be filled relatively easily via recruitment	• Understands basic machine operation • Has knowledge and skills related to drawings, welding and so on. • Has the basic skills needed to perform the work • Is proactive and flexible • Has communication skills and is cooperative	• Continue training via OJT • Improve soft skills • Prioritize accomplishments at university and vocational training institutions
Engineer	• Handle development, design, and production engineering • University education focuses on classroom instruction, lack practical skills • Employment linked to participation in OJT programs for students • Trained via OJT after joining the company • Tend to transfer out once they gain the necessary skills • Difficult to fill positions via recruitment, talent drain is a problem	• Can carry out development and design work • Has advanced IT skills • Thinks logically • Can provide guidance to technicians • Is proactive, flexible, responsible, curious, and cooperative	• Continue training via OJT • Improve soft skills • Prioritize accomplishments at university and vocational training institutions • Develop the ability to generate new ideas through creativity and innovation

Middle management	• Promoted from engineer and similar positions or hired from the outside • Middle managers who have worked their way up from the bottom are very rare • Retention rate is high after fifteen years of service • Difficult to fill positions	• Has a head for business and decision-making skills • Knows company products well and is concerned about customer satisfaction • Can make proposals to cut costs and improve quality • Can supervise employees	• Improve management ability • Enhance leadership training • Improve soft skills

Source: Prepared by the JICA Survey Team

Chapter 6 Japan and Other Development Partners' Support in the field of IHRD

6-1 Japanese Cooperation

6-1-1 Japan's Country-specific Aid Policy for the Philippines

(1) Overview of the Country-specific Aid Policy for the Philippines

As indicated by the Country-specific Aid Policy for the Philippines (April 2012), the Philippines is an important country in terms of geopolitics and regional security, located at a strategic position with respect to marine traffic. The Policy also states that the sustainable development of the Philippines will be instrumental to the stability and growth of the East Asia region, and that the Philippines is a key East Asian partner to Japan.

Additionally, as many Japanese corporations are expanding to the Philippines, the Policy notes that for Japan, the Philippines is a major base of economic activity. The Policy goes on to identify the possibility of the further expansion of mutually beneficial cooperation through the use of infrastructure for human exchanges between Japan, with its decreasing birth rate and aging population, and the Philippines, a country with a large population of young people.

Japan has been a key partner for the Philippines, providing aid assistance over an extended period of time. It is expected that the "diplomatic asset" Japan has accumulated thus far, in forms such as its long-standing presence in the Philippines and the countries' favorable relations in the private sphere, will continue to grow.

(2) Basic assistance policy and areas of emphasis

The basic assistance policy and areas of emphasis as established by the Country-specific Aid Policy are as follows.

Table 6-1 Basic Assistance Policy and Area of Emphasis

Basic Assistance policy	Assistance aimed at the realization of inclusive growth In order to further strengthen this strategic partnership, the government of Japan will implement economic cooperation aimed at the realization of inclusive growth, which is the objective of the Philippines Development Plan 2011-2016.
Areas of emphasis	1) Sustainable economic growth through promotion of investment Assistance in areas including: improvements to infrastructure such as traffic and transportation, energy, and water, centered on major urban areas; improvement of administrative functionality; reinforcement of maritime security; and industrial human resources development.
	2) Amelioration of vulnerabilities and stabilization of living and manufacturing infrastructure Assistance in areas including: the establishment of a safety net

	incorporating elements such as infrastructure and health care and including non-material resources such as personnel and information, for the purpose of responding to disasters and environmental issues; the improvement of agricultural production and productivity; and the manufacturing and distribution of agricultural products.
	3) Peace and development in Mindanao Regional development assistance through measures such as strengthening of governance, poverty reduction including improved access to social services, infrastructure improvements, and promotion of industry.

Source: Country-specific Aid Policy for the Philippines (April 2012 Ministry of Foreign Affairs)

6-1-2 Assistance for Industrial human resource development

JICA has been implementing the projects related to industrial human resource development through capacity development of vocational training institutions, improvement of basic education and higher education, development human resources for promotion of local industry, and so on.

JICA assists with industrial human resource development in terms of sustainable economic growth through promotion of investment following current Aid Policy mentioned above.

The figure 6-1 shows the projects for industrial human resource development implemented since the 1990s.

Figure 6-1 JICA's Project in the Field of IHRD (since 1990's)

6-1-3 Review of the on-going and completed projects

In this section, among the projects related to the industrial human resource development mentioned above,10 projects shown in Table 6-2 are reviewed through project reports, related materials, interview with counterparts or responded to questionnaire, and interview with JICA experts. It grasps the current status and issues, and extracted the lessons learned from the project.

Table 6-2 Review of theOn-going and Completed Projects

Category	Project
Technical Vocational Education and Training	(1) Project for enhancing vocational training of the Institute (PEVOTI)
	(2) Gender Responsive Employability and Training (GREAT)
	(3) Project for Supporting Senior High School(SHS) Program in Technical Vocational High Schools
Higher Education	(4) AUN/SEED-Net
	(5) Saitama-Cebu Comprehensive HR Monozukuri Project II
HRD on IT and Electronic Industry	(6) Advanced IT Human Resource Development Project
	(7) Study on the Supply Chain of the Philippine Electronics Industry
HRD on local industrial development	(8) Davao Industry Cluster Capacity Enhancement Project (DICCEP)
	(9) National Industry Cluster Capacity Enhancement Project (NICCEP)
	(10) Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology

(1) Technical Vocational Education and Training (TVET)

JICA aims to improve education and training to meet the changing needs of industry. In this regard, JICA supports to improve the system of TVET as well as enhance the education of polytechnics and vocational training schools.

In the Philippines, JICA conducted projects on TVET since the early 1990s. Three projects, namely “Project for Enhancing Vocational Training of the Institute (PEVOTI)”, “Gender Responsive Employability and Training”, and “Project for Supporting Senior High School (SHS) Program in Vocational High Schools” are reviewed as follows.

(1)-1 Project for Enhancing Vocational Training of the Institute (PEVOTI)

PEVOTI started in April 1994 and completed in March 1999. It was a five-year project to increase the capacity of TESDA to implement vocational training in line with Training Management Cycle (TMC). Table 6-3 shows the outline of the project.

Table 6-3 Outline of the Project

Project Title	Project for enhancing vocational training of the Institute (PEVOTI)
Status	Completed
Project Type	Technical Cooperation
Term of Cooperation	1st April 1994 – 31st March 1999
Project Inputs	Japan side: 30 million Japanese yen (project cost) 240 million Japanese yen (equipment supply) Long term Japanese expert 15 persons Short term Japanese expert 16 persons Counterpart training in Japan (16 persons) Philippines side: 7.36 million pesos (project cost) 14.4 million pesos (training center construction) Counterparts 20 persons Project office
Counterpart	TESDA

Source: Terminal Evaluation Report, 1998

[Achievement of the project]

According to the project terminal evaluation report (1998), the project was comprehensively highly evaluated. It was assessed as below;

- Filipino counterparts understood the basic concept of TMC, and developed appropriate TMC in the Philippines. Following Japanese Expert instructions, they planned seminars and conducted a training course for managers and trainers in TESDA. Furthermore, the counterparts can develop and improve curriculum and other software in line with the TMC concept. In that sense, it is justified that counterparts recognized and fully understood the TMC approach in most parts.

Also, "Sustainability" was assessed from the three aspects: (i) Organizational aspect, (ii)Financial aspect, and (iii) Human resources and technical aspect. The result was good as follows;

(i) Organizational aspect

TESDA's budget occupies a substantial portion of DOLE. The number of employees also increased as a result of the organization reform. In addition, it is considered that TMC should be propagated to all vocational training institutions in the Philippines by TESDA. Therefore, it seems that the project will be sustained through the leadership of TESDA.

(ii) Financial aspect

Since the government gives a high priority to the generation of employment opportunities, the enhancement of technical and vocational education is regarded as a very important matter. The

budget of this Project shall not be taken from the government, but also through a partnership with private industries in order to secure enough fund for the different activities. Thus, the financing for the TMC project seems to be sustainable.

(iii) Human resources and technical aspect

The counterparts planned, prepared, and conducted the training course by themselves, and they fully understand the TMC concept. In that sense, the technical transfer of this Project is very successful, and the output of the project is sustainable. Also, TMC videos and materials, which is the most significant fruits of this project, are already made and planned to distribute to the regional training centers in the Philippines. In addition, since NITVET (National Institute for Technical Vocational Education and Training) has the Facilities and Equipment Maintenance Division, the equipment and machinery which was provided by Japan during the project will be well maintained

As mentioned above, PEVOTI successfully introduced TMC into TESDA, and sustainability seemed to be secured.

[Current status and issues]

Although about 20 years have passed since the end of the project, TESDA still has several staff members who engaged with PEVOTI. According to these counterparts, it was confirmed that TMC training was conducted for TESDA regional offices and introduced the concept of TMC into the regions after the project. In addition, one of the counterparts said that she also tried to introduce the concept of TMC to other offices where she transferred by taking advantage of the project's experience (currently she is working again at TESDA).

However, as 20 years has elapsed, it was also confirmed that many of the staff members whose capacity was strengthened through the project, were transferred and retired, and TMC was gradually lost. Moreover, the equipment provided by the project become older. Also, since the management system of TESDA changes every six years due to the change of administration, the change of management seems to have a big influence on the direction and operation of TESDA.

In the Philippines, as mentioned in the previous chapters, the demands for higher quality human resource development in TESDA are increasing from the industries along with the changes in the socio-economic situation. The role of TESDA is expected to change with the start of K to 12 program, and it is necessary to respond more appropriately to the diversifying needs of the industry with environmental changes.

(1)-2 Gender Responsive Employability and Training (GREAT)

The project for Gender Responsive Employability and Training started in February 2004 and completed in February 2007. It was a three-year project to enhance capacity of TESDA Women's Center to be a hub for empowerment of women through providing training, conducting research, making a policy recommendation, information service, etc. Also, it aimed

to improve women's employability, who trained in TESDA Women's Center. Table 6-4 shows the outline of the project.

Table 6-4 Outline of the Project

Project Title	Gender Responsive Employability and Training
Status	Completed
Project Type	Technical Cooperation
Term of Cooperation	16th February 2004 – 15th February 2007
Project Inputs	Japan side: Long term expert two persons Short term expert three persons Counterpart training in Japan, Third Country Training Equipment supply (as necessary) Project cost Philippines side: Counterparts 33 persons Project office
Counterpart	TESDA Women's Center (TWC)

Source: JICA Knowledge Site

[Current status and issues]

Approximately ten years have passed since the project ended, the TWC counterpart continued to operate the Center ambitiously, and they received the silver certification from the Asia Pacific Certification Committee (APACC) [66]in 2008, 2012 and 2015. Also in 2014, TWC received "GAD Timpara Award" by the Philippines government which will be awarded to the most advanced Ministries in terms of gender mainstreaming. This shows that TWC is being evaluated both internally and internationally. TWC is also proud of acquiring such reputation, and they are aiming at the position of gold status in the next APACC certification. These certification and award lead to motivation of TWC staff members.

Since TWC is the only vocational training institution for women in the Philippines, it fulfills the function as a model center in the country. TWC has produced 6,734 graduates since its establishment, with an average employment rate of about 60%. In addition, men are also accepted as trainees up to 10% of each course. In recent years, about 300 people are constantly trained at TWC.

TWC currently offers 12 courses (all are NCII levels). The curriculum is based on the competency required in each field. Since it utilizes a module form, it is one of the features that the trainee can proceed with learning at their pace. In addition, TWC is proactively promoting partnership with private sectors, and currently, the following programs are ongoing.

[66] An international TVET accreditation organization consisting of 16 countries (http://www.apacc4hrd.org/)

Table 6-5 Partnership and Linkage with Private Sectors

Private sector	contents
ABC Cooking Studio Co.Ltd.	・ Financial support for implementation of Japanese cuisine training ・ Providing the training for housewives, household service workers, returning OFW, persons with partial disability, victims of VAW[67], TESDA graduates in Cookery, Food Processing, and Food and Beverage Service.
TWC alumni association	・ Collaboration for improvement of women's socio-economic status ・ Financial support for starting small business
Procter and Gamble Philippines（P&GP）	・ Conducting evening course for women to provide more opportunities for training in Shielded Metal Arc Welding (NSII), Plumbing (NCII), Automotive Servicing (NCII), Electrical Installation and Maintenance (NCII).
Galang Philippines（NGO）	・ To provide equal access to education and employment opportunities to LBT.[68]
YAMAHA Motor Philippines	・ Providing two units of motorcycles and all necessary tools for Motorcycle Small Engine Servicing（NCII） ・ Providing Dual Training
SAMSUNG Philippines	・ TESDA-Samsung Consumer Electronics Servicing Training Laboratory ・ Providing Dual Training

Source: TWC

As mentioned above, TWC is making efforts aiming at providing better vocational training as a hub that boosts women's economic empowerment. From now on, TWC will focus on regional expansion intending to raising the socio-economic status of women and raising employment opportunities, especially in rural areas. As Gender Focal Point is assigned to TESDA in each region, it is possible to improve the capabilities of these personnel and their networking. However, it is a problem because sufficient budget allocation has not yet progressed.

In addition, although TWC has an intention to increase the number of female trainers, there is no concrete plan, and it has not been realized yet. During the JICA project, TWC invited participants from ASEAN countries, and it was possible to host international seminars entitled "International Training Program for Women in the Asia-Pacific Region". However, it is difficult to hold such a large-scale seminar without support from a project even though TWC is willing to demonstrate leadership to promote gender mainstreaming among ASEAN countries. In

[67] Violence against women: known as gender-based violence
[68] Lesbians, bisexual and transgender

addition, TWC was built with grant aid from JICA 18 years ago. It is also an issue that the equipment provided at that time becoming older.

There are needs from TWC; (i) support for TWC's regional expansion (ii) further improvement of training curriculum and training delivery system (iii) renewal of equipment (iv) need for strengthening the capacity of TWC staff and female trainers.

The center was built with the support of JICA in the past, and the capacity of TWC has been strengthened through JICA's project. Also, there are many Japanese visitors to TWC through exchange programs. These facts show a deep relationship with Japan, even now TWC's expectation to JICA is great. As mentioned, TWC personnel are working on further improvement of TWC with a positive attitude, but it was confirmed that TWC needs JICA's cooperation particularly for expanding TWC function to regions.

Also, TWC and TSDA will develop "TWC Institutional Development Plan (2017-2021)" and "TESDA Gender Development Plan (2017-2021)" this year under the new administration.

(1)-3 Project for Supporting Senior High School (SHS) Program in Technical Vocational High Schools

The project started in February 2014, and it continues until May 2017. It aims to develop a mechanism for Technical Vocational High Schools (TVHS) activities to enhance its effective implementation through collaboration with industries/firms including those from Japan. Table 6-6 shows the outline of the project.

Table 6-6 Outline of the Project

Project Title	Project for Supporting Senior High School (SHS) Program in Technical Vocational High Schools
Status	On-going
Project Type	Technical Cooperation
Term of Cooperation	1th February 2014 – 31st May 2017
Project Site	Metro Manila, Laguna, and Cebu
Project Inputs	Japan side: JICA expert School improvement grants Project office expense Philippines side: Counterparts, Project Office
Counterpart	Technical-Vocational Unit, Bureau of Secondary Education, Department of Education, and four TVHSs

Source: JICA Knowledge Site

[Achievement of the project]

As mentioned in the previous chapters, K to 12 program was introduced from 2016. The project started before implementing K to 12 program fully, and the project is aiming at strengthening the cooperation between SHS and industries in the four pilot schools. Also, the project offers competitive subsidies to six model schools to improve educational environment so that the schools can provide more effective technical vocational education.

According to the project progress report (April 2016), in order to build a partnership between SHS and industries, the project and the local education office cooperated to hold consultation meetings with private enterprises and industries to explain K to 12 program. Also, the project supported the schools for the graduates being employed through employment situation survey, monitoring, establishment of Job Support desk, strengthening of capacity for industry linkage officer, providing information about cases of Japanese high schools, etc. As a result, at pilot schools, mismatches between graduates' skills and industries' needs were grasped, and measures were taken by the School Improvement Plan (SIP). Also, support activities for being employed were increased, and the opportunities for exchange between pilot schools and other schools were developed.

In November 2016, DepEd organized "Industry Summit" on Strengthening Partnership for Technical-Vocational Education". The project cooperated with DepEd to hold the summit, four pilot schools and six model schools made presentations about good practices and lessons learned to share with participants from other technical vocational high schools, government institutions, and industries. Table 6-7 shows the good practices.

Table 6-7 Good Practices and Lessons Learned

Items	Contents
Building linkage with industries	・ Making connections with provate sectors through industry associations and Chamber of Commerce. Also, they can give feedbacks and advice. ・ Support from guardians and alumni ・ Necessity of cooperation with government institutions, local government (PESO and LGU). Advice about needs assessment of industries and providing information. ・ Development relationship with companies in SEZ. Government institutions are helpful to make such relationships.
Communication with industries	・ Necessity of regular meetings with private sectors ・ to have industries interest in SHS ・ Schools need to visit companies proactively ・ Schools need to attend events such as job fair actively

Meet the demand from industries	・ Curriculum based on the industrial and communities' needs so that students can be employed soon after the graduation. ・ Needs assessment, improvement of curriculum, flexibility
Work immersion	・ Assessment of work immersion program for each student to improve teachers teaching. ・ Teacher training in same companies which students will do work immersion ・ Protect students during work immersion
Information about employment and local industries	・ Provide information and support for employment by PESO ・ Development of industry map around the community to analyze what kind of human resources are needed, and to find companies that could accept students for work immersion.
Career guidance	・ need career guidance for each student
Soft skill	・ Industries demand not only technical skills but also soft skills such as communication skill, independence, ownership, teamwork etc. ・ Invite industries people to schools to deliver speech or lecture about human resources that private sector need.
Equipment and facilities	・ Need support from LGU (School building construction, procurement of desks, chair, and PCs) ・ JICA's support was very helpful. Without its' support, schools could not prepare all equipment.

Source: PPT materials in the Industry Summit

As mentioned above, it was a major achievement of the project that the participants shared good practices and lessons learned among stakeholders such as pilot schools, other technical vocational high schools, related Ministries and industries, through the Industry Summit. These good practices and lessons learned are considered to be a great reference for SHS in future.

[Current status and issues]

As a result of interviewing the head teachers of 3 out of 4 pilot schools, the major issues that SHS have are (1) time of work immersion is insufficient, (2) lack of teachers (both quantity and quality) (3) shortage of necessary equipment and facilities. As mentioned in the good practices, regarding industrial collaboration and how to promote employment, a certain degree of direction has been found at each school by the support of the project. These findings are applicable to other schools. On the other hand, there are problems that affect the technical education itself.

Work immersion is currently set at 80 hours. However, this is the minimum time, and it can be extended by the agreement of school, company, student, and guardian. For this reason, there are variations among schools such as implementing 300 hours. Most of the companies also think 80

hours are insufficient. DepEd also recognized that the number of hours of work immersion is subject to be reviewed in the future.

Although the lack of teachers and shortage of equipment are important issues, there has not been clear measures at present. For example, one pilot school requested 48 new teachers this year, but only 11 teachers were assigned. In addition, there is the fact that teachers themselves do not know the technical contents well, and they go to same companies to have training where their students receive work immersion program.

In order to strengthen the capacity of teachers, there was also a request for establishment of a specialized instructor training center such as Center for Instructor and Advanced Skills Training (CIAST) in Malaysia. In addition, there was a strong need to JICA support for the provision of equipment and facilities for vocational training in SHS.

(2) Higher Education

JICA aims to boost capacity at universities in various regions and countries. It includes raising faculties' skills, improvement in university management capacity, expanding campuses, and increasing educational and research materials and equipment. Also, JICA is working to strengthen collaboration between industry and universities as well as between local government and universities.

JICA has been conducting network-type cooperation, "ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net)" since 2003. In the Philippines, University of Philippines (UP), De La Salle University (DLSU), and Mindanao State University Iligan Institute of Technology (MSU IIT) are members. Also, more recently, JICA supports "Saitama-Cebu Comprehensive Human Resource Monozukuri Project" implemented by Japanese local government, Saitama Prefecture. These two projects are reviewed as follows.

(2)-1 AUN/SEED-Net Phase III

AUN/SEED-Net started in 2003 and continued until 2008. After that, Phase II was implemented from 2008 to 2013. During Phase I and II, AUN/SEED-Net strengthened capacity of the member universities for education and research as well as multilateral academic network through assisting taking higher degrees for approximately 900 faculties

Soon after Phase II, Phase III started, and it is on-going until 2018. In Phase III, ASEAN member universities are 26, and 14 Japanese universities are supporting the project. Table 6-8 shows the outline of the project.

Table 6-8 Outline of the Project

Project Title	ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net) Phase III
Status	On-going
Project Type	Technical Cooperation
Term of Cooperation	11th March 2013 – 10th March 2018
Member Universities in the Philippines	UP-Diliman, DLSU, MSU IIT
Project Inputs	Japan side: 1) Dispatch Chief Advisor (1), Deputy Chief Advisor (1), administrative staff (3) 2) Dispatch Japanese teachers 3)Operational cost of program implementation, collaborative research, publishing academic journal, alumni 4) AUN/SEED-Net office management cost Partner countries: 1) AUN/SEED-Net office personnel (by Thai government) 2) AUN/SEED-Net office operational cost (by Thai government) 3) Cost sharing for AUN/SEED-Net activities (by member universities) 4) Assign teachers and staff in member universities

Source: JICA Knowledge Site

[Current status and issues]

Based on the asset of the cooperation so far, Phase III is more focusing on improving the collaboration with industry including Japanese companies moving into ASEAN region. Also, it aims to promote sophistication of ASEAN industry, globalization, and addressing common regional issues through carrying out research activities. The number of member universities is increased from 19 to 26 in Phase III so that the academic network among multilateral universities will be further enhanced. Also, it will be expected to build a platform of advancement of science and technology in Asian countries.

The target beneficiaries of the project are as follows:

- Around 600 teachers in 26 member universities that will take higher degree through the project.
- Around 6,000 teachers in 26 member universities that will participate in collaboration research and academic meetings in the region.
- Around 150,000 students enrolled in the engineering faculty at member universities

In the Philippines, UP-Diliman and DLSU have been member universities since Phase I, while MSU IIT joined from Phase III.

According to JICA's data, 14 from UP, 27 from DLSU, and three from MSU IIT (44 in total) were sent to Japan or other member universities from 2001 to 2015 through AUN/SEED-Net for taking a higher degree (Master and Doctor courses). Also, since PU and DLSU are host universities of the degree program, 76 students and 87 students were accepted in PU and DLSU respectively during the same period.

Table 6-9 shows the results of the collaborative research program from 2011 to 2015. In the Philippines, the number of entries to the collaborative research program through the project is small overall, especially in the case of Collaborative Research with Industry being 0 in five years.

Regarding this, no clear reasons were mentioned by the member universities. However, it is assumed as follows; i)the number of researchers with PhD is small, ii) Universities are focused on more than education rather than research, iii)the merit of collaborative research are not penetrated in both universities and companies, iv) there are not many companies that have needs for new technology research and development.

Table 6-9 Achievement of Collaborative Research Program (2011-2015)

Research Program		Philippines (3 universities)	Indonesia (4 universities)	Vietnam (2 universities)
Collaborative Research for Alumni	Application	3	27	25
	Award	2	18	13
Collaborative Research for Common Regional Issues	Application	7	22	33
	Award	2	6	10
Collaborative Research with Industry	Application	0	19	32
	Award	0	8	14

Source: JICA

According to the DLSU, the project's achievements are i) increase in opportunities to obtain higher degrees by scholarship, ii) active interaction among member universities and the establishment of a network, iii) increase in the number of published papers. DLSU has a great expectation for the scholarship support from the project continuously. Also, there is a high demand for support for expansion of industry-academia linkage.

In addition, in the Philippines, a consortium named "National Science and Technology Human Resource Development through Engineering Research and Development for Technology

(ERDT)" consisting of 8 universities[69] is independently formed following SEED-Net's practice. In this consortium, three programs are being implemented: Scholarships supported by the government, promotion of R & D, and improvement of infrastructure.

Regarding scholarship program, DOST provides scholarship to support for taking higher degree within eight universities, sandwich programs and doctorate program with overseas universities (principally Western universities), and it has been successful. However, the shortage of research facilities, lack of research funds, and lack of interest in R & D from local industries have been problems. In order to cope with these issues, ERDT plans to promote joint research through industry-academia collaboration, expand the consortium, and collaborate with overseas research institutions in the future.

In the universities in the Philippines, since OJT is required for graduation and students are often employed through OJT, OJT is essential for students. Also, various events like job fair are actively held in the universities. Regarding this point, cooperation between universities and private companies has been stable.

However, as compared with other countries, there are few results of collaborative research with industry in SEED-Net. Also, the lack of interest in R & D and promotion of industry-academia collaboration are issues in ERDT. It should be addressed to strengthen industry-academia linkage in engineering universities in the Philippines.

(2)-2 Saitama-Cebu Comprehensive HR Monozukuri Project Phase II

The project started in 2013 and completed in March 2016. Soon after, Phase II has started and will continue until March 2019. It is an on-going project financially supported by JICA as a Grassroots Cooperation Project which is one of the JICA's assistance schemes. Saitama Prefecture is conducting the project. Table 6.10 shows outline.

Table 6-10 Outline of the Project

Project Title	Saitama-Cebu Comprehensive HR Monozukuri Project Phase II
Status	On-going
Project Type	Grassroots Cooperation Project
Term of Cooperation	April 2016 – March 2019
Project Site	Cebu
Implementation	Saitama Prefecture, University of San Jose-Recoletos, University of San Carlos, and Cebu Technological University

Source: JICA website

[69] Ateneo de Manila University, Central Luzon State University, De La Salle University, Mapua Institute of Technology, Mindanao State Irigan Institute of Technology, University of the Philippines, Los Banos University, San Carlos University

[Current status and issues]

The project aims to develop advanced human resources contributing to industrial development in Cebu as well as Saitama Prefecture through the training based on the Japanese traditional "Monozukuri" spirit. In a collaboration among Saitama Prefecture, private companies, and several universities in Saitama, "Monozukuri" training ("Monozukuri" philosophy, corporate culture, and basic skills as a society member[70], etc.) is on-going at the three universities in Cebu. Also, the project dispatches faculties and students from Cebu to Saitama for the training of "project management", "intellectual property", and "Monozukuri spirit" etc.

The project target generating 450 students with Monozukuri skills and spirit. In addition, the project promotes interaction between the students and Japanese companies especially for internship program as well as matching for job opportunities.

The professors from the Philippines side gave the following comments on the project. It shows the positive evaluation and high expectation for the project.

- Working ethics and values taught by Prof. Yoshida is appropriate for students to get ready for the real world.
- Students' perception of Japanese companies has changed in a positive way after learning the Monozukuri spirit and practice.
- Japanese companies in Cebu employed more than 10 students and a few are already working in Japan. These are good outcomes.
- Provincial Governor of Cebu is willing to enhance cooperation with Japan in terms of industrial human resource development in the entire Cebu.

Furthermore, the "Monodzukuri Research Institute" was established at University of San Jose Recoletos in October 2016. Although activities of the laboratory have not yet been conducted, it aims to be a base for producing human resources for Monozukuri in Asia in the future. Prior to that, the project has an intention of expanding "Monozukuri Research Institute" across the Philippines after the end of the project.

As mentioned in the previous chapter, there were indications from private companies that "soft skills" such as serious attitude toward the work, teamwork, communication skill, responsibility, etc. were insufficient among employees.

[70] It consists of three abilities (including 12 ability elements), "Power to step forward (the power to step forward and the ability to persevere in the face of failure)", "Thinking power (the ability to question and to think it through)", and "Team work (the ability to work towards a goal with diverse people)". The Ministry of Economy, Trade and Industry has been proposing these skills since 2006 as basic skills to work with diverse people in workplace as well as community. These skills are becoming more important in addition to basic academic ability and expertise due to environmental changes surrounding companies and young people. (source: The Ministry of Economy, Trade and Industry website)

Also, as a result of the "Enterprise Survey" (World Bank 2016) conducted by the World Bank this year in the Philippines, there are many answers that it is difficult to find talented people with motivation to work and communication skills. Thus, in addition to the basic academic skill and expertise, the need to improve social skills and soft skills are increasing.

Since the project responds to such issues, it is necessary to continue to review the project's efforts and results continuously.

(3) HRD on IT and Electronic Industry

In the Philippines, JICA implemented projects for HRD on IT industry since the 1990s. Most recently, "Advanced IT Human Resource Development Project" was implemented from 2010 to 2011. Also, "Study on the Supply Chain of the Philippines Electronics Industry" was conducted in 2010.

(3)-1 Advanced IT Human Resource Development Project

"Advanced IT Human Resource Development Project" started in March 2010 and completed in February 2011 to follow up the previous project, "Information Technology Human Resource Development Project", which was implemented from 2004 to 2009.

The project provided technical support for introducing new courses into the University of the Philippines IT Training Center (UP-ITTC) so that they could continuously generate advanced human resources responding to the demand from IT industry. Also, necessary equipment for the new courses was supplied. Table 6-11 shows the outline of the project

Table 6-11 Outline of the Project

Project Title	Advanced IT Human Resource Development Project
Status	Completed
Project Type	Technical Cooperation
Term of Cooperation	1st March 2010 – 28th February 2011
Project Inputs	Japan side: Japanese Expert 10 persons Equipment Supply (5 million Japanese yen) Equipment Maintenance (27 million Japanese yen) Counterpart Training in Japan Philippines side: Counterpart, Project office, running cost
Counterpart	University of the Philippines IT Training Center (UP-ITTC)

Source: JICA Knowledge Site

[Achievement of the project]

Since "Advanced IT Human Resource Development Project" was a follow-up project for the previous one, it was only one year project.

According to the terminal evaluation report of the previous project (August 2008), it showed promise of achievement of all indicators. Also, it was highly evaluated in terms of Relevancy, Effectiveness, Efficiency and Impact. At the time of terminal evaluation, the overall result was good.

On the other hand, only for sustainability, it was evaluated “Medium-High” because of the result judging to be relatively high dependence on Japanese experts in the part of industrial collaboration with Japanese IT companies and curriculum updating.

As a result, it was judged that technical support for strengthening industrial collaboration as well as monitoring for the curriculum update were still necessary. Thus, the extension (follow-up) of the project was decided and the "Advanced IT human resource development project" was implemented for one year.

According to the project completion report (March 2011), training materials for newly-started eight courses were developed as planned. Also, new equipment was introduced and utilized properly. In addition, financial soundness and independence of the organization were improved through strengthening collaboration with private companies based on the marketing plan. Achieving these outcomes, there were successful factors;

- UP-ITTC is supported by UP regarding personnel, physical environment, etc. Also, UP-ITTC utilizes the value of UP brand. It contributes to increment of the number of enrollment and to make a connection with private companies.
- The personal ability of the project leader in UP-ITTC was outstanding. He has experiences of working at a manager level in a private company, and he has a wide network out of the University. In addition, he showed strong leadership in UP-ITTC. These features contributed to promoting the project in terms of improving the quality of training as well as marketing.
- There is a high market demand on IT human resources in the Philippines as well as abroad. UP-ITTC directly responds to the demand from the industry. The employment rate of the graduates is high.
- UP-ITTC has different income sources not only tuition fee but also event income, providing customized courses[71], etc. UP-ITTC has been trying to increase income sources to stabilize financial base.
- UP-ITTC enhanced management structure based on ISO9001
- UP-ITTC effectively utilizes various human resources from different organizations: Teachers from UP, Engineers from IT companies, the graduates from UP-ITTC, and so on.

[71] Accepting an order of training for private companies, government institutions, local educational institutions etc.

As mentioned above, UP-ITTC developed human resources based on the needs of the industry through support of the project, and it achieved a good result. Also, from the viewpoint of project management, the smooth operation was carried out by high motivation and commitment of counterparts. Other environmental factors (e.g. backup from UP, different sources of income, etc.) were also a positive aspect for the project implementation.

[Current status and issues]

UP-ITTC was renamed as the University of the Philippines Information Development Center (UP-ITDC) in 2012. UP-ITDC provides IT training, consulting, content and software development, and other IT services. Also, UP-ITDC conducts advocacy campaigns to promote the development of ICT in the Philippines and provides advice and opinion to the government on ICT matters.

Regarding the training, UP-ITDC is conducting high-level and practical IT training in an effective and efficient manner, in cooperation with the academe and the IT industry. UP-ITDC supports the needs of IT industry by producing IT engineers with skills required by IT companies. There are five training courses in UP-ITDC at present; Applications Development, Game Design and Development, Mobile Application Development, Embedded Systems Development, and Network and Systems Administration.

Table 6-12 shows the number of participants of full-time course (IT Certificate program) and short time course from 2005 to 2015.

The total number of full-time graduates is 373 in the five years from 2006 to 2010, and it is 315 in the next 2011 to 2015. A tendency is decreasing slightly. The ex-post evaluation report (2014) of the project pointed out that a reduction in the number of scholarships provided by private companies affects the decrease in the number of applicants.

Table 6-12 Number of Participants

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Full-time	38	75	93	63	56	86	73	60	60	64	58
Short time	71	435	771	889	341	1,454	1,179	1,012	944	642	528

Source: UP-ITDC

According to UP-ITDC, training courses are reviewed once a year through collaboration with IT industry organizations such as Philippine Society for IT Educators, Philippine Software Industry Association, and Philippine Game Development Association, etc., and they are revised based on the industry's needs.

Although UP-ITDC does not offer job placement, they set up a place for students and companies to meet, such as IT fair and graduation ceremony every year inviting IT companies.

Among graduates of full-time training courses, 90% to 95% of those can find a job soon after the graduation.

It can be said that the training provided by UP-ITDC matches the needs of the industry. Also, UP-ITDC pointed out that the curriculum of Universities (undergraduates' course) including UP is biased towards theory and it is the cause of skill mismatch.

■Short Message about ITDC from the graduates

- I am now a full-time software developer for an IT startup. Even if this is my first IT job, my skills are at par with colleagues who are IT graduates. Gaining IT skills has given me a competitive advantage in today's increasingly digital world.
- It was a very good experience. I already wanted to pursue this career path, so adjusting was necessary. Lessons were intense, but we learned a lot. Made new friends with the same mindset, and I'm in a job that asks for what I've learned and more. I'm happy I decided to get that class. Plus, I learned Japanese.

(Source:UP-ITDC)

(3)-2 Study on the Supply Chain of the Philippine Electronics Industry

"Study on the Supply Chain of the Philippine Electronics Industry" was conducted in 2010 to analyze the supply chain of the electronics industry and focusing on missing the link in the Philippines. Also, it considered how the country could attract investments from those sectors. Table 6-13 shows the outline of the study.

Table 6-13 Outline of the Study

Project Title	Study on the Supply Chain of the Philippine Electronics Industry
Status	Completed
Project Type	Development Study
Term of Cooperation	April 2010 – October 2010
Counterpart	DTI Board of Investments (BOI)

Source: Project Report, JICA Knowledge Site

As mentioned in Chapter 2, the electronics industry is one of the most important industries in the Philippines. Since the electronics industry is driving the export of the Philippines and it is a promising industry in the future, it is necessary to train human resources that can play an active part in the electronic industry.

Promoting the attraction of existing industry, HDD and Semiconductor was discussed in the study. Also, next-generation energy industry, such as photovoltaic power generation (PV), Lithium-ion rechargeable battery (LIB), Light Emitting Diode (LED) were examined. In

addition, promotion of Embedded Software Business and R&D&D (Research and Development and Design) were reviewed. The conclusions are briefly shown in Table 6-14.

Table 6-14 Directions for Attracting Investment

Electronics industry	Directions
HDD	The first step to attracting the investment of the HDD industry is increasing HDD production. The sole HDD manufacturer operating in the Philippines at present is Toshiba. It is necessary to attract investments toward Toshiba actively.
Semiconductor	The electronics industry (particularly the semiconductor industry) is one of the important industries for the Philippines, which accounts for a large part of GDP and exports. The Philippines should strengthen the existing semiconductor back-end process and some assembly operations in the Philippines and try to expand the upstream and downstream value chain.
Electrical Energy Industry (PV, LIB)	The new energy industry has the potential to become the second largest pillar industry after the electronics industry. It will not only become a cash cow to earn foreign currencies, but will also help improve the environments of big cities such as Manila that suffer from significant air pollution due to chronic traffic jams. The new energy industry should be positioned as one of the next-generation industries that the Philippines must develop.
LED	In order to develop the LED industry in the Philippines, it is necessary to stimulate the application industries that use LED modules; namely, industries such as printers, copiers, LCD (Liquid Crystal Display) modules, and general lighting, which are main applications of LED modules. In particular, the production bases of laser beam printers and LCD TVs and monitors that use many LED modules are expected to serve as driven forces to form the LED industry around them.
Embedded Software Business	Embedded Software is essential for using electronics products. With an increase in the use of electronics, the number of man-hours to develop embedded software increases. Some simple software can be developed without sophisticated technology because special development tools are available. However, demand for the development of complex software is growing. Promotion of the skills to develop such embedded software and, in particular, promotion of development of human resources increase the interest in the Philippines and the chance of attracting investment from overseas.
R&D&D	In order to strengthen the competitiveness of the electronics industry in the Philippines, it is desirable not only to attract simple assembly work but also to accumulate more sophisticated technologies and use them to develop the next-generation industries. In that sense, R&D&D are strengthening gradually to advance the electronics industry in the Philippines. The first step is to strengthen functions such as testing/inspection that are close to the current industrial activities.

Source: Project Report

It is hoped that human resource development related to the electronics industry will be promoted in the future with reference to the above survey results.

(4) HRD on local industrial development

JICA also implemented the projects promoting industrial and human resource development in regions. Three projects, namely "Davao Industry Cluster Capacity Enhancement Project (DICCEP)", "National Industry Cluster Capacity Enhancement Project (NICCEP)", and "Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology" were reviewed as follows.

(4)-1 DICCEP

DICCEP was implemented from November 2007 to June 2010 aiming to increase capacity for industrial cluster approach of the eight clusters. Table 6-15 shows the outline of the project.

Table 6-15 Outline of the Project

Project Title	Davao Industry Cluster Capacity Enhancement Project (DICCEP)
Status	Completed
Project Type	Technical Cooperation
Term of Cooperation	5th November 2007 – 30th June 2010
Project Site	Davao
Project Inputs	Japan side: JICA Expert CP training in Japan Financial support for implementation of the action plan Equipment Supply Philippines side: counterpart, project office, operational cost for utilities and communication cost, etc. Cost sharing for implementation of the action plan
Counterpart	DTI, Region XI Office

Source: JICA Knowledge Site

[Achievement of the project]

The project is considered as one of the best practices of ODA projects in the Philippines and was awarded "the National Best Practice" by the Philippines government. Also, according to PDP (2011-2016) Mid-Term Update on page 94, NICCEP's achievements were specifically highlighted. The project completion report (May 2010) indicated that there were two major factors which brought the project to the success: i) active participation of the counterparts and

ii) implementation of training based on practice.

The project counterpart was DTI-XI. DTI-XI strongly considered that the project supported by JICA was their own project which brings benefit to the Philippines. Generally speaking, once a JICA project started, counterparts tend to rely on JICA expert largely. However, this case was different. DTI-XI seriously committed to the project and expected technical transfer itself from JICA expert rather than financial support from JICA.

Regarding the training method, the project focused on the practical implementation of the cluster approach. Usually, "capacity building" tends to target training itself and evaluated by the number of trainees. However, the project considered that the training without implementation was ineffective and powerless. Therefore, the project tried to have trainees learn a theory of cluster approach through actual implementation. Finally, the project found that actual implementation through the practice enhanced trainees' understanding, and it brought them high motivation for the training.

Also, the project counterpart, DTI-XI, said as follows;

- DICCEP as a capacity building project was successful mobilizing industry development in the region. It successfully built a pool of industry cluster experts within DTI-XI personnel; now they are industry cluster champions of their cluster in the region as well as national levels.
- Private sector leadership engagement was the main critical success factor for DICCEP. Strong backing of DTI was also a key factor for the success.
- Regarding sustainability, since the cluster approach has been integrated with DTI-XI plans and programs, it assured the assignment of personnel as well as budget.

[Current issues]

Thus, the counterparts highly evaluated DICCEP and continuously following it. Also, the success of DICCEP has already internalized into DTI-XI and their awareness of sustainability is strong. In addition, according to DTI, when they prepared "Davao Region Industry Cluster Roadmaps 2014-2030", DICCEP was used as a basic platform of the roadmap. DTI personnel especially those who were trained by DICCEP and NICCEP helped NEDA in putting together all the inputs for the roadmaps.

Regarding promoting cluster approach, the counterparts pointed out the importance of understanding and coordination of related government agencies. As implementing the project which involves many stakeholders like DICCEP, the coordination of concerned government agencies and developing consensus among stakeholders are indispensable.

DTI counterpart pointed out that;

- The most challenging point in the implementation of DICCEP and NICCEP was to get the commitment of the cluster lead national government agencies. During the first part of the DICCEP implementation, the NGAs did not prioritize industry clustering initiatives in their plan. It was not part of the agencies General Appropriations Act (GAA.) The agencies did not have a budget allocation to support industry clustering related activities.

  The directive from the Regional Development Council XI (RDC-XI), adopting industry clustering as a development strategy for Davao Region, strengthened the collaboration of DTI as the convener, and the lead cluster agency in the implementation of the projects undertaken by the clusters. That at the time of the project's second phase, NICCEP, the clusters have the full support of the lead agencies especially in terms of technical support.

As mentioned above, the capacity of stakeholders for industrial cluster approach was enhanced through the project.

On the other hand, looking at the current status of each industrial cluster, it seems there are issues peculiar to each cluster.

The followings are examples.

(i) Coconut

The volume of coconut production in the Region XI is the highest in the country, which also creates the second biggest employment opportunities next to the banana industry in the region. However, Typhoon Yolanda in 2013 badly damaged the production, from which farmers are still struggling to recover. The value of the coconut export in 2015 was down to 3.5% of the total from 5.5% in the previous year. In recent years, the value-added products such as virgin coconut oil (VCO) and coco sugar are getting popular in the international market and the demand is mounting. However, the production has not yet caught up with it.

Coconut is a crop which can be grown easily without putting much effort, skills, and techniques, if the quality of the products is not taken as important. These coconut farmers, therefore, earn the least among all, which discourage them to continue the production, to seek for the other crops. At present, the Philippines Coconuts Authority (PCA) and Department of Agriculture are trying hard to improve the productivity and restore the farmland. Dislike the Manila HQ, Davao PCA is suffering from the lack of human resources (currently its permanent officer positions are filled only half), and cannot manage anything more than the productivity improvement and expansion of the farm land. The additional function such as the development of the new value added products, marketing, etc. can be managed only by the HQ.

(ii) Seaweed

The production of seaweed in Davao Region had been small in the volume, but it became even smaller because of the damage caused by Typhoon Yolanda in 2013 and fatal disease which spread in 2014. Even nationally, the producers are struggling since the market price was largely down because of a newly emerged substitute for carrageenan, an extract from seaweed and Philippine's export product. In early 2016, the only operating seaweed processing factory in Davao was closed due to the circumstance. Currently, the seaweed is brought to Cebu to be processed and sold even cheaper to the buyers. This vicious circle has accelerated the decline of the number of the producers, and eventually the Bureau of Fishery and Aquatic Resources (BFAR) has stopped its support for the cluster. Now, only the Southern Philippines Agri-Business and Marine and Aquatic School of Technology (SPAMAST) continues the support, though in a small scale, such as the development of the new products.

(iii) Mango

Davao Cluster Strategy issued in 2014 set the plan to provide technical training for mango farmers, improve the productivity by distributing hybrid seeds with high productivity and support for the expansion of the production.

The production of mango costs high because of the expensive input including fertilizers, and requires so much care and effort. Its supply chain is multi-layered and the buyers' market. The competition has been fierce in the international market, regarding not only the price but also the quality. Mango is now produced in many countries such as India which has the highest production in the world, as well as Africa and ASEAN countries, putting much effort in the quality control complying with the international standards, which has pushed down the international market price.

Mango producers in the Philippines were badly affected by the price down since they did not have the price competitiveness due to the high cost of the production. Consequently, many farmers in Davao have converted to other crops.

(4)-2 NICCEP

NICCEP was carried out from February 2012 to March 2015. It aimed to increase capacity of DTI to expand and enhance industrial cluster approach as a mechanism for industrial development in the Philippines through the implementation of the model of the cluster approach nationwide. It expanded DICCEP's achievement to Luzon, Visaya, Mindanao excluding Davao. Table 6-16 shows the outline of the project.

Table 6-16 Outline of the Project

Project Title	National Industry Cluster Capacity Enhancement Project (NICCEP)
Status	Completed
Project Type	Technical Cooperation
Term of Cooperation	20th February 2012 – 31st March 2015
Project Site	Luzon, Visaya, Mindanao (excluded Davao)
Project Inputs	Japan side: JICA Expert (Short term 3persons, Long term 1 person) CP training in Japan Workshop and monitoring cost Cluster activities' cost Philippines side: personnel, project office Cost sharing for workshops, monitoring, and transportation, etc.
Counterpart	DTI, Regional Operations and Development Group

Source: JICA Knowledge Site

[Achievement of the project]

NICCEP focused on the capacity building through practical implementation following the creative approach of DICCEP. Based on the experience of DICCEP, the project improved the process of a cluster activity, which was 1) analysis for the potential of each cluster, 2) planning based on the analysis, 3) building consensus among stakeholders, and 4) take actions. NICCEP encouraged to develop feasible action plans. Also, NICCEP tried to promote collaboration between industry, government, academia, and stakeholders to enhance industrial cluster activities. In addition, NICCEP updated the training materials and manuals.

The mid-term review report of the project said that DTI showed a strong commitment to NICCEP. Also, Relevancy, Effectiveness, Efficiency, and Impact were highly evaluated in the report.

In addition, NICCEP also provided funds for the pilot project for cluster approach. Cluster people had the opportunity to practice. It triggered to consider the use of the budget of DTI and other agencies.

■YOKOHAMA Business Women Festa 2014
JICA invited 18 business women from the Philippines, who are engaged in handicraft cluster and ICT cluster, entrepreneurs, and business managers, to "Women Entrepreneur Training" in December 2014. During the training, the participants grasped features of Japanese market and business custom in Japan along with getting some ideas for developing businesses in the Philippines. Also, the participants interacted with Japanese companies which might become a business partner in the future. In addition, the participants attended YOKOHAMA Business Women Festa 2014. Ms. Bureshira Aberanosa Rantayona from DTI introduced cluster activities and handicraft from the Philippines. Ms. Leonor Baluto Paninbatan from DTI regional office said, "I was impressed with collaboration between universities and industry to improve marketing as well as development of products. Also, I found that local government proactively promote SMEs in Japan. I felt that cluster approach should be promoted strategically through the collaboration between industry-government-academia."
(Source: JICA website)

Through both DICCEP and NICCEP, the cluster approach was applied and it enhanced the organizational and technical capacity of the clusters. Also, the capacity of government institutions at local level was strengthened. The project achieved the goal to some extent.

Regarding the way to expansion of cluster approach, DTI counterpart suggested as follows;

- If there are any difficulties of linkage and cooperation among stakeholders and players in the value chains, the cluster approach could not be applicable. When we expand the approach, the government should invest time and resources in putting in place the business environment so that linkage among industry players can be enhanced.

However, as mentioned earlier, there are some issues about current cluster activities because of critical external factors such as change of market preference, tough competition, the appearance of alternative, and so on. As a result, some clusters are no longer supported by the government or low priority. On the other hand, new cluster, such as the coffee cluster, was successfully established applying the cluster approach model which was developed by DICCEP and NICCEP.

Market trend and industrial cluster is a non-divisible relation. If the market is not existing, the cluster does not work. Therefore, the priority cluster greatly changes according to the market trend. Although it is necessary to be flexible following the market trend, it can also say that frequent change of the direction does not have a long-term perspective and it may not produce a good result.

(4)-3 Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology

"Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology" is an on-going project. It started in 2013 and will continue until 2017. The project aims to develop a system for reduction of post-harvest losses and packaging design for transport through introducing appropriate packaging for the transport of main eight items of agricultural products in its production areas. Also, it is expected to enhance capacity of counterpart to develop packaging design for transport. Table 6-17 shows an outline of the project.

Table 6-17 Outline of the Project

Project Title	Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology
Status	On-going
Project Type	Technical Cooperation

Term of Cooperation	27th February 2013 – 31st March 2017
Project Site	Metro Manila, Taguig
Project Inputs	Japan side: JICA Expert CP training in Japan Equipment Supply (11 million Japanese Yen) Philippines side: Counterpart 22 persons, project office Operational cost (supplies expense, equipment management, etc.)
Counterpart	Packaging Technology Division (PTD), DOST

(Source: JICA Knowledge Site)

[Current status and issues]

The project has been targeted eight items, Durian, Smoked Fish, Ocarina, Chrysanthemum, Rose, Broccoli, Cauliflower, and Mangosteen since the beginning. Also, Mango and Tomato were added as target items based on the request from the counterpart.

The development of packaging technology is progressing relatively smoothly. However, since the developed packaging technology cannot be tried if the crop is not harvested, the progress of the project itself is influenced by weather and the condition of the crop. This is the biggest problem of the project. The timing of the dispatch of JICA experts is also influenced by the harvest time, there has been many changes to their dispatch schedule.

Also, the eight target items and its production area had been selected already by the counterparts before the project started. According to JICA experts, these selected production areas have not always good production area. There was a problem about quality sometimes. In that case, the issues are not only about the packaging. I addition, low-temperature and storage facilities are insufficient, and cold chain has not been developed well in the Philippines, these are also problems.

On the other hand, regarding smoked fish, the packaging technology of shelf-stable "Tsukudani style"[72] was developed. JICA expert transferred this technology to five SMEs in Battan. Also a fishery school requested the training to the project. "Tsukudani style" seems to be spread.

According to the counterpart, even though the scale of the project is small compared to the project phase I[73], their capacity of developing packaging technology and packaging design has been enhanced by the project substantially. They positively evaluated the project output. Also, the counterpart is going to promote smart package and green package in future, they expected JICA support on such areas. In addition, they also noticed that insufficient infrastructure for storage and

[72] The name is given by JICA expert. Smoked fish is similar to *tsukudani*. It is shelf-stable and effectual in the Philippine where low-temperature facilities are insufficient.

[73] "Improvement of Packaging Technology for Philippine Food Products in the Regions"(2005-2009)

transportation of crops has been a problem. It can be said that the government needs to address the issue. Regarding human resources in DOST-PTD, the background of personnel is Mechanical Engineering, Chemical Engineering, Electrical Engineering, Agricultural Engineering, and so on. However, they consider the number of experts is insufficient. Also, only Central Philippine University（CPU）in Iroiro City is offering a packaging technology course in the Philippines.

6-1-4 Lessons Learned from completed and on-going projects

(1) Significance of human resource development that meets the needs of industry

As can be seen, “Advanced IT Human Resource Development Project” and “Saitama-Cebu Comprehensive HR Monozukuri Project” directly produce talented human resources for the relevant industries. “Advanced IT Human Resource Development Project” has a high rate of UP-ITDC graduates go on to find work in IT companies, and the matching of students by the “Saitama-Cebu Comprehensive HR Monozukuri Project” with Japanese companies has also been enhanced.

As both projects have clearly defined what kinds of human resources they want and what kinds of work they are training them for, this enhances the understanding of both Philippines side and Japan side who involved in the projects, and helps the project to become a success.

As mentioned above, regarding the projects that directly train industrial human resources, the easier it is to generate tangible results through projects’ input and intervention.

(2) Commitments of the stakeholders

As seen in the DICCEP, NICCEP and Advanced IT Human Resource Development Project, the motivation, commitment, and leadership of all counterparts has a big impact on the success or failure of the project.

In the DICCEP and NICCEP, in addition to the enhancement of planning formulation skills to promote the industry cluster, the counterparts and project participants were given the opportunity to try these skills out for real, boosting their practical skills. And, it brought a success for obtaining the deep commitment from participants.

It is not only the JICA experts who implemented the project, but the counterparts themselves who felt that "through the practical exercises, there was a change in participants’ awareness, leading to changes in their behavior". It could say that the essence of the project was conveyed to them. Also, this contributed to the further motivation of the counterparts and it seemed that a positive cycle was formed in the project.

It is thought that it is necessary to make the results of the project be visible and to have the counterparts and participants experience practically as much as possible so that they can commit

to the project more deeply and actively based on their realization.

(3) Coordination among related organizations and stakeholders

As can be seen in the "Project for Supporting Senior High School(SHS) Program in Technical Vocational High Schools", DICCEP, and NICCEP, it is critical to breed coordination and trust with all stakeholders who involved in the project, such as governmental organizations, local administrative organizations, industries, and other private enterprises. In the Project for Supporting Senior High School (SHS) Program in Technical Vocational High Schools, they tried to find opportunities to explain about SHS and work immersion to obtain cooperation with industry. And, the teachers themselves at the pilot schools worked hard together with the project and continued such efforts. Furthermore, as DICCEP counterpart pointed out, it was difficult to get understanding from each government agency at the beginning, and DTI had to coordinate with each office and other stakeholders. It was also important to foster mutual understanding between the private sectors and the government.

When implementing projects for industrial human resource development, as such a diverse range of actors are involved, effective coordination and facilitation are required so that they fulfill their roles respectively and proactively.

(4) Sustainability of a project

As can be seen in DICCEP and NICCEP, industry cluster approach was consistent with governmental policies, and as personnel placement and budget allocation in the government office were enhanced, a system for continuing the work for industry cluster activities was set up as a part of government regular duties even after the project ended. It leaded to an improvement in sustainability of the project.

In addition, in the "Project for Supporting Senior High School (SHS) Program in Technical Vocational High Schools", good practices and experiences of the pilot schools were shared widely among the participants in the industry summit. Since K to 12 program has started, each school need to follow the program certainly. Therefore, there is no doubt that each school will promote their activities regarding linkage with industries introducing the examples of the pilot schools which the project supported. The result of the project will be supposed to expand to each school.

Furthermore, in the project "Enhancing the Competitiveness of Fresh and Semi-Processed Agricultural Product Through the Application on Appropriate and Sustainable Packaging Technology", as technical transfer from JICA experts has been progressing smoothly, it will improve technical skills of Packaging Technology Division (PTD) in DOST as a whole. It seems that the result of the project would be sustainable.

As above, it is important to aim to internalize a result of a project so that it can be maintained even after the end of the project.

On the other hand, as seen in the “PEVOTI”, it is undeniable that the system introduced and disseminated by the project will decline in time along with the changes in the social environment.

(5) Training via On the Job Training (OJT)

As repeatedly stated in this report, training methods in DICCEP and NICCEP is placed an emphasis on "doing". In projects that aim to enhance capacities and skills, it is thought that not only lectures and seminars, but actual capacity development and technology transfer through OJT via practical experience are also effective.

(6) Upgrading equipment

When providing equipment in a project, the counterparts are exceedingly grateful.
In projects related to industrial human resource development, the provision of the necessary equipment and facilities are thought of as essential. It may directly connect to the success of a project.

6-2 Framework for Development Partners’ Coordination

The Philippines Development Forum (PDF), chaired by the Philippines’ Department of Finance, is the primary mechanism of the government to facilitate policy dialogue and ensure coordination of assistance of all its development partners in support of the country’s development agenda. The Forum also serves as a process for developing consensus and generating commitments among different stakeholders toward critical actionable items of the Government’s reform agenda. This makes sure that intervention efforts among the different development partners do not overlap and are not duplicated, in order to maximize development results.

The PDF process involves continuous dialogue on 10 thematic areas through working groups and sub-working groups. For instance, the PDF Subgroup on education is formed under the MDGs and Social Progress (thematic area) and comprised of the key education agencies of government and major development partners working in education sector in the Philippines. The PDF meets every quarter to discuss pre-agreed thematic areas to ensure development partner alignment with government priorities, strategies and directions, and to enhance complementarity of interventions and initiatives, maximize synergies and avoid overlaps and duplication of initiatives between and among development partners.

Within the Philippine Government, the National Economic and Development Authority (NEDA)

serves as the oversight agency of official development assistance (ODA). NEDA reviews and appraises proposed ODA projects and conducts monitoring and evaluation of projects. Interagency committees such as the Development Budget Coordinating Committee and the Investment Coordination Committees under the NEDA Board have specific roles in the programming, implementation and monitoring and evaluation of ODA. Given its key role in coordinating the preparation and/or upgrading of the Philippines Development Plan, NEDA has also ensured that the various analytical and research agenda of the government, and respond to the pressing development needs in the various sectors.

6-3 Activities of Other Development Partners

Over the years, a number of development partners have supported the Philippine government to improve education, technical and vocational training, and science and technology development/research, enhance the employability of the youth, and improve the labor market, which contributes the development of IHRD directly or indirectly. Of these supports, the following programs/projects provides relevant contents and lessons learned when the JICA's IHRD cooperation program (idea) and potential project concepts (idea) are examined.

6-3-1 Multilateral Development Partners

(1) Asian Development Bank

The Asian Development Bank (ADB) has helped improve education and skills training, and promote the smooth transition of the youth from school to the workplace through policy dialogue, loan programs, investment project loans, technical assistance, and so on.

Through two technical cooperation projects[74], the support was offered to pilot activities to establish Public Employment Service Offices (PESOs) and conduct their capacity building in four regions. Thanks to the support, the PESOs were able to offer modern employment promotion services (career guidance, life skills training, and OJT) to more than 1,600 at-risk youth[75] to combat a potential unemployment risk.

Following this support, through "Support for the Nationwide Rollout of JobStart Philippines" (technical cooperation), ADB supported the expansion of the pilot programs nationwide. This project will be implemented from 2016 to 2020, and have a budget of 13 million US dollars. The project will support capacity building of the DOLE's units in charge, development of a national life skills training curriculum and its dissemination nationwide, capacity building of 24

[74] Employment Facilitation for Inclusive Growth, Improving Competitiveness in Tourism

[75] at risk out of school youth ("At-risk" youth in the JSP program refers to out-of-school youth at risk of not integrating into the labor market. The criterion for 'at-risk' is youth aged between 18 to 24 with at least high-school education and less than 12 months of work experience.

PESOs and the promotion of modern employment services provided by PESOs, as well as the establishment of a labor market and employment information system.

In addition, through the "Senior High School Support Program", ADB has supported the implementation of the K to 12 program by the Philippine government. The Senior High School Support Program has been implemented from 2014 to 2019, and loans are being offered to help the Philippine government to achieve the specific results. The amount of loans comes to 300 million US dollars. The support contents of this program are shown in the table below.

Table 6-18 "Senior High School Support Program Support" Contents

Results	Support Contents
Result 1: Quality of DepED senior high school program improved.	Development and implementation of the core SHS curriculum and electives in four tracks (formulation of content, learning outcomes, instructional materials, and national assessment tools) and training of 84,000 teachers to allow the DepEd to achieve its minimum service standard for the number of qualified mathematics and science teachers per student etc.
Result 2: Minimum service standard for school facilities in DepED senior high schools achieved.	Establishment of schools and classrooms (40,000 classrooms) to meet minimum standards (40 students/classroom), Including assessment of the feasibility of delivering a portion of schools using public-private partnerships modality
Result 3: Senior high school voucher program developed and implemented.	Development and implementation of a voucher program to support graduates from DepED junior high schools and non-DepED junior high schools entering non-DepED senior high schools, targeting about 800,000 students per year.
Result 4: Basic education management, fiduciary, and safeguards systems strengthened.	Capacity building for finance management, procurement, oversight and implementation of the voucher program at schools and DepEd regional offices and DepED

Source: Prepared by the JICA Survey Team based on "Report and Recommendation of the President to the Board of Directors for Proposed Results-Based Loan Republic of the Philippines: Senior High School Support Program" (November 2014, ADB)

From December 21st, 2016, the DepED and ADB conducted a progress review of the program, and the results are scheduled to be shared with development partners after January 2017.

Furthermore, through the "Facilitating Youth School-to-Work Transition Program", ADB is preparing to support the Philippine government on the reforms listed below, to make it possible for the youth to transition smoothly from school to the workplace.

- Reforms to improve labor market programs to support job-seeking for the youth on the verge of an unemployment risks
- Reforms to improve young people's access to skills training through the creation of partnerships with employers in growth industries

- Reforms to help young people easily secure long-term employment and access social security

The program is scheduled to start in 2017, and loans will be given when the Philippine government establish and implement the agreed policies. The total amount of loans comes to 300 million US dollars.

(2) International Labor Organization

The International Labor Organization (ILO) supports knowledge products and policy establishment. The ILO was scheduled to support the establishment of DOLE's next employment and labor plan (2017-2021) by reviewing performance of the previous plan (2011-2016), identifying priority issues, analyzing the labor market, setting strategies for the next plan, but they are still waiting for the newly-formed Duterte administration to make preparations, and the support had not begun as of November 2016.

(3) World Bank

The World Bank (WB) conducts many surveys in addition to supporting knowledge products. For instance, it partnered with the Australian Embassy to analyze the skill profile of the workforce, skills necessary for employment and productivity, and the quality and extent of skill gaps through the "Skills Towards Employability and Productivity Study." The results of the survey will be published after January 2017. The results will be utilized as basic information when JICA supports IHRD in the Philippines.

6-3-2 Bilateral Development Partners

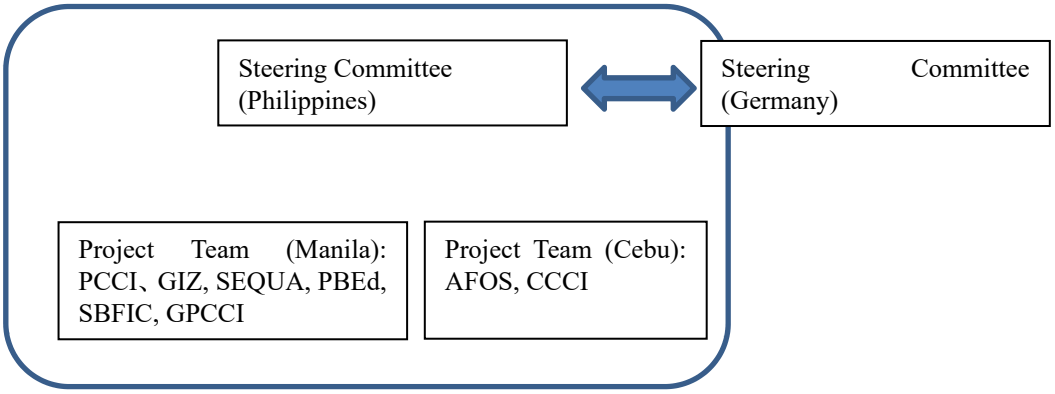
(1) Germany

To support vocational and technical tracks at senior high schools as a part of the K to 12 program being promoted by the Philippine government, the "K to 12 PLUS Project" Phase I and Phase II are being implemented through Germany's Ministry for Economic Cooperation and Development.

The project addresses the issues of youth unemployment and skill mismatch through pilot programs aiming to promote a dual education and training approach. Based on this approach, students can receive high quality education and training at schools and businesses which is aligned with industry needs.

To achieve the goal, it is vital that industry take part in education and training in order to implement education and training based on the needs of the labor market. Therefore, the K to 12 PLUS Project forges strong partnerships with commercial associations and industry groups to

implement the project[76]. For example, the project team includes the Philippine Chamber of Commerce and Industry (PCCI), the German Philippine Chamber of Commerce and Industry (GPCCI), the Cebu-Philippine Chamber of Commerce and Industry (CCCI) and other commercial associations.



Source: Prepared by the JICA Survey Team based on "K to 12 PLUC Project" data

Figure 6-2 "K to 12 PLUS Project" Implementation Structure

The coordination among related parties is conducted through the steering committees in the Philippines and Germany, and the coordinator stations in the Philippines[77].

Phase I of the project had a project budget of 4.5 million euros (grant) and was implemented between 2013 and 2016. In the Phase I, pilot schools, region and occupations were selected with consideration for regional labor demand, the interest of regional commercial associations and businesses, and poverty reduction effects.

Table 6-19 "K to 12 PLUS Project" Pilot Schools and Occupations

Pilot School Names	Regions	Occupations (Cluster) *	Number of Students Participating in Pilot Project	
			2015/2016	2016/2017
Barrio Luz National High School	Central Visayas	Food Processing, Food and Beverage	33	28
Zapatera National High School	Central Visayas	Construction	33	23
Banilad Center for Professional Development (SHS & TVI)	Central Visayas	Tourism	50	-
San Pedro Relocation Center National High School (SPRCN)**	Manila Metropolitan Area	Metals and Engineering	24	-
Laiya National High School	Calabarzon	Tourism	0	96

[76] The K to 12 Plus Project's counterpart in the Philippines is the Philippine Chamber of Commerce and Industry (PCCI). DepEd and TESDA are members of the steering committee.
[77] The original two steering committees are scheduled to be combined into one for easier coordination in Phase 2, according to the K to 12 Plus Project.

CARD Senior High School	Calabarzon	Finance and Trade	-	-
Looc National High School	Zamboanga Peninsula	Finance and Trade	-	8
Barobo National High School	Caraga	Finance and Trade	-	8
Patin-ay National High School	Caraga	Finance and Trade	-	13

Source: "K to 12 PLUS Project"

Note*): In the "K to 12 PLUS Project," a group of students, technical and vocational training institutions (high schools), industry sectors and business groups for specific industrial fields are called "clusters."

Note**): The school is also a target school in the "Project for Supporting Senior High School (SHS) Program in Technical Vocational High Schools" funded by JICA.

Activities differ depending on the target pilot schools and regions, but the main activities are as follows.

- Advice and guidance to education and training programs at schools[78]
- Instructor training (includes training for instructors conducted at companies)
- Advice and guidance to education and training programs at companies
- Training for in-house trainers at companies[79]
- Certification of educational programs by commercial associations and other industry groups[80]
- Promotion of participation in a dual training system for businesses[81]

According to the K to 12 PLUS Project, the K to 12 PLUS Project has not provide equipment for schools due to obsolete equipment and facilities, lack of school budget for maintenance and replacement of consumables, and lack of instructor ability to use equipment and facilities properly.

Continuing from Phase I, Phase II has a budget of about 4.8 million euros, and is implemented from October 2016 until September 2019. The goals, results, and indicators for Phase II are shown in the table below.

Table 6-20 "K to 12 PLUS Project" (Phase II) Goals, Results, Indicators

Goal	Indicators
Philippine chambers of commerce and industry as well as sector associations actively use enhanced framework	・ Regarding training receiving support from the project, at least 220 graduates will be certified by commercial associations. ・ As a result of disseminating lessons learned from the project, ten new technical and vocational training clusters will be

[78] Because the current TESDA courses are extremely subdivided by individually skills, it is being recommended that multiple courses be combined into a single new course.

[79] The German Philippine Chamber of Commerce is providing in-house trainer development training for businesses in the area surrounding the San Pedro Relocation Center National High School (SPRCN). The content is not technical but from management. GPCC is bearing the cost of tuition for participants.

[80] On Cebu, the Cebu Chamber of Commerce and Industry (CCCI) is presenting certificates to students who complete specified programs.

[81] The Philippine Chamber of Commerce is surveying the short-term and long-term merits of having business participate in skills training, and is implementing activities to invite more businesses to participate.

conditions for broad-based dissemination of dual vocational education and training approaches.	established by existing and new partners. ・ From tracer studies, it is certified that students who have received dual-approach education and training have higher employability. ・ Commercial associations and industry groups have successfully advocated for the endorsement of at least two reform proposals.
Results	**Indicators**
1.Existing clusters practice dual education and training approach.	・ Among the 242 students taking part in the pilot course, at least 220 persons having completed grade 12 will receive completion certificates from commercial associations. ・ Relevant parties will monitor the pilot courses, and summarize success cases and challenges in a document.
2.Previous experience is summarized as a manual or policy proposal.	・ The Philippine Chamber of Commerce and Industry will disseminate its experience of the dual education and training approach together with TESDA. ・ In cooperation with local commercial associations and industry groups, the Philippine Chamber of Commerce and Industry will summarize previous experience, such as in-house training implementation and evaluation methods, as a manual or policy proposal. ・ The Philippine Chamber of Commerce and Industry and the Cebu Chamber of Commerce and Industry will prepare to introduce the dual education and training approach to at least 15 local commercial associations
3.Government policy, laws and regulations clearly promote continuation of the dual education and training approach.	・ The Philippine Chamber of Commerce and Industry will collaborate with other commercial associations and industry groups to aim to revise relevant laws and regulations.
4.Commercial associations, industry groups and businesses will improve their ability to implement the dual education and training approach.	・ The Philippine Chamber of Commerce and Industry will secure a source of funding other than project funds, through membership fees, etc. ・ A sustainable funding procurement mechanism will be implemented. ・ At least 50 master trainers (trainers who train trainers) and 100 in-house trainers will be trained.

Source: Prepared by the JICA Survey Team based on application documents for K to 12 PLUS Project (Phase II)

Logistics and agribusiness are scheduled to be added in addition to the target occupations from Phase I. Also, the number of target schools is scheduled to be increased to about 20 schools, including the 9 target schools from Phase I, but details will be decided on through discussions by relevant parties during in the forthcoming scheduled workshop.

(2) United States Agency for International Development

The United States Agency for International Development (USAID) has recently been contributing to the development of higher education in the Philippines through the "Innovative Development Through Entrepreneurship Acceleration Project" (IDEA), the "Higher Education and Productivity Project" (HEPP), and "Science, Technology, Research, and Innovation for Development" (STRIDE). Among these, by the end of 2016, IDEA and HEPP ended, and STRIDE is scheduled

to end halfway through 2018. As of December 2016, USAID has not decided any support in future.

The outlines of IDEA, HEPP, STRIDE, as well as useful experience and lessons learned for the JICA's IHRD cooperation program (idea) and potential project concepts (idea) are presented in the table below.

Table 6-21 IDEA's Outline and Useful Experiences/Lessons Learned

Project name	Innovative Development Through Entrepreneurship Acceleration Project (IDEA)
Project goal	Strengthen university engineering programs from the perspective of fostering an entrepreneurial mindset and culture of entrepreneurship.
Project period	2013 to December 2016
Project budget	15 million US dollars
Target majors and human resources level	Engineering Programs (Departments)
Participating universities	Support was focused on Saint Louis University, the University of the Philippines Diliman School, Batangas State University, San Carlos University, and the Southern Philippine Institute of Science and Technology. Selection criteria for participating universities included whether universities could function as a regional hub, whether universities were initiating an entrepreneurship course, whether universities were interested in participating, etc.
Main activities	①Yearly entrepreneurship symposium, ② entrepreneurial mindset workshops (performance record: 900 participants including students, professors and entrepreneurs), ③ visiting professors from US universities (performance record: 26 professors invited to 16 Philippine universities), ④ Technopreneurship yearly instructor camp (performance record: 120 engineering professors from 64 Philippine universities participated), ⑤ short-term research at UC Berkeley (performance record: 10 Filipino professors), ⑥ submission of CHED recommendation, especially from activity ①-③.
Results	CHED has decided to introduce a Technopreneurship 101 (introductory course) at 539 universities with an engineering course in 2018.
Useful experiences/lessons learned	・Exchanges with overseas universities can help Philippine universities and professors understand dialogue between the industrial and education sectors will lead to improve the quality of education and research, which is the first step toward promoting partnerships between the industrial and education sectors.

Source: Prepared by the JICA Survey Team based on hearing survey

Table 6-22 HEPP's Outline and Useful Experience/Lessons Learned

Project name	Higher Education and Productivity Project (HEPP)
Project goal	Improve the consistency between academic results and the needs of industry, strengthen partnerships between the industry and education sectors, address the skills gap and skill mismatch, and provide the human resources necessary for inclusive growth.
Project period	December 2012 – December 2015
Project budget	1.5 million US dollars
Target majors and human resources level	Management engineering, engineering, tourism, and information technology (these majors were selected because they account for about 50% of entering students)/department programs

Participating universities	Major universities in cities affiliated with the urban development initiative led by USAID were selected as participating universities. Batangas: First Asia Institute of Technology and Humanities, Batangas State University, Lyceum of the Philippines – Batangas、De La Salle Lipa Cagayan de Oro: Xavier University - Ateneo de Cagayan, Liceo de Cagayan University、Mindanao University of Science and Technology, Cagayan de Oro College Phinma Education Network Iloilo: West Visayas State University, Central Philippine University Palawan: Palawan State University, Holy Trinity University, Western Philippines University Bohol: University of Bohol, Bohol Island State University. Holy Name of University Pampanga: Holy Angel University Zamboanga: Ateneo de Zamboanga University, Western Mindanao State University
Main activities	Dialogue among government departments, the industrial sector, universities, and local governments at the national and local level, survey of human resources needs in the industrial sector, analysis of necessary competencies at the entry of business, and curriculum suggestions
Results	The curriculum for the bachelor program in information technology was published by CHED at the end of 2015.
Useful experiences/lessons learned	・For curriculum development, first, the necessary competencies for being hired into full-time employment were made clear. A consultant reviewed the results of interview surveys with companies and other data at a curriculum workshop involving a group of participants from the industrial sector. When businesses from each various field gathered, the cooperation of industry groups was solicited. The results were submitted to the CHED technology panel. In some cases, the technology panel reflected the competencies in the curriculum, and in other cases they did not. ・The industrial sector identified three problems. ① As far as general competence goes, communication skills are weak, students do not like teamwork, and logical thinking skills are weak. ② Specific competence: students can read diagrams but cannot fabricate items based on diagrams. ③ Universities do not have the necessary information to help students select appropriate educational programs. For example, tourism is popular in Bohol, so many students enroll in a four-year tourism course major. However, the majors actually desired by the industrial sector are gardening and landscaping. There is no need for these types of human resources to attend university. ・Universities and the industrial sector do not speak the same language, so there is need for a trusted third party (such as a consultant) to act as matchmaker and translator between the two. ・Advocacy activities to promote companies' participation are needed. Having companies participate in curriculum creation and revision improves the quality of students and cuts down on company training costs following hiring. Companies need to be made to understand the benefits of securing graduates who will contribute to their market power.

Source: Prepared by the JICA Survey Team based on hearing survey

Table 6-23 STRIDE's Outline and Useful Experience/Lessons Learned

Project name	Science, Technology, Research, and Innovation for Development (STRIDE)
Project goal	Spar inclusive growth by promoting research in science and technology
Project period	2013- July 2018
Project budget	1.3 million US dollars
Target majors and human resources level	Researchers
Participating universities	A total of about 130 universities participated in at least one of the STRIDE activities, and about 30 universities participated actively.
Main activities	Subsidies to industry-university joint research projects, scholarships to cutting-edge research activities in the USA, visiting professors from the USA, establishment of an industry-university partnership promotion office, professors' internships in the industrial sector, establishment of a Master's of Professional Science
Useful experience/lessons learned	・Promoting partnerships between industry and universities is not easy. First, steps must be taken to deepen mutual understanding between universities and the industrial sector. STRIDE began with very basic elements. For example, for 3-4 weeks, university professors would be dispatched to train at companies, while company employees would be dispatched to universities to give 1-2 hour lectures to professors and students. ・Posited reasons that joint research between companies and universities does not proceed in the Philippines are a lack of mutual understanding between businesses and universities, a dearth of researchers (PhD holders), a focus on education over research in universities, and a dearth of companies conducting new research and development.

Source: Prepared by the JICA Survey Team based on hearing survey

6-3-3 Relationships with JICA's Potential Support in Future

Based on the reviews of other development partners' activities, the following table summarizes considerations for JICA to support IHRD in the Philippines in future in terms of coordination and cooperation with other development partners' activities.

Table 6-24 Coordination and Cooperation with Other Development Partners' Activities

Development Partner	Project Name	Relationships with JICA's Potential Support
Multilateral Development Partners		
Asian Development Bank (ADB)	Support for the Nationwide Rollout of JobStart Philippines (under preparation: 2017-2021, implementing agencies: local government units)	・ In cases where JICA supports senior high schools (technical and vocational track), schools supported by JICA provides school-side (supply-side) information to the project supported by ADB while receiving information from the project supported by ADB on the labor market and requirements demanded by business (demand-side) and reflecting them in the content of JICA support. This type of partnership contributes to erasing the mismatch between the supply side and the demand side and promoting youth employment.

	Senior High School Support Program (on-going:2014-2019, implementing agencies: DepEd)	・ The program supported by ADB is working on issues on/to which the government is highly prioritized and committed. A progress review of the program which was conducted in December 2016 will identify issues needing further support. In cases where JICA supports senior high schools (technical and vocational track), the review results should be utilized as basic information.
	Facilitating Youth School-to-Work Transition Program (under preparation: 2017-2023, implementing agencies: DOLE, its attached agencies such as TESDA, the Department of Tourism and NEDA)	・ Depending on policy reforms on labor market programs and access to technical and vocational trainings and so on the captioned program will support, there is a possibility that JICA's support for individual schools may be affected, so the contents of policy reform should be monitored.
International Labor Organization (ILO)	・ The ILO was scheduled to support the establishment of DOLE's next employment and labor plan (2017-2021), but they are still waiting for the newly-formed Duterte administration to make preparations, and the support had not begun as of November 2016.	
World Bank (WB)	Skills Towards Employability and Productivity Study (on-going: 2015-2016)	・ The results of the study will be utilized as basic information when JICA supports IHRD in the Philippines[82].
Bilateral Development Partners		
Germany	K to 12 PLUS Project (phase II) (On-going: 2016-2019, major Philippine partners: Philippine Chamber of Commerce and Industry, Cebu Chamber of Commerce and Industry, Bankers' Association of the Philippine)	・ The number of target pilot schools is likely to be increased from the 9 target schools of Phase I to about 20 schools. As of early December 2016, the names of schools to participate in Phase II had not been decided aside from the 9 schools which already took part in Phase I. In cases where JICA supports senior high schools (technical and vocational track), target pilot schools for Phase II and occupations should be confirmed, and overlap should be avoided, or, in case of overlap, partnership strategies should be considered. ・ There are many merits to conducting IHRD in partnership with commercial associations and industry groups – grasping the local labor market, promoting the participation of businesses in education and training, grasping the human resources needs of businesses, and promoting partnerships between industry sectors and educational sectors that go beyond the level of partnerships between individual businesses and schools. On the other hand, as the number of institutions involved increases, interest-related coordination costs are incurred. In addition, to reflect the results of pilot initiatives at the policy level, the thorough participation of government agencies such as the DepED is vital. Ample prior coordination and design will be needed regarding these points.

[82] As of December 2017, the results were being finalized.

United States Agency for International Development (USAID)	Innovative Development Through Entrepreneurship Acceleration Project (completed: 2013-2016)	・ Knowledge and experiences from the project will be utilized in terms of ways of promoting dialogue between industry/business and the education sector such as organizing round table meetings and exchanges of human resources.
	Higher Education and Productivity Project (completed: 2012-2015)	・ Knowledge and experiences from the project will be utilized in terms of ways of promoting dialogue between industry/business and the education sector such as organizing round table meetings and exchanges of human resources.
	Science, Technology, Research, and Innovation for Development (On-going: 2013-2018)	・ Knowledge and experiences from the project will be utilized in terms of promotion of joint research between businesses and universities, and dialogue between the industrial and education sectors such as organizing round table meetings and exchanges of human resources.

Source: Prepared by the JICA Survey Team

Chapter 7 Development Opportunities and JICA's IHRD Cooperation Programs for Industrial Development

7-1 Development Issues and Opportunities

In Chapters 3 outlines the Philippine government's strategies and programs for the expansion of IHRD while in Chapters 4 and 5 an analysis of the current situation and issues is made relating to the educational institutions and technical and vocational training institutions and the companies respectively of industrial human resources. Considering the results of these analyses, development issues and opportunities which both governments will jointly work for to develop IHRD for industry development are sorted out in this chapter.

7-1-1 Issues and Opportunities on Demand Side

(1) Recruitment difficulties in government-supported growth sectors

The Philippine government has formulated the Comprehensive National Industry Strategy, an industry-specific roadmap, and the Manufacturing Resurgence Program to promote industrial development, but at the present time, it is difficult to secure the necessary human resources for some job types.

According to a survey conducted by the National Statistics Office of the Philippines, the most difficult job recruitment categories are engineers and other professionals, skilled workers and specialist assistants in the fields of machinery and electrical equipment, and plant and machine operators and assemblers. These job categories play an important role in the manufacturing industry which is one of the Philippines' priority industries. Japan, which has a comparative advantage in the manufacturing industry, can leverage its knowledge and experience of human resource development in this field.

(2) Learning practical skills for on-site use

There is a shortage of practical skills that can be used at work sites. Theory and practice must be linked by increasing the opportunities not only for classroom learning but also for practical training, actually operating the machines used in companies and expanding on-the-job training in manufacturing processes. In classroom learning, it is necessary to devise ways of studying theories (quality control, etc.) widely used in industry. In addition, the teachers/trainers who teach the students must also constantly update their knowledge of industry trends and the latest technologies.

(3) Clarification of skills by educational level

Most companies require a basic work attitude and basic knowledge and skills when new recruits join the company, but not many companies can clearly define the required manpower skills in further detail. To encourage turning out of the needed human resources in future, industry and companies must strive to stipulate the required manpower skills by educational level, whether senior high school, technical and vocation training institution or university.

(4) Information sharing

Information on educational and training institutions must be shared with industry and companies, to enhance motivation to hire new recruits and boost interest in educational and training institutions. While companies know implicitly what human resources they require, most have no information at all or only fragmentary information about the educational and training institutions, such as what kind of training programs the institutions provide, how the training programs are taught or what kind of human resources they turn out.

(5) Importance of soft skills such as work ethics, attitudes and interpersonal communication skills

It is thought that most companies, in order to meet day-to-day technological and environmental changes, will increasingly place importance on acquiring soft skills rather than learning specific skills before joining the company. In addition, they recognize that specific skills can be learned after joining the company, while soft skills are better acquired beforehand in educational and training institutions. The educational and training institutions must introduce and improve the education content related to work ethics and values, 5S workplace organization methodology, work safety, quality control, and presentation and communication skills.

(6) Promotion of understanding of industry-specific corporate culture and career paths

There is a lack of understanding of industry's unique corporate culture and career paths, such as the focus on the manufacturing floor and the relatively long time required to learn advanced skills or be promoted to managerial level. This is linked to the high turnover rate and difficulty in securing human resources. It results in difficulty to pass on skills within a company and has a negative effect on the creation of a highly skilled and attractive workplace. As part of industry's public relations, industry and companies must work with educational and training institutions to create career plans, provide long-term career counselling and define the required skills and human resource image.

(7) Standardization of on-the-job training (OJT) in educational and training institutions

At present, most companies have low expectations of human resource development in educational and training institutions. Based on this assumption, they take the view that they must develop human resources at their own expense through on-the-job training (OJT) after recruitment. The detailed content of OJT is not clear, but Philippine companies with a deep talent pool and long-established companies implement OJT systematically to a certain degree, while OJT in other companies is thought to be nothing more than on-the-spot advice whenever a problem arises. Either way, OJT is a short-term cost for companies and if the training programs in educational and training institutions can be upgraded and part of the OJT content can be provided through regular training in educational and training institutions, it will be mutually beneficial to the companies and to the educational and training institutions.

(8) Industrial development and human resource development in rural areas

The correction of regional social and economic inequality in the Philippines is a major policy issue for the Philippine government and the issue has been raised as an important theme in Philippine national development plans. Regions with the most substantial disparity are concentrated in Mindanao and Visayas, but as the main industry in these regions is primary industries, economic activities are at the mercy of natural conditions and global market trends. In addition, in many cases employment opportunities are limited and workers are forced to accept unstable hiring conditions.

Unlike industrial human resource development in regions where industry is already clustered to a certain degree, such regions require support for industrial development and promotion of value adding for primary products as well as development of industrial human resources.

7-1-2 Issues and opportunities on the supply side

(1) Deepening dialogue with industry

Even if opportunities for dialogue with industry, companies and educational and training institutions are ensured by the curriculum review committees in universities and technical and vocational training institutions, as far as can be judged from the scale of participation by industry and companies, the participating members and the content of the discussions, in some cases only superficial or limited dialogue appears to take place. Furthermore, the K to 12 Program was only introduced in high schools in 2016 and many schools are having difficulty in obtaining places for workplace experience obligated under the program. What is needed above all is to deepen mutual understanding with industry, companies and educational and training institutions through, on one hand, accepting instructors/trainers from industry and companies, while on the other hand increasing opportunities for dialogue between teachers/trainers and

industry/companies and providing teachers with opportunities for company visits and corporate training. Moreover, strengthening of the facilitation function of educational and training institutions is necessary to bridge the gap between the way of thinking on the industry side and the way of thinking on the university side.

(2) Reflection of the needs of industry in education content

It is likely that the needs of industry and companies are not fully reflected in education content due to the lack of recognition of the need for dialogue with industry and companies on the part of administrators and teachers/trainers in educational and training institutions, lack of recognition of the required skills and lack of reflection of such skills in educational outcomes. The processes of defining competence at the time of recruitment, as well as its reflection in educational outcomes and education content in educational and training institutions must be systematized based on intensified dialogue with companies and industry. To achieve this, it is necessary to cultivate the required human resources and organization in charge.

(3) Provision of opportunities and incentives for teachers/trainers to update their knowledge

Due to the limited time devoted by teachers/trainers to training and the few companies that accept training, opportunities for teachers/trainers to update their knowledge are limited. As well as intensifying dialogue with industry and companies and increasing opportunities for participation in company visits and trainings, efforts must be made to improve the motivation of teachers/trainers by introducing a teacher/trainer assessment system that reflects the student employment rate and updating of knowledge by corporate training and encouraging feedback from students on creative lessons and teaching methods.

(4) Securing facilities and equipment in both quality and quantity

For students to demonstrate the necessary professional skills after graduation, educational and training institutions need facilities and equipment that will enable students to develop the ability to apply theory to practical work. However, due to the limited government budget, it is especially difficult for public educational and training institutions to secure the necessary facilities and equipment. While on the one hand technology is advancing from day to day, even with a huge budget it would not be realistic for educational and training institutions to keep upgrading their facilities and equipment in conformity with technological progress. Educational and training institutions must consider what facilities and equipment they should have, based on a review carried out jointly with industry and companies of how these related institutions will equip students with the required skills by the time they join a company.

(5) Strengthening career guidance and employment support services

The provision of career guidance and employment support is a new undertaking in the Philippines; few educational and training institutions provide appropriate services. It is necessary to provide students with information and advice on labor supply and demand, skills required in the workplace, career development in the workplace, and choice of educational programs and careers.

7-2 Analysis on the focal areas for JICA's Cooperation Program on IHRD for Industry Development (idea)

In this section, the industries are analyzed to identify the ones with growth potential as well as job creation impact to accelerate Philippines' economic growth for JICA to support the IHRD in the Philippines.

7-2-1 Methodologies

The Survey team shall screen the industries with three filters as explained below.

[First Filter]

The Philippine's industrial and economic development strategies and plans are reviewed to identify the priority industries.

[Second Filter]

Whether the priority industries selected in the first filter can demonstrate "Necessity of the support" is examined quantitatively and qualitatively. For the former, each industry's numerical indicators such as GDP, trade index, comparison with other ASEAN countries are examined to see the growth potential, as well as its present/future labor demand. For the latter, we looked if the said industry is required to have more skilled workforce to deal with the changes and development in the market and if its IHRD could contribute to the development of ŧhe local industries.

(1) Quantitative Analysis

For quantitative analysis, we focused on

(i) Growth potential

- Compound Annual Growth Rate (CAGR)[83] for each industry's GDP contribution
- Strength in trade using average International Competitiveness Index
- Comparative Advantages within ASEAN using Revealed Comparative Advantage (RCA)

83 Compound annual growth rate (CAGR) is used to provide a smoothed growth rate considering the beginning and final value.

(ii) Labor demand

- Present
- Future

(2) Qualitative Analysis

As regards to the qualitative analysis, we looked at the following.

(i) Quality requirements:

To see if the quality human resources are required to support the identified industries' HRD due to the variables such as technology development (automation), ASEAN market integration, as well as emerging market demand such as the ones required by environment protection, etc. It is important to understand that, as the history shows, the economic growth shall bring the transition from labor-intensive to capital-intensive industries, the manufacturing to service industries as well as the demand for higher skilled labor force.

(ii) Local industry promotion

To see if local government units (LGUs) in Cebu and Davao have identified them as their KEG (key employment generation) industries.

[Third Filter]

Comparative advantage of Japan's support is the criteria. Once the growth potential identified, these industries are screened with the lens of consistency with Japan's ODA policies and, Japan's strengths.

7-2-2 First Filter

The prioritized industries were identified with looking through the following policies, plans and strategies exercised by the Philippines government.

- The Philippine Development Plan 2011 to 2016
- Comprehensive National Industrial Strategy
- Investments Priorities Plan of 2011 to 2016
- Industry Roadmaps
- Manufacturing Resurgence Plan (the MRP)
- Key Employment Generating(KEG) Industries

As a result, it is found that the industry categories shown below are prioritized by the government, to be assessed with this survey.

Table 7-1 Priority Industries for the Government to Support

Industry categories
Agriculture, fishery and forestry
Mining
Construction
Real estate and business services
Wholesale/Retails
Tourism
Financial intermediate
Transportation/Logistics/Trade
BPO/ICT

Industry Categories	
Light industry	Food products
	Garment /Textile etc.
	Furniture and fixtures, wood, bamboo, paper, consumer goods etc
Heavy industry	Electronics/Electric
	Machinery
	Transport machinery
	Chemical
	Metal engineering

Source: Prepared by the JICA Survey Team

7-2-3 Second Filter: Quantitative Analysis

(1) CAGR for GDP

The contribution of the overall manufacturing industry to the total GDP was 7.7% in 2015, down from the previous year by 0.4%, while the service industry remains the biggest contributor with 56.7%, thanks to BPO/ICT's solid growth.

Table 7-2 GDP Contribution by Key Industries (constant 2000 prices in million pesos)

	2008	2009	2010	2011	2012	2013	2014	2015	2008-15 CAGR
Agriculture and Fishing, Forestry	668,550	663,744	662,665	679,835	698,978	706,586	717,824	719,323	1.05%
Mining and Quarrying	50,926	59,130	65,898	70,509	72,047	72,895	76,474	75,444	5.78%
Manufacturing	1,194,921	1,137,534	1,264,523	1,324,330	1,395,711	1,538,912	1,666,514	1,762,103	5.71%
Construction	266,751	284,994	325,820	294,564	348,262	384,108	422,150	459,586	8.08%
Electricity, Gas and Water	186,572	184,943	203,274	204,547	215,423	223,209	229,555	240,625	3.70%
Transportation, Communication and Storage	423,952	423,398	427,766	446,026	476,855	505,415	536,562	579,054	4.55%
Trade & Repair of Motor Vehicles, Personal & Hhld Goods	863,732	875,616	948,743	981,022	1,055,672	1,121,102	1,184,994	1,266,656	5.62%
Finance Intermediation	322,672	340,329	374,716	394,371	426,787	480,683	515,484	545,076	7.78%
Real Estate, Renting & Business Activity	526,116	547,866	588,947	638,244	678,898	738,788	803,241	861,581	7.30%
Public Admin & Defense, Compulsary Social Security	227,223	241,009	255,087	259,962	274,870	282,323	292,441	294,229	3.76%
Other Services	505,683	538,677	584,100	616,791	661,725	696,058	718,777	776,263	6.31%

Source: PSA Gross National Income and Gross Domestic Product by Type of Valuation, Industrial Origin and 2014 (http://countrystat.psa.gov.ph/selection.asp)

To identify the growth potential, we looked at Compound Annual Growth Rate (CAGR) of each industry's GDP contribution in the past 9 years from 2008 to 2015. CAGR was used since what is included in the data in each category varies depending on the source, and therefore, it was not possible to use the volume for the comparison. In addition, the data availability was a big issue for the survey, which is the reason why we had to limit the period of the analysis to 9 years. Under the circumstances, the different statistics had to be used to obtain the necessary data, mainly from PSA for overall data, DTI industry roadmap for BPO/ICT, UNstats for Wholesale/Retails, which did not have the data for 2015, so the duration is from 2007 to 2014. The currency units are US dollars for the latter two, however, since we use CAGR, it does not affect the outcome.

Table 7-3 CAGR for GDP Contribution

Industry	CAGR		CAGR
BPO/ICT	19.48%	Transportation/Logistics/Trade	5.62%
Furniture and fixtures, wood, bamboo, paper, consumer goods etc.	12.01%	Metal engineering	5.57%
Tourism	10.76%	Electronics/Electric	5.21%
Wholesale/Retails	8.20%	Transport machinary	5.10%
Construction	8.08%	Food products	4.46%
Finance intermedite	7.78%	Machinery	4.31%
Real estate and business services	7.30%	Agriculture, fishery and forestry	1.05%
Chemical	5.93%	Garment /Textile etc.	-1.74%
Mining	5.78%		

Source: Prepared by the JICA Survey Team

The highest CAGR for GDP contribution growth is 'BPO/ICT', 19.5%, followed by 'Tourism' 10.76%, 'Wholesale/Retails' 8.2%, 'Financial intermediate' 7.8%, 'Real estate and business services' 7.3%. 'Construction' shows strong growth of 8.1% in reflection of the many construction projects to improve the infrastructure in the Philippines. The biggest CAGR in the manufacturing industries was recorded by 'Furniture and fixtures, wood, bamboo, paper, consumer goods etc.', 12.01%, followed by 'Chemical' 5.93%, 'Metal Engineering' 5.57%, 'Electronics/ Electric' 5.21%, 'Transport machinery' 5.1% and 'Transportation/Logistics/Trade' 4.6%. 'Food products' records at 4.46%. The ones for the Primary industries such as 'the agriculture, fishery and fishery' and 'Mining' are 1.1% and 5.8% respectively. The only negative CAGR was recorded by 'Garment/Textile etc.', -1.74%.

(2) Import/export balance: average Industry Competitiveness Index

Philippine's export trend is not steadily upward, with positive and negative growth coming in turn. It is partly because its agriproducts are highly affected by the weather conditions. The growth driver of Philippine's export has been the manufacturing industries such as 'Machinery and Electronics', 'Capital goods' and 'Consumer goods'. However, when looking at it closely, the net trade (export-import) shows that even these categories are not particularly strong. The ones for 'Electronics', 'Chemicals/Plastic/Rubber', 'Consumer goods', 'Food Products', 'Fuels Metals/Minerals/Stones', 'Raw materials', 'Transport' are all negative' due to its increasing import value. (The import exceeds the export)

Source: Prepared by the JICA Survey Team based on the IMF data

Figure 7-1 Transition of the Export Volume

It illustrates that these industries depend on the import of the raw materials for the processing, which is only contributing to value added, as can be seen in electronics and chemical industries. On the other hand, both the export and the value added to GDP are growing for the materials such as wood, bamboo, cane, rattan, though small.

To grasp the whole picture, we employed the concept of international competitiveness index, i.e., export- import/export + import, that scores from '-1' (weak) to '+1' (strong), to see the competitiveness of each industry. The overall figures were obtained from the World Bank's WITS, while the import and export for the service industry from ASEAN.org.

Table 7-4 International Competitiveness Index (average)

Industry	Internatinal Competitiveness Index	Industry	Internatinal Competitiveness Index
BPO/ICT	**0.7**	Tourism	**-0.3**
Garment/ Textile etc.	**0.1**	Transport machinery	**-0.3**
Electronics/Electric	**0.1**	Transportation/Logistics/Trade	**-0.4**
Machinery	**0.1**	Metal engineering	**-0.4**
Construction	**0.1**	Mining	**-0.5**
Agriculture, fishery and forestry	**0.0**	Chemicals	**-0.5**
Furniture and fixtures, wood, bamboo, paper, consumer goods etc.	**-0.1**	Financial intermediate	**-0.7**
Food products	**-0.2**		

Source: Prepared by the JICA Survey Team based on the data from WB WITS and ASEAN.Org

As can be seen, most industries whose products are traded in international markets have either negative or small positive scores. ,Among them, 'Electronics and Machinery's is the best with score 0.1 while "Mining (fuels, metals, minerals)" and 'Chemicals' have the worst, -0.5. In trade in services, "BPO/ICT (Telecommunications, computer, and information services)" has the highest score, 0.7, and 'Construction', 0.1. 'Financial Intermediate' scored the worst, -0.7.

(3) Comparative Advantages within ASEAN: Revealed Comparative Advantage (RCA)

Under the more and more deeply intertwined industry structures, the industries' growth potential cannot be discussed without identifying the comparative advantages among ASEAN countries, and it is important to find out which industry sector in a country has more growth potential than the others.

According to the report of the International Monetary Fund (IMF)[84], indirect services that support the industry sectors, such as R&D, IP rights, legal systems and risk management for all, are determining comparative advantages. The high Revealed Comparative Advantage (RCA) signifies these indirect services are well developed. For example, "In Asia's case, part of the success in the electronics and transportation equipment sectors in Japan and Korea is indeed driven by a high revealed comparative advantage (RCA) in indirect services that support these

[84] 'World Economic and Financial Surveys: Regional Economic Outlook', IMF, April 2016.

sectors[85]"

The research assessed 13 Asian and Pacific Region countries, i.e., Australia, Japan, Korea, New Zealand, China, Taiwan, Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore and Thailand. Vietnam was not included in the research. The Score of the RCA in the ASEAN5 (Due to the absence of Vietnam, Singapore was listed as one of the ASEAN5), is as below.

'Electronics', 'Transport machinery' and 'Wholesale/ Retail' are ranked the 1st among ASEAN5. The Philippines is actually ranked top in 'Electronics' and the second in "Wholesale/ Retail" next to Hong Kong among the 13. 'Financial Intermediates' and 'Business services' such as real estate ranked the 2nd while 'Food products', 'Chemical', 'Basic Metal (mining)' and 'Other manufacturing' including machinery as the 5th. Garment/Textile is ranked as 3rd reflecting Philippine's strong growth in its domestic market.

Table 7-5 RCA Score for ASEAN 5

RANKING	Food Products	Textiles	Chemicals	Basic Metals (Mining)	Electronics	Transport Machinery	Machinery /Metal Enginrg equipmt (Other)	Light industry Manufacturing (Other)	Wholesale, Retail	Transportation/logistics/Trade	Financial Intermediate	Real Estate /Business Services
Indonesia	1	1	3	1	3	1	1	2	5	3	4	2
Malaysia	3	4	1	3	4	5	2	4	4	4	3	2
Philippines	**5**	**3**	**5**	**5**	**1**	**1**	**5**	**5**	**1**	**5**	**2**	**2**
Singapore	4	5	2	3	5	3	3	3	3	2	1	1
Thailand	2	2	4	2	2	3	4	1	2	1	5	5

RANKING	BPO/ICT	Tourism	Construction
Indonesia	3	3	1
Malaysia	2	5	3
Philippines	**1**	**2**	**4**
Singapore	5	4	5
Thailand	4	1	2

Source: Prepared by the JICA Survey Team based on the IMF report

Since BPO/ICT, Tourism and Construction were not specifically assessed in this research, the other data source was used, BPO/ICT from UNCTAD[86], Tourism from ASEAN Tourism Statistics Database[87] and construction from Building Radar GmbH[88], respectively. CAGR for the former two and growth rate forecast from 2014-2019 for the last were used instead of RCA.

[85] p39, ibid.,
[86] International Trade in Related the services: Computer and information, annual, 2003-2012 (http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx)
[87] Tourist Arrivals' in ASEAN as of 30 September 2015
[88] Growth of Construction Spending in 2014-2019 (https://buildingradar.com/construction-blog/asian-construction-market-forecast-from-2015-2020/)

(4) Labor Demand; Present and Future

[Present]

Through the Project JobsFit of DOLE and the consultations of the TESDA regional offices, the projected demand per region per sector for three years from 2014 to 2016 was calculated.

Table 7-6 Labor Demand for the Key Industry

Industry	Head counts in thousand
BPO/ICT	727
Construction	249
Tourism	208
Food products	150
Manufacturing	69
Electronics/Electric	25
Transportation/Logistics/Trade	21
Transport machinery	20
Metal engineering	20
Wholesale/ Retails	18
Garment /Textile etc.	17
Mining	3
TOTAL	1458

Source: Prepared by the JICA Survey Team based on DOLE data

BPO/ICT has the biggest demand for HR, 727k headcounts followed by "Infrastructure /Construction", 246k headcounts. Tourism is at the 3rd with 208k headcounts demand, 150k headcounts is demanded for Agribusiness. The manufacturing excluding Electronics industry comes as the 6th, 69K headcounts, and Electronics the 8th with 25k headcounts, both the strongest demand in Calabarzon and Davao Region.

[Future]

ADB and ILO, in its report[89], employed the computable general equilibrium (CGE) model to assess the labor market impact of ASEAN economic integration, to provide the forecast for the share of workforce by industry by 2025. Scenario (II) illustrates the forecast.

The CGE model is based on the factors including, but not limited to, industries' monopolistic competition, their structure of production and trade, income distribution, spending, resource constraints, aggregate capital stock, skilled and unskilled labor force supply.

[89] ASEAN Community 2015: Managing integration for better jobs and shared prosperity, ILO and ADB, 2014

Table 7-7 Employment by Sector as a Share of Total Employment Comparison between 2010 Baseline and 2025 Forecast

Industry	2010 Baseline (I)	2025 (II)	II-I
Agriculture and Fishing, Forestry	34.8	29	-5.8
Textile /Garment	0.8	0.7	-0.1
Chemicals	1.1	0.9	-0.2
Construction	5.6	7.1	1.5
Electronics/electric	1.8	2.1	0.3
Food Products	2.1	2.4	0.3
Machinery	0.8	0.6	-0.2
Metals Engineering	0.6	0.4	-0.2
Mining	0.5	0.4	-0.1
Other manufacturing	0.5	0.4	-0.1
Utilities	0.6	0.6	0.0
Transport equipment	0.5	0.6	0.1
Furniture and fixtures, wood, bamboo, paper, consumer goods etc.	0.9	0.7	-0.2
Transportation/Logistics/Trade	28.3	32.7	4.4
Private services	8.7	10	1.3
Total	100	100	

Source: Prepared by the JICA Survey Team based on ADB ILO report

Although the categorization is not exactly the same between PSA's actual employment data and CGE and we cannot compute exact figures except a few, we can see the trend of human resources in coming 10 years.

Table 7-8 The Number of the Employed by Industry in 2015

Number of the Employed by Industry (thousand)

Industry	2015
Agriculure, fishery and forestory	11,404
Wholesale and retail trade, repaire of Motor Vehicles and Motorcycle	7,249
Manufacturing	3,313
Transportation and storage	2,738
Construction	2,556
Other service Activities	2,188
Tourism	1,811
Administrative and Suport Service Activities	1,077
Infomrmation and Communication	345
Mining	225

Source: Prepared by the JICA Survey Team based on PSA data

Ignoring the population growth rate just to simplify, the number of employed in the agriculture is expected to fall by 5.8%, therefore 661k (11,404k x -5.8%) is forced to move to other sectors, while Construction will increase by1.5%, which would generate 38k more jobs. The biggest

increase is expected for ‘Transportation/Logistics/Trade, 4.4%, therefore the logistics service alone would generate 120k jobs (Transport and storage; 2,738k x 4.4%).

7-2-4 Second Filter: Qualitative Analysis

(1) Quality requirements (scored as yes=1, no=0)

We set the score ‘1’ for positive and ‘0’ for negative.

According to ILO’s research[90], all of industries except ‘Real estate and business services’, ‘Furniture and fixtures, wood, bamboo, paper, consumer goods’ and ‘Metal engineering’ would be expected to generate new occupation due to technology development, market demands as well as the establishment of the AEC.

ILO specifically pointed out that manufacturing industries, such as ‘Automotive’, ‘Electronics’, ‘Garment/Textile’ as well as service industries such as ‘BPO/ICT’ and ‘Wholesale/Retails’ would require skilled jobs to remain competitive against technology advancement. In addition, the Employees Workshop held in Davao concluded that the Agriculture, Mining, Construction, Financial intermediate, Tourism, BPO/ICT needs to address the same factors mentioned above.

(2) Local industry promotion (scored as yes=1, no=0)

Agriculture, Forestry and Fishery, Mining, Construction, Wholesale/Retails, Tourism, Food products, Electronics/ Electric and BPO/ICT are all the subjects of local industry development policies.

The table below summarizes the analyses in terms of consistency with Philippine's industrial policies and necessity of the support[91].

[90] ASEAN IN TRANSFORMATION: HOW TECHNOLOGY IS CHANGING JOBS AND ENTERPRISES, International Labour Organization 2016

[91] 1)Regarding 'Real estate and business services' and 'Retail/Wholesale', the import and export is not applicable, therefore, International Competitiveness Index is not applicable. 2)Agriculture was not considered 'competitive' by ADB/ILO, therefore is treated as lower rank than the others, and scored '6'

Table 7-9 Summary of the Analyses with Consistency with Philippine's Industrial Policies and Necessity of the Support

No	Industry categories		1. Consistency with Philippine's industry policy	2. Necessity of the support: Quantitative Analysis					:Qualitative Analysis	
				(1)Growth potential			(2)Labor demand		(3) Quality requirements Yes=1 No=0	(4) Local industry promotion Yes=1 No=0
				CAGR for GDP from 2008-15	Average Industry Competitiveness Index 2011-2015	Competitiveness in ASEAN 5	Present (no of HC in ,000 demand from '13-'16)	Future (% increased from 2010 to 2025)		
1	Agriculture, fishery and forestry		Yes	1.1	0.0	6	Small	-5.8	1	1
2	Mining		Yes	5.8	-0.5	5	3	-0.1	1	1
3	Construction		Yes	8.1	0.1	4	249	1.5	1	0
4	Real estate and business services		Yes	7.3	-*	2	Small	1.3	0	0
5	Wholesale/Retails		Yes	8.2	-*	1	18	1.3	1	0
6	Tourism		Yes	10.8	-0.3	2	208	1.3	1	1
7	Financial intermediate		Yes	7.8	-0.7	2	small	1.3	1	0
8	Transportation/Logistics/Trade		Yes	4.6	-0.4	5	21	4.4	1	0
9	Light industry	Food products	Yes	4.5	-0.2	5	150	0.3	1	1
		Garment /Textile etc.	Yes	-1.7	0.1	3	17	-0.1	1	1
		Furniture and fixtures, wood, bamboo, paper, consumer goods etc	Yes	12.0	-0.1	5	Small	0.2	1	1
10	Heavy industry	Electronics/Electric	Yes	5.2	0.1	1	25	0.3	1	1
		Machinery	Yes	4.3	0.1	5	small	-0.2	1	0
		Transport machinery	Yes	5.1	-0.3	1	20	0.1	1	1
		Chemical	Yes	5.9	-0.5	5	small	-0.2	0	0
		Metal engineering	Yes	5.6	-0.4	5	19.64	-0.2	0	0
11	BPO/ICT		Yes	19.5	0.7	1	727	1.3	1	1

Source: Prepared by the JICA Survey Team

Table 7-10 Summary of the Analyses with Consistency with Philippine's Industrial Policies and Necessity of the Project (Ranking)

No	Industry categories		1. Consistency with Philippine's industry policy	2. Necessity of the support: Quantitative Analysis					:Qualitative Analysis		Scores	Raking
				(1)Growth potential			(2)Labor demand		(3) Quality requirements Yes=1 No=0	(4) Local industry promotion Yes=1 No=0		
				CAGR for GDP from 2008-15	Average Industry Competitiveness Index 2011-2015	Competitiveness in ASEAN 5	Present (no of HC in ,000 demand from '13-'16)	Future (% increased from 2010 to 2025)				
1	Agriculture, fishery and forestry		Yes	16	6	6**	12	17	1	1	59	15
2	Mining		Yes	9	14	5	11	12	1	1	53	13
3	Construction		Yes	5	5	5	2	2	1	2	22	2
4	Real estate and business services		Yes	7	-*	2	12	3	2	2	-*	-*
5	Wholesale/Retails		Yes	4	-*	1	9	3	1	2	-*	-*
6	Tourism		Yes	3	9	3	3	3	1	1	23	3
7	Financial intermediate		Yes	6	15	2	15	3	1	2	44	9
8	Transportation/Logistics/Trade		Yes	13	12	5	6	1	1	2	40	6
9	Light industry	Food products	Yes	14	8	5	4	8	1	1	41	7
		Garment /Textile etc.	Yes	17	2	3	10	12	1	1	46	10
		Furniture and fixtures, wood, bamboo, paper, consumer goods etc	Yes	2	7	5	12	10	1	1	38	5
10	Heavy industry	Electronics/Electric	Yes	11	3	1	5	8	1	1	30	4
		Machinery	Yes	15	3	5	12	14	1	2	52	11
		Transport machinery	Yes	12	10	1	7	11	1	1	43	8
		Chemical	Yes	8	13	5	12	14	2	2	56	14
		Metal engineering	Yes	10	11	5	8	14	2	2	52	11
11	BPO/ICT		Yes	1	1	2	1	3	1	1	10	1

Source: Prepared by the JICA Survey Team based on DOLE data

As a result, the industry potential ranking Top 10 was as below.

1. BPO/ICT
2. Construction
3. Tourism
4. Electronics/Electric
5. Furniture and fixtures, Wood, bamboo, paper, consumer goods etc
6. Transportation/Logistics/Trade
7. Food products
8. Transport machinery (Automotive, shipbuilding, aerospace)
9. Financial Intermediate
10. Garment/Textile

As the next step, we examine whether these 10 industries are appropriate for Japan's support.

7-2-5 Third Filter: Comparative advantages of Japan's support

(1) The consistency of Japan's ODA policy

Through a perspective of the consistency of ODA's policy to the Philippines, the validity of Japan's support for the industries above was assessed. The consistency of Japan's ODA policy was referred to the Country Assistance Policy and Rolling Plan for Philippines.

(2) Japan's strengths

Japan's development process shows its copious knowledge and experience in the area of promoting and advancing agricultural forestry industries and fisheries, promoting science technology, manufacturing technology and measuring against natural disaster. Japan's past supports to the Philippines are also considered to assess Japan's strength.

As a result of the analysis by the third filter shown in the table below, 10 industries were narrowed down to three industries: electronics/electronic, transport machinery, and food products.

Table 7-11 Results of Analysis for Validity of Japan's Support

Industry categories		Comparative advantages of Japan's support	
		(1)Consistency with Japan's ODA policies	(2)Japan's strengths
Construction			
Tourism			
Transportation/Logistics/Trade		✓	
Financial intermediate			
Light industry	Food products	✓	○
	Garment /Textile etc.	✓	
	Furniture and fixtures, wood, bamboo, paper, consumer goods etc.		
Heavy industry	Electronics/Electric	✓	◎
	Transport machinery	✓	◎
BPO/ICT		✓	

Source: Prepared by the JICA survey team

This survey is aimed at development of the industrial human resources necessary to spur industrial growth to strengthen competitiveness and promote entry into the global supply chain, so there will be a need to provide necessary support for industry sectors which will be able to be/is incorporated into global supply chain. We use a term of "Global Supply Chain where the different stages of the production process are located across different countries, as defined by OECD[92].

With the definition, electronics/electronic and transport machinery such as automobile, and food products, which were narrowed down in the analysis above are typical example of GVC industries. Making a product, multi-layered production processes and procurement activities are interconnected across different countries and markets.

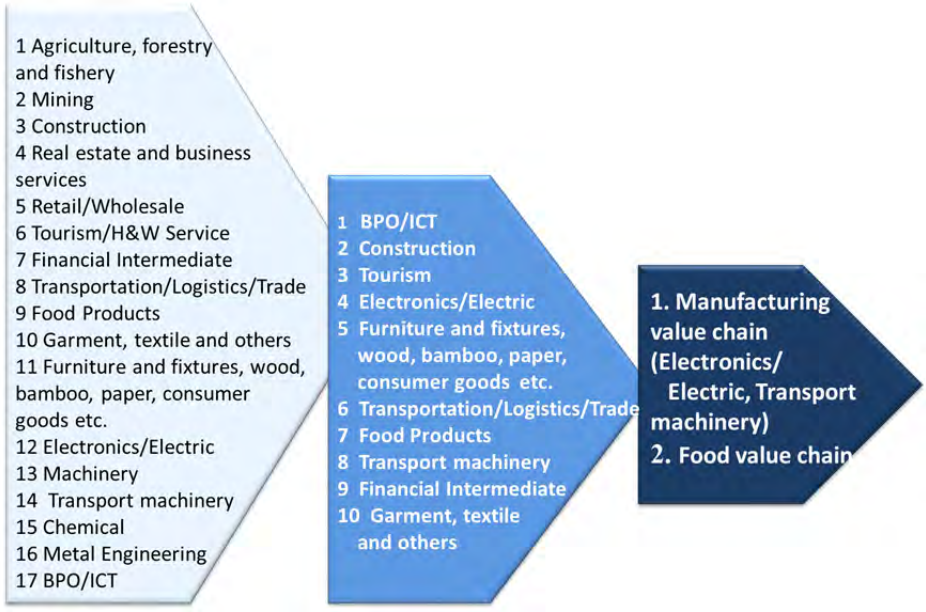
In addition, to strengthen competitiveness of industry, it is necessary to dynamically participate in global value chain. Therefore, to support development of industrial human resources for the development of Philippine industry, the suggested support areas are the manufacturing value chain (electronics/electronic, transport machinery), and the food value chain including the downstream and upstream industries.

[92] https://www.oecd.org/sti/ind/global-value-chains.htm

7-2-6 Conclusion

Focal industries were narrowed down using three filters (consistency with Philippine national industry/economic development strategy/plan, necessity for support, comparative advantages of Japan's support) to support IHRD to spur industry development in the Philippines. The first filter selected 17 industrial sectors, and the second filter reduced the number of industrial sectors to 10 based on the necessity of support (potential for growth, demand for labor, need for higher degree of skilled human resources and boosting local industry). Following this, the third filter selected 2 value chains (manufacturing value chain such as electronics / electric and transport machinery and food value chain) from the 10 industrial sectors remaining based on the comparative advantages of Japan's support (consistency of Japan's ODA policy and, Japan's strength).

The analysis also took into account the meaning of the survey that is development of the industrial human resources necessary to spur industrial growth to strengthen competitiveness and promote entry into the global supply chain.



Source: Prepared by the JICA Survey Team

Figure 7-2 Process to Identify Focal Industries

7-3 Proposal of JICA's IHRD Cooperation Program for Industrial Development (idea)

Based on the results of analysis from Chapter 1 until this point and discussions with the persons concerned, the following JICA's medium and long-term IHRD cooperation program (idea) is proposed.

(1) Policies and measures on development issues and opportunities

The cooperation program will pursue a two-sided approach through development of advanced human resources for high-growth industries in urban areas, and development of human resources who will contribute to sustained regional development aimed at expanding decent work in rural areas.

(2) Tentative name

The JICA's medium and long-term IHRD cooperation program for industrial development is tentatively entitled the Industrial Development and Human Resource Development Program.

(3) Objective

The Industrial Development and Human Resource Development Program (tentative name) will support development of human resources who will contribute to the development of important industries from the perspective of boosting competitiveness and promoting participation in the global supply chain.

(4) Outline

At the present time there is a mismatch in the Philippines between the content and level of education and training for development of human resources, and the labor market situation and industry needs, and the human resources necessary for industrial development, therefore, have not been supplied. Under the Industrial Development and Human Resource Development Program (tentative name), the quality and skills of human resources required in high growth industrial fields will be specified, cooperation with key relevant institutions will be strengthened and a strategic demand-led human resource development model will be developed and supported.

(5) Expected outcomes and approaches

The expected outcomes of implementing the cooperation program are as follows.

1. Industrial human resource development models based on cooperation with the private sector that appropriately reflect labor market situation and industry needs will be established and disseminated.
2. Employability of young people (especially at senior high schools and technical vocational institutions) will be strengthened.
3. Human resources linked to industries that will create decent work in rural areas will be developed.

The following approaches are proposed to achieve these outcomes.

Table 7-12 Expected Outcomes and Approaches

Expected outcome	Approach to achieve the outcome
1. Establishing and dissemination of industrial human resource development models based on cooperation with the private sector that appropriately reflect labor market situation and industry needs	(1) The skills and level of human resources required in Special Economic Zones with high-potential industries and high concentration of advanced human resources will be clearly defined. To satisfy the human resource needs, an advanced human resources vocational training model will be formulated, tested and disseminated with the strategic participation of companies (and industry organizations) that will be the employers, universities and technical education institutions that will cultivate the human resources, and students who will pursue a career in growth industries. Promotion of dialogue with industry, companies, universities and technical education institutions and improvement of education content can be expected through this process.
	(2) Opportunities for industry-university interaction will be increased aimed at improving the mismatch of skills, and promotion of diverse industry-university cooperation activities will be supported, such as participation by companies in reviews of the engineering curriculum in universities, courses endowed by companies and acceptance of company visits. As well as cultivating human resources with a high degree of expertise who will play a role in technical innovation and technical R&D, development of human resources with knowledge of both technology development and business management who possess advanced management skills and can make appropriate decisions for the organization will be pursued.
2. Enhanced employability of the youth (especially at senior high schools and technical vocational institutions)	Capacity-building of school principals and teachers through high school programs (Technical-Vocational- Livelihood track) in collaboration with local industry, and development of technical and vocational training course curricula (including local industry surveys, factory visits and work experience) to meet the needs of local industry will be supported. Counselling, aptitude testing and job guidance will also be provided in addition to vocational training to enhance employability. Knowledge and experience gained from prior projects will be leveraged at this time.
3. Human resource development linked to industries that create decent work in rural areas	Industrial promotion activities platformed on industry clusters developed and strengthened through initiatives so far will be implemented, contributing to further development of the industry clusters. Participation in the global value chain will be supported through improved productivity, human resource development and creation of high value-added products, leading to job creation and promotion of exports and FDI by contributing to improved competitiveness of industry, and contributing to industrial development in rural areas.

Source: Prepared by the JICA Survey Team

The cooperation program (idea) assumes multilevel targets such as, in the area of human resources, advanced human resources, human resources with elementary and intermediate level skills,

industrial development in rural areas and the human resources required for such development; in the area of educational and training institutions this includes universities, technical and vocational training schools and high schools. There is no order of priority between the approaches and they all have uniformly high priority. However, strengthening of the management skills of educational and training institutions which is included in a number of the approaches is a basic constituent element of the approaches and should be implemented first.

(6) Relationship with current cooperation programs

Current cooperation programs related to the Industrial Development and Human Resource Development Program (tentative name) are the Investment Climate Improvement Program, Ensuring Food Security Program and Safety Net Program. The relationship of the Industrial Development and Human Resource Development Program (tentative name) with these current cooperation programs is as described below.

Investment Climate Improvement Program

To achieve sustained economic growth that will bring job creation, together with improving the investment environment, development of human resources suited to the needs of industry is indispensable. For example, development of the human resources required in the Special Economic Zones with high-potential industries and high concentration of advanced human resources under the Industrial Development and Human Resource Development Program (tentative name) can contribute to further expansion of domestic and foreign direct investment and promotion of participation by local companies in the global supply chain. Furthermore, the knowledge and information on industrial trends and human resource needs obtained through the establishment of laws, systems and industrial promotion policies in the Investment Climate Improvement Program can be directly leveraged in the development of industrial human resources.

Ensuring Food Security Program

Management guidance and capacity building of farmers' associations in rural areas, quality control of agricultural, forestry and fishery products, development of new products, and upgrading of marketing, processing and distribution processes will be promoted, contributing to increased productivity of agricultural, forestry and fishery products and distribution of diverse products. In addition, a synergy effect between the programs can be expected by supporting the industrial fields targeted in the Ensuring Food Security Program from the perspective of human resource development in the Industrial Development and Human Resource Development Program (tentative name).

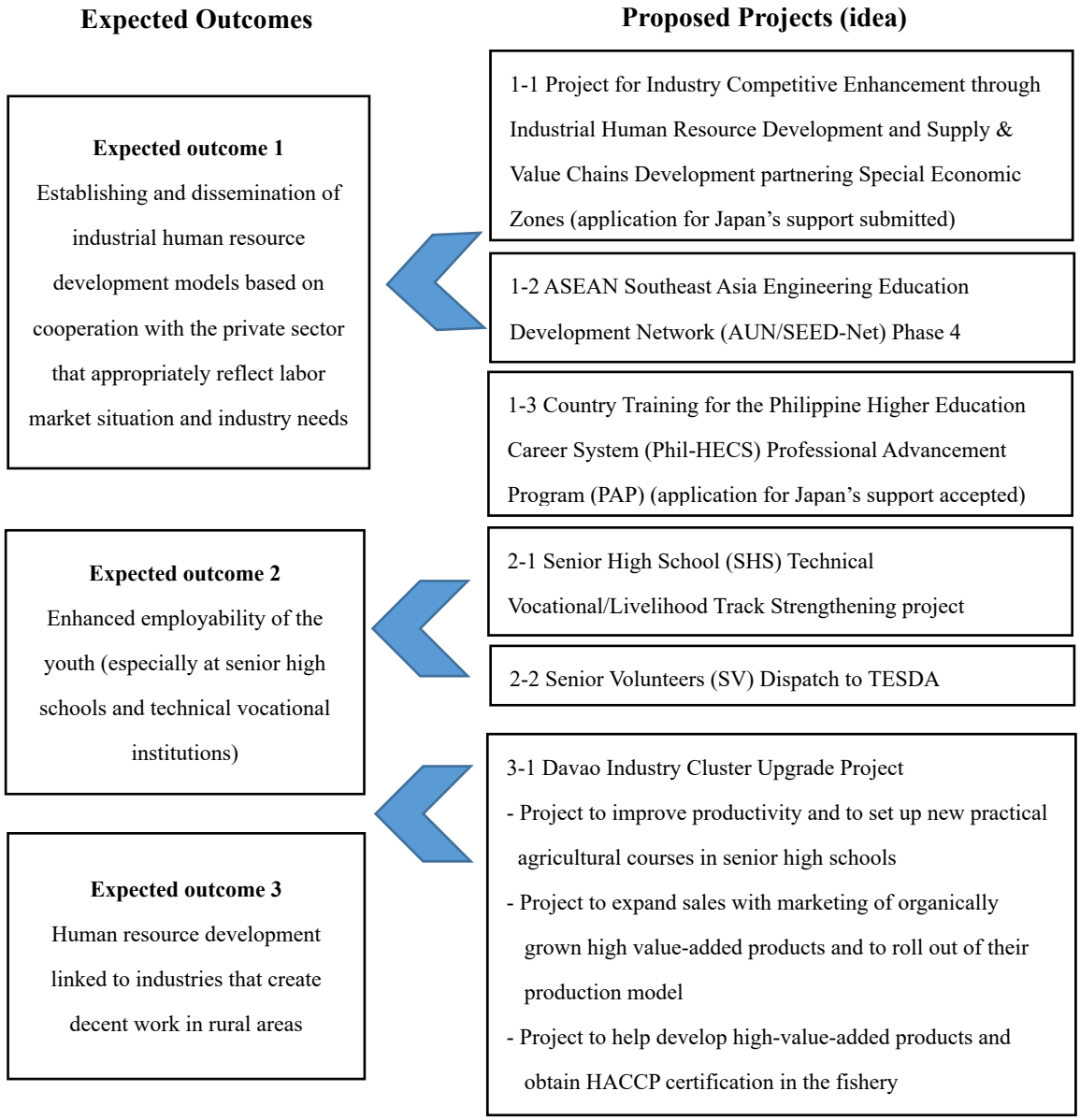
Safety Net Program

Promotion of local industry and support for the development of the necessary human resources through advancement of agriculture, forestry and fisheries in rural areas, concentration of related industries and development of new products and technologies will contribute to the creation of decent work. Furthermore, support for the development of human resources with elementary and intermediate level skills who will provide long-term support for the Philippine economy from the perspective of acquiring lifelong skills and providing job guidance will contribute to the alleviation of poverty among young people due to job separation or unemployment.

Chapter 8 JICA's Potential Project Concepts for Industrial Promotion through Human Resource Development (idea)

8-1 Expected outcomes and cooperation project plan

The following section presents the JICA's potential project concepts (idea) needed in order to attain the expected outcomes set out in Chapter 7. The connections between the expected outcomes and proposed project concepts are as shown in the chart below.



Source: Prepared by the JICA Survey Team

Figure 8-1 Connections between Expected outcomes and Proposed Projects

8-2 Project concepts (idea) under each outcome of the JICA's IHRD Cooperation Program

8-2-1 Project concepts under expected outcomes 1

(1) Project for Industry Competitive Enhancement through Industrial Human Resource Development and Supply & Value Chains Development partnering Special Economic Zones (application for Japan's support submitted)

This survey focuses on identification of issues and needs of educational and training institutions and companies in detail shown in chapter 4 and 5 and proposals of the implementation structure in this section for the project as the DTI submitted the project application for Japan's technical cooperation to the NEDA.

1) Requested Contents

The following table shows the project contents according to the DTI's project application to NEDA.

Table 8-1 Requested Contents of Project for Industry Competitive Enhancement through Industrial Human Resource Development and Supply & Value Chains Development Partnering Special Economic Zones

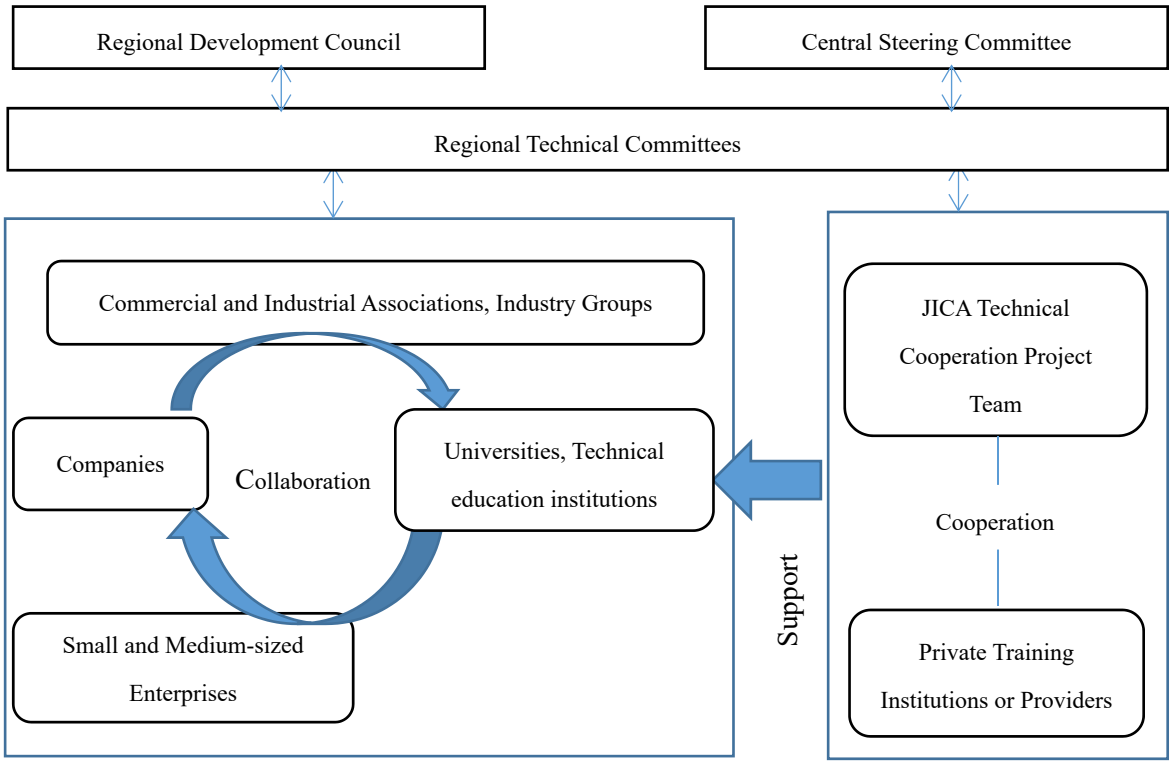
Project Name	Project for industry competitive enhancement through industrial human resource development and supply & value chains development partnering special economic zones
Position of JICA's IHRD Cooperation Program	Industrial human resource development models based on cooperation with the private sector that appropriately reflect labor market situation and industry needs will be established and disseminated.
Overall goal	Programs for industrial human resources development (IHRD) and supply and value chain development (SVCD) are implemented in targeted Special Economic Zones (SEZs) and replicated to other SEZs.
Project purpose	Effective Models of IHRD and SVCD are developed through pilot projects at targeted SEZ.
Outputs	1. Specific needs for IHRD and SVCD in targeted SEZs are identified through dialogues with private sector and a series of JICA surveys. 2. Better operational models of TESDA training programs in partnership with companies at target SEZ are developed with addressing job-skill mismatch between TESDA graduates and companies in target SEZs. 3. Better operational models including "industry immersion" and curriculum adjustment of State Universities and Colleges (SUGs) related higher-education programs to address job – industry technology mismatch between universities graduates and in target SEZs are developed by support of CHED

	4. Linkage between large/foreign companies in targeted SEZ and local suppliers are promoted through a series of intervention measures including, but not limited to, TESDA/CHED training and education programs. 5. Recommendation of future programs for IHRD and SVCD are made based on the lessons learned in the pilot projects.

Source: Prepared by the JICA Survey Team based on project application form for Japan's technical cooperation (DTI, September 19th, 2016)

2) Implementation Structure (idea)

Based on the interview surveys with the relevant organizations, the implementation structure proposed for this project is as shown below.



Source: Prepared by the JICA Survey Team

Figure 8-2 Implementation Structure for Project to Develop Industrial Human Resources in Partnership with the Special Economic Zones and to Improve Industrial Competitiveness through the Building of a Supply/Value Chain

3) Assignment of roles to main parties concerned (idea)

The roles of the main parties concerned are as shown in the table below.

Table 8-2 Assignment of Roles to Main Parties Concerned in the Project to Develop Industrial Human Resources in Partnership with the Special Economic Zones and to Improve Industrial Competitiveness through the Building of a Supply/Value Chain

Category	Role	Potential members
Central Steering Committee	Coordination and supervision, advice on feasible action plans (short-term, medium-term, long-term, industry, academia (per university, technical/ vocational educational institution)) and on expanding the model to other special economic zones	Project Director: DTI Industrial Development Group, Project Manager: PEZA Head Office, TESDA Head Office, CHED, DTI Industrial Development Group Other: NEDA
Regional Technical Committee	Preparation of feasible action plans (short-term, medium-term, long-term, industry, academia (per university or technical/vocational educational institution)) and preparation of a model for expansion to other special economic zones	Regional offices (DTI, PEZA, TESDA, NEDA), CHED (In Region 4[a], the utilization of the Academe and Industry Linkage Committee operating below the Regional Development Council will be considered.)
DTI Head Office/Regional Offices	Overall coordination, overall consolidation of feasible action plans (short-term, medium-term, long-term, industry, academia (per university or technical/vocational educational institution), support for identifying participating companies (including small and medium-sized enterprises), promotion of corporate participation in the project, partnership promotion in policies for the industrial development of small and medium-sized enterprises	
CHED	Provision of necessary data, support for identifying participating universities, consolidation of feasible action plans (short-term, medium-term, long-term, industry, academia (universities))	
PEZA Head Office/Regional Offices	Promotion of participation in the project by companies in the special economic zones, assistance in the consolidation of feasible action plans (short-term, mid-term, long-term, industry, academia)	
TESDA Head Office/Regional Offices	Provision of necessary data, support for identifying participating technical and vocational training institutions, consolidation of feasible action plans (short-term, mid-term, long-term, industry, technical/vocational educational institutions)	
Commercial and Industrial Associations, Industry Groups	support for identifying companies (including small and medium-sized enterprises), promotion of corporate participation in the project, activities to advocate companies to cooperate with industry, government and academia, assistance in consolidation of the human resource needs of the industrial sector, assistance in formulating measures to strengthen connections between large corporations and small to medium-sized companies, assistance in consolidating the input from the industrial sector in the drawing-up of action plans	AHRD, CCCI, CAMPI, EIAP, LCCI, PCCI, SEIPI, etc.

Universities, Technical training organizations	Participation in the analysis of the human resource needs of the industrial sector, improvement and implementation of education and technical and vocational training programs, study and implementation of plans to strengthen linkage between the industrial sector and the educational world	Region 4a: University of Batangas, Cavite State University, Laguna Institute of Technology (the above being universities); TESDA-Region 4a Training Center, Jacobo Z. Gonzales Memorial School of Arts and Trades (the above being technical and vocational training institutions) Cebu: University of San Jose-Recoletos, University of San Carlos, Cebu Institute of Technology (the above being universities), TESDA-Region 7 Training Center (the above being a technical and vocational training institution)
(Large) Companies	Support for identifying small and medium-sized enterprises, cooperation in the analysis of the human resource needs of the industrial sector, cooperation in the improvement and implementation of programs for university education and technical and vocational training, study and implementation of plans to strengthen linkage between the industrial sector and the educational world, study and implementation of measures for collaboration with small and medium-sized enterprises	
Small and medium-sized enterprises	Cooperation in the analysis of the human resource needs of the industrial sector, cooperation in the improvement and implementation of programs for university education and technical and vocational training, study and implementation of measures for collaboration with large corporations	
Private training institutions or providers	Collaboration with private enterprises and the sharing of experiences/assistance in the planning and implementation of university education and technical and vocational training programs	Toyota Motor Philippines School of Technology, Alliance Mansols Inc. Dualtech Center, National College of Science and Technology, etc.

Source: Prepared by the JICA Survey Team
AHRD: Association of Human Resource Development
CCCI: Cebu Chamber of Commerce and Industry
CAMPI: Chamber of Automotive Manufacturers of the Philippines, Inc.
EIAP: Electronics Industries Association of the Philippines, Inc.
LCCI: Laguna Chamber of Commerce and Industry
PCCI: Philippine Chamber of Commerce and Industry
SEIPI: Semiconductor and Electronics Industries in the Philippines, Inc.

(2) ASEAN Southeast Asia Engineering Education Development Network (SEED-Net) Project - Phase 4

The ASEAN SEED-Net was launched in 2003, and currently the Phase 3 is being executed and scheduled to complete in March 2018. University of the Philippines (UP), De La Salle University (DLSU), and Mindanao State University-Iligan Institute of Technology(MSU IIT) are the member universities in the Philippines. The Phase 4 is now in discussion for the implementation. It will aim to improve research capacities while focusing on enhancement of quality of faculty members of the universities, as well as development of human resources by further reinforcing and expanding the network of member universities attending the SEED-Net.

As discussed earlier, it has been pointed out that there is a lack of opportunities to learn practical and applied skills in higher educational institutes (in the engineering field) in the Philippines. One of the possible fundamental reasons for that may be a lack of mutual understanding between the industry and academia. This has already become apparent in the past projects implemented by the USAID (United States Agency for International Development). For example, in the "Higher Education and Productivity Project (HEPP)" pointed out that there was a gap between industry and academia in their mutual understanding because their background was quite different and the way of thinking was also distinct. Therefore, the role of the third person such as a consultant was functioning to coordinate and intermediate in their communication. Also, in the "Science, Technology, Research, and Innovation for Development (STRIDE)", university teachers were dispatched to enterprises, and industry people came to universities to know each other well. Such an effort was needed to deepen the understanding between industry and academia during the project. In order to promote the development of advanced human resources necessary in the industry in the Philippines, it is essential to make an effort to bridge the gap between industry and academia under mutual cooperation.

The introduction of a new program, "Industrial Human Resource Development program" is to be considered in the SEED-Net Project Phase 4. This program could be considerable to include 1) internship program, 2) Project-Based Learning (PBL), 3) sponsored program by industry, 4) visit and training program for university teachers in private companies, etc. for its' effective implementation and to respond to the demand for the support in the higher education (in the engineering field) in the Philippines. Also, when the program will be designed and implemented, it is desirable to establish a function (the third person) that play a role in deepening understanding between education and industry based on the practice of the USAID projects described above.

(3) Country Training for the Philippine Higher Education Career System (Phil-HECS) Professional Advancement Program (PAP)

It has been challenge for CHED to address the fundamental weakness of Philippines higher education: a lack of vision and structure, deteriorating quality, etc. CHED proposed strengthening institutional governance in public higher education institutions (HEIs), and CHED also emphasizes on capacity development of executive officers and leaders and make them more functional. Thus, in 2014, the Philippine Higher Education Career System (Phil-HECS) was introduced. Phil-HECS consists of three components; 1) Recruitment and Selection, which sources talent into the public higher education sector and screens application for entry into the system, 2) Professional Advancement Program (PAP), which enhances and update the competencies of both eligible candidates and incumbent State Universities and Colleges (SUCs) leaders, 3) Career Management, which grants eligibility, tracks individual performance, and identifies placement opportunities for those included in the system. CHED aims at develop more talented executives, senior officers, and leaders by using this system.

Table 8-3 Outline of the Project

Project Name	Country Training for the Philippine Higher Education Career System (Phil-HECS) Professional Advancement Program (PAP)
Position of JICA's IHRD Cooperation Program	Industrial human resource development models based on cooperation with the private sector that appropriately reflect labor market situation and industry needs will be established and disseminated.
Project Background	CHED introduced the Philippine Higher Education Career System (Phil-HECS) in 2014. The system promotes and facilitates the recruitment, selection, professional advancement, and career management of a Roster of Eligible Executives for deployment in 112 Philippines SUCs. Phil-HECS aims at improvement of quality of governance in HEIs through enhancing capacities and competencies of Eligible Executives and leaders. Phil-HECS consists of three components, and Professional Advancement Program (PAP), which is one of the components, aims to enhance the capacities of SUC presidents and senior level officials. CHED-ODA (CHED Office for Official Development Assistance) is proposing a short-term leaning visit to Asia, Europe, and North America. For Asia, Japan was selected by CHED as the ideal venue where the participants may learn about Asia's best practices and styles in leadership and governance for HEIs.
Overall Goal	1. To complement the other activities of the PAP to develop the key competencies of Higher Education Executives according to the six competencies identified in the Phil-HECS Competencies Framework. 2. To create opportunities for SUCs in the Philippines to expand their social and institutional networks through foreign acquaintances, thus enabling future collaborations and linkage between communities and institutions.
Project Purpose	1. To expose participants to the various issues, styles, practices and paradigms involving leadership and governance to enhance their capability and competence as leaders of Philippine Higher Education Institutions. 2. To provide opportunity for the participants to benchmark their standards vis-à-vis the standards of leadership and governance in Japan. 3. To allow CHED to evaluate the Phil-HECS PAP through the conduct of an individual performance evaluation of participants during the pilot run of PAP. 4. To allow CHED to determine the practicality of incorporation foreign visits into the program. 5. To use the results of the assessment to be conducted by JICA on the participants to complement efforts to evaluate the foreign learning visit.
Outputs	1. Plan of action to improve respective SUCs based on knowledge gained from the study visit. 2. An end of project report that will thoroughly discuss the results of the implementation of the proposed project.
Activities	Short-term courses specific to the concern on 21st century ASEAN style leadership for Higher Education Executives. The program will be for 20 representatives per year and it will last for 7 days.
Implementation Schedule	Year 2017－2020
Implementing Agency	CHED
Beneficiaries	University, Higher Education Executives, Students
Input	The Philippine Government:travel expenses including the roundtrip airfare ticket as well as other incidental allowances. JICA:

	1. Consult and coordinate regarding the design of the short-term course/program that will focus on leadership and governance for higher education executives. 2. Identify three appropriate universities in Japan for further site visits. 3. Coordinate regarding implementation of the short-term course and university visits. 4. Cover in country costs including transportation, accommodation, and other costs related to the program. 5. Conduct an assessment of the participants' performance during the program. 6. If felt necessary, design next steps of the program.

8-2-2 Project concepts under expected outcome 2

(1) Senior High School (SHS) Technical Vocational Livelihood Track Strengthening Project

(1)-1 Status of basic education (especially secondary education)

The issues of skills gap and mismatch have been pointed out in the Philippines for many years.

According to the Labor Force Survey[93] conducted by the Philippine Statistics Authority (PSA), the average rate of unemployment between 1994 and 2016 in the Philippines was 8.63%. The national average rate of unemployment in October 2016 was as low as 4.7. However, the age group of 15 to 24 accounted for 47.6% of the 2,040,000 unemployed. Among the unemployed, high school (10-year term) dropouts, high school graduates, university dropouts, and university graduates accounts for 10.5%, 32.9%, 13.8%, and 20.5%, respectively. Among 500,000 university graduates per year, only about 40% found employment within a year from graduation[94], and only about 10% of university graduates and postgraduates majoring in natural science were employed by manufacturing companies[95]. According to a survey conducted by the PSA[96], specialist jobs (system analysis/design, university faculties, accountants, civil engineers, personnel/human resources development specialists, etc.), technicians and assistant specialists (sales representatives, secretaries, work safety examiners, mechanical engineering technicians, computer engineers, etc.), as well as administrative jobs (customer service at call center, accountants/bookkeepers, and receptionists, etc.) are included in job categories with difficulties in recruitment (which takes long time to hire employees).

Through a series of survey analysis for skills gap and mismatch, conducted by organizations in and around the Philippines, the followings are listed as possible reasons for high unemployment rate among the youngsters.

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[93] Philippine Statistics Authority, Labor Force Survey, October 2016.

[94] Philippine Institute for Development Studies, "Are Higher Education Institutions Responsive to Changes in the Labor Market?", Discussion Paper Series No. 2016-08.

[95] World Bank, "Philippine Development Report 2013".

[96] Philippine Statistics Authority, "Job Vacancies: 2013-2014…hard-to-fill occupations in focus (Second of a three-part series)", LABSTAT Updates, March 2016.

- There is a mismatch between skills of the graduates from high school, university, and vocational school (TVET) and the ones required by companies.
- General academic capabilities of the graduates from high school, university, and vocational school (TVET) are limited.
- Specialized skills of the graduates acquired though the high school, university, and vocational school (TVET) graduates are limited.
- There are few educational institutes offering courses related to highly demanded occupations in the labor market, while many offer courses related to occupations that are less demanded.
- Neither young employment seekers nor companies are being able to obtain necessary information for recruitment/job hunting in a timely manner.
- Young employment seekers tend to expect jobs contents and work conditions that are not corresponding to their skills and experience.
- There are few jobs that match the skills of young job seekers (domestic industries have not developed).

In order to address these issues, the CHED (Commission of Higher Education), DepEd (Department of Education), and TESDA (Technical Education and Skills Development Authority) have developed the Philippine Qualification Framework as well as prepared to apply ASEAN Qualification Reference Framework to it.

Since 2010, DepEd has consistently worked on implementation of 12-year basic educational system. The Late Secondary Education Senior High School (SHS) program, a late secondary education, is introduced nationwide since fiscal 2017. The 11th grade is introduced in fiscal 2017 and the 12th in 2018. It also provides programs in which students can study in private high schools using a voucher system (paid by the national government) to make up for shortage of classrooms and teachers in public high schools. The program also offers measures to enable public/private universities and private educational institutes to provide the late secondary education courses.

(1)-2 Issues and needs

[SHS (technical vocational track)]

The basic education in the Philippines was 10-year system (6 years in elementary and 4 years in secondary schools). In 2017 onwards, secondary educational institutes will employ 6-year system by adding 2 years of late secondary education to the existing 4 years to extend the period of basic education to 12 years in total.

In the past, students completed the basic education and graduated from school at age 16, and were

not old enough to be employed (since 18 is the age to be able to get a job in the Philippines). This two-year gap was one of the major factors for the higher unemployment rate for secondary school (10-year term) graduates who were not going to universities or vocational schools. Since they were not able to work as full-time employees right after their graduation, many male youngsters turn to juvenile delinquency and many female youngsters get pregnant.

In April 2018, for the first time, 18-year-old students will graduate from secondary schools after completing the late secondary education. The goal for the Philippine government aiming to end poverty is to ensure as many employment opportunities as possible for youngsters who completed vocational education and but not going to universities.

As of 2016, NC I and II of the TESDA qualifications, are obtained by secondary school (10-year term) graduates when they complete the course at the TVET Center or while they are in 2-year course of university industrial technology department or after complete it. In a mid- to long-term perspective, the qualifications will be obtained for the graduates who have completed the technical vocational track at high schools. It is expected that high school's technical vocational track would be able to fulfill a role that used to be played by the TVET Center and 2-year-course industrial technology department at universities.

Table 8-4 Issues and Support Needs of Upper Secondary Education

Issues	Support needs
The requirements from the industry are not sufficiently reflected in the teaching materials and instruction manuals for technical vocational courses.	It is necessary ・ to ensure opportunities to obtain the feedback from local companies and local TESDA for improvement. ・ to conduct workshops and meetings to provide opportunities for teachers in the local community to find answers to questions, help each other, and to share good practices.
There is not enough teaching equipment and materials in terms of both quality and quantity.	It is necessary ・ to improve proposal preparation techniques to make a budget request to the DepEd. ・ to strengthen the relationship with local companies so that schools can ask for donations of equipment from them. ・ to seek for the permission for sharing the equipment if there are universities (with industrial engineering and other departments) or the TVET Center nearby who own it.
There is a lack of competency in the teaching staff members.	・ It is necessary to establish a firm relationship with local companies, universities (with industrial engineering and other departments) in the region and TVET Center so that teachers can get trainings during their holidays.
Not enough companies who can accept students for Work Immersion.	It is necessary ・ to strengthen collaborations with universities (with industrial engineering and other departments),

	TESDA, and PESO (Philippine Education Support Organization), etc., in the region. ・ to provide industry-academia collaboration enhancement training to the teachers. ・ to utilize events such as inauguration and graduation ceremonies as opportunities to explain the purpose of technical vocational high schools in the context of HRD for local industries to the local government, local companies, as well as students' parents.
Students' academic knowledge on math, physics, and chemistry, etc. is inadequate.	・ It is necessary to support enhancement of math and science programs in the curriculums of elementary and secondary education.
There is a lack of English proficiency in students.	・ It is necessary to support enhancement of English proficiency in the curriculums of elementary and secondary education.
There is a lack of appropriate attitude/enthusiasm for work in students.	It is necessary ・ to have local companies review the contents of the materials used for development of soft skills. ・ to provide support by incorporating 'spirit of Monozukuri (manufacturing)' in the curriculum, as has been done in "Saitama-Cebu Comprehensive HR Monozukuri Project". ・ to provide the support to get 5S and time management taught, and to have some contents that can show the pleasure of Monozukuri incorporated, in the classes.
An employment support system for students has not been arranged adequately.	It is necessary ・ to give career guidance training to the teachers. ・ to set up an employment support service counter in schools. ・ to support an effort to share the model and knowhow of universities that are making good use of OJT in the students' job hunting, with teachers in the technical vocational track since OJT (or Work Immersion in high schools) is part of the job hunting process in the Philippines.

(1)-3 Project concept of senior high school (SHS) technical vocational/livelihood track strengthening project

The concept (idea) of a project, which is assumed in the light of issues and support needs in senior high school, is shown below.

Table 8-5 Project Concept (idea) of Senior High School (SHS) Technical Vocational/Livelihood Strengthening Project

Project Name	Senior High School (SHS) Technical Vocational Track Strengthening Project (tentative)
Position of JICA's IHRD Cooperation Program	To enhance employability for young people (especially at senior high schools and technical vocational institutions)

Project background	The basic education in the Philippines was a 10-year term system (6 years in elementary and 4 years in secondary schools), thus students completed the basic education at age 16, not old enough to be eligible to get employed in the Philippines (the eligible age is 18). Nonetheless, technical vocational high schools have not adequately been involved in promoting the collaboration with local industries and employment/company support for the students. Moreover, human resources development program, that should have been promoted in tandem with the industrial development, has not been taken as important in the local industrial development plans. As part of K to 12 program, senior high school ("SHS", or late secondary educational institutes, 11-12th graders) was officially introduced nationwide in June 2016, which enabled the students in SHS technical vocational track to take TESDA occupational training course and obtain National Certificate I and II at their graduation. As SHS students will graduate at the age of 18, an eligible age for employment, in 2018 onwards, it is expected their employment opportunities shall improve. However, since SHSs have not adequately promoted collaboration with local industries to support job hunting for students, there are many urgent issues to address: skill development for SHS principals and teaching staff members, curriculum development for technical vocational training courses based on the needs of the local industries (including local industry surveys, establishment of industry-academia collaboration, site visits to factories/farms, Work Immersion/pre-employment orientation, sharing of experiences for Work Immersion and its outcome), upgrade and improvement of materials/equipment in the light of local industrial needs, enhancement of the capabilities of DepEd staff members to build better system to reflect the needs in the field, and promoting better understanding for human resources development for the local government and local industries. For the skill development training for SHS principals and teaching staff members (including visit to Japan), establishment of industry-academia collaboration, site visit to factories/farms, Work Immersion/pre-employment orientation, sharing of experiences for Work Immersion and its outcome, upgrade and improvement of material/equipment in the light of local industrial needs, enhancement of the capabilities of DepEd staff members to build better system to reflect the needs in the field (including tours to Japanese counterparts), and sharing of good practices, the knowledge and experiences obtained through on-going "Project for Supporting Senior High School(SHS) Program in Technical Vocational High Schools" as well as its manuals, and training materials will be fully utilized. It is proposed that the courses related to automotive, electronics, and food processing, which will be focused in the industrial human resources development program (idea), as target technical courses for the project. As for target regions for the support project, we propose Region 4a (Calabarzon Region), Region 7 (Cebu), and Region 11 (Davao), considering the accessibility, security situation, and feasibility of industry-academia collaboration. Since there are schools covered by "Project for Supporting Senior High School (SHS) Program in Technical Vocational High Schools which is currently underway in all 3 regions, we shall make the maximum use of the knowledge and experiences obtained there. On the other hand, there are high schools that just opened technical vocational track in fiscal 2016 for the first time (meaning that they are not technical vocational high schools) as well as the high schools with geographical restrictions in all 3 regions. We shall

	aim to support these schools to exchanges and share the information with leading schools in the region, and to disseminate the know-how to achieve the goal even under the difficult environment with the schools under the similar conditions nationwide. (The number/type of schools in the region: according to the list on the DepEd website, Region 4a has 11 high schools offering both automotive technician and electronics courses, 4 offering farming courses, and 2 food processing courses).
Overall goal	To have knowledge obtained by the SHSs participating in the project shared with all SHSs nationwide, and have actions for quality improvement of education/training started.
Project purpose	To enable SHSs (target schools) to operate the high quality "technical vocational/livelihood" track based on the needs of local industries
Outputs	1. To conduct surveys on local industrial needs and SHS in the region and select target schools for the project. 2. To develop and implement the "technical-vocational/livelihood" track standard package. 3. To strengthen the skills of the project-target principals, teaching staff members, and schools in the region to be able to operate courses based on the standard package. 4. To share the standard package used in the target schools with other SHSs in and out of the region and to have the DepEd utilize the case examples of the target schools to revise various guidelines. 5. To strengthen the collaboration with the local industries.
Activities	<u>Activities for Output 1</u> 1-1 Conduct surveys on industrial human resources needs in the target regions as well as on SHSs in the regions (how technical vocational courses are offered, current status of industry-academia collaboration and of job hunting support, as well as issues, etc.). 1-2 Based on the 1-1, identify the target schools in cooperation with DepEd. 1-3 Invite local agencies of DepEd, CHED, TESDA, NEDA, DTI (Department of Trade and Industry), DOST, head of municipality, head of technical vocational SHSs in the region, representative of local industries, as well as the community members (such as students' parents) to the target schools for the purpose of publicizing and sharing information. 1-4 Make use of the survey results in the planning and executing of Activities 2 to 5. <u>Activities for Output 2</u> 2-1 Review the curriculum (including site visit to factories/farms and OJT program) with industry partners in the region and develop and suggest revised curriculum 2-2 Review the teaching method and equipment with industry partners in the region and develop improved teaching method. 2-3 Review equipment and facilities with industry partners in the region and procure necessary equipment 2-4 Based on the 2-1 and 2-3 results, prepare the standard package of the target courses for "technical vocational/livelihood track" (local industry-academia collaboration process, teaching method improving process, equipment procurement method, and employment support process, etc.). 2-5 Use PDCA (plan-do-check-act) cycle for the standard package of the target courses for 'technical vocational/livelihood Track', and prepare the final standard package.

	2-6 Share the above standard package with the DepEd and technical vocational SHSs in the region. Activities for Output 3 3-1 Prepare a plan for skills improvement for principals, teaching staff members, industry-academia collaboration coordinators, and career counselors (of not only target schools, but also all technical vocational high schools in the region). 3-2 Develop skills of principals, teaching staff members, industry-academia collaboration coordinators, and career counselors. 3-3 Make sure that the improvement of skills in principals, teaching staff members, industry-academia collaboration coordinators, and career counselors has been made, and prepare and execute a follow-up plan for skills improvement, when necessary. Activities for Output 4 4-1 For the purpose of incorporating the regional IHRD project, including technical vocational high schools, in the regional industrial development plan (such as regional development plan and industrial human resources development roadmaps by DTI and TESDA), officials of the DepEd and NEDA, as well as principals and teaching staff members of the target schools, head of municipalities and administrators shall visit engineering high schools and agriculture, forestry and fisheries high schools in Japan. 4-2 In the 2nd to 4th year of the project when some development was made, officials of the DepEd, NEDA, head of municipalities, and administrators in the target regions, and technical vocational SHS in and out of the regions shall make a visit to the target schools. 4-3 Officials of the DepEd, the target schools, and technical vocational SHSs in and out of the regions shall have meetings to discuss distribution of the standard package and issues that may require changes/adjustment in the system. 4-4 The target schools shall invite officials of local agencies of the DepEd, CHED, TESDA, NEDA, DTI, DOST, and heads of municipalities and the community in the region to share the project outcome. 4-5 The DepEd shall utilize the case examples in the target schools for the revision of various guidelines. Activities for Output 5 5-1 Review the status of collaboration with businesses, employment support activities in the target schools (Focus on the target schools by referring to SHS survey results in activities 1-3). 5-2 Establish the system for collaboration with businesses and employment support activities in the target schools and implement them (including analysis of employment situations and implementation of a system to conduct periodical follow-up surveys). 5-3 Prepare and implement School Improvement Plan (SIP) in the target schools, based on the needs of local industries. 5-4 DepEd regional offices make inventory of companies in the region which can cooperate with work immersion. And, DepEd regional offices lead a role for coordination and matching. 5-5 DepEd reginal offices conduct regular roundtable forum to strengthen communication between industry and educational institutions.
Implementation Schedule	2018 – 2022 (tentative)
Project target area	Region 4a, Region 7a, and Region 11 are suggested.

Implementing agency/Cooperating agency	Implementing agency: DepEd (Bureau of Curriculum Development, Region 4a, Region 7a, and Region 11) Cooperating agencies: NEDA (National Economic and Development Authority) office and TESDA office in the target region, municipalities where the target schools are located, and the Chamber of Commerce in the Philippines in each region
Beneficiaries	Students in SHS technical vocational track
Input	1. Japan side: Team leader, specialists for technical training, automotive technician training, electronics technician training, farming skills training, business -government-academia collaboration and career guidance, as well as operational coordinators 2. The Philippines side: appointment of the counterparts

(2) Senior Volunteer (SV) Dispatch to TESDA

(2)-1 Status of the industrial human resources development in the Philippines

The issues of skills gap and mismatch have been pointed out in the Philippines for many years.

According to the Labor Force Survey[97] conducted by the Philippine Statistics Authority (PSA), the average rate of unemployment between 1994 and 2016 in the Philippines was 8.63%. The national average rate of unemployment in October 2016 was as low as 4.7%. However, the age group of 15 to 24 accounted for 47.6% of the 2,040,000 unemployed. Among the unemployed, high school (10-year term) dropouts, high school (ditto) graduates, university dropouts, and university graduates accounts for 10.5%, 32.9%, 13.8%, and 20.5%, respectively. Among 500,000 university graduates per year, only about 40% found employment within a year from graduation[98], and only about 10% of university graduates and post graduates majoring in natural science were employed by manufacturing companies[99]. According to a survey conducted by the PSA[100], specialist jobs (system analysis/design, university faculties, accountants, civil engineers, personnel/HRD specialists, etc.), technicians and assistant specialists (sales representatives, secretaries, work safety examiners, mechanical engineering technicians, computer engineers, etc.), as well as administrative jobs (customer service staff at call center, accountants/bookkeepers, and receptionists, etc.) are included in job categories with difficulties in recruitment (which takes long time to hire employees).

Through a series of survey analysis for skills gap and mismatch, conducted by organizations in and around the Philippines, the followings have been presented as possible reasons for high unemployment rate among the youngsters.

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[98] Philippine Institute for Development Studies, "Are Higher Education Institutions Responsive to Changes in the Labor Market?", Discussion Paper Series No. 2016-08.
[99] World Bank, "Philippine Development Report 2013".
[100] Philippine Statistics Authority, "Job Vacancies: 2013-2014…hard-to-fill occupations in focus (Second of a three-part series)", LABSTAT Updates, March 2016.

- There is a mismatch between skills of high school, university, and vocational school (TVET)-graduates and the ones required by the companies.
- General academic abilities of high school, university, and vocational school (TVET)-graduates are low.
- The level of professional skills acquired by high school-, university-, and vocational school (TVET)-graduates are low.
- There are few educational institutes offering courses related to highly demanded occupations in the labor market, while many offer courses related to occupations that are less demanded.
- Neither young job seekers nor companies are being able to obtain necessary information for recruitment/job hunting in a timely manner.
- Young job seekers tend to expect job contents and work conditions that are not corresponding to their skills and experience.
- There are few jobs that match the skills of young job seekers available (Domestic industries have not matured yet).

In order to address these issues, the CHED (Commission of Higher Education), DepEd (DepEd), and TESDA (Technical Education and Skills Development Authority) have developed the Philippine Qualification Framework as well as prepared for applying ASEAN Qualification Reference Framework.

TESDA has started implementing 112 out of 258 Training Regulations (TR), revised 35 TRs, and developed 9 new TRs in the past 6 years. In addition, TESDA has established TVET trainer qualification framework (level 1 – 4) to make efforts to train more trainers. The number of people who took the TESDA qualification exams has doubled from 716,220 in 2010 to 1,424, 814 in 2015, while the acceptance rate has also increased from 83% in 2010 to 90.7% in May 2016. The employment rate of the students who completed TVET improved dramatically from 48.5% in 2005 to 65.4% in 2014. The employment rate for students who completed the IT-BPM course reached to 70.9% while for the electronics/semiconductor course rose to as high as 91.4%. TVET graduates include those who dropped out of universities (13.8%) and university graduates (16%), which indicates that the students are becoming aware of the benefit of TVET for getting a job.

(2)-2 Issues and needs

In the past, NC I and II of the TESDA qualifications were obtained by secondary school (10-year term) graduates when they complete the course at the TVET Center or while they are in 2-year course of university industrial technology department or after complete it. In a mid- to long-term perspective, the qualifications will be obtained for the graduates who have completed the technical vocational track at high schools.

TESDA will need to develop higher-level TESDA qualification Training Regulations (NC III, NC IV, and diploma) and give instructions/supervision to TVET Center to play a role as an operator in

a mid- to long-term perspective.

Table 8-6 Issues and Support Needs for Technical Vocational Training

Issues	Support needs
Develop higher-level TESDA Qualification Training Regulations (NC III, NC IV, and diploma) in response to the needs of the industry.	It is necessary ・ to specify which courses require higher-level of TR development in the light of the needs of companies and the labor market trend. ・ to have companies check/review whether TR contents are correct and satisfactory. ・ to thoroughly discuss issues including purposes of the diploma course in PQF with DepEd and CHED for the establishment of diploma course.
train trainers who can teach higher-level TESDA qualification courses.	・ In case investment is required for equipment/materials, it is highly likely to be necessary to have trainers to participate in the immersion program at companies.
Bundle multiple TESDA qualifications in a package in response to the needs of industry.	・ It is necessary to identify TESDA qualifications that can be effective when bundled, in the light of the needs of the companies and the labor market trend.
Prepared for facilities, equipment and teaching materials for implementation of higher-level TESDA qualification courses.	・ In case the fund cannot be allocated from the government budget, it is highly likely that financial support may be required from donners.
Strengthen the collaboration with the industry. Establish and revitalize Industry Board/Industry Training Council.	・ In addition to reviews and revision of TRs, it is essential to strengthen the industry-academia collaboration to develop higher-level TRs and bundle TESDA qualifications. (From companies' perspectives, if Japanese companies are interested in TR development and bundling of qualifications in specific areas, they need to participate in discussions in order to get their opinions reflected).
Increase the number of examiners, standardize the judging procedure, and systematize the issuance of the certificate in response to an increase of TESDA qualification exam applicants.	・ It will be necessary to train and certify the examiners. ・ It will be necessary to standardize the selection procedure. ・ It will be necessary to establish a system for efficient operation for issuance of the certificate.

(2)-3 Project Concept for Senior Volunteer (SV) Dispatch to TESDA

JICA expert(s) which will be dispatched for the Project for Industry Competitive Enhancement through Industrial Human Resource Development and Supply & Value Chains Development Partnering Special Economic Zones (1-1) will support TESDA to develop better operational models of TESDA training programs in partnership with companies at target SEZs. To supplement the activities of the expert (s) and promote development effects, SV dispatch to TESDA is proposed with the concepts as shown below. In dispatching SV, implementation arrangements should be considered to secure a close collaboration and coordination with the expert(s) for the project partnering special economic zones mentioned above.

Table 8-7 Dispatch of Senior Volunteers (SV) to TESDA

Project name	Senior Volunteer Dispatch to TESDA
Position of JICA's IHRD Cooperation Program	To enhance employability for young people (especially at senior high schools and technical vocational institutions)
Project background	In the past, NC I and II of TESDA qualifications were obtained by secondary school (10-year term) graduates when they completed the course at TVET Center or while in 2-year course of university industrial technology department or after they completed it. In a mid- to long-term perspective, however, they will be obtainable to high school graduates who have completed the technical vocational track. It is an urgent issue for TESDA to develop higher-level TESDA qualification Training Regulations (NC III, NC IV, and diploma), bundle multiple TESDA qualifications into a package, and to develop trainers to teach higher-level TESDA qualification courses in response to the needs in the industry side. Instead of assuming JICA (SV) to cover all the following support areas 1-3 (tentative), SV shall be dispatched on TOR (Terms of Reference) to support the areas designated by TESDA as the least satisfactory in terms of manpower, knowledge, and experience
[Support area 1 (tentative)] Development support for TESDA qualification Training Regulation (NC III, NC IV, diploma)	Advices shall be given based on the knowledge and experience accumulated in Japan to develop higher-level Training Regulations for TESDA qualifications (NC III, NC IV, and diploma) in response to the industry needs. The assumed areas include automotive-, electronics/electrics-, and agriculture/forestry/fisheries-related areas.
[Support area 2 (tentative)] Support bundling of mutually-related multiple TESDA qualifications into a package.	Advices shall be given to TESDA agencies in concern, based on the knowledge and experience accumulated in Japan when bundling mutually-related multiple TESDA qualifications (Example: bundling of NC I to NC IV in the same course, bundling of mutually-related but different courses, such as the ones for painting and repair of automotive) into a package, in response to the industry needs. The target areas will be automotive, electronics/electrics, and agriculture/forestry/fisheries related areas.
[Support area 3 (tentative)] Train trainers to teach TESDA qualification courses（NC III, NC IV, diploma).	Advices shall be given based on the knowledge and experience accumulated in Japan when TESDA is developing trainers to teach the courses developed and packaged in Support areas 1 and 2 (tentative).
Implementation Schedule	2018 – 2022 (tentative)
Project target area	Require discussion with TESDA (possibly TESDA headquarters for the support area 1-2 (tentative) and with TESDA for support area 3 (tentative)).
Implementing agency	TESDA
Beneficiaries	Trainees in the TVET Center

8-2-3 Project concepts under for expected outcome 3

(1) Status of Davao Industry Cluster

The cluster approach was employed in the Philippines for DICCEP (Davao Industry Cluster

Capacity Enhancement Project) implemented from 2007 to 2010 and NICCEP (National Industry Cluster Capacity Enhancement Project) from 2012 to 2015. In these projects, efforts were focused on developing organizational/technical capacities of the cluster team, and the capacities of personnel in charge of the development of SMEs at local government units (LGUs) as well as the national government agencies.

In Region XI or Davao Region (hereinafter, "Davao"), 15 clusters were designated for the support in 2014, and various support plans were formulated by cluster coordinators and others. In June 2016, coffee was added as a new cluster.

Table 8-8 Davao Industry Cluster in Fiscal 2014

Abaca	Banana	Bangus	Cacao
Coconut	Durian	ICT	Livestock
Mango	Mining	Renewal energy	Rice
Seaweed	Tourism	Wood	Coffee (new)

In November 2016, under the new administration who is focusing more on agriculture, the DTI (Department of Trade and Industry) announced new nationwide priority clusters, that is, Cacao, Coffee, Coco coir (coconut itself is under the administration of the Philippines Coconut Authority (PCA)), Processed fruits (banana, mango, pineapple, calamanci) and nuts (peanut, pili nuts, cashew nuts), Wearables (accessories, bags, etc.), Rubber and Bamboo.

Among these clusters, Davao DTI has selected the ones suitable for the status in Davao, and proposed the following;

A) Cacao: The production in Davao accounts for 80% of the total, thus cacao has the highest priority cluster in Davao. The DA is also promoting cacao production as an intercrop with coconut, supporting for the expansion of its production.

B) Coffee:Davao will mainly support the expansion of the production. The DA and other agencies are promoting intercropping it with coconut.

C) Processed fruits/nuts:Davao plays a leading role for the banana cluster, while a partner (means the leader is another region) for peanuts.

Industries related to Wearables, Rubber and Bamboo are of non-existence or very small in the size in Davao, thus are not designated as priority industries. Coco coir is mainly used for soil remediation and desertification prevention, and currently in a high demand in China. However, Davao PCA is not interested in it because of the recent price decline caused by the fierce competition among many other countries producing it.

Davao DA designates cacao, coffee, and banana that are high value-added agricultural products, as high priority clusters. For bananas, both domestic and overseas major companies have already been exporting Cavendish banana. The DA plans to promote the production of Cardaba banana as staple food to substitute for rice and other crops, whose production is hardly catching up with the high demands. The price of mangoes has been declining in the international market, which has forced many mango producers to stop the production and convert for the other crops, and thus DA stopped its support. Durian, although the support effort is continuing, is not a priority cluster. Bureau of Fishery and Aquatic Resources (BFAR), a DA's agency in charge of fisheries, stopped its support effort for Seaweed cluster. The production volume of seaweed in Davao was as small as 0.2% of the total in the country, and it was further reduced due to the damage caused by Typhoon Yolanda and spread of epidemic disease. In addition, the price of seaweed declined after a new substitute for Carrageenan (a seaweed extract and major export it) emerged in the market. Consequently, many seaweed farmers stopped the production and BFAR had to stop the support for the cluster. Currently, only the Southern Philippines Agri-Business and Marine and Aquatic School of Technology (SPAMAST) is continuing its support for product development.

Meanwhile, the BFAR still continues its support for bangus cluster, especially for producers who are struggling to cope with the price decline. It provides support for developing the high value added products, farming fries, while issuing warnings on environmental problems, against which the farmers haven't responded to it. Although the price of bungas is declining, it is still the most consumed fish in the Philippines, and the market is big. It is also consumed in Taiwan. Since Japan is leading the world in the fishery technologies, it should be highly possible for Japan to be able to give support in this area.

Although Davao has the highest coconut production output in the Philippines, Davao PCA, unlike Manila headquarters, is short-staffed (currently its permanent officer positions are filled only half) and cannot manage anything more than the productivity improvement and expansion of the farm land. The functions of developing high value-added new products and product marketing are limited to the headquarters.

(2) Issues for Davao Industry cluster

Some clusters have been unlisted from the government-support subjects, or their priority was downgraded due to the external factors, such as changes in consumers' preference, fierce competition, or emergence of new substitutes in the market. Meanwhile, there have been some newly emerging clusters. The market trend and industry clusters are inseparable, and clusters cannot exist without the market. Therefore, priority clusters in the Philippines are rearranged frequently, which in a way may be regarded as flexible with the changing environments, but at the same time it can also be said to lack in a long-term perspective. The cluster approach consists of productivity improvement, export support and new product development including R&D, as well

as HRD, which requires long-term commitment. Frequent changes of the course would hamper the efforts to achieve the goals.

On the other hand, there is a notable achievement in that the cluster approach model developed in the DICCEP and NICCEP was well rooted, and was promptly applied for newly emerging clusters such as Coffee.

(3) Concept of Davao Industry cluster upgrade project

Against the backdrop, we prepared the project concept (idea). It is aiming at further development of the industry clusters which are competitive and have the growth potential and which can take advantages of knowledge and experiences accumulated in Japan. These two factors can be pre-requisites for the long-term support from Japan.

The project consists of 3 sub-projects. With the DTI as a main counterpart, sub-counterparts shall be assigned for each sub-project.

1) Sub-project 1: Project to improve productivity and to set up new practical agricultural courses in senior high schools

Though we selected cacao for this project, this approach could be rolled out to other agricultural clusters, including coffee, durian, and bananas.

2) Sub-project 2: Project to expand sales with marketing of organically grown high value-added products and to roll out of their production model

Though we selected coconut for this project, this approach could be rolled out to other agricultural clusters, including cacao, coffee, durian, and mangos.

3) Sub-project 3: Project to help develop high-value-added products and obtain HACCP certification in the fishery industry

This is an area where fishery technologies in Japan may be made use of. The technologies can be applied not only to bungas, but also to tilapia, whose market is currently growing.

The concepts of the sub-project (idea) are shown in Tables below. The other items such as inputs, operating period, project target area, implementing agency/cooperating agencies, and end beneficiaries are shown at the end of the following 3 sub-projects.

Table 8-9 Concept of the Sub-project 1 (idea)

Project name	Project to improve productivity and to set up new practical agricultural courses in senior high schools (tentative)
Position of JICA's IHRD Cooperation Program	Human resource development linked to industries that create decent work in rural areas

Project background	The production of cacao in Davao accounted for as high as 80% of the total in the country, and thus we focused on Cacao cluster that is regarded as the highest priority by DTI-XI. The DA has already prepared Cacao Roadmap 2016-2022. The PCA is promoting intercropping of cacao with coconut through the Coconut-Cacao Enterprise Development Project (CCEDP). Currently, there is 50,000 MT of domestic demand in the Philippines while the domestic supply is 6,000MT (Source: International Cocoa Organization). Both demand and the price of cacao are ever increasing in the international market. It is said that there would be 1 million tons of supply shortage by 2020. Meanwhile, the cacao production is nationally stagnating and major domestic chocolate companies, including Universal Robina Corporation, Commonwealth Foods, Inc., Goya, Inc. under Delfi Foods Inc., are depending on the imports of cacao beans. Thus, CIDAMi (Cacao Industry Development Association of Mindanao, Inc.), which is a public-private-academia corporation organization, consisting of government agencies such as DTI, DA, and MinDA (Mindanao Development Authority), NPOs such as ACDI/VOCA and PBSP (Philippine Business for Social Progress), with the help of partners including UNDP (United Nations Development Programme) and USDA (US Department of Agriculture), in addition to cacao farmers, agricultural cooperatives, cocoa processing companies, import companies, and input companies, plays a leading role in a project named "the Philippine Cacao Challenge", with the aim of expanding the cacao farm from the present 14,000 ha to 155,000 ha and increasing the production volume to 100,000MT by 2020 (http://www.cidami.org/philippine-2020-challenge/). However, at present, not only are the skills and knowledge of allegedly 10,000-strong cacao farmers in Davo is limited, but also the sheer number is not enough for the labor-intensive cacao production. Therefore, Davao DTI is proposing to create a new course where students grow cacao seedling in senior high school curriculum. As part of the SHS program, the new curriculum is underway to enable students to obtain National Certificate I and II of TESDA occupational training course in the SHS technical vocational track, before graduation. Presently it is in the process of preparing the curriculum. In Davao, there is ApoChoco Inc., a cacao farm where Keizo Muto, a Japanese businessman, joined as a senior management (http://chocolatebox.asia/apochoco/). It hit headlines recently that it began growing the Criollo cacao, which accounts for only 5% of the total world cacao production. (http://www.nikkei.com/article/DGXLASDG31H1G_V10C16A9CR8000/)
Overall goal	Promotion of local industry cluster

Cocoa production in the world

Unit: 1000 tons (estimate)

	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016推定
Ivory Coast	1485.9	1449	1746.2	1795.9	1650
Ghana	879.3	835.5	896.9	740.3	800
Indonesia	440	410	375	325	320
Cameroon	206.5	225	211	232.3	220
Ecuador	798	191.5	234	250	220
Nigeria	245	238	248	195	190
Brazil	220	185.3	228.2	230	180
Peru	60.6	69.8	81.7	85.1	85
Dominican Republic	72.2	68	70	82	72
Columbia	42.6	48.4	48.8	51	53
India	13	15	14	16	16
Malaysia	4	3	6	6.5	6.5
The Philippines	4.8	4.8	5.2	5.5	6
Vietnam	2	2.2	2.4	3	3
Thailand	0.4	0.4	0.4	0.4	0.4
Whole world	4694.8	3943.5	4373.2	4233.1	4039.5

The International Cocoa Organization (ICCO)

Project purpose	To contribute to the further development of industry clusters through industrial promotion activities, utilizing the existing clusters developed and strengthened in the DICCEP and NICCEP. To contribute to the local industry development by creating more employment and promoting export/FDI To roll out the approach of the successful model to other clusters.
Outputs	1. Develop human resources necessary for the growth of the cluster through the public-private-academia collaboration. 2. Create activity cases of dynamic industry clusters through contributing to the improvement of industries' competitiveness by supporting them in productivity improvement, human resource development, and participation in the global value chain. 3. Establish a platform and approach which allow the clusters to share information with each other, promote corporation, an overcome common challenges.
Activities	<u>Activities for Output 1</u> 1-1 JICA Project Coordinator will play a leading role in preparing materials and schemes to introduce the latest production technology in cooperation with DA, Department of Agrarian Reform (DAR), PCA, CIDAMi, MCDC, and USM . 1-2 Davao TESDA will expand the Agriculture NC II course and Trainers Methodology Certificate Course that are necessary qualifications for a SHS trainer. TESDA is also expected to train trainers (TOT). 1-3 In cooperation with DTI and CHED, identify SHSs who will be pilot schools. 1-4 Invite experts in agricultural high schools from Japan to give instructions for curriculum preparation. Establish a system to ensure the fair trade on cacao by obliging the buyers to obtain the license. <u>Activities for Output 2</u> 2-1 Draw up plans for expansion of the farmland and improvement of the productivity in cooperation with the PCA and DA. Municipal Agriculture Office will be in charge of giving instructions to farmers and encouraging participation. 2-2 Encourage the DA to expand the shared service facility (SSF) to be used for fermentation and drying of cacao. 2-3 Promote a cooperation with the Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) through CIDAMi in the area of R&D as well as in export and investment. 2-4 In collaboration with Mars Cacao Development Center(MCDC), create quality standards and certification on Philippine cacao as indicated in DA Cacao Roadmap 2016-2022. 2-5For strengthening the domestic supply chain in the Philippines, encourage major domestic chocolate companies, such as Universal Robina Corporation, Commonwealth Foods, Inc., and Goya, Inc. under Delfi Foods, Inc., to procure domestically produced cacao beans. At the same time, address the quality assurance and control of cacao at the processing and distribution in addition to the production, in collaboration with traders and processors. 2-6 Expand the production of Criollo cacao by receiving support from fore-mentioned Mr. Muto. <u>Activities for Output 3</u> 3-1 Productivity improvement and expansion of the production => Development of human resources in quality and quantity => Strengthen domestic supply chain => Prepare reports regarding the scenario of market expansion by participation in the GVC 3-2 Coordinators conference: Conduct conferences with other Cluster Coordinators, chaired by Cacao National Cluster Coordinator to share information. 3-3 Roll out to other clusters.

Table 8-10 Concept for Sub-project 2 (idea)

Project name	Project to expand sales of organically grown high value-added products with marketing activities and to roll out their production model (tentative)
Position of JICA's IHRD Cooperation Program	Human resource development linked to industries that create decent work in rural areas
Project background	Among the agricultural exports of the Philippines, coconuts have generated the most added value. For this reason, the Philippine Coconut Authority, which used to be an agency under the Department of Agriculture, was put directly under the Office of the President in 2014. Davao produces the highest volume of coconut in the country, and the coconut farming generates the second most job opportunities within the Region. However, the 2013 Typhoon Yolanda devastated farms in the Region, many of which are still recovering from the damage. In FY2015, the share of coconut export of the country dropped to 3.5% from 5.5% in the previous year. Coconut is very easy to grow in the first place, requiring no special skills or knowledge, unless the high-quality is required. Because of this, coconut farmers are said to have the lowest income among all farmers in the Philippines, which has decreased the number of farmers engaged in coconut farming year by year. Therefore, the PCA and DA are currently making great efforts to improve the productivity of coconut farming and restore the farmland, while providing a variety of support to coconut farmers to help improve their livelihood. The demand for coconuts has been increasing in recent years as the high-value-added products including virgin coconut oil (VCO) and coconut sugar are getting popular in the international markets. However, the production is not keeping up with the demand.  Source: Lao Integrated Farms, Inc.website Lao Integrated Farms, Inc. produces unique coconut products, including coconut syrup and coconut sugar using coconuts grown 100% organically. They practice organic farming in every aspect of their coconut production, including the use of organic pesticides, organic soil remediation, and organic soil erosion prevention -- not to mention organic fertilizers. Their know-hows of organic farming are specific to the Philippines, which has a mild climate, and the implementation does not require much cost. The company also sells their organic fertilizers produced on their own farm to neighboring farms at a low price (265 pesos per 50 kg bag). In recent years, organic crops have gained popularity also in Japan, keeping the demand for such crops high. While providing its farmers with training, the company is also working to improve their income and welfare through various means, including insuring them through a farmers' insurance. The average monthly income of farmers working at the company is 20,000 pesos, which is much higher compared to 10,000 pesos earned by common college graduates.
Overall goal	Promotion of local industry clusters
Project purpose	To contribute to the further development of industry clusters through industrial promotion activities, utilizing the existing clusters developed and strengthened in the DICCEP and NICCEP. To contribute to the local industry development by creating more employment and promoting export/FDI

	To roll out the approach of the successful model to other clusters.
Outputs	1. Develop human resources necessary for the growth of the cluster through the public-private-academia collaboration. 2. Create activity cases of dynamic industry clusters through contributing to the improvement of industries' competitiveness by supporting them in productivity improvement, human resource development, and participation in the global value chain. 3. Establish a platform and approach which allow the clusters to share information with each other, promote corporation, and overcome common challenges.
Activities	Activities for Output 1 1-1. Curricula of senior high schools: Starting next fiscal year, Lao Integrated Farms, Inc will serve as a location for the Immersion Program, part of senior high schools' curriculum, in response to the request from DepEd. Currently, while the company has already started to offer the "Small Enterprise Technology Upgrading Program" as part of the SETUP program commissioned by DOST, it also provides independent training programs in compliance with the authorization qualifications for organic farming as well as a GAP/GMP training. Under the instruction of experts in preparing curricula for agricultural high schools, these know-hows shall be taught not only in the Immersion Program, but also in a TOT program, in the form of lectures, to teach organic farming and GAP/GMP at senior high schools. Activities for Outcome 2 2-1. Organic produce has a high added value in the markets of developed countries such as Japan. With the support from the agricultural experts with profound knowledge on the JAS Standards for organic products, the Lao's organic farming model shall be rolled out to other farms to promote organic farming and the export of such products. 2-2. Coconut sugar and syrup are not so well known as much as VCO in Japan and other countries outside the Philippines. Therefore, in cooperation with the PCA headquarters in Manila, which has product development and export promotion functions, as well as DTI XI, we help raise the profile of these products and promote sales by marketing. 2-3. Form consortium such as Farmers Associations by GAP/GMP accredited farmers participating in the project with capabilities on organic farming, in order to administrate the trade on organically produced coconuts. The consortium will be also in charge of monitoring the eligibility of the members' certificates and qualifications, collective purchase of input and sales of organic produced coconuts 2-4. Explore opportunities of FDI by food processing companies and retail companies in cooperation with agricultural experts and the Davao City Investment Promotion Center. Activities for Output 3 3-1. In cooperation with the tourism cluster, promote the farm as a place where people can also have hands-on experiences in organic farming to help raise the profile of organic products and organic farming. 3-2. Coordinators conference: Conduct conferences with other Cluster Coordinators, led by Coconut Cluster Coordinator to share information. 3-3. Roll out to other clusters.

Table 8-11 Concept of the Sub-project 3 (idea)

Project name	Project to help develop high-value-added products and obtain HACCP certification in the fishery industry (tentative)
Position of JICA's IHRD Cooperation Program	Human resource development linked to industries that create decent work in rural areas
Project background	Bungas (*"Milkfish" in English,"Sabahi" in Japanese*) is the national fish of the Philippines and is most consumed in the country. The catch of the fish in Davao is already three times more than the demand in the Region, and it has been exported to other regions. However, with the recent continuous decline of the price, aquaculturists are struggling to deal with this situation. The reason for the price decline is not clear. Various efforts to add high-values to the fish have been made, including provision of the fish to Taiwanese fishing boats as bait for bonito fishing and export of frozen, packaged bungas fillet by Alsons Aqua Technologies Inc. However, none of these efforts have been notably successful. Meanwhile, the environment of fishing grounds has been left without any improvements for many years and therefore steadily worsening: there is unused bait accumulated higher than one meter on the seabed. To remove this, we would have to stop the production completion or move the production site to a different location and pull up the farming baskets called "cages" to let the bait disperse naturally. Although BFAR has been persistently asking fishermen to clean up the seabed, nothing has been done yet. This current condition might be one of the causes of bacterial infections and infectious diseases which have been a serious problem for fishermen. Currently, aquaculturists in Davao are not HACCP certified. While there are currently higher education institutions in Davao which offer degree programs in the fishery field, including Davao del Norte State College (DNSC), which offers a bachelor's degree program in fisheries science and master's degree program in fisheries management, and SPAMAST, which offers bachelor's and master's degree programs in science in fisheries and fishery business, the number of fisher technologists in Davao is still scarce and there seems to be no end in the spread of infectious disease and bacterial infections. We believe this is part of the reason why fishermen in the area are falling behind HACCP certification.
Overall goal	Promotion of local industry clusters
Project purpose	To contribute to the further development of industry clusters through industrial promotion activities, utilizing the existing industry clusters developed and enhanced through DICCEP and NICCEP. To help create new jobs and promote export and FDI to contribute to the industrial development of rural areas. To apply the approach of the successful model in other clusters.
Outputs	1. Develop human resources necessary for the growth of the cluster through the public-private-academia collaboration. 2. Create dynamic activity cases of the industry clusters through contributing to the improvement of industries' competitiveness by supporting them in productivity improvement, human resource development, and participation in the global value chain. 3. Establish a platform and approach which allow the clusters to share information with each other, promote corporation, and overcome common challenges.

Activities	Activities for Output 1 1-1. Deploy Japanese technical experts in fisheries to these universities to help improve their curricula and support career guidance, and thus to develop fisher technologists with expertise in international standards including HACCP, who can address damage caused by bacterial infections and infectious diseases, and solve other production problems. 1-2. Help improve the training programs for fishermen offered by BFAR-Regional Fishery Training Center XI on Good Manufacturing Practice (GMP), food safety and labeling, and packaging techniques. 1-3. In cooperation with BFAR, an authorizing agency of HACCP, require aquaculturists to comply with HACCP to develop new markets. Request major fishery HACCP accredited companies such as Alsons Aqua Technologies Inc. are to encourage aquaculturists to comply with HACCP regulations. Activities for Output 2 2-1. Japan has various fish processing technologies. Using bungas as feed for bonito has already been tried in Japan, while Japan's processing technology for fishery paste products such as *kamaboko* (fish minced and steamed) is unique to the country and they are now sold all over the world. While the main ingredients of these fishery paste products are bland fish such as Alaska pollack and shark species, bungas may be used as an ingredient, too. Therefore, we explore the possibility of using bungas in paste products by Japanese experts in fish processing. We will also develop high-value-added bungas products in cooperation with BFAR, an agency of DA, universities including the Davao del Norte State College (DNSC), and private companies including Alsons Aqua Technologies Inc., an exporter of processed bungas products (packaged fillet). 2-2. BFAR being a leading part, seek the cooperation with the Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA), etc. with the aim of participating in the GVC. Activities for Output 3 3-1. Development and increase of human resources => Improvement of production environment and productivity => Development of new products that match market needs => Prepare reports regarding the scenario of market expansion though participation in the GVC 3-2. Coordinators conference: Conduct conferences with the food cluster to share information. 3-3. Roll out to other clusters.

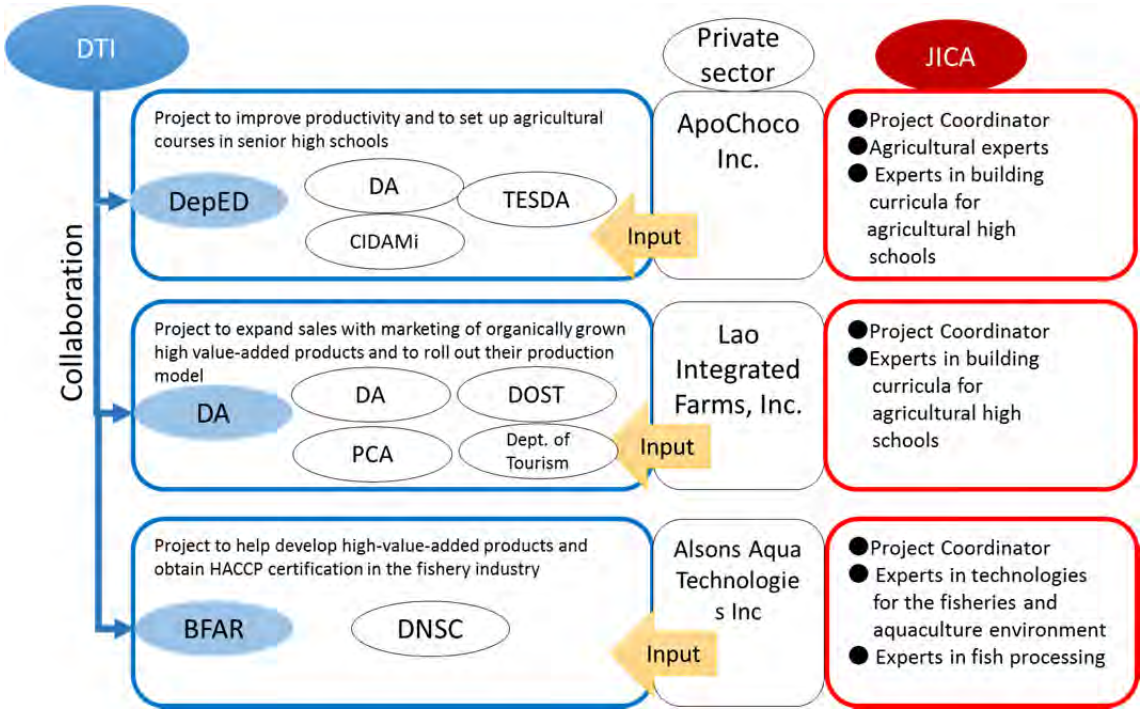
Table 8-12 Commitment and Implementation Timeline for Sub-projects #1-3

Input	1. Japan side: Team leader/Experts for cluster development, experts in building high school-level curricula (agriculture and fisheries), agriculture, food processing and product development, the fishery and aquaculture environment, marine product processing, as well as operational coordinator 2. The Philippines side: Appointment of counterparts (DTI-XI as the main counterpart; PCA-XI, DA-XI, DOST-XI, DOT-XI, and DepEd-XI as sub-counterparts)
Implementation Schedule	2018 - 2022 (tentative)
Project target area	Davao

Implementing agencies/ cooperating agencies	[Proposed approach 1] Implementing Agency: Cacao Industry Development Association of Mindanao, Inc. (CIDAMi) Cooperating Agencies: DA, DepEd, TESDA, University of Southern Mindanao (USM), Mars Cacao Development Center (MCDC), PCA and others [Proposed approach 2] Implementing Agency: PCA Cooperating Agencies: DA, DOST, DTI, Department of Tourism, Lao Integrated Farms, Inc. [Proposed approach 3] Implementing Agency: BFAR XI, Cooperating Agencies: The BFAR- Regional Fishery Training Center XI, The Davao del Norte State College (DNSC), SPAMAST, Alsons Aqua Technologies Inc
Beneficiaries	General: the Davao Industry Cluster Proposed approach 1: cacao farmers Proposed approach 2: coconut farmers Proposed approach 3: bungas aquaculturistss

(4) Implementation system

The figure below shows the proposed implementation system of this project. Having DTI as the main counterpart, set up a sub-counterpart for each sub-project.



Source: Prepared by the JICA Survey Team

Figure 8-3 Organization diagram for the Davao Industry Cluster Upgrading Project

(5) Role sharing of agencies involved in the project

The table below shows the major role (s) of each agency involved in the project.

Table 8-13 Roles of the Main Agencies Involved in the Davao Industry Cluster Upgrading Project

Category / Agency names	Role(s)
Government agencies	
DTI	The leader of all the three projects
DepEd	Creating a curriculum in Project (1) Creating an Immersion Program in Sub-Project (2)
DA	Supporting production in Project (1) and (2)
BFAR	The counterpart of DTI in Project (3)
PCA	Supporting the cultivation of organic coconuts and marketing of products made from organic coconuts in Project (2)
TESDA	Development of senior high school trainers in Project (1)
Department of Tourism	Supporting marketing activities in Project (2) and planning of Agritourism
CIDAMi	Project (1) Coordination of public-private-academia collaboration
DNSC	Development of fishing technicians in Project (3)
Private	
ApoChoco Inc.	Provision of the know-hows on Criollo cacao cultivation
Lao Integrated Farms, Inc.	Provision of the know-hows on organic cultivation of coconuts
Alsons Aqua Technologies Inc	Provision of the know-hows on the production and marketing of high-value-added bungas product

Closing Remarks

The ideas about the JICA's potential project concepts are proposed in Chapter 8 based on information and data collected through field surveys and discussions with the related agencies and organizations. Over a wide range of collected information and data, some were not employed for the project concepts, but are worth being referred at future discussions. These ideas are taken notes below, considering the meaning of the survey that the relevant information and data are widely collected.

(1) Response to changes in labor market brought by new and advanced developments in technology

In developed countries, many industries have recently dealt with automation brought by new ideas and technologies such as IoT (Internet of Things) and AI (Artificial Intelligence). These New and advanced developments in technology will impact structures and needs of industrial human resources in middle income countries in the Philippines in future.

ILO conducted a survey[101] to analyze how technology is transforming five key labour-intensive and economically prominent sectors in ASEAN: the automotive and auto parts; electrical and electronics; textiles, clothing and footwear; business process outsourcing; and retail sectors.

According to the survey, no imminent risks of severe loss of employment opportunity are expected. However, the survey points out that low skilled jobs could be replaced by robots. There are high possibilities that 56 % of wage jobs have been lost in Indonesia, Philippines, Thailand and Vietnam in 20-30 years from now. The survey suggests that people should have solid expertise to effectively work with digitalized machines, dealing with new technologies, and core skills to respond changes through appropriate trainings.

The survey analyses impacts of development of new technologies in Automotive and Auto Parts industry and Electrical and Electronics industry in the table below.

Impacts of Technological Innovation in Automotive and Auto Parts and Electrical and Electronics

Industry Sector	Main Technologies Impacting the Sector	Impact on Enterprises and People
Automotive and Auto Parts	Global trends: ・ Electric/hybrid electric vehicles	・ Robots are replacing lower-skilled jobs ・ The industry needs new types of higher-skilled workers who are difficult to

101 「ASEAN in transformation: How technology is changing jobs and enterprises」(ILO, 2016)

	・ Advanced, lightweight materials ・ Autonomous vehicles In ASEAN, robotic automation is most prominent.	find: ✓ Increased need for engineers with specialized knowledge on automation and robotic programming ✓ Increased demand for workers with STEM backgrounds ・ The sector needs to rebrand its image among young people and women
Electrical and Electronics	Robotic automation: replacing simple tasks The IoT: presents a major growth opportunity for the entire sector 3D printing: currently limited but likely to expand。	・ Automated processes are replacing low-skilled jobs in assembling and packaging ・ Production in E&E will be catalysed, encouraging the creation of more innovative products and new jobs opportunities ・ Demand for higher skills with strong technical, engineering and science fields will increase ・ Workers need to scale up their skills, especially in STEM

Source: Prepared by the JICA Survey Team based on "ASEAN in transformation: How technology is changing jobs and enterprises"（ILO, 2016）

(2) Expansion of skills and creation of employment assuming environmental consideration as a keyword

The people's awareness of environment will be expected to increase in future as Green Jobs Act was enacted in May 2016 in the Philippine. Green jobs refer to employment that contributes to preserving or restoring the quality of the environment, be it in the agriculture, industry or services sector. Specifically, but not exclusively, this include creating new jobs that help to protect ecosystems and biodiversity, reduce energy, materials and water consumption through high efficiency strategies, decarbonize the economy, and minimize or altogether avoid generation of all forms of waste and pollution.

The existing occupations also become of requiring the expansion and enhancement of their skills.. For instance, automobile mechanic needs to acquire skills to handle hybrid vehicles. Construction engineers are required knowledge to deal with new construction materials which are environmental friendly.

Japan can add values to human resources development in this field as Japan has advanced technologies in environment.

(3) Approach of policy based support

JICA has supported the education sector in the Philippine mainly through the implementation of the projects covering from primary education to higher education. JICA needs to consider policy based support, combined with project based support along with accumulated experiences and knowledge in the sector.

Multilateral development partners have utilized policy based support as a main modality and actually have been deeply involved in preparing the Philippine Development Plan (2017-2022) and proceeding mid-term sector development strategies and plans. In the education sector, ADB has played a major role and in the upper secondary education sector which builds a foundation for IHRD, ADB makes a commitment to Secondary Education Support Program which plans to be approved in 2018[102]. This program will continue to support K to 12 Program through the Results-Based Lending modality, following the on-going Higher Education Support Program. At present, the consultants were recruited and are being prepared contents of the program. If JICA has an intention to support the Philippine's secondary education both through policy based support and project based support, it is necessary for JICA to consult with ADB immediately.

(4) Support for Achievement of Sustainable Development Goals (SDGs)

The Millennium Development Goals (MDGs) led international communities as a development guide for a long time and completed its roles. At present, the Sustainable Development Goals (SDGs) has succeeded the Millennium Development Goals (MDGs) since 2016.

Under the SDGs which has 17 goals, especially, SDG 4: "Ensure inclusive and equitable quality education and promote life-long learning opportunities for all" is closely related to the education sector. Development partners has been discussed how to reflect SDG 4 into their on-going or planned projects/programs. JICA, as a one of the development partners is also expected to support the achievements of the goal.

Japan may be able to contribute to Item I and Item 3 of the SDG 4 targets described blow.

- Item 1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcome)
- Item 3: By 2030, ensure equal access for women and men to affordable and quality technical, vocational and tertiary education, including university

Development partners provided supports, targeting education elements such as curriculum, facilities, faculty, textbooks and scholarship. Recently, W.B and ADB especially are tending to put more focuses on enhancement of learning achievements as an outcome rather than inputs to enhance outcomes. The Programme for International Student Assessment (PISA) is internationally recognized and widely used and reliable assessment for learning achievements. The Organisation for Economic Co-operation and Development (OECD) conducts PISA every three year. The

[102] Country Operations Business Plan: Philippines 2017–2019 (ADB, November 2016)

Philippines did not participate in PICA in 2015, but will return to PISA 2018, which is considered as government intentions to strengthen global competitiveness of its human resources.

Japan can provide various supports in this area as Japan has occupied higher ranks in PISA. PISA 2018 will be conducted in April 2018 and the results will be announced at the end of 2019. PISA 2018 will newly introduce global competencies and assess in-depth knowledge and understanding of global and intercultural issues, the ability to learn from and live with people from diverse backgrounds, and the attitudes and values necessary to interact respectfully with others. The results of PISA 2018 may give a significant impact on the government policies for education and industrial human resource development in the Philippines.

JICA need to start participating in discussions on PISA in the Philippines and examining the necessity of the support depending on results of PISA 2018. At present, ADB is supporting PISA in Vietnam while W.B and Koreas is supporting PISA in Cambodia.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