

# **Data Collection Survey on Automotive Industry Development in Islamic Republic of Pakistan**

## **Final Report**

**August 2021**

**Japan International Cooperation Agency (JICA)**

**ALMEC Corporation**

**International Development Center of Japan (IDCJ)**

**Oriental Consultants Global Co., Ltd.**

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## Abbreviation

5C	Connecting rod, Cylinder head, Cylinder block, Camshaft, Crankshaft.
AACV	Autonomous, Automated and Connected Vehicles
ADB	Asian Development Bank
ADP	Automotive Development Policy
AFTA	ASEAN Free Trade Area
AICO	ASEAN Industrial Cooperation
AIDC	Automotive Industry Development Committee
AIDEP	Auto Industry Development and Export Plan
AIDP	Automotive Industry Development Programme
AIIP	Auto Industry Investment Program
AISDC	Auto Industry Skills Development Company
APIC	Auto-Parts Industry Club
ASEAN	Association of South-East Asian Nations
AT	Automatic Transmission
AUV	Asian Utility Vehicle
B2B	Business to Business
BDS	Business Development Services
BF	Brown Field
BKPM	<i>Badan Koordinasi Penanaman Modal</i>
BMW	<i>Bayerische Motoren Werke AG</i>
BOI	Board of Investment
C/P	Counterpart
CAFE	Corporate Average Fuel Efficiency
CAGR	Compound Annual Growth Rate
CASE	Connected, Autonomous, Shared, Electric
CBT-A	Competency Based Training and Assessment
CBU	Complete Build-up
CEV	Clean Energy Vehicle
CIDA	Canadian International Development Agency
CII	Confederation of Indian Industry
CKD	Complete Knock Down
COE	Center of Excellence
COVID-19	coronavirus disease 2019
COMCEC	Standing Committee for Economic and Commercial
CPEC	China-Pakistan Economic Corridor
CPI	Consumer Price Index
CRS	Cold Rolled Steel
CV	Commercial Vehicle
CVT	Continuously Variable Transmission
CY	Calendar Year
D-8	Developing 8

DCM	Data Communication Module
D/E Ratio	Debt to Equity Ratio
DFID	Department for International Development
DEN	National Energy Council ( <i>Dewan Energi Nasional</i> )
DIP	Department of Industrial Promotion
DIPP	Department of industrial policy and promotion
ECC	Economic Coordination Committee
ECG	European Car-transport Group of interest
ECO	Economic Cooperation Organization
ECU	Electronic Control Unit
EDB	Engineering Development Board
EEV	Energy Efficient Vehicle
EFF	Extended Fund Facility
EMS	European Monetary System
EPZA	Export Processing Zone Authority
EU	European Union
EV	Electric Vehicle
FBR	Federal Board of Reserve
FCA	Fiat Chrysler Automobiles
FCV	Fuel Cell Vehicle
FDI	Foreign Direct Investment
FED	Federal Excise Duty
FF	Front-engine Front-drive
FOB	Free on Board
FR	Front Engine Rear Drive
FTA	Free Trade Agreement
FTI	Federation of Thai Industries (FTI)
FMS	Flexible Manufacturing System
FY	Fiscal Year
GDP	Gross Domestic Product
GF	Green Field
GIZ	German Agency for International Cooperation ( <i>Gesellschaft für Internationale Zusammenarbeit</i> )
GKS	GERBANGKERTOSUSILA
GNI	Gross National Income
GRDP	Gross regional domestic product
GSP	Generalized System of Preference
GVC	Global Value Chain
HCV	Heavy Commercial Vehicle
HEV	Hybrid Electric Vehicle
HQ	Headquarter
HRS	Hot Rolled Steel
HS	Harmonized System
ICE	Internal Combustion Engine
IC/R	Inception Report

ICT	Information Communication Technology
IFC	International Finance Corporation
IIM	Indian Institute of Management
IIT	Indian Institute of Technology
ILO	International Labour Organization
IOR	Input Output Ratio
IoT	Internet of Things
ITB	Bandung Institute of Technology ( <i>Institut Teknologi Bandung</i> )
ITC	International Trade Centre
ITS	Surabaya Institute of Technology ( <i>Institut Teknologi Sepuluh November</i> )
IMF	International Monetary Fund
IMV	Innovative International Multi-purpose Vehicle
ISDP	Industry Specific Deletion Program
IS&EBSC	Industry Support and Environment & Business Sustainability Cell
IWVTA	International Whole Vehicle Type Approval
JARI	Japan Automobile Research Institute
JACI	Japan Association of Commerce and Industry
JASIC	Japan Automobile Standards Internationalization Center
JCCB	Japanese Chamber of Commerce, Bangkok
JCPOA	Joint Comprehensive Plan of Action
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JNCAP	Japan New Car Assessment Program
JV	Joint Venture
JVC	Japan International Volunteer Center
KD	Knock Down
KIN	National Industrial Policy ( <i>Kebijakan Industri Nasional</i> )
KPT	Karachi Port Trust
L/C	Letter of Credit
LCEP	Low Carbon Emission Plan
LCEV	Low Carbon Emission Vehicle
LCGC	Low Cost Green Car
LCV	Light Commercial Vehicle
LMCP	Local Material Content Policy
LPI	Logistics Performance Index
LSM	Large Scale Manufacturing
LTFF	Long Term Financing Facility
MaaS	Mobility as a Service
MAI	Malaysia Automotive Institute
MARII	Malaysia Automotive, Robotics & IoT Institute
MCC	Ministry of Climate Change
MDI	Mandatory Deleted Item
MHRD	Ministry of Human Resource Development
MIROS	Malaysian Institute of Road Safety Research

M/M	Man/Month
MOC	Ministry of Commerce
MOC	Ministry of Communication
MOF	Ministry of Finance
MOI	Ministry of Industry (Thailand)
MOIP	Ministry of Industry and Production
MOL	Ministry of Labor
MOLINA	National Electric Car ( <i>Mobil Listrik Nasional</i> )
MOMA	Ministry of Maritime Affairs
MOR	Ministry of Railways
MOST	Ministry of Science and Technology
MOT	Ministry of Transport of Malaysia
MPC	Monetary Policy Committee
MPV	Multiple Purpose Vehicle
MST	Ministry of Science and Technology
MRV	Measurement, Reporting and Verification
MT	Manual Transmission
MTDF	Medium Term Development Framework
MW	Megawatt
NAP	National Automotive Policy (Malaysia)
NAVTTTC	National Vocational & Technical Training Commission
NBAR	National Blueprint for Automotive Robotics
NED	NED University of Engineering and Technology
NESDB	National Economic and Social Development Board
NEV	New Energy Vehicle
NCSME	National Committee on Small and Medium Enterprises
NHA	National Highway Authority
NIC	National Incubation Center
NIP	National Industrial Parks Development and Management Company
NSS	National Skills Strategy
NUST	National University of Sciences and Technology
NVQF	National Vocational Qualification Framework
NXGV	Next Generation Vehicles
OEM	Original Equipment Manufacturer
OIC	Organisation of Islamic Cooperation
OICA	International Organization of Motor Vehicle Manufacturers
OJT	On-the-Job Training
OPEC	Organization of the Petroleum Exporting Countries
OT	Operational Technology
PAAPAM	Pakistan Association of Automotive Parts & Accessories Manufacturers
PACO	Pakistan Automotive Corporation
PAI	Pakistan Automotive Institute
PAII	Productive Asset Investment Incentive
PAMA	Pakistan Automotive Manufacturers Association
PBC	Pakistan Business Council



PHV	Plug-in Hybrid Vehicle
PHEV	Plug-in Hybrid Electric Vehicle
PPV	Passenger Pickup Vehicle
PQA	Port Qasim Authority
PRSP	Poverty Reduction Strategy Papers
PSDP	Public Sector Development Program
PSQCA	Pakistan Standard & Quality Control Authority
PTA	Preferential Trade Agreement
PTI	<i>Pakistan Tehreek-e-Insaf</i> (Pakistan Movement for Justice)
PV	Passenger Vehicle
QCD	Quality, Cost and Delivery
RD	Regulatory Duty
RDE	Real Driving Emission
R&D	Research and Development
RIPIN	Master Plan of National Industry Development ( <i>Rencana Induk Pembangunan Industri Nasional</i> )
SBP	State Bank of Pakistan
SC	Supply Chain
SCF	Supply Chain Finance
SCT	Special Consumption Tax
SDL	Smart Device Link
SECP	Securities and Exchange Commission of Pakistan
SEZ	Special Economic Zone
SIDP	Supporting Industry Development Program
SIRIM	Standard and Industrial Research Institute of Malaysia
SKD	Semi Knock Down
SME	Small and Medium Enterprise
SMEDA	Small and Medium Enterprise Development Authority
SNS	social networking service
SRO	Statutory Notifications
STPF	Strategic Trade Policy Framework
SUV	Sport Utility Vehicle
T/A	Technical Assistance
TAHRDP	Thai Automotive Human Resource Development Project
TAI	Thai Automotive Institute
TAIA	Thai Automotive Industry Association
TAMPA	Thai Auto-Parts Manufacturers Association
TASF	Technology Acquisition Support Fund
TASS	Technology Acquisition Support Scheme
TBS	Tariff Based System
TDAP	Trade Development Authority of Pakistan
TEVTA	Technical Education & Vocational Training Authority
TIV	Total Industry Volume
TKDN	<i>Tingkat. Kanbungan Dalam Negri</i>
TOGG	Turkey's Automobile Joint Venture Group

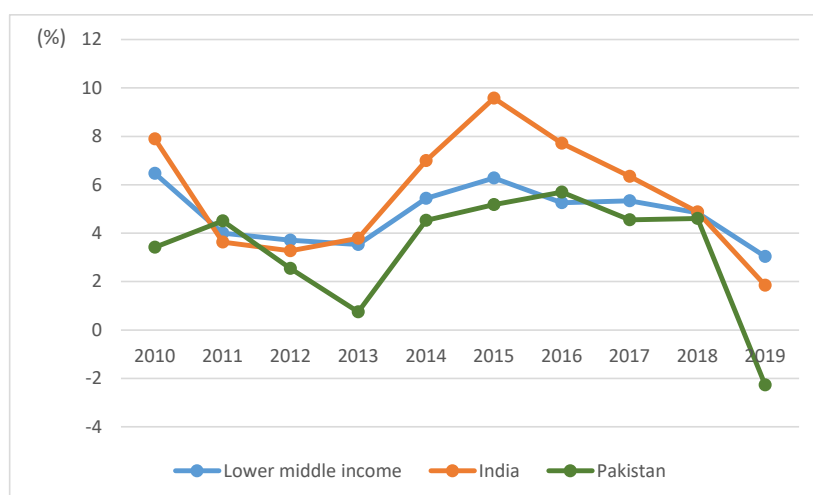
TPS-OIC	Trade Preferential System Among the Member States of the OIC
TRIMs	Trade-Related Investment Measures
TRSP	TVET Reform Support Program
TUV	Toyota Utility Vehicle
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development
URL	Uniform Resource Locator
USAID	United States Agency for International Development
UET	University of Engineering and Technology Lahore
VA	Value Analysis
VE	Value Engineering
VC	Value Chain
VDA	<i>Verband der Automobilindustrie</i>
VLFM	Visionary Leaders For Manufacturing
VW	Volkswagen
WB	World Bank
WHO	World Health Organization
WLTP	Worldwide harmonized Light vehicles Test Procedures
WP29	UNECE World Forum for Harmonization of Vehicle Regulations
WTO	World Trade Organization
x-EV	Electrified Vehicle
ZEV	Zero Emission Vehicle

## Introduction

### 1. Background of the Study

In 2019, the GDP growth rate of Pakistan sharply dropped to 1% from a robust economic growth rate of 5% in the preceding years from 2016 to 2018<sup>1</sup>. The government of Pakistan suffered from a deteriorated balance of international payments and the risk of a foreign currency shortage given the heavy investment from China and a depreciated local currency. In May 2019, the government decided to accept financial support of as much as USD 6.0 billion from the International Monetary Fund (IMF) and committed itself to a structural reform. While Pakistan has long suffered from a trade deficit, the trend of economic growth in the long run and an emerging middle class have heightened the concern about the expanding trade deficit. Hence, the biggest challenges Pakistan now faces are an expanding international deficit, decreasing foreign exchange reserves, and an increasing fiscal deficit. To tackle these difficulties, increasing the export of automobiles is being eyed to improve the trade balance and boost foreign exchange reserves.

The manufacturing sector in Pakistan accounts for 17% of the national GDP and is considered by the government as an engine for economic growth. In particular, the government has emphasized the promotion of an automobile industry that embraces thousands of suppliers to generate high economic impact. However, the geometric mean of the annual growth rate of the entire industry, including manufacturing and construction, from 2017 to 2019 was merely 2.3%, which was lower than neighbouring India's 4.3% for the same period<sup>2</sup> (Figure 1). The value added per worker in Pakistan's manufacturing sector was USD 2,864, which was less than half that of India, i.e., USD 6,635<sup>3</sup>. These figures indicate that there are some rooms to develop in the manufacturing sector in Pakistan, and the automotive industry might be one of these.



Source: The World Bank, World Development Indicators

**Figure 1 Annual Growth Rates of the Industrial Sector in 2010–2019**

<sup>1</sup> The World Bank, World Development Indicators (<https://databank.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/1ff4a498/Popular-Indicators#>)

<sup>2</sup> The World Bank, World Development Indicators (<https://data.worldbank.org/indicator/NV.IND.TOTL.KD.ZG?locations=PK-XN-IN>)

<sup>3</sup> The World Bank, World Development Indicators (<https://data.worldbank.org/indicator/NV.IND.EMPL.KD>)

In its Automotive Development Policy (ADP) 2016–2021, the government of Pakistan has set an annual production goal of 429,000 four-wheel vehicles by 2021. Although the goal seemed realistic when the number of production or sales passed 250,000 in 2010, the rapid depreciation of the rupee, followed by a large-scale tax increase, made annual automobile production and sales dive into levels below 200,000. The COVID-19 exacerbated the trend.

The Japan International Cooperation Agency (JICA) has provided a series of technical assistance to Pakistan’s automotive industry, including the assignment of an expert in 2012–2014 to help develop the technical capacities of small and medium-size auto parts manufacturers, the assignment of an automotive industry development adviser in 2012–2014 and another in 2015–2017, the conduct of the “Project for Technical Support to Auto Parts Manufacturing Industry” in 2015–2019, and the assignment of an adviser for vehicle maintenance and gas emission standards in 2016–2017. However, the action plans formulated through these technical assistance projects have not been carried out. Further support in formulating appropriate policies and building implementation mechanisms to ensure execution is required to develop the local automotive industry, particularly the parts supply chain.

## 2. Study Objective

This current study thus aims to offer recommendations to the government of Pakistan as they formulate its new auto policy, or the Automotive Industry Development and Export Plan (AIDEP), which will come into effect in July 2021.

The study’s scope of work includes setting the vision of the possible structure of the automobile industry in Pakistan, analyzing the status and issues concerning related agencies, and learning the lessons from the experiences of the third countries.

## 3. Study Period and Target

The study started in May 2020 and will end in August 2021. The target areas of the study are the provinces of Islamabad, Sindh, and Punjab, and a third country. In the course of the study, the Team conducted interviews with the organizations listed in the table below.

**Table 1 Organizations Interviewed by the JICA Study Team**

City	Organization	
Islamabad	Public Sector	Ministry of Industry and Production (MOIP), Engineering Development Board (EDB), Ministry of Commerce (MOC), Ministry of Science and Technology (MST), Ministry of Overseas Pakistanis and Human Resource Development (MOPHRD), Ministry of Climate Change (MCC), Federal Board of Reserve (FBR), Board of Investment (BOI), Pakistan Standard & Quality Control Authority (PSQCA), National Vocational & Technical Training Commission (NAVTTTC), and others.
Karachi	Public Sector	The Karachi branch of Small and Medium Enterprise Development Authority (SMEDA), the Karachi branch of EDB, Industries and Commerce Department Government of Sindh, Sindh Board of Investment, Transport & Mass Transit Department Government of Sindh, State Bank of Pakistan (SBP), Trade Development Authority of Pakistan (TDAP), National Industrial Parks Development and Management Company (NIP), and others
	Private Sector	Pakistan Automotive Manufacturers Association (PAMA), Pakistan Association of Automotive Parts & Accessories Manufacturers (PAAPAM) South Office, the Japanese OEMs, the parts manufacturers, and others
Lahore	Public Sector	The headquarters of SMEDA, Industries and Commerce Department Government of Punjab, Punjab Board of Investment, Transport & Mass Transit Department Government of Punjab, and others
	Private Sector	The headquarters of PAAPAM, parts manufacturers, and others

Source: JICA Study Team

#### **4. Contents of this Report**

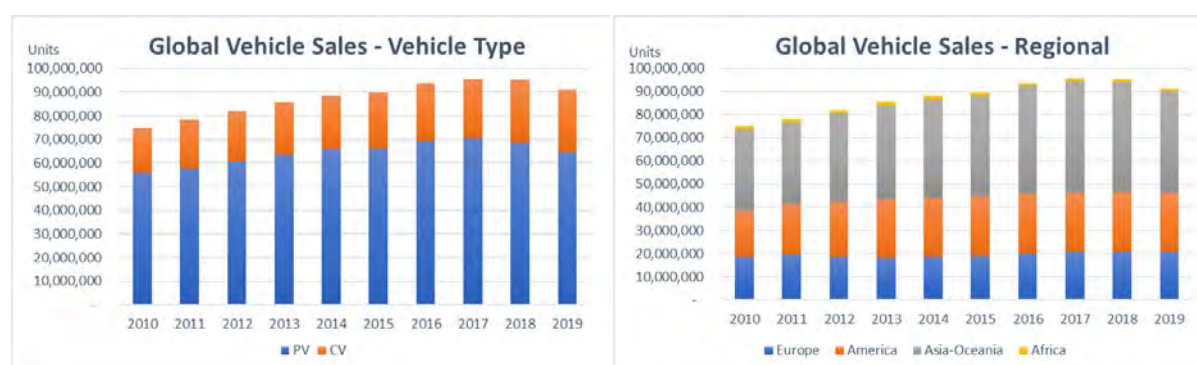
This report comprises five chapters. Chapter 1 describes the position of the automotive industry of Pakistan in the global value chain, as well as the impacts and changes in the automotive industry brought about by the COVID-19 pandemic. Chapter 2 delves deeper into the status of the automotive industry of Pakistan. Chapter 3 analyzes the status and issues in the automotive industry policy of Pakistan using matrix analysis created exclusively for this study. Case studies of other car-producing countries, including Japan, are given in Chapter 4 to serve as guideposts for Pakistan. Chapter 5 summarizes the results of this study and offers recommendations, including inputs, for the next automotive industry development policy (2021-2026) as well as the future directions of the industry's development.

# 1 Automotive Industry of Pakistan in the Global Value Chain

## 1.1 World Automotive Industry under COVID-19 Pandemic

### 1.1.1 Sales and Production by Region

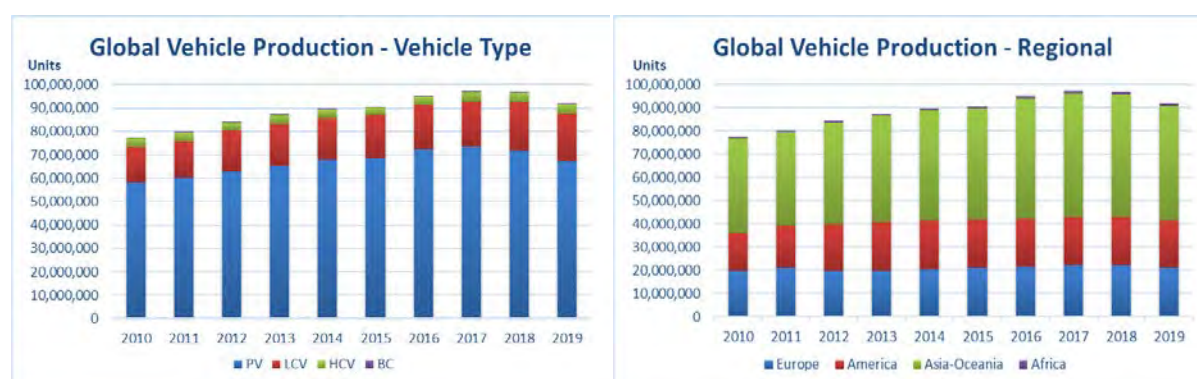
The global automotive industry was performing well until 2017. Production started to decline from 2018, further worsening in 2020 due to the COVID-19 outbreak in February. For the period 2010–2019, total global vehicle sales showed the dominance of passenger vehicles (PVs) at 73.5%, followed by commercial vehicles (CVs) at 26.5%. Manufacturers from Asia-Oceania accounted for the biggest sales at 48.3%, followed by those in America (27.8%), Europe (22.4%), and Africa (1.6%).



Source: JICA Study Team

**Figure 1.1.1 Trends in Global Automobile Sales in 2010–2019**

Total global vehicle production in 2010–2019 showed the dominance of PVs at 75.0%, followed by light CVs (LCVs) at 20.28%; heavy commercial vehicles (HCVs) at 4.4%; and bus commercial vehicles (BCVs) at 0.37%. Manufacturers from Asia-Oceania comprised the largest producer group at 53.2%, followed by those from Europe at 23.5%, America at 22.5%, and Africa at 0.9%.



Source: JICA Study Team

**Figure 1.1.2 Trends in Global Automobile Production in 2010–2019**

Global vehicle sales in the 1<sup>st</sup> half of 2020 decreased by 27% year-on-year to 32.6 million units. Production also decreased by 23% year-on-year to 17.9 million units, but in the 2<sup>nd</sup> half of the year, the cumulative total of three months has already exceeded the 1<sup>st</sup> half, indicating that production has started to recover (Figure 1.1.3).



Note: 2<sup>nd</sup> half of 2020 (H2) data is for June to September.  
 Source: MarkLines (left) and OICA (right)

**Figure 1.1.3 World Automobile Sales and Production in 2019–2020**

In the first half of 2020, total global sales by vehicle category decreased by 30% year-on-year, with commercial vehicle sales declining by 18%. However, COVID-19 had a greater impact on passenger car sales (Figure 1.1.4).



Note: 2<sup>nd</sup> half of 2020 (H2) data is for June to September.  
 Source: MarkLines

**Figure 1.1.4 World Automobile Sales by Category and Region in 2019–2020**

Similar to production, passenger car sales also decreased by 25% year-on-year, light commercial vehicles (LCVs) by 15%, heavy commercial vehicles (HCVs) by 26%, and bus commercial vehicles (BCVs) by 29%. Since the outbreak of COVID-19 began in Wuhan, China, the Asia-Oceania region showed the highest vehicle production decline of 31% in the 1<sup>st</sup> half of 2020, but it started to show recovery in the 2<sup>nd</sup> half of 2020 (-25%) compared to the other regions.

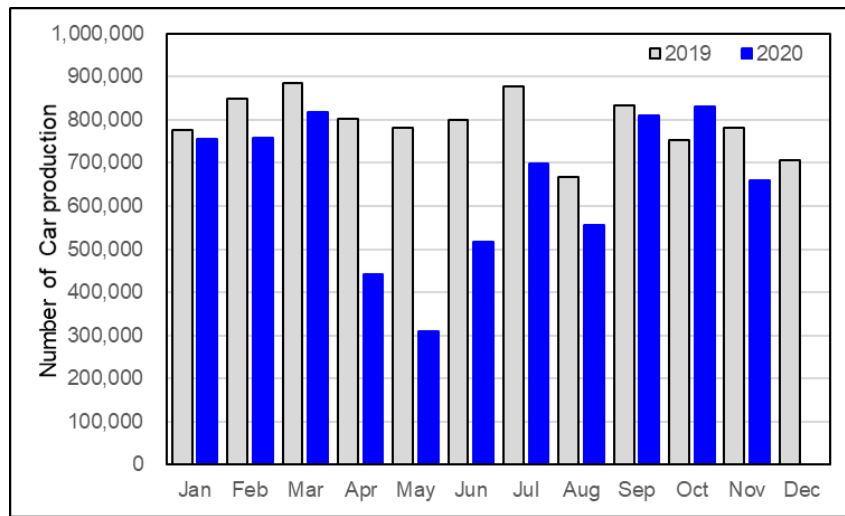
## 1.1.2 Impacts on the Automotive Industries in the Third Country and Japan

### (1) Changes in Production Volume

Due to the influence of COVID-19, Japanese automobile production decreased from April 2020. The following month, production fell to 39.6% only of the volume posted in May 2019. Production started gradually recovering from June, and in September it recorded a 97.2% production compared to the September 2019 volume.

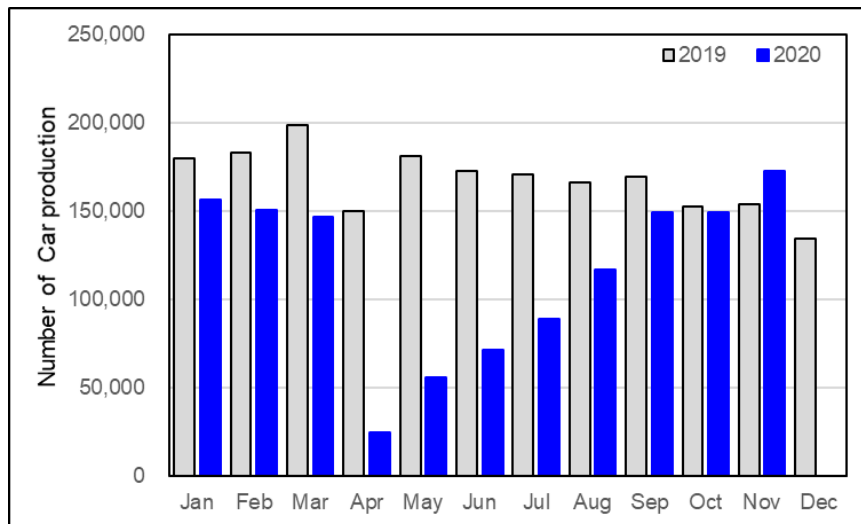
Thailand's automobile production fell the most in April, at only 16.4% year-on-year basis. It has been gradually recovering since May, and in October it returned to 97.6% compared to October 2019.

Indonesian production fell sharply in April 2020 and even more sharply in May, when it recorded 2.4% year-on-year. Since then, it has been gradually recovering although at a lower level than Japan and Thailand, i.e., 64.1% in November compared to November 2019.



Source: JICA Study Team prepared based on Marklines portal site

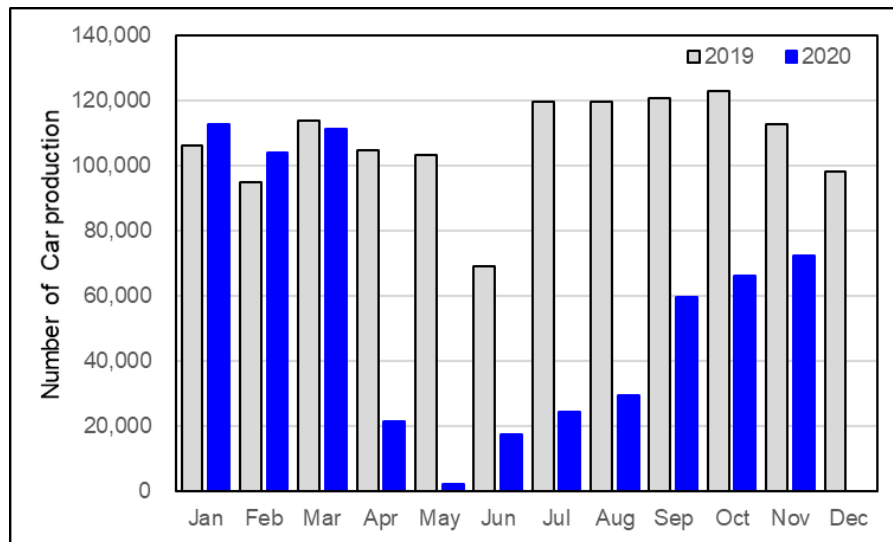
**Figure 1.1.5 Trends in the Number of Vehicles Produced in Japan**



Source: JICA Study Team prepared based on Marklines portal site

**Figure 1.1.6 Trends in the Number of Vehicles Produced in Thailand**





Source: JICA Study Team prepared based on Marklines portal site

**Figure 1.1.7 Trends in the Number of Vehicles Produced in Indonesia**

## (2) Impacts on Finished Vehicles and Auto Parts Industry in Japan and Third Countries

This section describes the various impacts of COVID-19 on original equipment manufacturers (OEMs) and auto-component manufacturers by country, taking Southeast Asian countries as third countries and Japan as examples.

### 1) Third Countries

From January to March 2020, the negative impacts of the COVID-19 on Japanese firms' supply chain in southeast Asian countries began with the difficulty in procuring raw materials and components from China. But with the recovery of the Chinese economy being swifter than expected, the supply chain involving China gradually improved. The problem was the disruption and stagnation of the supply chain due to the restrictions to movement and operation imposed by Southeast Asian countries as the infection spread. However, the resulting decline in demand stagnated the economies of these countries, and its effects spread to the rest of the industrial sector. For example, in Thailand and Indonesia, where automobile manufacturing is one of the major industries, Japanese manufacturers either cut or stopped production, and suppliers were negatively affected.

The impacts of COVID-19 on the supply chain are as follows:

- 1) Decrease in production and orders due to the contraction of domestic and foreign economies;
- 2) Production suspension due to restrictive measures on movement and operation imposed by central and local governments;
- 3) Reduction in production efficiency due to measures to prevent infection in factories;
- 4) Decline in operation rate due to the difficulty in commuting resulting from the suspension of public transportation services;
- 5) Difficulty in continuing production because the operations of domestic and overseas suppliers of raw materials and packaging materials stopped;
- 6) Increase in transportation costs due to reduced air flights and difficulty in importing / exporting because of suspension of air flights; and

- 7) Delays in logistics caused by a slowdown in customs clearance due to fewer customs personnel.

In the table below, supply chain issues among Japanese firms located in Southeast Asian countries are summarized by JETRO<sup>1</sup>.

**Table 1.1.1 Supply Chain Issues among Japanese Firms in SEA Countries**

Impact	Description
Production suspension due to movement and operation restrictions by central and local governments	(Metal maker in Malaysia) Since production was forced to stop after March 18 (due to movement restriction), the products produced at the Malaysian factory were handled by its affiliated Thai company and the head office in Japan. (Late May 2021)
Reduction of production efficiency due to infection prevention measures within the factory	(Electrical equipment manufacturer in Vietnam) Production was temporarily suspended in early April 2021 due to the installation of partitions in the work space to prevent the spread of infection, in accordance with the Prime Minister's Decision No. 16.
Difficulties in continued production because of operational suspension among domestic and foreign suppliers	(Regional Headquarters of electrical and electronic manufacturers in Singapore) Due to the movement restriction ordinance in Malaysia, it became impossible to procure raw materials from suppliers. It is unavoidable that costs increase due to the conversion of orders to other suppliers. (Early April 2021)
Increased transportation costs due to reduced air flights, difficulty in arranging, impossible import / export due to suspension of air cargo	(Distribution-related company in the Philippines) Although products made in the country could be delivered by land, cargo flights were reduced and this increased freight rates. It was difficult to secure transport by sea. (Early April 2021)
Delay in logistics and distribution caused by slowdown in customs clearance due to reduced number of customs personnel	(Distribution-related company in Cambodia) Prolonged customs clearance for imports from Vietnam due to border congestion (Late March 2021)

Source (access: 19<sup>th</sup> July 2021): <https://www.jetro.go.jp/biz/areareports/special/2020/0901/d4fb00237115fc57.html>

The automotive market in Germany, one of the industrialized nations, was also examined.<sup>2</sup> In August 2020, the German Association of the Automotive Industry (VDA) released the results of a July 2020 questionnaire survey on the current situation and prospects of their domestic auto-component industry. Approximately 50% of the respondent firms answered that “the business is affected negatively by COVID-19 until 2022,” while 10% said “it is until 2023.” One of the questions asked about the status of the domestic auto-component industry, to which 64% answered their production was “50–74%” of normal operations, while 30.2% answered “over 75%.” Under the influence of COVID-19, auto-component manufacturers in the country were expected to reduce personnel and shift manufacturing overseas. In contrast, 59.5% of the respondents planned to reduce their workforce in Germany. Among those firms planning to reduce personnel, 52.0% and 16.0% intended to reduce 5–10% and 11–15%, respectively, of their employees.

When it comes to manufacturing, 42.9% of the respondents planned to shift it overseas even before the COVID-19 pandemic. Of this number, 69.4% said the plan was accelerated due to COVID-19.

<sup>1</sup> The summary is based on JETRO's article dated 6<sup>th</sup> November 2020, the title of which is “Recognizing the disruption and stagnation of SC in ASEAN so as to avoid and mitigate risks of the COVID-19 (Pat 2).” For details, please refer to the following URL (access: 12<sup>th</sup> May 2021):

<https://www.jetro.go.jp/biz/areareports/special/2020/0901/d4fb00237115fc57.html>

<sup>2</sup> For details, please refer to the following URL (access: 11<sup>th</sup> May 2021):

<https://www.jetro.go.jp/biznews/2020/08/b8e326a244c809eb.html>

## 2) Japan

Unlike earthquakes and floods, the COVID-19 pandemic is not a disaster affecting equipment; it instead hit humans, a phenomenon which the business circle has never experienced. Therefore, it is considered how COVID-19 has affected the global automotive industry and parts manufacturers.

According to a MarkLines article dated 30 October 2020, when it comes to the total number of vehicle sales worldwide, the cumulative total sales from January to August 2020 was only 45.6 million units, a significant drop of about 13.0 million units from the same period in 2019. By major country and region, western Europe and southeast Asia fell by more than 30% on a year-on-year basis. On the other hand, South Korea and China, who succeeded in preventing the spread of the infectious disease at an early stage, suffered less damage. By manufacturer, Renault-Nissan fell sharply by 29% on a year-on-year basis. Meanwhile, BMW, Hyundai / Kia, Daimler, etc. have only decreased by around 20%.

Due to the closure of factories and the suspension of operations of auto-component manufacturers, the production volume experienced a larger fluctuation than the sales volume. Since Western Europe, North America, and Southeast Asia were in the midst of factory closures in April 2020, production could hardly be carried out. Production in Japan and South Korea was halved in May 2020, while sales in China have recovered as much as sales. Since the number of those who were infected increased sharply and lockdown was carried out on a widespread and long-term basis in Europe and the United States, GM and VW closed almost all plants for about 1 to 2 months from the middle of March of the same year. From April to July of the year, Toyota partially suspended operations of their plants and lines, in view of the supply-demand conditions of each vehicle type and of the number of the infected. As to the impact on profit and loss of major OEMs, Toyota and BMW, which had little damage to their own markets due to brand power and continued cost reduction, as well as Hyundai and Kia, which had little damage in South Korea, have maintained positive operating profit margins, albeit at a low level. On the other hand, the operating profit margins of Ford and Nissan, which had been sluggish for the past several years, deteriorated significantly, and the cumulative total profit from January to June 2020 was negative by nearly 10%. Meanwhile, according to the results of a survey conducted by Teikoku Databank in June 2020 regarding the views of companies on COVID-19, 93.8% of automobiles and auto parts retailers experienced a "negative impact".<sup>3</sup>

Likewise, according to Jiji.com News (3 November 2020),<sup>4</sup> local auto parts makers were severely affected. A parts manufacturer in Ota city, in which Subaru, one of the OEMs, is based said: "Due to the reduction in the production of major OEMs in the first half of 2020, every month until August of the same year, sales have halved from the previous year." Meanwhile, according to a manager of a parts manufacturer in Kanagawa Prefecture, some major OEMs did not share their 2021 plan for production with them, and that these OEMs offered no proposal to get out of the difficulties caused by the COVID-19 pandemic. Another auto-parts manufacturer pointed out: "Such OEMs are so myopic that our contributions over the years cannot be taken into consideration."<sup>5</sup> There is also an analysis that major OEMs with poor performance are also declining in management strength to protect parts

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<sup>3</sup> Please refer to the following URL (access: 13<sup>th</sup> January 2021): <https://response.jp/article/2020/06/10/335443.html>

<sup>4</sup> Please refer to the following URL (access: 12<sup>th</sup>: January 2021): <https://www.jiji.com/jc/article?k=2020110300515&q=cyr>

<sup>5</sup> Please refer to the following URL (access: 13<sup>th</sup>: January 2021): <https://www.jiji.com/jc/article?k=2020110300515&q=cyr>

manufacturers.

### (3) Promotion on the Production and Purchase of EVs and HVs

In countries with agglomerated automobile industries, governments have viewed the coronavirus pandemic as an opportunity for structural change even though they have suffered large economic losses. These countries with advanced automotive industries are accelerating the move towards hybrid and electric vehicles (xEVs) with a combination of regulations and preferential treatments.

**Table 1.1.2 Trends in xEV Policies**

Country/ Region	Regulation	Preferential Treatment
China	<ul style="list-style-type: none"> <li>◆ Fuel efficiency regulation: CAFE Standards. <sup>6</sup> 2021-2025: 4.0 L/100 km</li> <li>◆ NEV regulation <sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>◆ Subsidy for new-energy vehicles: Extended expiry from 2020 to 2022.</li> <li>◆ Subsidy for the promotion campaign for rural areas.</li> <li>◆ Preferential treatment for certain number plates in urban areas.</li> </ul>
EU	<ul style="list-style-type: none"> <li>◆ Fuel efficiency: CAFÉ Standards of 95 g/km for year 2021</li> <li>◆ Promote discussion on the regulation based on Life Cycle Assessment (LCA).</li> </ul>	<ul style="list-style-type: none"> <li>◆ Subsidy for new-energy vehicles: Major car-producing nations, including Germany, UK, France and others, increased subsidies and extended terms due to the COVID-19 crisis.</li> <li>◆ Approved EUR2.9 billion of subsidy for EV batteries allocated to EU member countries.</li> </ul>
Japan	<ul style="list-style-type: none"> <li>◆ Fuel efficiency regulation: CAFÉ Standards with new standards of 25.4 km/L launched, evaluation in a way of "Well to Wheel."</li> </ul>	<ul style="list-style-type: none"> <li>◆ Subsidy for new-energy vehicles: Tax deduction for eco cars, subsidy for purchasing CEVs <sup>8</sup>, subsidy from the Ministry of Environment. With these subsidies, a car can be purchased with subsidies from JPY400 thousand to 80 thousand depending on various conditions.</li> <li>◆ Subsidies from local governmental bodies.</li> </ul>
U.S.A	<ul style="list-style-type: none"> <li>◆ Fuel efficiency regulation: CAFE Standards of 17.2 km/L set by the Trump administration may be increased.</li> <li>◆ ZEV<sup>9</sup> regulations</li> </ul>	<ul style="list-style-type: none"> <li>◆ Subsidy for new-energy vehicles: Plug-in Electric Drive Vehicle Credit using federal subsidy for tax returns to PHV buyers.</li> <li>◆ American Jobs Plan announced in Mar. 2021 committing USD17.50 billion.</li> <li>◆ Subsidy scheme at the time of purchase in the State of California.</li> </ul>

Source: *Trends in xEVs and way forward*, Yano Research Institute, 2021

<sup>6</sup> Corporate Average Fuel Efficiency: A method that calculates and regulates the average fuel consumption (overweight harmonic mean fuel consumption) that takes into account the number of units shipped by the entire manufacturer, not by vehicle type. Even if the fuel efficiency standard cannot be achieved for a specific vehicle model, it can be made up with improving the fuel efficiency of other vehicle models.

<sup>7</sup> New-energy Vehicle (NEV) includes EVs, FCEVs, and PHEVs. Chinese NEV regulation make it mandatory for manufacturers with annual production or imports of 30,000 or more to sell NEV proportionate to the number of vehicles sold.

<sup>8</sup> Clean-energy Vehicle (CEV) defined by the government of Japan includes EVs, PHEVs, and FCEVs, and clean energy cars.

<sup>9</sup> Zero-energy Vehicle (ZEV) typically includes EVs and FCEVs. This regulation requires firms that produce more than the standards to sell ZEVs proportionate to the number of vehicles sold.

#### **(4) Changes in Philosophies in Technologies and Human Resource Development**

The demand for technological, skills, and human resource development has differed greatly from time to time. The evolution of remote technologies has forced shifts from human-oriented to materials-oriented development. Advanced technologies, such as IT and AI, that are compatible with Industry4.0 have brought mankind to the point where things control things.

The way of thinking about technologies, skills, and human resources caused significant changes in the following ways:

##### Technology and Skills Development

- ◆ Firstly, design and development process will be digitalized with virtual technology bringing a massive progress in car production. This enables entire processes, from design through evaluation, to be conducted on desktops.
- ◆ As the process shifts from waterfall to agile methods, more emphasis is put on earlier processes than latter ones.
- ◆ Thus, technology and skills development can be completed anywhere in the world. A limited number of excellent staff can maintain technologies and skills.

##### Human Resource Development

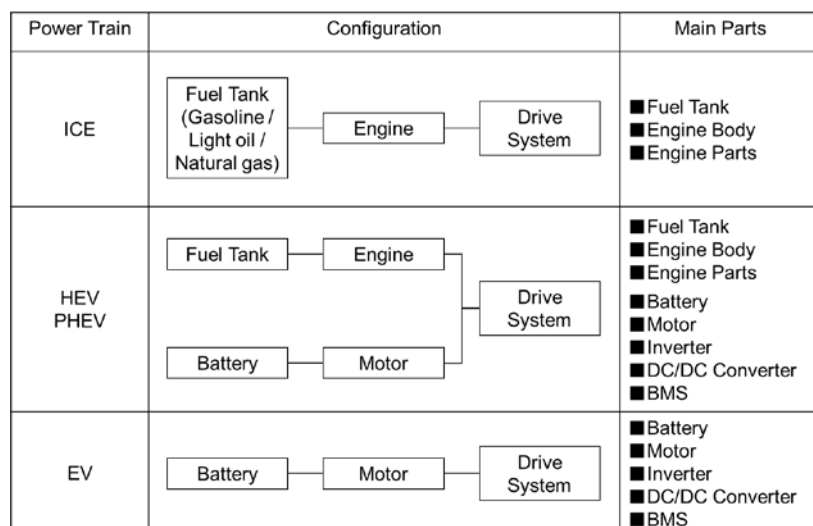
- ◆ There is an increasing need for human resources compatible with automation and flexible manufacturing system (FMS) technology. There is an increasing need to develop specialists over a long period of time in a wide range of fields, such as production control, equipment management, and product development.
- ◆ Focus will be placed on developing human resources combining conventional IT for building development and production controls and operation technology (OT) necessary for industrial control systems.
- ◆ Management staff are required to be competent in integrating opinions from related departments within a firm.
- ◆ There is an increasing need for human resources to improve production sites using big data.
- ◆ Until now, in Society 4.0, information possession and analysis have been carried out mainly by people (physical space), so it has been emphasized how people can efficiently access and utilize information. However, in Society 5.0, AI is expected to aggregate and analyze information on behalf of humans.

#### **(5) Changes in Technological Trends in Automobile Manufacturing**

With the growing global interest in environmental issues, attention has focused in recent years on next-generation vehicles, such as electric vehicles and hybrid vehicles. The composition of major automobile parts has changed significantly following changes in the powertrain. Figure 1.1.8 shows the main components of powertrains<sup>10</sup>. In the medium to long term, it is necessary to apply the latest technology to producing HEVs / PHEVs while improving technical capabilities so that the main parts of EVs can be manufactured.

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<sup>10</sup> Arther D. Little (2018) "*Jidoshabuhin sangyo no hensen ni kansuru chosa* [Survey on changes in the auto parts industry]"  
Details of the main parts are given in Table 3.3.5.1



Source: JICA Study Team

**Figure 1.1.8 Main Components of Powertrains**

### 1.1.3 Automotive Industry Crisis and Outlook

COVID-19 is disrupting the entire global value chain (GVC) of the automotive industry. The automobile industry is still facing three major crises: restrictions on parts supply, reduced working capital and liquidity, and further declines in demand due to the fear of spreading infection.

#### (1) Parts Supply Restrictions

In the 1<sup>st</sup> half of 2020, as COVID-19 infections spread, suppliers worldwide quarantined or completely closed production lines. Legal closure of borders and trade restrictions have caused a shortage of necessary parts in various regions. Before the spread of COVID-19, the auto industry had already been vulnerable to supply chain crises due to just-in-time production and wasteful inventories. The main reason was that OEMs were building a global network that utilized low-cost labor, minimized working capital, and aimed for a zero inventory.

The world's automobile production is strongly dependent on China. Today's GVC has a number of requirements for globalization, including regulatory standardization, labor and infrastructure sharing, and timely authentication of safety parts, despite the complexity of having countless suppliers. Therefore, the recovery of the automobile supply chain takes time compared to other industries due to the necessity to synchronize production across the supply chain. The trend to decrease overdependence on one country will become more prominent.

#### (2) Working Capital and Liquidity Decline

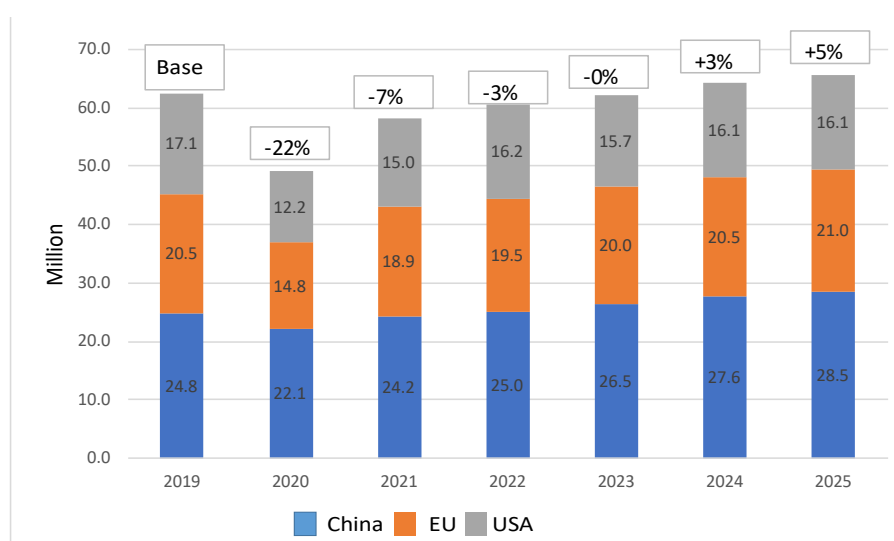
In the automotive industry, the cash burn rate, which indicates how long a company can survive without cash inflow, is currently less than two months. Many OEMs now face liquidity problems as operating cash flow has diminished during the crisis. Therefore, OEMs have strictly controlled cash flows and have been reviewing all cost-saving measures, such as freezing new employment and postponing capital investment. In addition, some OEMs have negotiated higher credit lines with banks to overcome the crisis. Some manufacturers have required government assistance, such as short-term labor financing, short-term financing, and tax deferral, to prevent bankruptcy or unemployment. Dealers and suppliers have also

become more vulnerable to limited operating cash flows due to the forced shutdown of dealer sales operations in many countries. Therefore, OEMs have extended the dealer payment due dates, taking into account the financial status of their major partners.

### (3) Way Forward for the Global Automotive Market

Since the first quarter of 2020, companies around the world have been forced to shut down or reduce their activities due to the coronavirus. Car sales have fallen like never before, with many workers losing their incomes and jobs. Specifically, the following short-term issues have been observed:

- ◆ Slumping consumer demands in the short run;
- ◆ Stagnation of production by OEMs and parts suppliers with halts of overseas supplies and active cases of COVID-19 among suppliers;
- ◆ Deterioration of cash flow among upstream and downstream companies<sup>11</sup> with obsolete inventory and constant expenses; and
- ◆ Shrinking in-person sales, delayed new product rollouts, hindered services by dealers.



Source: Boston Consulting Group

**Figure 1.1.9 Forecast of Vehicle Sales**

However, in the most likely case announced by Boston Consulting Group, production volume which plunged in 2020 by 14% to 22% would recover by 2024–2025 to pre-COVID-19 levels.

### (4) Investment Climate in Pakistan and Third Countries in a Post Covid-19

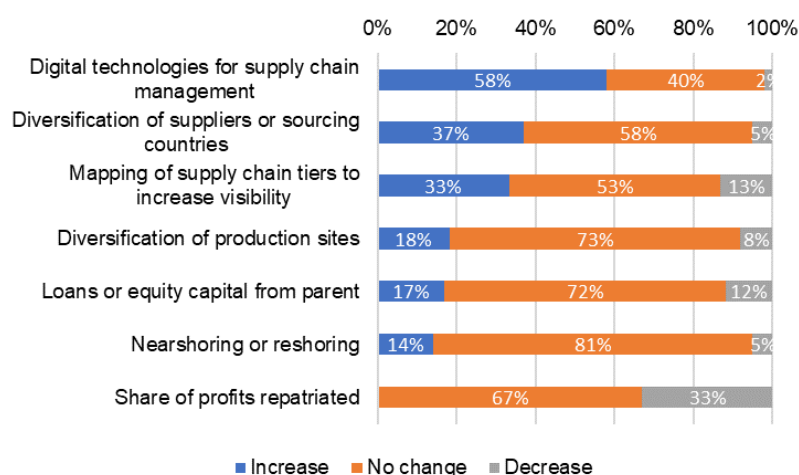
From 1 July 2020 to 26 August 2020, the World Bank conducted a pulse survey on 78 multinational companies doing business operations in 30 developing countries<sup>12</sup>. The result of the first-round pulse survey was released in April 2020, and the second-round survey examined the measures taken by multinational companies and their perceptions of the investment climate in developing countries. This can be interpreted as a multinational

<sup>11</sup> In the midst of the epidemic of the new coronavirus infection, dealers are forced to face not only a decrease in sales volume and sales, but also high fixed costs and allocation of management expenses, and OEM rebates are delayed. As a result, many dealers are facing financial risk.

<sup>12</sup> The Impact of COVID-19 on Foreign Investors: Evidence from the Second Round of a Global Pulse Survey, the World Bank, September 2020

companies' response to the ongoing negative impact of COVID-19, with an eye on the medium and long term for business expansion.

The survey reveals that 58% of companies have started digitizing their supply chains. Digitization includes data science applications, distributed ledger technology (DLT), business process automation, and internet of things (IoT), which make possible the optimization of global business production capacity, inventory levels, and logistics management. In addition, 37% of companies have started to diversify their suppliers and 18% of companies have diversified their production bases. There is a sign of near-shoring as 14% of companies have relocated their production bases closer to consumers. With the uncertainty of COVID-19, the countermeasures of these multinational companies are expected to increase.



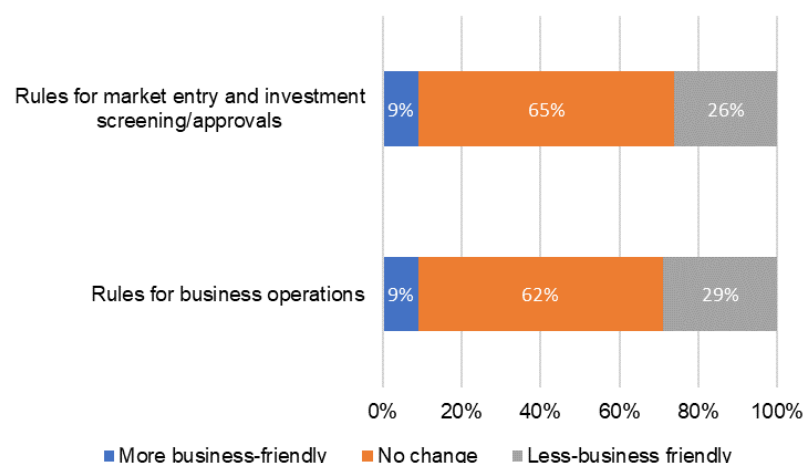
Source : The Impact of COVID-19 on Foreign Investors: Evidence from the Second Round of a Global Pulse Survey, the World Bank, September 2020

**Figure 1.1.10 Measures Taken by Multinational Corporations Operating in Developing Countries**

UNCTAD indicates that some countries may launch a new policy that restricts investment related to national security<sup>13</sup>. The World Bank's second-round pulse survey also shows that the investment climate in developing countries will tend to be worse because 26% of multinational companies give negative feedback on the rules of FDI while 29% of them negatively evaluate business operations.

<sup>13</sup> World Investment Report 2020: International Production Beyond the Pandemic. New York, NY: United Nations Publications, UNCTAD, 2020





Source: The Impact of COVID-19 on Foreign Investors: Evidence from the Second Round of a Global Pulse Survey, the World Bank, September 2020

**Figure 1.1.11 Perception of Multinational Companies in Developing Countries on FDI Rules**

### (5) Trends in Policies in the Post-COVID-19 Period

Governments of countries with concentrated automobile industries have stepped forward to develop mechanisms to promote restructuring and innovation of social systems to combat economic stagnation as a result of the coronavirus disaster. These countries have taken the following measures in pursuit of mobility, industry transformation, zero carbon emissions, and xEV transformation.

#### Policies to Support Medium- and Long-term Restructuring

- ◆ Transform vehicles, infrastructure, and O&M to fit the CASE<sup>14</sup> era.
- ◆ Develop infrastructure that is not limited to automobiles alone but can be common asset for the society as a whole, including other transport modes.

#### Policies to Support Strategic Industries needed for Structural Change

- ◆ Improve the environment for corporate growth (e.g., improving the investment environment for R&D and HRD and supporting the development of batteries and semiconductors, which are key devices for electrification and automation).
- ◆ Strengthen the supply chain (e.g., support cash flow, secure domestic demand, improve safety and electrification).

#### Policies to Support Transformation towards Zero Emission Cars and xEVs

- ◆ Accelerate policy making for zero emissions (e.g., advance the zero-emission target year, provide biofuel utilization incentives, advance EV introduction target year).
- ◆ Consider measures to encourage behaviour change (e.g., encourage users to choose environmentally friendly modes).
- ◆ Accelerate the realization of an electric and hydrogen society (e.g., strengthen research and development, develop related human resources).

In particular, the shift to EVs has become a global trend during the pandemic. The UK

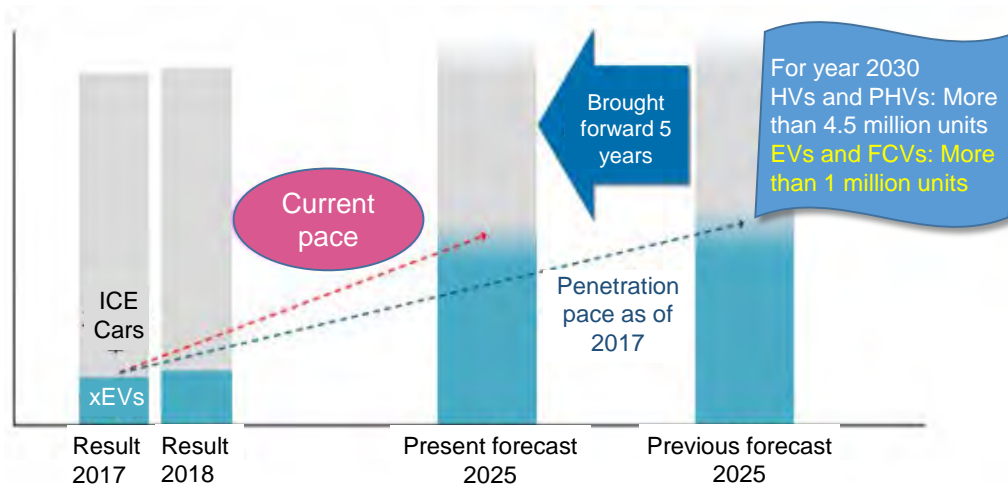
<sup>14</sup> CASE stands for connectivity, autonomous/automation, shared/subscription, and electrification.

initially said it would ban the sale of new gasoline and diesel vehicles by 2040, but the target year was moved forward to 2030. The British government was initially tolerant of HVs and plug-in hybrid vehicles (PHEVs), but sales of these vehicles using some elements of ICE was set to end by 2035. Similarly, Germany has announced a policy to ban new sales of cars with engines, including HVs and PHEVs, by 2030, and France has also set a deadline of 2040.

In December 2020, the government of Japan announced that by the mid-2030s all new vehicles should be hybrid vehicles (HV), EVs, and fuel cell electric vehicles (FCEVs).

In this way, EV promotion or the elimination of pure fossil-fuelled engines has become a global trend. The UK, Germany, France, China, California in the United States, and Quebec in Canada have already said that they would ban the sale of new cars other than electric cars from 2030 to 2040. Since only new cars are subject to this ban, fossil fuel cars will run in the city for the time being, but the number is expected to gradually decrease.

Toyota has announced that it would achieve its annual sales target of 5.5 million electric vehicles by 2025, about five years ahead of schedule. The car giant launched full-scale introduction of EVs (Lexus UX300e and C-HR EV) for the first time in the firm's history and sold 3,343 vehicles in 2020. The firm will sell more than 10 models in the first half of the 2020s.



Source: Prepared by JICA Study Team based on the web page of Toyota (<https://global.toyota/jp/newsroom/corporate/28416855.html>)

**Figure 1.1.12 Market Penetration of Toyota's xEVs**

## 1.2 High-growth Emerging Markets and Sluggish Developed Markets

In the early 2000s, two major changes were observed in the world automobile market. One is the share of emerging markets exceeding that of developed ones, and the other is the size of the world auto market expanding from 60 million to 90 million vehicles in the 2005–2019 period (Figure 1.2.1).<sup>15</sup> Figures 1.2.2 and 1.2.3 compare the domestic sales in the top 10 emerging and developed markets, respectively, in 2005 and 2019. The 2005 and 2019 sales figures of these 20 markets (top 10 emerging and developed markets) accounted for approximately 83.8% and 87.1% of the world's sales. It can therefore be argued that the analysis of the top 10 emerging and developed markets gives us an overview of the global

<sup>15</sup> For the details of emerging markets, please refer to Nomura and Yamamoto (2018), etc.

sales market in the said years.

[2005]

The 2005 Ranking in World's Sales			No. of Vehicles Sold in Domestic Market
Emerging Markets	(World's Markets)	Country	
1	(3)	China	5,758,189
2	(9)	Russia	1,806,625
3	(10)	Brazil	1,714,644
4	(12)	India	1,440,455
5	(13)	Mexico	1,168,508
6	(16)	Iran	857,500
7	(17)	Turkey	715,212
8	(18)	Thailand	692,506
9	(19)	South Africa	617,406
10	(20)	Malaysia	551,042
Total of Top 10 Emerging Markets (A)			15,322,087
Share of (A) in the total of (A) and (B): (A)/ [(A) + (B)]			27.4%

[2019]

The 2019 Ranking in World's Sales			No. of Vehicles Sold in Domestic Market
Emerging Markets	(World's Markets)	Country	
1	(1)	China	25,768,677
2	(5)	India	3,816,891
3	(6)	Brazil	2,787,850
4	(12)	Russia	1,778,841
5	(14)	Mexico	1,359,671
6	(15)	Indonesia	1,043,017
7	(17)	Thailand	1,007,552
8	(18)	Poland	656,265
9	(19)	Iran	655,515
10	(21)	Malaysia	604,287
Total of Top 10 Emerging Markets (C)			39,478,566
Share of (C) in the total of (C) and (D): (C)/ [(C) + (D)]			49.4%

Notes:

1. (A) and (C) refer to the total sales of the top 10 emerging markets in 2005 and 2019, respectively.
2. (B) and (D) refer to the total sales of the top 10 developed markets in 2005 and 2019, respectively.

Source: OICA

**Figure 1.2.1 Changes in Domestic Sales and Shares of the Top 10 Emerging Markets in Global Automotive Sales (2005–2019)**

[2005]

The 2005 Ranking in World's Sales			No. of Vehicles Sold in Domestic Market
Developed Markets	(World's Markets)	Country	
1	(1)	USA	17,444,329
2	(2)	Japan	5,852,034
3	(4)	Germany	3,614,886
4	(5)	UK	2,828,127
5	(6)	France	2,598,183
6	(7)	Italy	2,495,436
7	(8)	Spain	1,959,488
8	(11)	Canada	1,630,142
9	(14)	South Korea	1,145,230
10	(15)	Australia	989,269
Total of Top 10 Developed Markets (B)			40,557,124
Share of (B) in the total of (A) and (B): (B)/ [(A) + (B)]			72.6%

[2019]

The 2019 Ranking in World's Sales			No. of Vehicles Sold in Domestic Market
Developed Markets	(World's Markets)	Country	
1	(2)	USA	17,480,004
2	(3)	Japan	5,195,216
3	(4)	Germany	4,017,059
4	(7)	France	2,693,977
5	(8)	UK	2,676,918
6	(9)	Italy	2,131,916
7	(10)	Canada	1,975,855
8	(11)	South Korea	1,795,134
9	(13)	Spain	1,501,260
10	(16)	Australia	1,034,379
Total of Top 10 Developed Markets (D)			40,501,718
Share of (D) in the total of (C) and (D): (D)/ [(C) + (D)]			50.6%

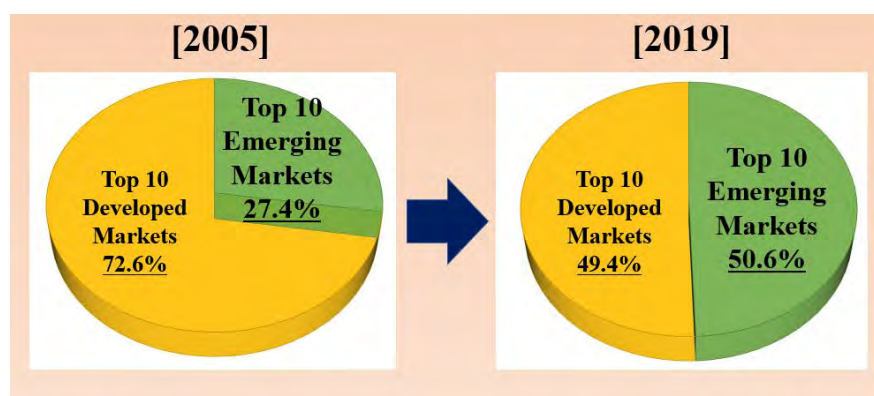
Notes:

1. (B) and (D) refer to the total sales of the top 10 developed markets in 2005 and 2019, respectively.
2. (A) and (C) refer to the total sales of the top 10 emerging markets in 2005 and 2019, respectively.

Source: OICA

**Figure 1.2.2 Changes in Domestic Sales and Shares of the Top 10 Developed Markets in Global Automotive Sales (2005–2019)**

In the 2005–2019 period, in summary, the share of the top 10 developed markets declined from 72.6% to 49.4%, while that of the top 10 emerging markets rose from 27.4% to 50.6% (Figure 1.2.3). This period saw the rise of emerging markets in the world automotive sales.



Source: JICA Study Team

**Figure 1.2.3 Changes in the Shares of Developed and Emerging Markets in Global Automotive Sales**

The other major change is attributable to the fierce competition among major international OEMs in two market segments (Table 1.1.2)<sup>16</sup>, that is, (1) small passenger cars in the low-price range and (2) light commercial vehicles (LCVs) in the high-price range. The volume of sales of low-priced small passenger cars (USD5,000–15,000) expanded in India, Brazil, etc. In India, Suzuki’s Multi 800 (around USD5,000) accounted for more than 40% of the share in this market segment.<sup>17</sup> In Brazil, small cars, the price of which is approximately USD10,000, secured about 60% of the market segment.<sup>18</sup> Likewise, in Pakistan, Suzuki enjoyed a share of 58.4% in 2019.<sup>19</sup> In particular, the competition in the small-car market in India and Brazil was very stiff because major OEMs have entered the market.

On the other hand, the market for high-priced LCVs was created in the first half of 2000s when Toyota launched “Innovative International Multi-purpose Vehicles” (IMVs)<sup>20</sup> including one-ton pick-up trucks. The IMVs are one of its “world cars” produced specifically for emerging markets. It is said that since the release of IMVs the market segment for LCVs was created in emerging markets at a size of one million vehicles. In the early 2010s, Ford and Volkswagen (VW) introduced their “Ranger” and “Amarok” versions, respectively, in the market. Then, in 2017, Mercedes Benz released its X-class models. The competition among major OEMs in this high-price market segment (USD30,000 to 50,000) became increasingly intense.

**Table 1.2.1 Price Ranges and Models Released in Emerging Markets**

Price Range	Model	Remark
Low-price Range Segment (USD5,000 to 15,000)	GM’s Aveo, Ford’s Fgo, Suzuki’s Baleno, Honda’s Bri,o, Nissan’s Datsun GO, etc.	Emerging markets are characterized by polarization of demand into the high- and low-price market segments.
High-price Range Segment (USD30,000 to 50,000)	Toyota’s IMV, Ford’s Ranger, VW’s Amrok, Mercedes Benz’s X-class, etc.	

Source: JICA Study Team

<sup>16</sup> According to Nomura and Yamamoto (2018) “Toyota’s Strategy for Emerging Markets,” the emerging markets are characterized by bipolarization of demands in the high- and low-price range segments.

<sup>17</sup> The share refers to that in passenger market (excluding bus and truck).

<sup>18</sup> Please refer to Nomura and Yamamoto (2018) above.

<sup>19</sup> For details, please refer to the website of MarkLines.

<sup>20</sup> For details of IMV, please refer to Nomura (2015), Nomura and Yamamoto (2018), Hara (2007), etc.

### 1.3 GVC and the Pakistan Automotive Industry (Four- and Two-wheelers)

In recent years, the number of sold cars in emerging markets had been higher than those in developed ones, which means the demand for new cars had gradually shifted from developed to emerging markets.

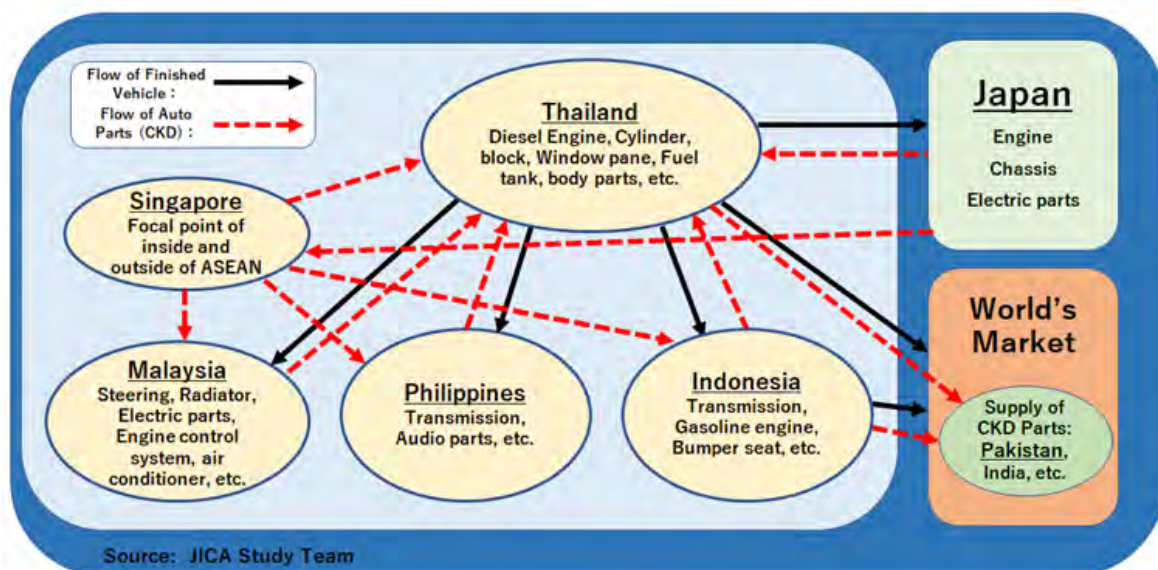
In this section, the GVCs of Japanese OEMs (i.e., Suzuki, Toyota, and Honda) is explained, and the position of Pakistan in the four- and two-wheeler market is examined.

#### 1.3.1 Motor Vehicles (Four-wheelers)

##### 1) Toyota's IMV

When it comes to Toyota, the GVC of IMVs was examined. The company announced the IMV Project which aims to develop a world car particularly for emerging markets.<sup>21</sup> The products of this project are called "IMV series." Currently, there are three body types, i.e., (i) Hilux (IMV-1 to -3), (ii) Fortuner (IMV-4), and (iii) Kijang Innova (IMV-5), based on a one-car platform,<sup>22</sup> and five models (IMV-1 to -5) were produced and sold along the GVC.

Figure 1.2.1 indicates the conceptual GVC of Hilux (IMV-1 to -3). A variety of components is manufactured in Southeast Asian countries and sent to two global production plants (i.e., Thailand and Indonesia). All the components are assembled into Hilux in these two plants, and finished products are exported to the world.



Source: JICA Study Team

**Figure 1.3.1 Conceptual GVC of IMVs and their Components in ASEAN and Other Markets**

<sup>21</sup> IMV Project aims to develop the GVC, along which specific automobiles are manufactured, supplied, and sold, by diminishing the impact of demand change and the risk of exchange rate. This project is also one of Toyota's "Global 15" projects. For details, please refer to the following URL:

<https://ja.wikipedia.org/wiki/%E3%83%88%E3%83%A8%E3%82%BFIMV%E3%83%97%E3%83%AD%E3%82%B8%E3%82%A7%E3%82%AF%E3%83%88%E7%94%9F%E7%94%A3%E6%8B%A0%E7%82%B9>

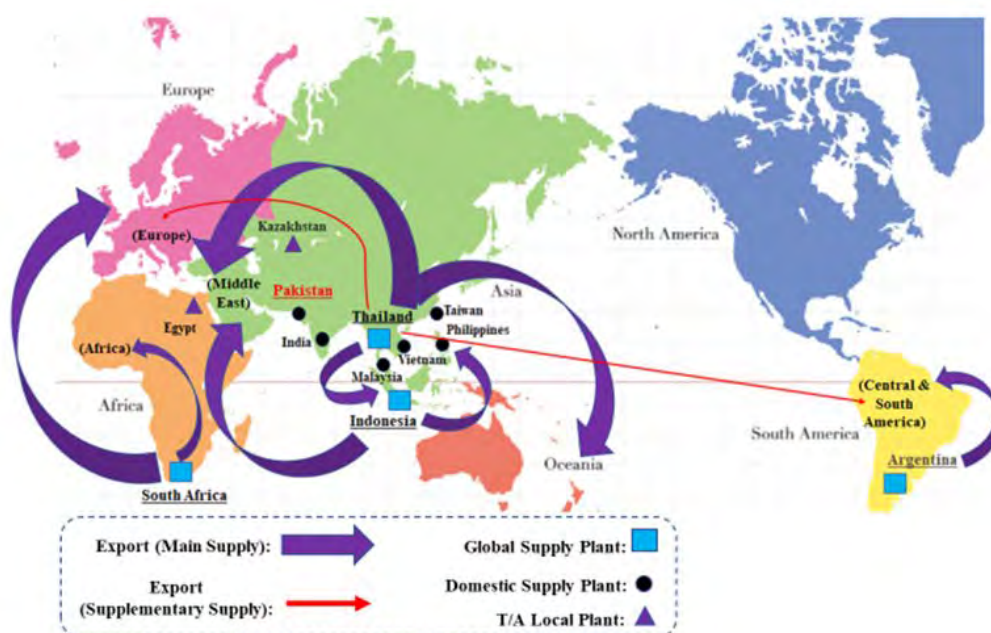
(access on 1<sup>st</sup> July 2020)

<sup>22</sup> A car platform is a shared set of common design, engineering, and production efforts, as well as major components over a number of outwardly distinct models and even types of cars, often from different, but somewhat related marques. Meanwhile, the body types include 1) pick-up truck, 2) sports utility vehicle (SUV) and 3) minivan.

Presently, five models of IMVs are manufactured in Southeast Asia and other countries (Figure 1.2.2). In 2019, approximately 840 thousand units were manufactured (Table 1.2.1). The production capacity of the top four manufacturing plants and their shares to the total capacity are as follows:<sup>23</sup>

- 1) Thailand: approximately 390 thousand units (share: 46.7%),
- 2) Indonesia: approximately 120 thousand units (share: 14.3%),
- 3) South Africa: approximately 104 thousand units (share: 12.4%), and
- 4) Argentina: approximately 100 thousand units (share: 11.9%),

Meanwhile, there is one IMV production plant in Pakistan, but it caters to domestic demand. In 2019, only 6,350 units were assembled in the country, accounting for only 0.8% for the total global production. It was one of the lowest among the countries listed in Table 1.2.1.



Source: JICA Study Team

**Figure 1.3.2 IMV's GVC and Manufacturing Plants**

**Table 1.3.1 Production Volumes of IMVs by Country (2019)**

Country	Type of Manufacturing Plant and Model	Units Produced	
		No.	Share (%)
Thailand	For World Markets (IMV 1, 2, 3,4)	392,520	46.7
Indonesia	For World Markets (IMV 5) + IMV 4	120,372	14.3
South Africa	For World Markets (IMV 1, 2, 3,4)	104,308	12.4
Argentina	For World Markets (IMV 1, 3,4)	99,618	11.9
India	For Domestic Market (IMV 4, 5)	76,857	9.2
Malaysia	For Domestic Market (IMV 3, 4, 5)	21,212	2.5
Philippines	For Domestic Market (IMV 5)	18,199	2.2
Vietnam	For Domestic Market (IMV 4, 5)	n.a.	n.a.

<sup>23</sup> The data about production volume and share comes from MarkLines' portal site.

Country	Type of Manufacturing Plant and Model	Units Produced	
		No.	Share (%)
Taiwan	For Domestic market (IMV 5)	n.a.	n.a.
Venezuela	For Domestic market (IMV 3,4)	350	0.04
<b>Pakistan</b>	<b>For Domestic Market (IMV 1, 3, 4)</b>	<b>6,350</b>	<b>0.8</b>
Total		839,786	100.0

Source: JICA Study Team

## 2) Suzuki's Wagon R

The production of Wagon Rs commenced in 1993 in Japan, and its offshore production began in 2013 in Indonesia and in 2014 in India and Pakistan. Currently, this model is sold in India by Multi Suzuki India and in Pakistan by Pak Suzuki. The one being sold in India and Pakistan is based on its 4<sup>th</sup> generation model, which started production in 2012 in Japan. It has a 1,000-cc engine, and it looks different from the Japanese model.

According to Suzuki people interviewed by the JICA Study Team, CKD kits are imported from Indonesia. In 2019, Pakistan's share in the GVC of the same model was only 8.5%, as shown in the table below, and its position in the GVC was relatively small.

**Table 1.3.2 Production Volumes and Shares of Wagon Rs in Selected Asian Countries**

Country	2013	2014	2015	2016	2017	2018	2019	Share in Total (%)
Japan	180,921	180,385	116,018	65,058	125,783	109,093	79,174	30.2
Indonesia	5,742	23,094	19,961	20,201	4,366	4,635	4,174	1.6
India	0	159,072	170,789	174,305	167,635	152,866	156,769	59.7
<b>Pakistan</b>	<b>0</b>	<b>4,053</b>	<b>7,305</b>	<b>13,455</b>	<b>25,379</b>	<b>31,844</b>	<b>22,360</b>	<b>8.5</b>
Total	186,663	366,604	314,073	273,019	323,163	298,438	262,477	100.0

Source: MarkLines portal site (accessed on 6 July 2020)

## 3) Honda's BR-V

As for Honda's GVC, the BR-V model, which is marketed as a family car, was examined. In the 2015 Indonesia International Motor Show, the prototype of this model was presented. Also in the same year, production began in Indonesia, and this model was launched not only in Indonesia but also in Thailand, India, and other emerging markets. In May 2016, production started in Thailand<sup>24</sup> (Table 1.3.3).

It is presumed that in Pakistan some parts of the BR-V are locally procured, and others are imported from Thailand as CKD (or complete knockdown).

**Table 1.3.3 Production Volumes and Shares of BR-Vs in Selected Asian Countries**

Country	2015	2016	2017	2018	2019	Share in Total (%)
Thailand	0	7,987	6,600	15,093	13,349	38.3
Malaysia	0	259	18,014	10,955	7,683	22.0
Indonesia	48	38,977	21,479	8,893	4,025	11.5
Philippines	0	0	0	672	1,916	5.6
India	0	20,640	9,839	6,258	4,126	11.8
<b>Pakistan</b>	<b>0</b>	<b>0</b>	<b>7,525</b>	<b>6,454</b>	<b>3,773</b>	<b>10.8</b>
Total	48	67,863	63,457	48,325	34,872	100.0

Source: MarkLines portal site (access: 6 July 2020)

<sup>24</sup> For details, please refer to the following URL:  
<https://ja.wikipedia.org/wiki/%E3%83%9B%E3%83%B3%E3%83%80%E3%83%BBBR-V> (access: 5 July 2020)

## 1.3.2 Motorcycles

### (1) Trends in the World's Motorcycle Market

Based on a MarkLines' report dated 26 July 2020, the global production volume in 2018 was approximately 58.8 million motorcycles.<sup>25</sup> Meanwhile, the 2018 world sales were 57.4 million, an increase of 6.2% on a year-on-year basis. As for the Asian market, some 46.8 million were sold, accounting for more than 80% of the total global sales.

In Pakistan, the 2017 production volume of motorcycles was approximately 1.9 million and ranked 6<sup>th</sup> in the world, following India, China, Indonesia, Vietnam, and Thailand.<sup>26</sup> For 2018, Pakistan's share to the global production was approximately 3.0% (Table 1.3.4).

**Table 1.3.4 Production Volumes of Motorcycles in Selected Countries**

(Unit: thousand)

	2013	2014	2015	2016	2017	2018	Share (%)
India	16,883	18,489	18,830	19,934	23,155	24,500	41.7
China	20,468	18,935	16,617	14,734	15,094	13,967	23.8
Indonesia	7,736	7,926	6,716	6,215	6,321	7,011	11.9
Vietnam	3,662	3,489	3,422	3,536	3,788	3,992	6.8
Thailand	2,820	2,442	2,397	2,446	2,536	2,578	4.4
<b>Pakistan</b>	<b>772</b>	<b>1,131</b>	<b>1,362</b>	<b>1,633</b>	<b>1,929</b>	<b>1,783</b>	<b>3.0</b>
World's Total	57,460	57,408	53,878	53,050	57,714	58,780	100.0

Source: Markline's portal site

Notes:

1. The value for India for 2018 refers to the aggregated value for the fiscal year 2018 that starts from April and ends in March.
2. The values for Indonesia after 2015 refer to the number of domestically produced motorcycles that are estimated sum of the number of products sold domestically and products exported.
3. The value for Pakistan for 2017 refers to the aggregated value for the fiscal year 2017 that starts from June and ends in July.

### (2) Motorcycle GVC

In this section, the characteristics of motorcycle production are discussed.

#### 1) Characteristics of Motorcycle Production

Producing motorcycles is different from producing automobiles.<sup>27</sup> There are five differences between the two: (a) motorcycles are smaller than motor vehicles; (b) the structure of motorcycles is simpler than that of motor vehicles, and the number of components of motor vehicles are ten times more than that of motorcycles; (c) from the standpoint of manufacturers, the entry barriers for motorcycles in terms of finance and technology are lower than those of motor vehicles; (d) the prices of motor vehicles are normally ten times higher than those of motorcycles; and (e) the local procurement rate of motor vehicles is higher than that of motorcycles.

In relation to the GVC, the production sites of motorcycles are closer to the local markets where they are sold, according to JICA's (2012) "Final Report on the Information Collection Survey for Industrial Policy Formulation in Cambodia." On top of this, Kensuke Shimizu from Mizuho Information & Research Institute, Inc., author of the article entitled "Small and medium enterprises should overcome the risks of order failure by organizational reform"

<sup>25</sup> For details, please refer to the following URL:

[https://www.marklines.com/ja/report\\_all/rep1897\\_201907#report\\_area\\_2](https://www.marklines.com/ja/report_all/rep1897_201907#report_area_2) (access: 13 July 2020)

<sup>26</sup> For details, please refer to the same URL as above: (access: 13 July 2020)

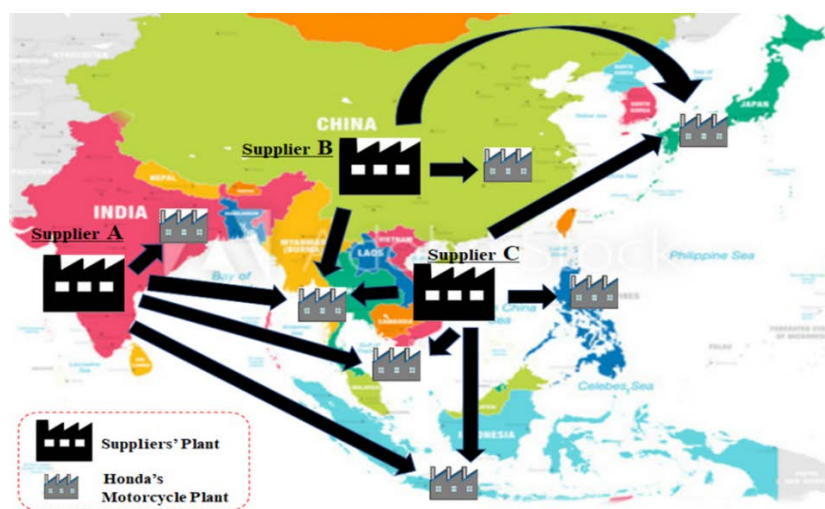
<sup>27</sup> Sato and Ohara (2006) "Asian Motorcycle Industries" IDE, JETRO.



published in 2012 pointed out that most of the demand for motorcycles is concentrated in emerging markets, and that the production sites of low-end models are closer to the local markets where there is demand for such models.

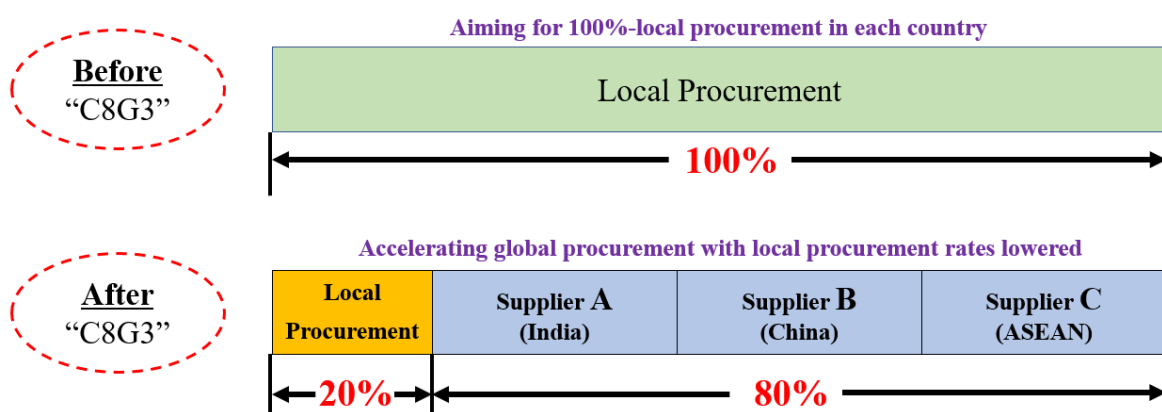
## 2) Two Types of GVC

The GVCs of motorcycles fall into two categories. The first type is to facilitate international procurement. A typical example is Honda's C8G3 strategy<sup>28</sup> which the company announced in the late 2000s. Before that, Honda aimed for 100% local procurement of the components. According to the strategy, 80% of the components of specific commuter models of the motorcycles are produced by only three global suppliers in three countries (i.e., India, China, and Thailand/Vietnam) and supplied to the company's manufacturing plants in Japan, India, China, and Southeast Asian countries (figures 1.2.3 and 1.2.4). The rest (20%) of the components are locally procured. Unfortunately, Pakistan is not part of this strategy.



Source: JICA Study Team

Figure 1.3.3 Concept of Honda's C8G3 Strategy for Motorcycle GVC



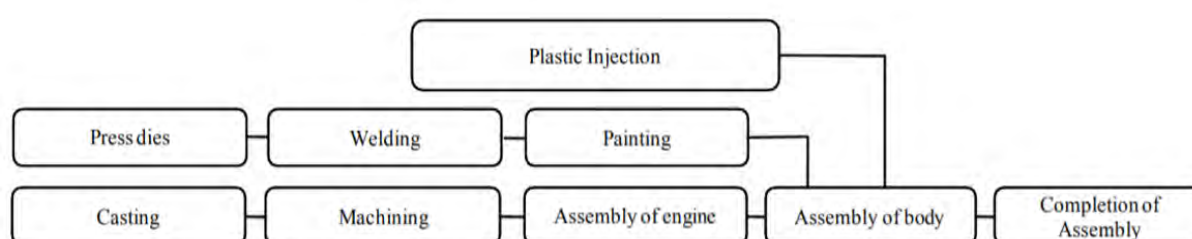
Source: JICA Study Team

Figure 1.3.4 Changes in Honda's Global Procurement Strategy Before and After C8G3

<sup>28</sup> Honda achieved 100% local procurement in China, India, and other Asian countries. However, according to the "C8G3" strategy, 80% of parts were to be procured globally and the rest locally. In line with this strategy, a global model named PCX was launched in 2009. For details, refer to the following URL: <https://toyokeizai.net/articles/-/3435> (accessed on 13 July 2020).

The second type of motorcycle GVC is to locate manufacturing sites in proximity to local markets. It is presumed that Pakistan belongs to this classification and is not part of a major GVC. It seems that most components are procured locally, and only some parts are imported from Thailand and India.

This section describes the case of Cambodia because there is a similarity between Pakistan and Cambodia: Both are neighbors of two of the world's top motorcycle producers, i.e., India is the largest and Thailand is the fifth largest. Results of an interview survey with one of the major Japanese OEMs is presented in JICA's "Final Report on the Information Collection Survey for Industrial Policy Formulation in Cambodia" published in 2012. Figure 1.3.5 shows the flow of motorcycle production in its assembly plant in Cambodia. In this flow, local processes/components cover welding, painting, and assembly of body. Other components are imported from major plants in Thailand, Indonesia, and/or Vietnam) (Table 1.3.5).



Source: JICA (2012) "Final Report on the Information Collection Survey for Industrial Policy Formulation in Cambodia"

**Figure 1.3.5 Motorcycle Assembly in a Japanese OEM's Plant in Cambodia**

**Table 1.3.5 Import of CKD Parts from Other SEA Countries (Case of Cambodia)**

Channel	Remark
(a) Thailand ⇒ Poipet (Thai border) ⇒ Phnom Penh (capital)	Transshipping cargo in the Thai border (Poipet)
(b) Indonesia ⇒ Singapore ⇒ Sihanoukville (Cambodia's main sea port) ⇒ Phnom Penh	Transporting cargo by land route from Sihanoukville to Phnom Penh
(c) Vietnam ⇒ Svay Rien (Vietnamese border) ⇒ Phnom Penh	Transshipping cargo in the Vietnamese border (Svay Rieng)

Source: JICA (2012) "Final Report on the Information Collection Survey for Industrial Policy Formulation in Cambodia"

## 1.4 Impacts of COVID-19 on the Automotive Supply Chain/ Value Chain

Except for Toyota, the rest of the world's major automotive OEMs (i.e., GM, Honda, Fiat Chrysler Automobiles [FCA], Volkswagen [VW], Daimler, and Nissan) recorded a deficit for the first quarter (April–June) of Japan's fiscal year of 2020 (FY2020) (Table 1.1.1).<sup>29</sup> Toyota's continuous cost reduction activities resulted in sales recovery, enabling it to record a surplus (USD1,512 million), although profits decreased approximately 74% on a year-on-year basis.

In the wake of the COVID-19 pandemic, Nissan announced that it would close its Spanish plant due to the impact the spread of the virus has created.<sup>30</sup> According to the chief

<sup>29</sup> For details, please refer to the following URL: <https://www.nikkei.com/article/DGXMZO62394110W0A800C2EA2000/> (Access: 6<sup>th</sup> Oct. 2020)

<sup>30</sup> For details of Nissan's closing of its plant, please refer to the following

executive officer (CEO) of Daimler of Germany, the firm has decided on corporate downsizing of surplus manpower (i.e., 20,000 to 30,000 employees). It is said that other OEMs are considering taking a wide variety of measures (e.g., drastic reduction of fixed costs) so as to improve the present situation.

**Table 1.4.1 Profit and Loss of Major Automotive OEMs for Q1 2020**

(Unit: USD million)<sup>31</sup>

	Toyota	GM	Honda	FCA	VW	Daimler	Nissan
Amount of Loss/ Profit	1,512	▲758	▲770	▲1,038	▲1,607	▲2,001	▲2,321

Source: JICA Study Team

Meanwhile, by the end of July 2020, eight Japanese major auto-component manufacturers belonging to the Toyota Group announced a consolidated, instead of separate, earnings outlook for FY 2020–2021. Six of them, except Denso and Aisin Seiki, are expected to record a deficit owing to the impact of COVID-19 on demand and supply.<sup>32</sup>

As stated earlier, only Toyota was able to record a surplus for the first quarter (April–June) of FY2020; but even then the Toyota Group is faced with difficult management dilemmas. There is a growing concern that the pandemic may have a wider negative influence on the automotive supply chain (SC) and/or value chain (VC). Some people expect that there may be a reorganization and a realignment in the world’s automobile sector, although the issues did not surface yet as of October 2020.

URL:<https://mainichi.jp/premier/business/articles/20200813/biz/00m/020/005000c> (Access: 6<sup>th</sup> Oct. 2020)

<sup>31</sup> Foreign exchange rate: 105 yen/ USD, 123 yen/ Euro (on 15<sup>th</sup> October 2020)

<sup>32</sup> For details, please refer to the following URL:  
[https://www.nikkei.com/article/DGXMZO62166560R30C20A7L91000/?n\\_cid=DSREA001](https://www.nikkei.com/article/DGXMZO62166560R30C20A7L91000/?n_cid=DSREA001) (Access: 7<sup>th</sup> Oct. 2020)

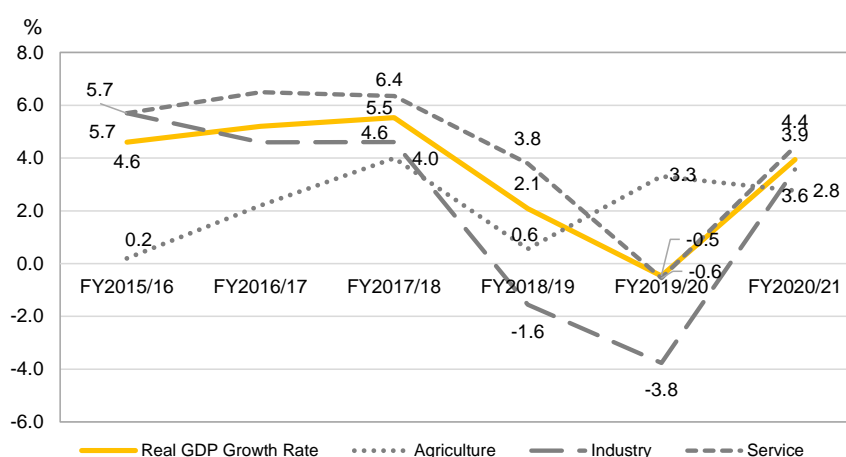
## 2 Overview of the Automotive Industry of Pakistan and the Impact of COVID-19

### 2.1 Overview of Pakistan's Economy

#### 2.1.1 Economic Trends before the Pandemic

##### (1) Sectoral Trends

In the past 13 years, Pakistan's economy was on an upward trend, attaining an all-time high in FY18. However, it became stagnant in FY19 due to the combined impact of an unstable economic policy and inflation, owing in turn to the depreciating Pakistan rupee (PKR). In FY19, the government set growth goals for the agricultural, industrial, and service sectors at 3.8, 7.6, and 6.5 %, respectively, but none of them was achieved. In FY20, the sectors' GDP was 2.7, -2.6, and -0.6, respectively, as the country's overall GDP recorded a -0.5% rate due to the negative impact of COVID-19. This figure is the lowest in the past 68 years. In contrast, FY21 saw a steep recovery of 3.9%.



Source: Pakistan Bureau of Statistics (PBS)

**Figure 2.1.1 Trends in Sectoral GDP (2016–2020)**

**Table 2.1.1 Major Macroeconomic Indicators**

		FY18 <sup>F</sup>	FY19 <sup>R</sup>	FY20 <sup>P</sup>
<i>Growth rate (percent)</i>				
Real GDP	Jul-Jun	5.5	1.9	-0.4
Agriculture	Jul-Jun	4.0	0.6	2.7
Industry	Jul-Jun	4.6	-2.3	-2.6
o/w LSM	Jul-Jun	5.1	-2.6	-7.8
Service	Jul-Jun	6.3	3.8	-0.6
Exchange rate	Jul-Mar	-9.2	-13.7	-4.0
Policy rate		10.00	13.25	7.00
<i>Million US Dollars</i>				
Exports	Jul-Jun	24.8	24.3	22.5
Imports	Jul-Jun	55.6	51.9	42.4
<i>Billion US Dollars</i>				
SBP's reserves (end-period)		9.8	7.3	12.1
Worker remittances	Jul-Jun	19.9	21.7	23.1
FDI in Pakistan	Jul-Jun	2.8	1.4	2.6
Current account balance	Jul-Jun	-19.2	-13.4	-3.0
<i>percent of GDP</i>				
Fiscal Balance	Jul-Jun	-6.5	-9.1 <sup>R</sup>	-9.4 <sup>E</sup>
Current account balance	Jul-Jun	-6.1	-4.8	-1.1
Investment	Jul-Jun	17.3	15.6	15.4

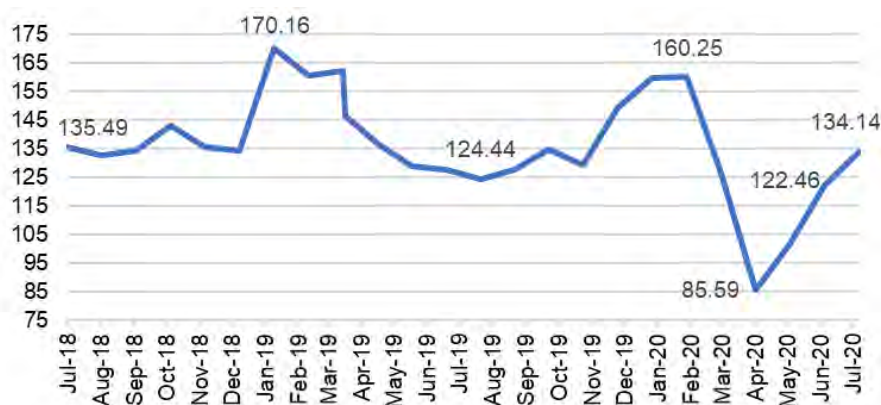
Note: P=Provisional; F=Final, R=Revised, E=Expected

Source: SBP

Sector-wise, the decline in the manufacturing sector in FY20 is remarkable, and the negative growth rate of large-scale manufacturing industries (LSMIs) is particularly large at -7.8%. The monthly quantum index of LSMIs dropped sharply from 160.25 in March 2020 to 85.59 in April 2020 (Figure 2.1.1). However, the index has been on a recovery path since May 2020, and in July 2020 it increased by 9.5% month-on-month and 5.0% year-on-year. In manufacturing, the quantum indices of food, beverages and tobacco; coke and petroleum products; and non-metallic mineral products increased significantly in July 2020 year-on-year, and they are on a recovery path. Meanwhile, the quantum indices of automobiles, electronics, and leather products declined significantly and have not recovered yet (Table 2.1.1).

The PKR1.24 trillion relief package announced by the government in the third quarter of FY20 has been used to support the economy not only through the provision of cash, but also through other supporting measures for the agricultural sector, job creation in the construction sector, and export promotion. The Pakistani government's measures to reduce the impact of COVID-19 include the Ehsaas Emergency Relief Program<sup>1</sup>, a comprehensive program aimed at reducing poverty. Moreover, the Prime Minister's COVID-19 Fund Portal provides eligible persons with a one-time allowance of PKR12,000, while the Ehsaas Roshan Portal provides vulnerable people with food and cash through donors. As of 27 July 2020, PKR160.5 billion had been disbursed to some 13.03 million people who were affected by the lockdown. In addition, the State Bank of Pakistan (SBP) provided hospitals with PKR64 billion, contributed PKR10.4 billion to investment, and allocated PKR119 billion for wage compensation<sup>2</sup>.

While fiscal spending on COVID-19 is expected to increase, tax revenues will decrease; accordingly, the actual tax collection is expected to be PKR3.9 trillion in FY20, against the Federal Board of Revenue (FBR)'s initial target of PKR4.8 trillion. Therefore, fiscal deficit in FY20 is projected to widen to 9.4% of the GDP<sup>3</sup>.



Source: SBP

**Figure 2.1.2 Monthly Quantum Indices of Large-scale Manufacturing Industries**

<sup>1</sup> <https://pass.gov.pk/Detail845ae76f-4161-4d46-8452-ab8805d1f953>.

<sup>2</sup> Government of Pakistan, Finance Division, Monthly Economic Update, July 2020.

<sup>3</sup> Government of Pakistan, Finance Division, Pakistan Economic Survey 2019-20.

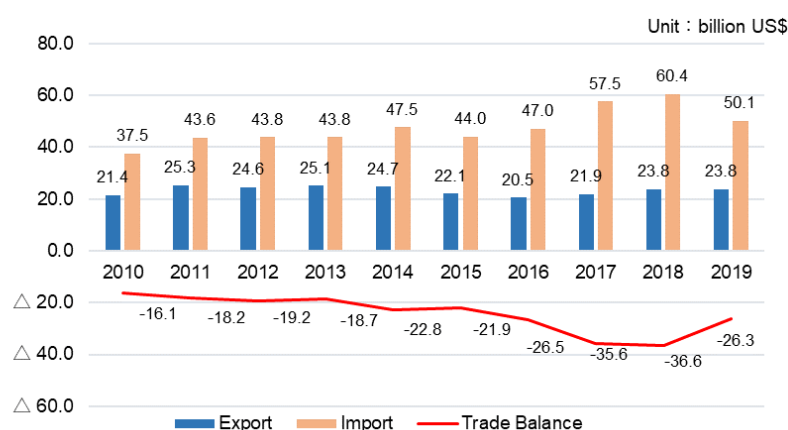
**Table 2.1.2 YOY Monthly Quantum Indices of Large-scale Manufacturing Industries**

Manufacturing Sector	(% Change)		Manufacturing Sector	(% Change)	
	Jul-19	Jul-20		Jul-19	Jul-20
Textile	0.29	1.66	Automobiles	-28.48	-23.31
Food Beverages & Tobacco	-9.15	21.73	Iron & Steel Products	-15.44	-11.13
Coke & Petroleum Products	-25.03	18.34	Fertilizers	16.34	-5.080
Pharmaceuticals	-11.79	19.2	Electronics	0.57	-33.31
Chemicals	3.26	0.19	Leather Products	5.77	-35.95
Non Metallic Mineral Products	2.43	29.01	Engineering Products	15.860	-32.60
Paper & Board	-1.45	5.04	Rubber Products	3.8	-15.00
			Wood Products	60.58	-18.63

Source: SBP

**(2) Trade**

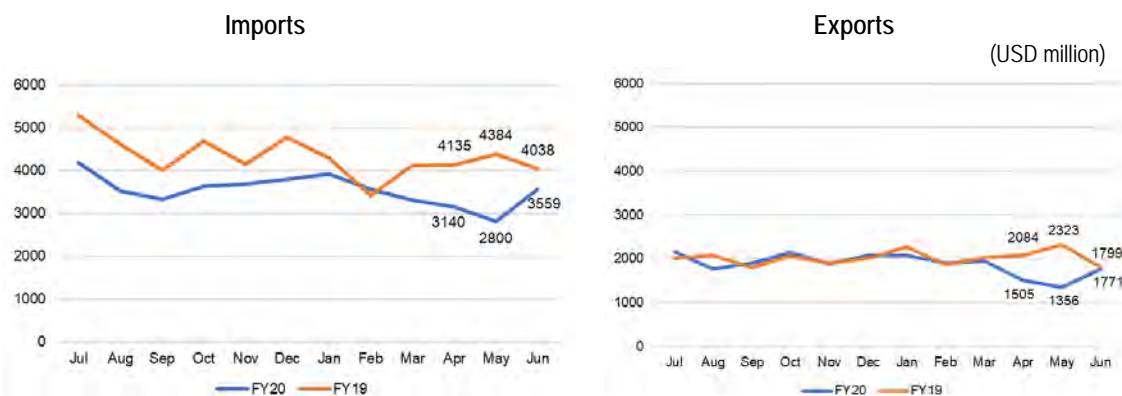
Trade deficit has been on an upward trend for 10 years. The amount increased from USD16.1 billion in 2010 to its peak of USD36.6 billion in 2018; however, trade deficit decreased in 2019 due to the decrease in import, whereas export was almost unchanged. This is due to the depreciation of the rupee and the completion of power projects included in the China–Pakistan Economic Corridor (CPEC), which decreased imports from China.

Source: ITC Trade Map (<https://www.trademap.org/>)**Figure 2.1.3 Pakistan's Trade Balance (2010–2019)**

Both imports and exports were on a downward trend during the period from March to May 2020 when the lockdown commenced. The value of imports in May decreased by 36% or USD1.58 billion year-on-year primarily due to the decline in retail and wholesale trade<sup>4</sup>. The value of exports also decreased by 42% or USD970 million year-on-year due to low external demand and low productivity. Since June 2020, however, both imports and exports have been on an upswing.

While the impact of COVID-19 on the overall economy was significant, the trade deficit narrowed due to the decline in imports. In addition, foreign currency remittances increased by 6.5% from USD21.7 billion in FY19 to USD23.1 billion in FY20. As a result of the shrinking current account deficit, the current account balance-to-GDP ratio increased from -4.8% in FY19 to -1.1% in FY20. Furthermore, FDI increased from USD13.6 billion in FY19 to USD25.6 billion in FY20, which is significant.

<sup>4</sup> Government of Pakistan, Finance Division, Pakistan Economic Survey 2019-20.



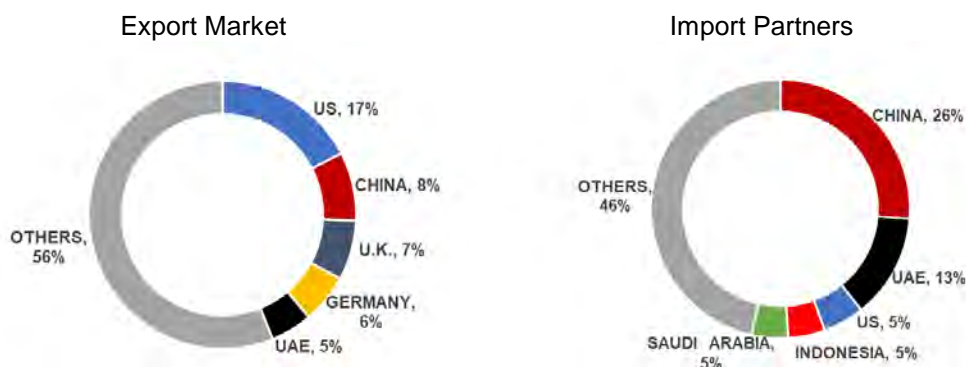
Source: SBP

**Figure 2.1.4 Imports and Exports in FY20 and FY19**

The United States is the largest export market of Pakistan, whereas China is its largest import partner (Figure 2.1.5). The top five trading partners of the country basically remained unchanged except that Afghanistan used to be fifth in the ranking. Pakistan mainly exports to U.S. and E.U. markets, whereas imports mainly come from China and Middle East countries. Pakistan’s trade relationship with Southeast Asian countries is weak.

The China–Pakistan Free Trade Agreement (CPFTA) Phase II came into effect on 1 January 2020. Pakistan commenced FTA negotiations with China in 2005. After the Early Harvest Program started in 2006, customs duty reduction in CPFTA Phase I was implemented from 2007 to 2012. However, negotiations for CPFTA Phase II stalled for years because Pakistan’s trade deficit with China increased significantly. In Phase II, China gives concessions to 8,238 items (HS tariff lines). Pakistan has never exported 1,035 of these 8,238 items but sees an opportunity for the rest of the 7,203 items<sup>5</sup>.

The country’s Ministry of Commerce (MOC) leads the “Look Africa Policy Initiatives,” which aims to strengthen trade with African countries. The first forum of the Initiatives was held in Kenya in January 2020, where Pakistan announced its plan to double its trade with the African region in five years<sup>6</sup>.



Source: ITC Trade Map (<https://www.trademap.org/>)

**Figure 2.1.5 Pakistan’s Major Trading Partners (July 2019–February 2020)**

<sup>5</sup> Preliminary Analysis of Pak-China FTA Phase II, Pakistan Business Council

<sup>6</sup> “Pakistan holds first ‘Look Africa Policy Initiative’ conference in Kenya: Commerce Minister,” <https://nation.com.pk/31-Jan-2020/pakistan-holds-look-africa>

Pakistan exports 4,096 items and imports 2,757 items; imported items are relatively few compared with exported ones<sup>7</sup>. Textile and apparel-related exports accounted for 58% of all exports in 2019<sup>8</sup>. The U.S. is the largest export market at the country level, while the E.U. is the largest regional partner, accounting for 34% in 2019. The U.S. offers Generalized System of Preferences (GSP) to Pakistan, whereas the E.U. offers GSP Plus, which allows Pakistan to export most items without customs duty. Pakistan's export is supported by these preferential tariff schemes<sup>9</sup>. Textiles and their products account for 67% of textile and apparel exports. This illustrates the insufficiency of more value-added apparel products. Rice is the largest export item, followed by cereals (HS10).

Oil-related products (HS27) is the largest import product and most of the items are imported from the Middle East. Machinery (HS84) and electrical machinery (HS85) are mostly imported from China, accounting for 49% and 75% of these items, respectively. Machinery includes not only power equipment but also a variety of equipment used in manufacturing, while electrical machinery includes telecommunications equipment and mobile phones. Steel (HS72) is mainly flat-rolled steel, which is primarily imported from China, accounting for 25%, but it is also imported from U.K. and Japan. Also, steel includes scrap imported from the U.S. and U.A.E. HS87 includes automobile and auto parts (spare parts), with Japan, Thailand, and China accounting for 81% of imports. Although Pakistan exports a large amount of cotton and textiles (HS52), it also imports cotton and cotton yarn of high quality.

**Table 2.1.3 Pakistan's Major Import and Export Items (2020)**

Export				Import			
(USD thousand)				(USD thousand)			
Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral . . .	14,408,237	29%	63 Other made-up textile articles; sets; worn clothing and worn textile articles; rags	4,070,644	17%		
84 Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	4,725,486	9%	52 Cotton	3,252,069	14%		
85 Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television . . .	4,266,116	9%	61 Articles of apparel and clothing accessories, knitted or crocheted	3,028,781	13%		
72 Iron and steel	3,100,415	6%	62 Articles of apparel and clothing accessories, not knitted or crocheted	2,814,503	12%		
29 Organic chemicals	2,363,931	5%	10 Cereals	2,375,641	10%		
39 Plastics and articles thereof	2,215,796	4%	42 Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles . . .	634,279	3%		
15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal . . .	1,935,981	4%	03 Fish and crustaceans, molluscs and other aquatic invertebrates	475,493	2%		
87 Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	1,468,958	3%	90 Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical . . .	454,177	2%		
12 Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal . . .	1,217,755	2%	25 Salt; sulphur; earths and stone; plastering materials, lime and cement	434,474	2%		
52 Cotton	833,234	2%	08 Edible fruit and nuts; peel of citrus fruit or melons	398,771	2%		
Others	13,598,903	27%	Others	5,879,985	25%		
TTL	50,134,812	100%	TTL	23,818,817	100%		

Source: ITC Trade Map, classified top 10 by HS Chapter (2 digits)

<sup>7</sup> The World Bank, World Integrated Trade Solution (WITS), CY18

<sup>8</sup> Items in HS Chapter 50-63 are considered as exported items for textile industry

<sup>9</sup> Since January 2014, Pakistan has enjoyed tariff reductions for 6,724 items, out of which 6,269 items are exported to EU without custom duty. In GSP, tariff reductions are applicable to 66 percent of tariff lines. Sensitive items (S) and non-sensitive items (NS) are set depending on items, and NS is principally duty-free, whereas S enjoys a certain concession. GSP Plus is a scheme to implement further reduction of customs duty and is extended to 10 countries, namely, Armenia, Bolivia, Carpe Verde, Costa Rica, Ecuador, Georgia, Mongolia, Paraguay, Pakistan, and Peru.



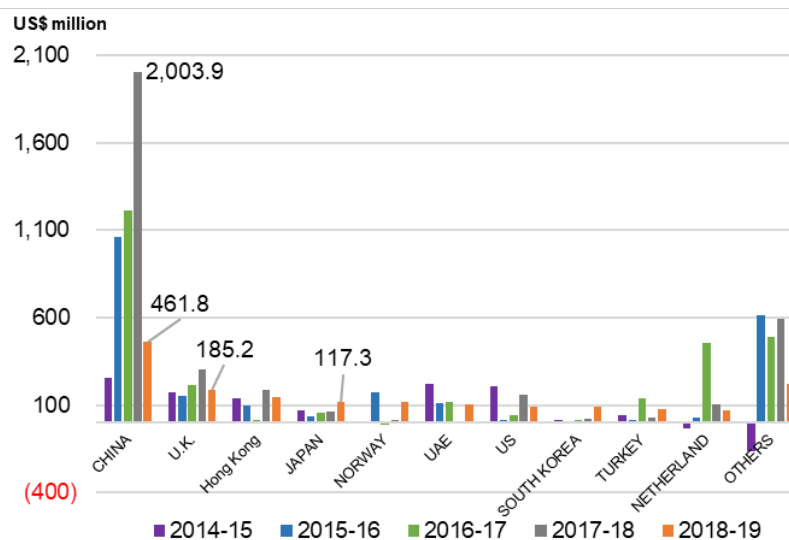
### (3) Foreign Direct Investment

CPEC investment increased from FY16, and the FDI reached its peak at USD3.47 billion in FY18, of which USD2 billion was from China. CPEC is the flagship project of the Belt and Road Initiative (BRI) which the Chinese government promotes as a global development strategy. After the completion of CPEC’s Early Harvest Programme Phase 1 in FY19, which comprised 32 projects, the FDI decreased by 77% YOY. Despite this, China remained Pakistan’s largest investor. As CPEC is supposed to continue until 2030, it is predicted that Chinese investments will continue to flow in, although the scale will not be the same as before.<sup>10</sup>

In FY19, China was the largest investor in Pakistan, followed by the U.K., Hong Kong, Japan, and Norway. As for the FDI from Middle East countries, that from U.A.E. decreased by USD3.3 million in FY18, then increased by USD102.5 million in FY19. Turkey’s FDI showed increases of USD29.8 million in FY18 and USD73.8 million in FY19.

Sector-wise the FDI in power in the last three years was spectacular because of CPEC’s emphasis on power generation projects; however, there was FDI outflow in FY19 as local Chinese companies made intercompany loan payments to their parent companies.

In FY19, there was FDI in petroleum gas exploration, financial business, and electrical equipment. However, the overall amount is on a decreasing trend even if the power sector is excluded (Table 2.1.3). In December 2018 and in February 2019, Fitch and S&P, respectively, lowered Pakistan’s credit rating to B- from B due to decreasing foreign currency reserves and increasing external deficits, which in turn tempered investor appetite<sup>11</sup>.



Source: State Bank of Pakistan

**Figure 2.1.6 FDI Inflows to Pakistan by Country of Origin**

<sup>10</sup> “32 CPEC early harvest projects get completed”, International The News on January 30, 2020, <https://www.thenews.com.pk/print/606241-32-cpec-early-harvest-projects-get-completed>

<sup>11</sup> UPDATE 1-S&P cuts Pakistan's credit rating to 'B-' from 'B'; keeps stable outlook, Reuter dated on February 4, 2019, <https://www.reuters.com/article/pakistan-ratings-sp/update-1-sp-cuts-pakistans-credit-rating-to-b-from-b-keeps-stable-outlook-idUSL3N1ZZ1LD>

**Table 2.1.4 FDI Inflows to Pakistan by Sector**

million US\$

	FY17	FY18	FY19
Power	700	1203	(254)
Construction	466	709	335
Financial Business	296	400	286
Oil&Gas Exploration	146	372	323
Pharmaceuticals	(10)	16	63
Telecommunications	(91)	100	(78)
Electrical Machinery	7	22	166
Textile	15	50	77
Others	1218	599	749
<b>Total</b>	<b>2,747</b>	<b>3,471</b>	<b>1,667</b>

Source: State Bank of Pakistan

FDI in FY19 was USD1.4 billion, whereas FDI in FY20 was USD2.6 billion, an increase of 88%. UNCTAD predicted that global FDIs would decrease by 40% in 2020<sup>12</sup>; in Pakistan even with the COVID-19 pandemic, FDI has increased since March 2020, with amounts exceeding that of the previous year except for May. Furthermore, the total FDI in July and August, which already fall under FY21, increased by 40% year-on-year.

In terms of FDI in FY20 by country, China, Norway, and Malta accounted for more than half of the total. In terms of market share by sector, power, and communications accounted for more than half of the total. From July to August in FY21, China had the highest FDI, but its outflow was also large. Hence, China is not included in the top five investor countries, which are Malta, the U.S., Malaysia, Switzerland, and the U.K. By sector, investments in finance and insurance, construction, oil and gas exploration, and communications during the same period accounted for 84% of the total investment of USD230 million.

In August 2020, Pakistan's Board of Investment (BOI) announced its Investment Promotion Strategy with the objective of attracting USD13.5 billion in FDI until 2023. Priority sectors are food and beverage, automobile and automobile parts, IT and ITS, logistics, and high-value-added textiles<sup>13</sup>.

**Table 2.1.5 Monthly FDIs in FY20 and FY19**

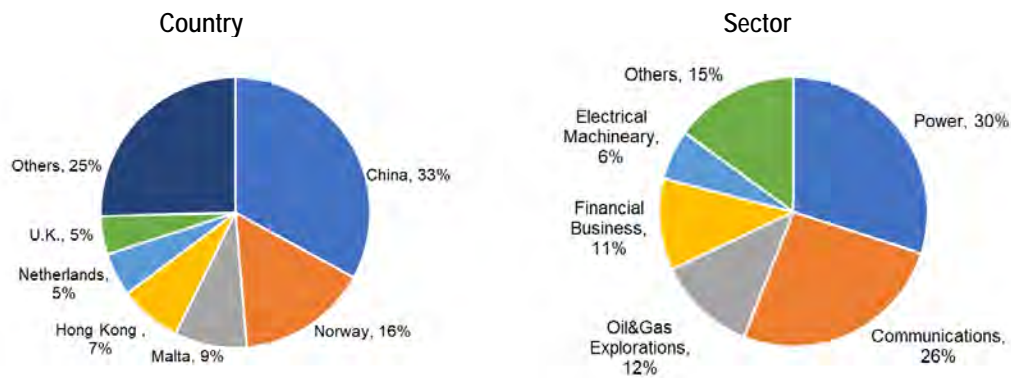
(USD Million)

Item	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
FY20	71	91	384	126	192	493	220	277	279	133	120	175	2,561
FY19	131	147	109	-391	238	267	146	112	145	101	254	102	1,362
Difference	-60	-56	274	517	-45	226	74	165	133	32	-134	72	1,199

Source: SBP

<sup>12</sup> UNCTAD's World Investment Report 2020.

<sup>13</sup> Profit, "BoI unveils three-year Investment Promotion Strategy, aims to take FDI to \$5bn by 2023", 27 August 2020.



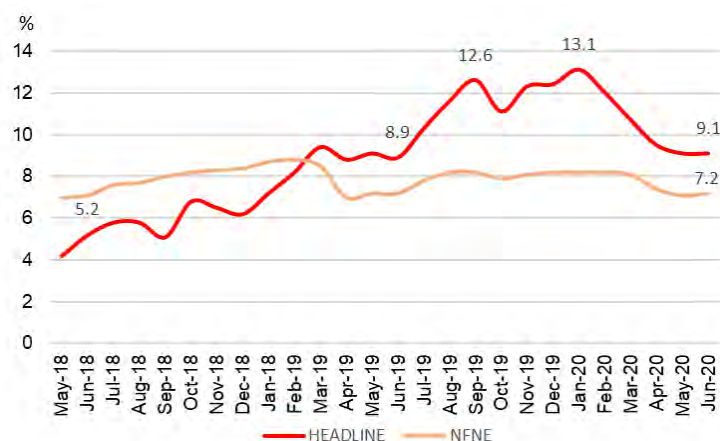
Source: SBP

**Figure 2.1.7 FDIs by Country and Sector in FY20**

#### (4) Finance

The consumer price index (CPI) increased from 5.2% in June 2018 to 8.9% in June 2019 (YoY). The average inflation in FY19 was estimated at 7.3% compared to 3.9% in the previous year<sup>14</sup>. This increase was a result of persistent demand-driven pressures, exchange rate depreciation pass-through, a rebound in international oil prices, and an increase in prices of natural gas. The largest impact on non-food inflation was found in natural gas prices and increases in petroleum product prices<sup>15</sup>.

In response to inflationary pressure, the Monetary Policy Committee (MPC) of the SBP raised the policy interest rate six times in FY19. Earlier, it was raised from 7.5% in 2018 to 12.25% in May 2019. Credit to private investment decreased due to tight monetary supply, but the CPI remained high because of a depreciated rupee. Furthermore, the first month of FY20 (i.e., July 2019), the MPC raised the policy interest rate to 13.25% and maintained it until the outbreak of COVID-19. However, because of lockdowns to stop the spread of COVID-19, food prices increased, and international oil prices plunged. The MPC predicted a low inflation and decreased the policy interest rate to 12.5%. The rate was further lowered to 8% to spur economic development and employment and remained so as of 20 May 2020.



Source: PBS Monthly Price Indices

**Figure 2.1.8 Year-on-year CPI (May 2018–June 2020)**

<sup>14</sup> Monthly Review on Price Indices, June, 2019, PBS

<sup>15</sup> Weathering the Storm Restoring Macroeconomic Stability, the World Bank, June 2019

## (5) Provincial Economy

**Sindh Province:** Sindh province is located in the south of Pakistan and has seven divisions and 29 districts. It had a population of 49 million in 2018, and its provincial capital, Karachi, had 1.65 million people. Its economy is the second-largest next to Punjab province, accounting for 27% of the country's GDP. Karachi is the largest city in Pakistan and its economy accounts for 15% of the country's GDP. In Sindh province, 67% of companies are concentrated in Karachi. The industrial sector in Karachi varies from heavy industries to finance. Agricultural production is practiced along the Indus River, and natural gas is produced in the coastal area. In manufacturing, there are machine manufacturing, cement, plastics, and others.

**Punjab Province:** Punjab province is located in the northeast of Pakistan and has nine divisions and 36 districts. It had a population of 110 million in 2017, and its provincial capital, Lahore, has 11 million people. Its economy is the largest in Pakistan, accounting for 57% of the country's GDP (2019). The area is the second-largest in the country, with 80% of its land allotted to agriculture, its main industry. Of the cultivated land, 42% is used for wheat production, while 14% and 11% are utilized for cotton and rice production, respectively. As for manufacturing, Punjab accounts for 65.4% of the country's SMEs engaged in manufacturing textiles and apparel, sports goods, and auto parts, as well as in food processing and others. The Punjab Industrial Policy 2018 plans to develop industrial clusters through the utilization of CPEC-related investment and SMEs.

### 2.1.2 Impact on SMEs

Due to COVID-19, the global GDP is estimated to decrease by 2.3–4.8%, while the FDI is projected to decline by 5–15%. According to the World Bank, South Asia will fall into the most serious economic situation in 40 years with half of the countries in serious recession, Pakistan included<sup>16</sup>. The International Labour Organization (ILO) also stated that the lockdowns would affect 81% of the world's labourers, making it the most serious crisis since World War II<sup>17</sup>. In Pakistan, SMEs account for more than 90% of the total number of enterprises, 40% of total exports, and 40% of GDP<sup>18</sup>.

Since the first confirmed COVID-19 infection on 26 February 2020, the number of infections in Pakistan increased to 962,313<sup>19</sup> as of 4 July 2021. The unemployment rate was 5.8% when Pakistan's labour force survey was conducted<sup>20</sup>, but it is predicted that the unemployment rate will rise to 8.1% during FY21 due to the impact of COVID-19<sup>21</sup>.

In an online questionnaire survey on 3–14 April 2020, the Small and Medium Enterprises Development Authority (SMEDA) surveyed 920 SMEs on the impacts of COVID-19 pandemic on them. The survey team of Leshan Normal University of China also conducted

<sup>16</sup> World Bank (2020). South Asia economic focus, spring 2020: The cursed blessing of public banks. Washington, DC: World Bank.

<sup>17</sup> ILO (2020). COVID-19 and the world of work: Updated estimates and analysis. ILO Monitor (2nd ed.): International Labour Organization.

<sup>18</sup> Syed Akhtar Hussain Shah (2018), Framework for SME Sector Development in Pakistan

<sup>19</sup> <http://covid.gov.pk/stats/pakistan>, accessed on Jul. 4, 2021.

<sup>20</sup> Sohail (2018). Labor force survey 2017-18. Islamabad: Government of Pakistan, Ministry of Statistics, Pakistan Bureau of Statistics.

<sup>21</sup> Siddiqui, S. (2020). COVID-19 lockdown to leave people jobless, businesses closed in Pakistan. The Express Tribune.

an online questionnaire survey among 184 companies on 9–21 April 2020<sup>22</sup>. Micro-enterprises (up to 10 employees) and small businesses (up to 50 employees) accounted for 90% of the surveyed firms in Leshan University's survey and 76% in SMEDA's survey.

Furthermore, SMEDA conducted an online survey on 19 April–2 May on the liquidity of 1,400 SMEs<sup>23</sup>.

### **(1) Impacts on Operations and Personnel Reduction**

According to SMEDA's survey<sup>24</sup>, 95% of SMEs responded that their operations decreased, of which 51.6% said that they had no domestic orders, whereas 22.6% stated that they had no orders from overseas. In terms of company size, smaller companies tended to suffer severely from the domestic situation. About 48% of the companies responded that during the lockdown they dismissed their workforce, although 60% responded that they would rehire employees within three months once the lockdown is lifted. The top three issues due to the COVID-19 pandemic are: poor cash flow (89%), weak sales (60%), and disrupted supply chain (43%).

The Leshan University survey revealed that 94.57% of SMEs were affected in one way or another, of which more than 38% of respondents confirmed that their business suffered the most serious impact (with 10 points being the highest of impacts). The five main issues of SMEs are limited finance (67.9%), disrupted supply chain (47.8%), declining demand (44.0%), poor sales (38.0%), and decreasing profits (41.1%). More than 25% of respondents estimated that sales and profits would decrease by more than 60% in 2020 compared to those in the previous year. In response to the cash flow issue due to reduced sales, 43% of companies dismissed their employees, whereas 12% companies reduced the salaries of their workers. More than two-thirds of the companies were able to withstand lockdowns of up to two months, but if these lasted up to six months, only 2% of respondents said they would be able to weather the crisis. Meanwhile, 72% of respondents mentioned that they could operate their businesses normally within a month once the lockdown was lifted.

### **(2) The Supply Chain**

The lockdown triggered by the spread of the COVID-19 virus has affected every sector. According to the World Bank, 54% of Pakistan's manufacturing exports in the supply chain are beverages and food, tobacco and textiles, and the impact of reduced demand for these items is significant. In the agricultural sector, labour was not available, and transportation was cut during the wheat harvest season which usually begins from late March to mid-June in southern Punjab. In the transportation sector, many drivers were obliged to stay at home, thereby disrupting the mode of transportation, and affecting wholesale and retail trade, transportation, warehousing, and telecommunications services<sup>25</sup>.

In SMEDA's survey<sup>26</sup>, 92% of respondents answered that they suffered from the disrupted supply chain. The degree of impact was evaluated on a scale of one to 10 (with 10 being

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<sup>22</sup> Mohsin Shafi, Jurong Liu, Wenju Ren (2020), Center for Trans-Himalaya Studies, Leshan Normal University, Leshan, China Impact of COVID-19 Pandemic on micro, small and medium-sized Enterprises operating in Pakistan.

<sup>23</sup> COVID-19 SME Liquidity Support and Business Formalization Survey Report, SMEDA. May 2020.

<sup>24</sup> SMEDA, Survey Report: Impact of COVID-19 on SMEs, April 2020.

<sup>25</sup> World Bank (2020). South Asia economic focus, spring 2020: The cursed blessing of public banks. Washington, DC: World Bank.

<sup>26</sup> Survey Report: Impact of COVID-19 on SMEs, Policy & Planning Division SMEDA, April 2020

the highest level of disruption), and 75% of the respondents chose eight to 10, whereas only 2% chose one, suggesting that the impact of the supply chain disruption was devastating to the businesses. Furthermore, the level of impact tended to decrease as the size of the company's employees increased. Small companies with 30 employees or less, which accounted for about half of the respondents, answered the highest level of 10. Thus, the impact on micro and small companies had greater than on medium-sized companies.

### (3) Access to Finance

According to SMEDA's survey conducted in April 2020<sup>27</sup>, 64% of surveyed SMEs expected financial support from the government in the form of low-interest loans and grants. Meanwhile, SMEDA's survey in May 2020<sup>28</sup> highlighted the issue of the commercial registration of SMEs. Distrust of government and concerns about complicated procedures remain as issues. Of the 1,400 respondents, 44% of SMEs do not have national tax numbers (NTNs) and hence do not have a corporate bank account. If ever the government provides an interest-free loan of PKR500 thousand to two million, 85% of companies responded that they would consider commercial registration, while 15% would not regardless of the amount of financial assistance. It is estimated that 70% of the non-agricultural working population of 38 million in Pakistan is in the informal sector, of which labour in wholesale and retail trade and the manufacturing sector accounts for the majority<sup>29</sup>. These informal sectors have not acquired NTNs and are not eligible for government financial support.

The government's fiscal and financial support measures for SMEs affected by the COVID-19 pandemic are as follows:<sup>30</sup>.

- Indirect cash flow assistance of PKR50.7 billion;
- Electricity subsidy (5 kw or less for commercial use and 70 kw or less for industrial use) from May to July 2020; and
- Higher credit limit, i.e., from PKR125 million to PKR 180 million.

According to a survey conducted by Karandaaz Pakistan<sup>31</sup>, 66% of SMEs or 81 out of the surveyed 123 SMEs were aware of relief programs. While about 30% of the respondents (34 firms) applied for the program, only 22% of respondents (27 firms) got approved<sup>32</sup>. On the other hand, according to SBP statistics, outstanding loans to SMEs by July 2020 was PKR401.1 billion, down from PKR464.9 billion year-on-year. The percentage of SME financing to the private sector declined from 7.5 % to 6.4% during the same period. Even though SMEs are susceptible to the influences of COVID-19, SME financing has not increased. Moreover, the percentage of non-performing loans (NPLs) increased from 17% in June 2019 to 22% in June 2020.

<sup>27</sup> SMEDA, Survey Report: Impact of COVID-19 on SMEs, April 2020

<sup>28</sup> SMEDA, SME Liquidity Support and Business Formalization Survey Report, May 2020

<sup>29</sup> Pakistan Bureau of Statistics (2018), The Labour Force Survey 2017-18,

<sup>30</sup> Economic Advisor Wing, Finance Division, Monthly Economic Update, July 2020

<sup>31</sup> Karandaaz Pakistan is a private company promoting access to finance for small businesses through a commercially directed investment platform and financial inclusion for individuals by employing technology-enabled digital solutions (<https://www.devex.com/organizations/karandaaz-pakistan-krn-68319>).

<sup>32</sup> Karandaaz (June 2020), Survey Findings Impact of COVID-19 on SMEs (April 2020)

**Table 2.1.6 SME Financing in FY19 and FY20**

Item	(Unit: PKR billion)	
	July 19	July 20
Outstanding SME Financing (PKR billion)	464.86	401.13
Private Sector Financing (PKR billion)	6,200.0	6,247.38
SME Fin as % of Domestic Pvt Sector Financing	7.50%	6.42%
SME NPLs Ratio	17.04%	21.85%
No. of SME Borrowers	183,606	188,804

Source: SBP

### 2.1.3 Labour Market

Labour force in Pakistan has shown a tendency to increase (Table 2.1.7). However, in 2020, due to widespread unemployment and shutdown of businesses affected by COVID-19, the working population decreased significantly from about 55.74 million in the previous year to about 35.04 million<sup>33</sup>.

**Table 2.1.7 Trends in Pakistan's Labour Force**

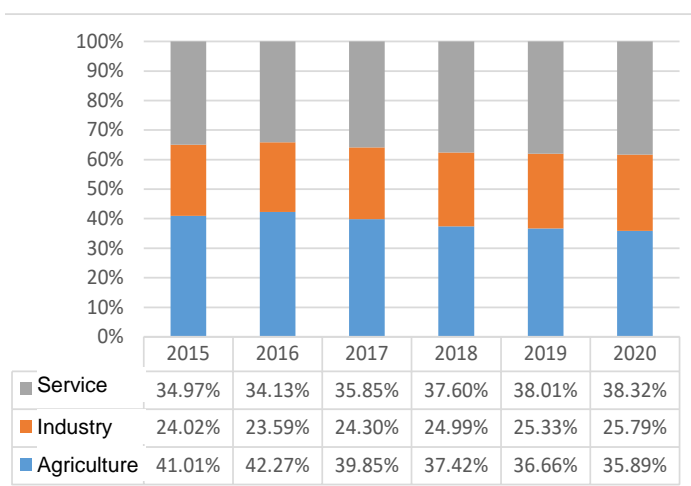
2015	2016	2017	2018	2019	2020
67,750,895	69,173,463	70,596,730	72,035,348	73,855,151	72,335,052

Note: unit; person

Source: World Bank website

(<https://data.worldbank.org/indicator/SL.TLF.TOTL.IN?contextual=default&end=2020&locations=PK&start=2014&view=chart>)

In terms of the working population by industry, the ratio of the service industry to the overall industry has been increasing in the past five years, while the agricultural working population has been declining year by year.



Source: Statista webpage

(<https://www.statista.com/statistics/383781/employment-by-economic-sector-in-pakistan/>)

**Figure 2.1.9 Trends in Pakistan's Labour Force by Industry**

About 1.2 million workers in the automobile industry were reported in 2017–2018, and the vast majority are male.

<sup>33</sup> Special Survey for Evaluating Socio-Economic Impact of COVID-19 on Wellbeing of People, the Pakistan Bureau of Statistics, Dec., 2020

**Table 2.1.8 Working Population in the Automotive Industry**

2014–2015			2017–2018		
Male	Female	Total	Male	Female	Total
840,000	60,000	900,000	1,090,000	110,000	1,200,000

Source: Prepared by JICA Study Team based on the interview with PAAPAM, Feb., 2021

## 2.1.4 Industrial Human Resource Development

Pakistan has set the improvement of labor market efficiency as one of the measures to increase the economic advantage in Vision 2025. The latest policy for industrial human resource development is the National Skills for All Strategy (NSS) 2018, which is being implemented by the National Vocational & Technical Training Commission (NAVTTTC). The policy sets eight priority areas, that is, governance, funding, capacity improvement, quality assurance, access and fairness, industry ownership, technological development for the international market, and public relations plans, entailing action plans for each area. Based on the NSS 2018, each state government has to have its own action plan. As a measure to develop human resources development in these priority fields, NAVTCC is taking the following measures in collaboration with the Technical Education and Vocational Training Authority (TEVTA), which is the coordinating and implementing agency for industrial human resources development in each state.

**Table 2.1.9 Initiatives of NAVTCC and TEVTA**

Initiative Name	Description
National Vocational Qualification Framework	<ul style="list-style-type: none"> <li>Standardize and systematize qualifications obtained through technical education and vocational training.</li> <li>Develop a common qualification system.</li> </ul>
Competency Based Training and Assessment (CBT&A)	<ul style="list-style-type: none"> <li>Develop a training and evaluation system based on practical competence. The goal is to acquire practical skills rather than theoretical knowledge.</li> </ul>
Apprenticeship	<ul style="list-style-type: none"> <li>Develop an in-house training system.</li> <li>Assist firms in receiving trainees.</li> <li>Establish a fund to obtain the commitment of the company.</li> </ul>
Center of Excellence	<ul style="list-style-type: none"> <li>Establish a model school for technical education and vocational training according to the requirements of industry.</li> <li>Implement competency-based training and assessment course, equipment renewal, training of managers, teachers, and evaluators.</li> </ul>

Source: JICA Study Team

According to an interview with NAVTTC, it recognizes that Pakistan's policy on industrial human resource development should correspond to Industry 4.0, but this has not been achieved yet due to various issues such as domestic poverty, low literacy rate, energy crisis, unemployment, political instability, and terrorism. The agency also stated that it seeks technical assistance from industrialized countries to modernize the engineering aspect of the local automotive industry.

There are 3,882 technical education and vocational training schools nationwide. Of these, 1,528 are public institutions and 2,363 are private institutions. By state, there are 1,592 technical education and vocational training schools in Punjab, 962 in Khyber Pakhtunkhwa (KPK), and 962 in Sindh.



There are diploma courses on automobile, diesel, and mechanical engineering given by technical junior colleges and polytechnic schools under each state TEVTA, and short-term automobile maintenance courses by vocational training schools. In Sindh, there is a Pak Swiss Training Center (machining field) under MOST. NED University is the only university that has a department of automotive engineering and produces management-level graduates.

Based on the data from the Vocational Training Institutes under NAVTTC, the output gap for mechanics training in Islamabad is significantly large, and the supply has not kept pace with the demand for car electricians and car mechanics training.

**Table 2.1.10 Demand and Supply Gap in Education and Training in the Automotive Industry (FY2020–2021)**

State	Course	Graduates	Demand	Gap
KPK	Auto Mechanic	2,586	2,154	432
KPK	Auto Electrician	31	201	-170
Balochistan	Auto Mechanic	0	4,220	-4,220
Balochistan	Auto Electrician	0	668	-668
Islamabad	Auto A/C Electrician	0	289	-289
Islamabad	Auto Alignment	0	85	-85
Islamabad	Auto Denter	0	561	-561
Islamabad	Auto Electrician	48	2,224	-2,176
Islamabad	Auto Gayer Repair	0	34	-34
Islamabad	Auto Mechanic	356	2,977	-2,621
Islamabad	Battery Repairer	0	40	-40
Islamabad	Bike Electrician	0	255	-255
Punjab	Auto Mechanic	3,727	653	3,074
Punjab	Auto Electrician	1,325	173	1,152
Sindh	Auto Mechanic	592	455	137
Sindh	Auto Electrician	99	123	-24
Balochistan	Auto Electrician	21	5	16
Balochistan	Auto Mechanic	163	29	134
AJK <sup>34</sup>	Auto Electrician	24	6	18
AJK	Auto Mechanic	67	21	46

Source: Prepared by JICA Study Team based on material provided by Vocational Training Institute

In the interviews conducted by the JICA Study Team, the experts pointed out the scarcity in automotive human resources, while turnover rate is somewhat at the same level with other countries. In addition, although education on automobile engineering is provided at NUST and NED universities, the knowledge on automobile engineering is also useful in other industries, so many people find employment outside the automotive industry. While NED University of Engineering and Technology graduates can find employment with Japanese OEMs and parts manufacturers, Japanese OEMs mainly train new employees who do not have basic knowledge of automobiles. Some Japanese OEMs have given endowment funds to universities and have dispatched lecturers to contribute to the development of human resources in the automobile industry. In 2016, the Atlas Honda

<sup>34</sup> Azad Jammu and Kashmir

Group established a private Atlas Vocational Training Institute.

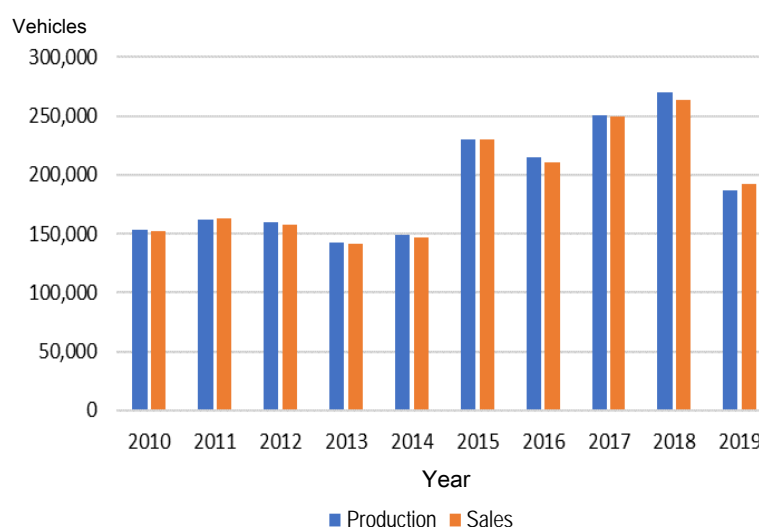
Japanese OEMs provide technical supervision to parts manufacturers to some of the top Tier 1 companies, but experts pointed out that such supervision lasted for only a short period of time, such as when launching a new project. No continuous support has been provided. In many cases, the personnel who receive guidance do not remain in the same workplace due to transfers or resignation. The issue is how to continuously provide technical guidance and create a system to pass on the technology in-house. Moreover, several Japanese automobile manufacturers and experts pointed out the need for the top managers in local parts manufacturing companies to keep up with new technologies.

## 2.2 Overview of the Automotive Industry in Pakistan

### 2.2.1 Trends in Production and Sales

#### (1) Trends in Production Volume for the Last Decade

From 2010 to 2019, the production volume of passenger cars, light commercial vehicles (LCVs), trucks, and buses in Pakistan was around the same level as the sales volume, excluding imported finished vehicles and used vehicles every year (Figure 2.2.8). In addition, almost all finished vehicles produced in Pakistan are sold in the domestic market. With regard to imported used cars, in some years 70,000 to 80,000 vehicles were imported.

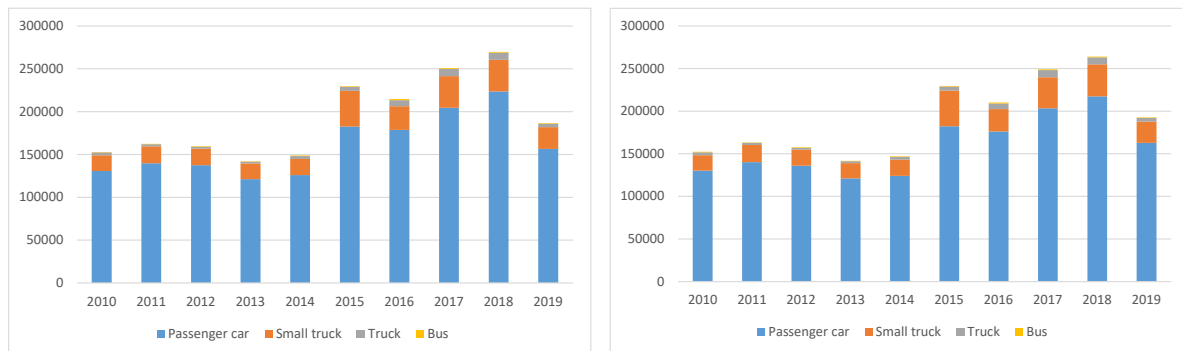


Source: JICA Study Team based on the portal site of Mark Lines

**Figure 2.2.1 Production and Sales of Cars, LCV, Trucks, and Buses (2010–2019)**

Production and sales were in an increasing trend since 2010, and it was expected that demand would continue to grow beyond 300,000 units. However, the year 2019 saw a plunge to the lowest level of less than 200,000 units for the first time in five years. The factors behind this can be ascribed to the sharp depreciation of the rupee in June, followed by the impact of a large tax increase on automobiles in July. The impact of those two factors was so significant that every OEM was forced to repeatedly rise prices, while incurred inflation decreased the demand, and increased interest rates discouraged car loan borrowers. Consequently, every Japanese OEM was forced to halt production for some days to adjust its obsolete inventory, make factory work in one shift, and lay off around 1,000 workers, who were mostly contractual employees.

Trends in production and sales by type of vehicle are shown in Figure 2.2.9. In an attempt to increase tax revenue, the government from July 2018 banned individuals called "non-filers," those who do not have tax numbers, from buying cars. As a result, sales of LCVs, which were the preferred vehicle of small, sole proprietorships (mostly non-filers), slowed down significantly, leading to a decrease in passenger car production and sales. Since March 2019, the government has allowed non-filers to purchase cars by paying additional taxes.

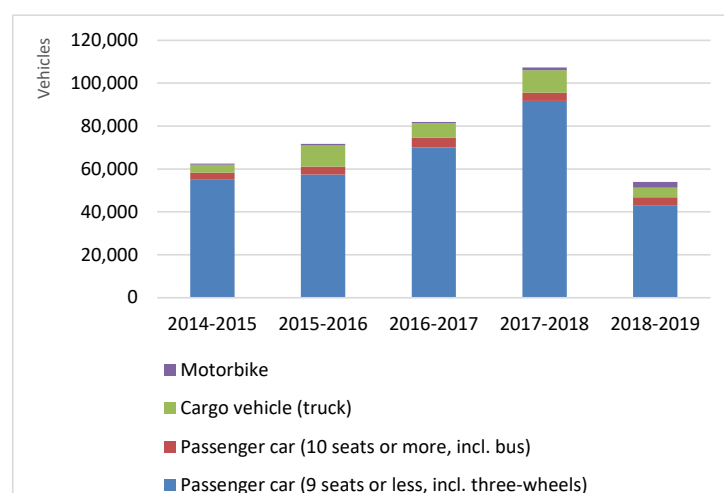


Source: JICA Study Team based on the portal site of Mark Lines

**Figure 2.2.2 Production and Sales by Type of Vehicle (2010–2019)**

## (2) Trends in Vehicle Importation

The number of completely built-up (CBU) cars imported to Pakistan reached 110,000 in FY2018 but dropped sharply to about 50,000 in FY2019. The reason behind this is the revision of Import Policy Order (2016) in January 2019. This new order required that tax must be paid from the bank account of a Pakistani who imports cars from overseas, and overseas remittances can be received only by the same person. If an importer does not have an account, one's family member's bank account is to be used. This restriction contributed to the decline in the volume of imported CBUs.



Source: Prepared by JICA Study Team based on Bureau of Statistics of Pakistan

**Figure 2.2.3 Number of Imported CBUs (2014–2019)**

## (3) Automotive Industry before and after COVID-19

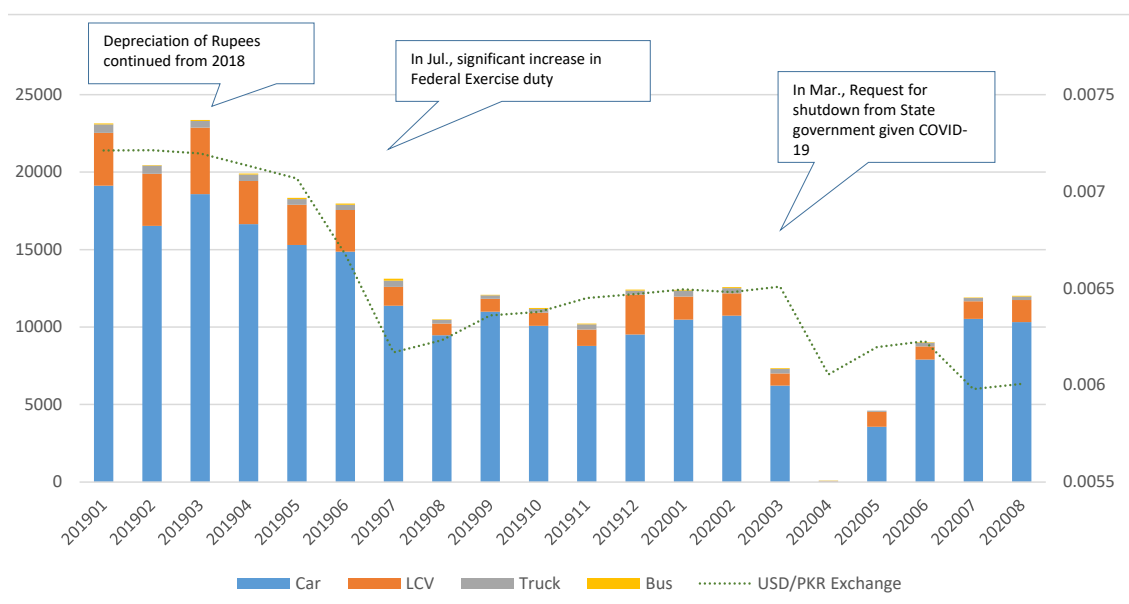
As discussed before, even before the onset of the pandemic in early 2020, the automotive industry of Pakistan already faced a sluggish demand due to the acute depreciation of the rupee to the US dollar combined with the hike of federal excise duty (FED) without notice.

To make matters worse, the COVID-19 pandemic forced lockdowns and shutdowns of factories in late March 2020. The big three OEMs, i.e., Suzuki, Toyota, and Honda, closed their factories one after another during the lockdown.

In late May, Toyota and Honda resumed operations when state government restrictions on the automobile industry were relaxed, followed by Suzuki's reopening in mid-June. Like the Japanese OEMs, the Kia-Hyundai Group and Al-Haj Faw Motors also closed their factories and resumed production in sequence since late May 2020. Although Toyota reopened its factory, an infected person was found in mid-June, and the operation was suspended for five days.

The shutdown of the entire industry resulted in almost zero production for April 2020 (Figure 2.2.4). From July 2019 to March 2020, the overall production marked just 47.9% of the same period last year.

To respond to the crisis, Japan Association of Commerce and Industry (JACI) in Karachi and JETRO sent the letter attended to the Prime Minister Imran Khan and Adviser to Prime Minister of Pakistan Abdul Razak Dawood to request emergency economic measures including large scale incentives with tax reduction on purchasing cars, bikes, or trucks, and stimulus measures to boost demand by cash transfer or tax reduction. The Japanese Ambassador physically met Mr. Dawood to convey the request.



Source: Prepared based on the portal site of Mark Lines and the table of the exchange rates of JICA

**Figure 2.2.4 Number of Vehicles Sold in Pakistan (2019–2020)**

#### (4) Government's Response to Rehabilitate the Automotive Industry

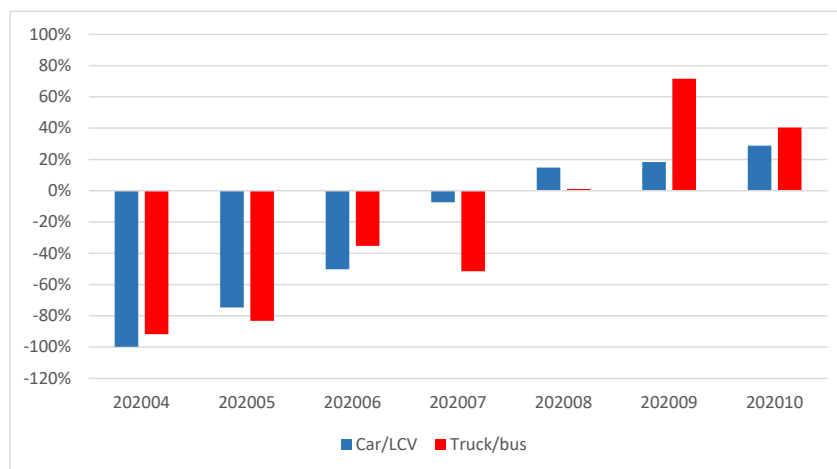
The FY21 (July 2020–June 2021) federal budget bill announced by the Pakistani government in June 2020 estimated that the economy would be significantly affected by the lockdowns, suspension of business activities, and prohibition of movement to prevent the spread of COVID-19. Due to the decrease in tax revenue resulting from these measures,

the expenditure scale was PKR7,137 billion (about JPY4,640 billion), which is about 11% lower than that in the previous year. FY20 saw a GDP decline of -0.5% for the first time in 68 years. This figure is the lowest in the past 68 years. In contrast, FY21 saw a steep recovery of 3.9%.

In formulating the budget plan, the government took into consideration the pandemic's impact on the economy, postponed the introduction of new taxes and the increase in tax rates, kept the corporate tax at 29%, and maintained the personal income tax rate at the same rate as that in the previous year. Although the government introduced tax incentives for the construction industry to promote housing development projects for low-income people in urban areas, no tax reprieves were announced for other major industries including the automotive industry. There was tariff relaxation ranging from 3% to 11% on 90 imported raw materials, depending on the items, but automotive parts were not among those preferred items. However, the government has announced it would launch another round of tariff relaxation for around 40 items for exporting firms, the manufacturing industry, mineral industry, agriculture, forestry and fisheries, cold chain, and IT industry.

### (5) Rapid Recovery of the New-car Market

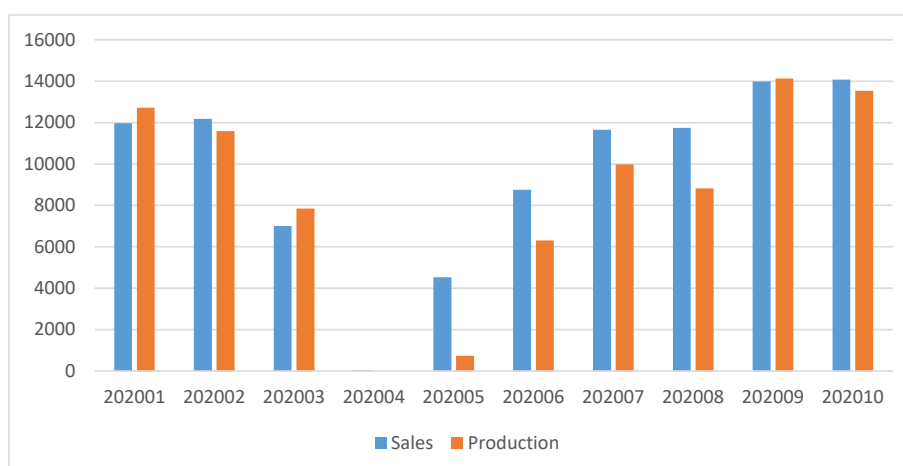
Defying the popular belief that the global auto industry needs a few years to completely recover, the automotive industry of Pakistan achieved a V-shaped recovery in the number of vehicles sold. As of the end of October 2020, the sales of cars/LCVs and buses/trucks increased by 28.8% and 40.5%, respectively, from the same period in 2019.



Source: JICA Study Team based on the portal site of MarkLines

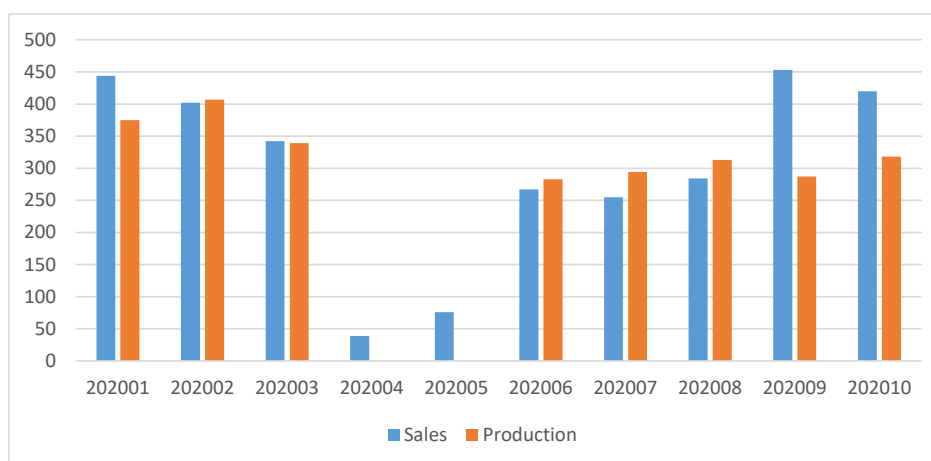
**Figure 2.2.5 Number of Vehicles Sold in Pakistan in 2020**

The production system could not keep up with the recovery of demand more than expected for OEMs and suppliers, and the sales volume of passenger cars and LCVs continued to exceed the production volume until around August (Figure 2.2.6). Similarly, the number of trucks and buses sold far exceeded the number produced, which means there was a huge gap in demand and supply (Figure 2.2.7).



Source: JICA Study Team based on the portal site of MarkLines

**Figure 2.2.6 Number of Passenger Cars and LCVs Sold and Produced in 2020**



Source: JICA Study Team based on the portal site of Mark Lines

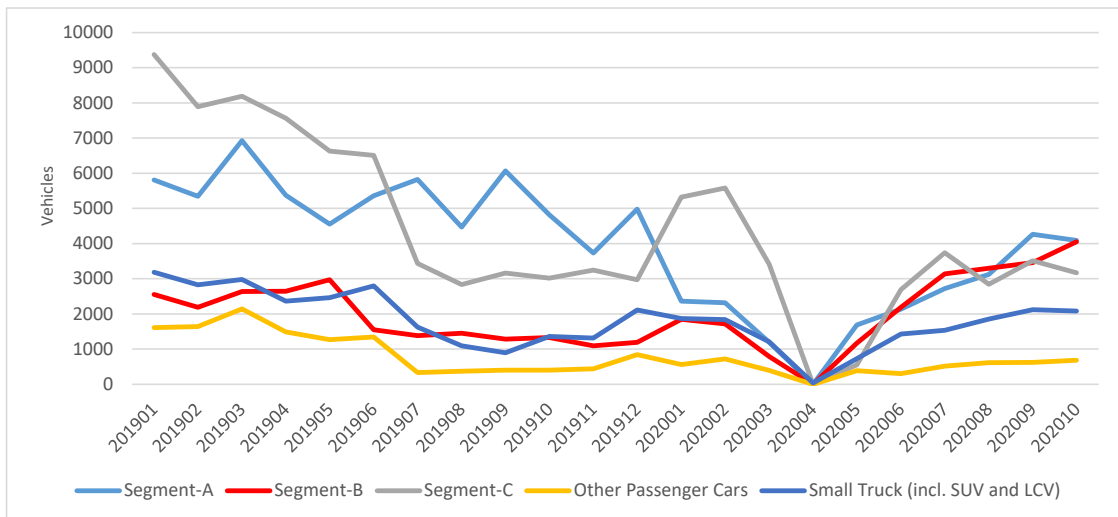
**Figure 2.2.7 Number of Trucks and Buses Sold and Produced in Pakistan in 2020**

In terms of the number of units sold by segment, segment B was significant and way higher than the sales level before the COVID-19 pandemic (Table 2.2.1 and Figure 2.2.8). During this period, there was no change in the tax rates per displacement.

**Table 2.2.1 Segments of Cars and LCVs**

Segment	Reference Price Range (PKR)	Model
A-Segment	1 million-1.7 million (Approx. USD6,250—10,625)	Suzuki Alto, Mehran, Wagon R
B-Segment	1.7 million-2.4 million (Approx. USD10,625—15,000)	Toyota Yaris, Suzuki Cultus, Swift
C-Segment	2.5 million-4.5 million (Approx. USD15,625—28,125)	Toyota Corolla, Honda Civic/City
Other Passenger Cars	1.1 million (Approx. USD6,875)	Suzuki Bolan
LCV	3.1 million-5.6 million (Approx. USD19,375—35,000)	Honda BR-V, Hyundai Tucson, Toyota Hilux

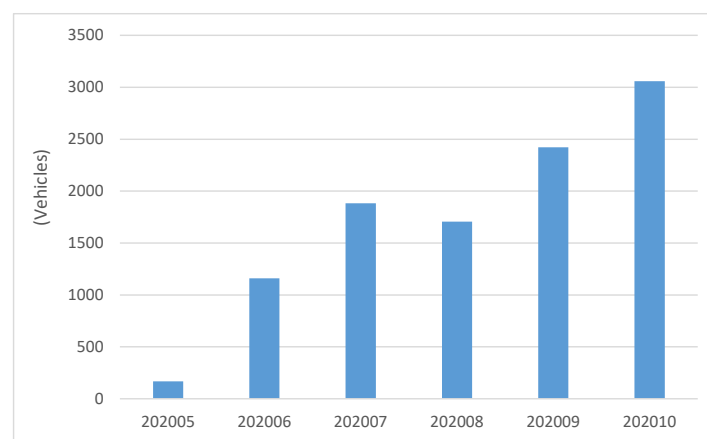
Source: JICA Study Team based on the webpage of each firm



Source: JICA Study Team based on the portal site of Mark Lines

**Figure 2.2.8 Number of Passenger Cars and LCVs Sold in Pakistan (2019–2020)**

The biggest reason for the rapid increase in the number of passenger cars under Segment-B was the explosive increase in the sale of Toyota Yaris, of which Indus Motor launched in May 2020. It became a big hit with sales of 10,394 vehicles for the first 6 months only (Figure 2.2.9). In October 2020, it was broadcast that Yaris would take a few months from placing an order to delivery. Generally, fully changed models are flooded with orders and takes a year to ease demand. Yaris proved this theory with an outstanding sales performance and exhibited the importance of a full-model-change to the whole automotive industry in Pakistan.



Source: JICA Study Team based on the portal site of Mark Lines

**Figure 2.2.9 Number of Toyota Yaris Sold in Pakistan by Month in 2020**

Similarly, Toyota Hilux and Honda BR-V, which are classified as high-priced SUVs, each exceeded 80% in the July-September period of 2020 compared to the same period of the previous year. Honda Civic also increased by 65%, while Suzuki Bolan increased by 59%, showing a remarkable increase in sales.

**Table 2.2.2 Passenger Car and LCV Sales by Model**

Brand	Model	Segment	Jul.-Sep., 2019	Jul.-Sep., 2020	Change	% Change
Suzuki	Alto	A	12943	7651	▲ 5, 292	-41%
Suzuki	Mehran	A	1249	0	▲ 1, 249	n/a
Suzuki	Bolan	Unclassifiabl	1106	1758	652	59%
Suzuki	Wagon R	A	2168	2460	292	13%
<b>Toyota</b>	<b>Yaris</b>	<b>B</b>	<b>0</b>	<b>6009</b>	<b>6, 009</b>	<b>n/a</b>
Suzuki	Cultus	B	3598	3263	▲ 335	-9%
Suzuki	Swift	B	524	630	106	20%
Toyota	Corolla	C	5503	3614	▲ 1, 889	-34%
Honda	Civic/City	C	3926	6483	2, 557	65%
Isuzu	Unknown	SUV	189	96	▲ 93	-49%
Honda	BR-V	SUV	528	952	424	80%
Hyundai	Tucson (ix35)	SUV	0	237	237	n/a
Toyota	Fortuner	SUV	266	390	124	47%
Toyota	Hilux	Small trucks	938	1702	764	81%
Suzuki	Ravi	Unclassifiabl	1559	1723	164	11%
Hyundai	Porter	Unclassifiabl	0	255	255	n/a
Anhui Jianghuai Automot	JAC	Unclassifiabl	138	160	22	16%

Source: JICA Study Team based on the portal site of Mark Lines

## 2.2.2 Associations in the Automotive Industry

### (1) Pakistan Automotive Manufacturers Association

Established in 1984, the Pakistan Automotive Manufacturers Association (PAMA) obtained a license following the issuance of the trade organizations ordinance of the MOC in 2017. Its major objectives include to safeguard the interest of the members and to play the central role in the government's formulation of policies for the automotive industry of Pakistan. The members of PAMA comprises 20 firms, as of July 2020 (Table 2.2.3).

**Table 2.2.3 Members of PAMA as of July 2020**

	Name	Place	Category
1	Pak Suzuki Motor Co. Ltd.	Karachi	Cars, LCVs, Two Wheelers
2	Indus Motor Co. Ltd.	Karachi	Cars, LCVs
3	Honda Atlas Cars (Pakistan) Ltd.	Lahore	Cars
4	Sigma Motors Ltd.	Islamabad	Cars
5	Hinopak Motors Ltd.	Karachi	Trucks, Buses
6	Ghandhara Industries Ltd.	Karachi	Trucks, Buses
7	Ghandhara Nissan Ltd.	Karachi	Cars, Trucks, Buses
8	Master Motor Corporation Ltd.	Karachi	Cars, Trucks, Buses
9	Millat Tractors Ltd.	Lahore	Tractors
10	Atlas Honda Ltd.	Karachi	Two Wheelers
11	Plum Qingqi Motors Ltd.	Lahore	Two and Three Wheelers
12	Fateh Motors Ltd.	Hyderabad	Two Wheelers
13	Ravi Automobile Pvt. Ltd.	Lahore	Two Wheelers
14	Sazgar Engineering Works Ltd.	Lahore	Three Wheelers
15	Orient Automotive Industries Pvt. Ltd.	Karachi	Tractors
16	Eiffel Industries Ltd.	Kasur	Two and Three Wheelers
17	Yamaha Motor Pakistan Pvt. Ltd.	Karachi	Two Wheelers
18	Al-Ghazi Tractors Ltd.	Karachi	Tractors
19	United Auto Industries Pvt. Ltd.	Lahore	Two and Three Wheelers
20	Hyundai Nishat Motor Pvt. Ltd.	Lahore	LCVs

Source: Prepared by JICA Study Team based on PAMA

The 20 member firms are a mix of two-, three- and four-wheel manufacturers and tractor



makers. Half of the members are headquartered in Karachi, followed by Lahore with seven firms. Islamabad, Hyderabad, and Kaur have one firm each.

## (2) Pakistan Auto Parts Manufacturers Association

The Pakistan Auto Parts Manufacturers Association (PAAPAM) was established in 1988 with the aim of supporting OEMs in technology and management at the request of OEM parts suppliers. Its head office is located in Lahore and a branch office is located in Karachi. The Karachi office has jurisdiction over the southern region of Pakistan, and the Lahore headquarters has jurisdiction over the northern region. There are 17 board members, including one chairman, one senior vice chairman, and one vice chairman. PAAPAM has a Skill Development Center (PSDC), which holds seminars and workshops on such topics as improvement, supply chain management, and business planning to improve the technological capacity of its member companies<sup>35</sup>.

As of 14 July 2020, PAAPAM has 353 member companies, more than 90% of which are located in Karachi (138) and Lahore (165). Only 153 companies stipulated their establishment years; the others don't. Almost all were established in the 1980s to 1990s. The oldest company was founded in 1940 and the newest in 2011. There are 61 companies that have acquired ISO and other certifications related to quality and environment, 60 companies have received ISO9001 and other quality-related certifications, and four companies meet ISO14001 environmental standards. Member companies<sup>36</sup> are classified into 11 product categories (Table 2.2.4).

**Table 2.2.4 PAAPAM Members by Manufactured Product**

	Classification	No. of companies
1	Machining	90 (14%)
2	Forging	69 (11%)
3	Casting	59 (9%)
4	Sheet metal	57 (9%)
5	Plastics	52 (8%)
6	Light	20 (3%)
7	Rubber	18 (3%)
8	Spring	13 (2%)
9	Radiator	11 (2%)
10	Tire & Tube	9 (1%)
11	Others	251 (39%)

Source: UNECE website  
<http://www.unece.org/trans/main/wp29/faq.html>

Firms registered as machining have the largest number of members at 90, followed by forging with 69 firms and casting with 59.

## 2.2.3 Technical Issues in the Automobile Parts Industry

There are very few references on Pakistan's automotive parts industry and supporting

<sup>35</sup> Excerpt from HP of PAAPAM: <https://www.paapam.com/>

<sup>36</sup> From the member company information posted on the HP, the Team extracted the keywords corresponding to the manufacturing department and calculated the ratio.

industries. One of these is "The Project for Technical Support to Auto Parts Manufacturing Industry," which aimed to strengthen the support system offered by SMEDA to automobile parts manufacturers, targeting midlevel technical companies which cannot deliver parts to OEMs. According to Toshiro Nomura, professor at Kagoshima Prefectural College, and Hajime Yamamoto, senior consultant at Nomura Research Institute, who co-wrote about Pakistan's automotive industry, 112 local suppliers supplied parts for Suzuki, 42 for Toyota, and 44 for Honda as of 2018.<sup>37</sup> Since these companies were able to supply parts to Japanese companies, who are known for being sticklers to exacting standards, it can be assumed that their technical capability was in the middle level. These companies are the target of SMEDA's project.

In the following section, the Study Team reviews the contents of "The Project for Technical Support to Auto Parts Manufacturing Industry" to confirm the technical issues of the group of suppliers with midlevel technical capacity.

### (1) Project Overview

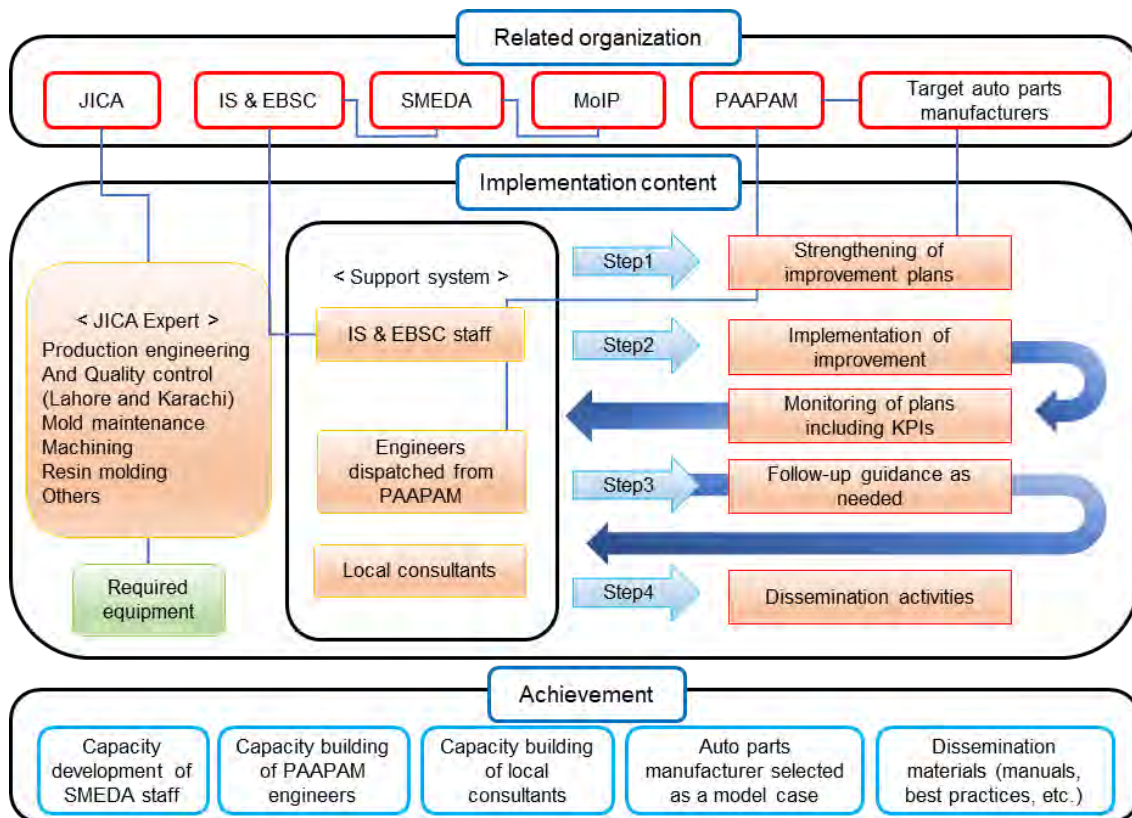
The outline of this project is shown in Table 2.2.5.

**Table 2.2.5 Outline of the Project for Technical Support to Auto Parts Manufacturing Industry**

Item	Content
Target area	Lahore and Karachi
Beneficiary	[Direct beneficiaries] SMEDA staff (6 people), target automobile parts manufacturers (52 companies), engineers dispatched from PAAPAM (6 people), local consultants (21 people) [Indirect beneficiaries] PAAPAM member companies (about 325 companies), automobile manufacturers
Cooperation period	April 2015–March 2019
Total project cost	About JPY440 million
Partner country implementing agency	SMEDA, PAAPAM
Input	1. Japanese side 1) Experts (total about 135M/M) Long-term expert (Summary/Production technology/quality control (I), Production technology/quality control (II)) Short-term expert (die maintenance, machining, resin molding, etc.) 2) Accepting trainees (Japan/third country training) 3) Equipment provision (vehicles, office equipment) 2. Pakistan side 1) Arrangement of counterparts 2) Project office
Support	SMEDA staff, engineers dispatched from PAAPAM, and local consultants were assigned exclusively to improve the capabilities of the members through the guidance of Japanese experts. Assistance was limited to companies with a technical level aiming for higher ranks in the future, except for companies that have already received direct guidance from OEMs.

Source: Prepared by the JICA Study Team based on the JICA Project Prior Evaluation Table ([https://www2.jica.go.jp/ja/evaluation/pdf/2014\\_1300541\\_1\\_s.pdf](https://www2.jica.go.jp/ja/evaluation/pdf/2014_1300541_1_s.pdf))

<sup>37</sup> Wrote "Toyota no Shinkokoku Taiou – Sohatsu ni yoru Shinka (Activities in developing countries by Toyota Motor Corporation – Creation and Invention).



Source: JICA “The Project for Technical Support to Auto Parts Manufacturing Industry” (2019)

**Figure 2.2.10 The Project for Technical Support to Auto Parts Manufacturing Industry**

**(2) Results**

**1) Building the Project’s support system**

The members who assisted the target manufacturing companies in the first phase of activities consisted of four staff members (two each in Lahore and Karachi) from the Industrial Support, Environmental and Business Sustainability Cell (IS&EBSC) of SMEDA, and one PAAPAM member each from Lahore and Karachi<sup>38</sup>. In the second phase, there were three members from Lahore and one from Karachi (Table 2.2.6). PAAPAM members consisted of engineers and local consultants. A total of 52 companies, comprising nine Lahore and 11 Karachi companies in the first phase and 15 and 17, respectively, in the second phase comprised the target companies.

**Table 2.2.6 Project Support System**

Entity	Phase 1		Phase 2		Total
	Lahore	Karachi	Lahore	Karachi	
SMEDA	2	2	2	2	4*
PAAPAM	1	1	3	1	4*
Target Company	9	11	15	17	52

Source: JICA “The Project for Technical Support to Auto Parts Manufacturing Industry” (2019)

\*Net number of staff.

<sup>38</sup> Phase 1: August 2015 to March 2017, Phase 2: April 2017 to August 2019

## 2) Model case

Based on the results of the technology extension services provided by SMEDA's project, 17 companies were selected as model cases. The main areas identified for improvement were: (1) quality control, (2) productivity improvement, line balance, layout; (3) cost reduction; (4) delivery guarantee; (5) reading of engineering drawings; (6) welding; (7) continued 5S/5T<sup>39</sup> practices; and (8) safety and environmental awareness. In the model case companies, a *monozukuri dojo*, or manufacturing training center was established for the purpose of improving skills and techniques in the factory, enhancing maintenance ability, and building the capacity to improve.

## 3) Capacity building of SMEDA and PAAPAM personnel

The project was able to train 33 personnel, i.e., six SMEDA engineers, six PAAPAM engineers, and 21 local consultants, in the two phases. After the project was completed, the trainees created guidelines/manuals so that they could provide similar consulting services to non-target companies. In order to design user-friendly manuals, lessons from the training, including the way of thinking, how to proceed, instructional content (improvement of manufacturing ability and processing technology), schedule, teaching materials, etc. are included.

## (3) Issues

The quality of finished vehicles produced in Pakistan is considered to be inferior to those produced abroad. Based on interviews with experts, local manufacturing companies do not have the equipment that can produce auto parts that meet the quality required by the OEMs. It is however a common practice in Pakistan to still use these same substandard auto parts in the local production of cars. The solution here is to introduce the latest equipment and to provide basic education on manufacturing to management who admit that they do not meet the required quality. The three main issues in the local automotive manufacturing are listed below.

### 1) Outdated equipment due to lack of funds

The quality of local supplies does not meet customer's requirement (OEM, Tier-1, etc.). Although this is because the procured materials do not meet the specifications indicated in the drawings, it is also important to note that local suppliers do not have the machinery to manufacture products according to the needed specifications. In press machines, for example, shearing, which originally requires 300 tons, is often performed using 100 tons. There were also cases where burrs could not be eliminated simply by adjusting the mold. And even if manufacturers introduce new equipment, they will not be able to recover their investment because they cannot go beyond the annual production of 200,000 units, which is based on domestic demand. Therefore, there is low motivation among the manufacturers to invest in new equipment.

### 2) Growing demands for middle-level managers

In many overseas factories, the organization is completely divided into top management and shopfloor workers. Therefore, middle-level managers (supervisors), who are responsible for smooth communication and connection between top management and

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<sup>39</sup> 5S is a simple tool for organizing your workplace in a clean, efficient and safe manner to enhance your productivity, visual management and to ensure the introduction of standardized working. It stands for seiri (sort), seiton (straighten), seiso (sweep), seiketsu (standardize), shitsuke (sustain) (source: <https://leanmanufacturingtools.org/192/what-is-5s-seiri-seiton-seiso-seiketsu-shitsuke/>)

shopfloor workers, as well as for providing instructions on standard operations to shopfloor workers, are missing. In Pakistan, as a whole, there are growing demands for middle-level managers who can teach basic technical skills on site.

### 3) Relationship with Japanese parts manufacturers and OEMs

Some of the supporting companies, which have a positive attitude toward improving quality and productivity, want technical partnerships or joint ventures with Japanese parts manufacturers, who in turn advise them to find in-house partners. But the best way to make high-quality products is to utilize the know-how of customers or companies with technological capabilities, so this remains a difficult issue to address.

## 2.2.4 Financial Status of Major Manufacturers

### (1) Financial Status

Recent financial indicators of two major companies representing Pakistani OEMs are shown in the table below.

**Table 2.2.7 Financial Status of Two Major Pakistani OEMs (2015–2020)**

	2020	2019	2018	2017	2016	2015
Firm A						
Total Asset Turnover	1.06	1.67	2.13	2.29	2.03	2.26
Net profit margin	(0.02)	(0.03)	0.01	0.04	0.04	0.07
D/E ratio	0.52	1.25	0.39	0.00	0.00	0.00
Firm B						
Total Asset Turnover	1.19	2.15	1.92	1.85	2.02	1.92
Net profit margin	0.06	0.09	0.11	0.12	0.11	0.09
D/E ratio	0.01	0.00	0.00	0.00	0.00	0.00

Source: Prepared by JICA Study Team based on the annual reports of each firm

Firm A's main business is manufacturing relatively small four-wheeled passenger cars and two-wheeled vehicles in segments A and B. Firm B's main products are midsize sedans and SUVs in the class above segment B. Firm B has a higher net profit margin than Firm A. Firm A's net profit margin was sluggish at 0.01 in 2018 probably due to the effects of the Pakistani rupees' depreciation at that time. Both companies had no loans until 2017, so the debt-to-capital ratio was zero. Firm A's borrowing increased in 2019, but it has recovered to 0.52 in 2020. It can be seen that the total asset turnover and net profit margin of both firms are decreasing sharply due to the influence of COVID-19.

The table below shows the changes in the financial status of a local parts manufacturer who is a member of PAAPAM.

**Table 2.2.8 Financial Status of a Local Parts Manufacturer (2015–2020)**

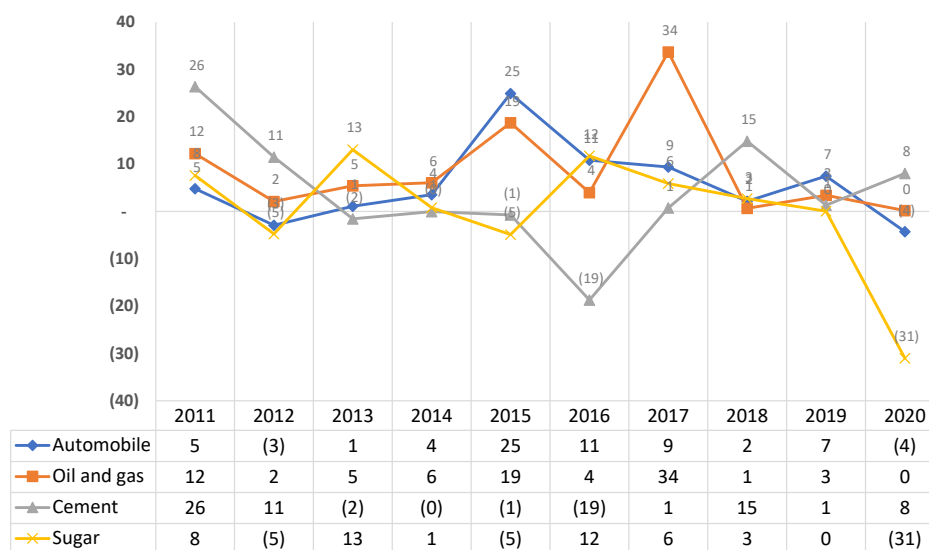
Firm C	2020	2019	2018	2017	2016	2015
Total Asset Turnover	0.36	0.74	0.87	1.14	1.35	1.24
Net profit margin	(0.17)	(0.02)	0.01	0.05	0.04	0.06
D/E ratio	1.36	1.06	0.47	0.01	0.46	0.45

Source: Prepared by JICA Study Team based on the annual reports of the firm

Compared to the two OEMs mentioned above, the total asset turnover and net profit margin of the parts manufacturer are on a downward trend, implying the possibility that the assets are not being used effectively. While borrowing has increased sharply since 2019, the net profit margin has been negative, leaving concerns about both profitability and safety.

## (2) Financial Market and Financing for Capital Investment

The growth rate of paid-in capital in the automotive industry has been relatively high among other industries in Pakistan (Figure 2.2.11). Larger paid-in capital makes it easier to receive long-term loans, since it shows corporate financial soundness.



Source: Prepared by JICA Study Team based on Pakistan Stock Exchange Portal Site (<https://dps.psx.com.pk/historical>)

**Figure 2.2.11 Growth Rates of Paid-in Capital by Industry (2011–2020)**

Financing schemes closely related to the automotive industry include the SBP's Long-Term Financial Facility (LTFF) to support exporters and the SME Supply Chain Finance (SCF) developed by the International Finance Corporation (IFC) and the United Kingdom's Department for International Development (DFID).

The LTFF is a loan for capital investment for export-oriented projects. Each loan has a maximum term of 10 years, with a grace period of two years, and a maximum amount of PKR1.5 billion. Eligibility for the loan is given to projects with less than USD5 million annual export value or if the export value is 50% or more of sales. The interest rate is determined by the SBP each time, but the bank that lends to the customer can set a margin of 1.5% to 3% from the lending interest rate to the customer depending on the redemption period.

The SCF is a system in which supplier SMEs can receive financial services, such as low-interest loans and prompt payments from financial institutions without collateral. Many Pakistani banks have introduced SCFs to SMEs that have direct business relationships with large companies called "anchor companies". Banks provide loans to SMEs based on bills payable issued by anchor companies or invoices to anchor companies. These bills and invoices are considered reliable enough to guarantee a loan to small businesses.

Based on an interview with the SBP, the number of commercial banks affiliated with SCF is expanding. However, the issue is that the suppliers who can use SCF are limited to Tier

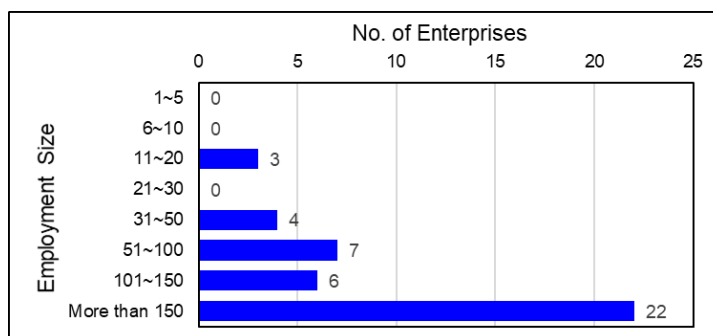
1 firms that deliver directly to OEMs, and the benefits are not distributed to small enterprises which are often in the low tiers.

### 2.2.5 Auto Parts Industry and COVID-19

To identify the impact of COVID-19 on the auto parts industry, the JICA Study Team conducted an online questionnaire survey among PAAPAM member companies in October 2020, and the number of respondents was 42 companies. Answers to the 12 questions are given below. Some part manufacturers that deliver directly to OEMs enjoy SCFs provided by Meezan Bank, Alfalah Bank and others.

#### (1) Employment Size

Twenty-two (22) companies answered that they had more than 150 persons. Seven (7) companies answered 51–100 persons, 6 companies answered 101–150 persons, 4 companies answered 31–50 persons, and 3 companies answered 11–20 persons.

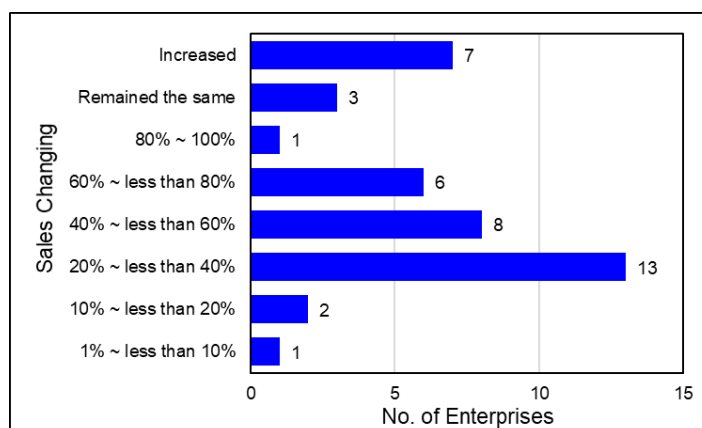


Source: JICA Study Team

**Figure 2.2.12 Employment Size of PAAPAM Member Respondents**

#### (2) Impact on Sales Performance of the Emergency Declaration for COVID-19

Of the 42 respondents, 13 companies answered that they suffered a 20–40% decrease in sales performance compared to the same period of 2019. Eight (8) companies had decreased sales of 40–60%, and 6 companies, 60–80%. On the other hand, 7 companies increased their sales.

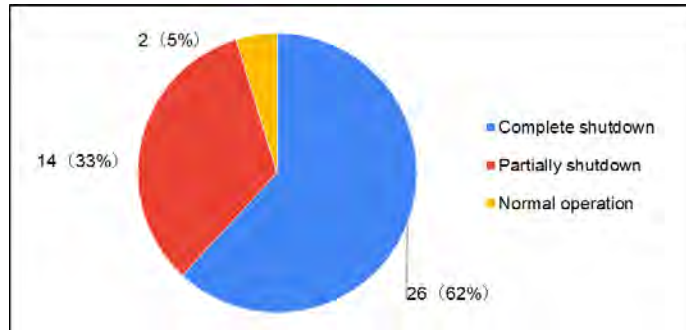


Source: JICA Study Team

**Figure 2.2.13 Impact on Sales Performance of PAAPAM Member Respondents**

**(3) Operation under Lockdown (between April and May 2020)**

During the operational lockdown between April and May 2020, 26 companies (62%) did a complete shutdown, while 14 (33%) carried out a partial shutdown, and 2 (5%) firms continued normal operations.

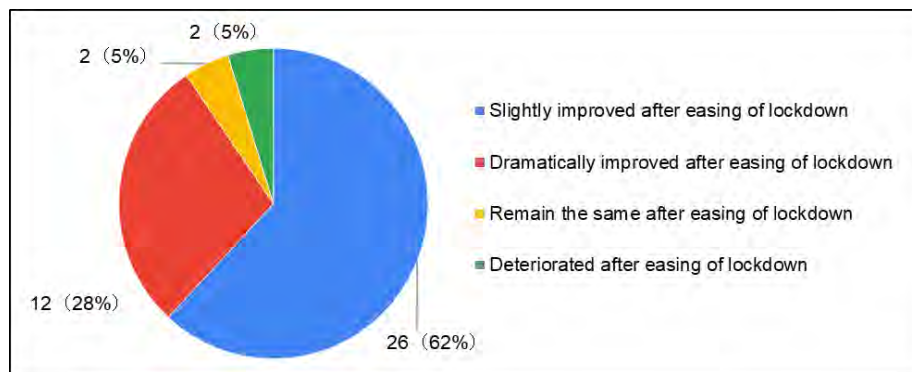


Source: JICA Study Team

**Figure 2.2.14 Response of PAAPAM Member Respondents to the Lockdown**

**(4) Impact after the Lockdown**

Comparing the period between April and May 2020 under lockdown and in June after easing of lockdown, 26 companies (62%) answered that their sales performance slightly improved after easing of lockdown. On the other hand, 12 companies (28%) improved their sales dramatically and 2 companies (5%) answered that it remained the same after easing of lockdown and another two said it deteriorated. Many companies showed signs of recovery after easing of lockdown.



Source: JICA Study Team

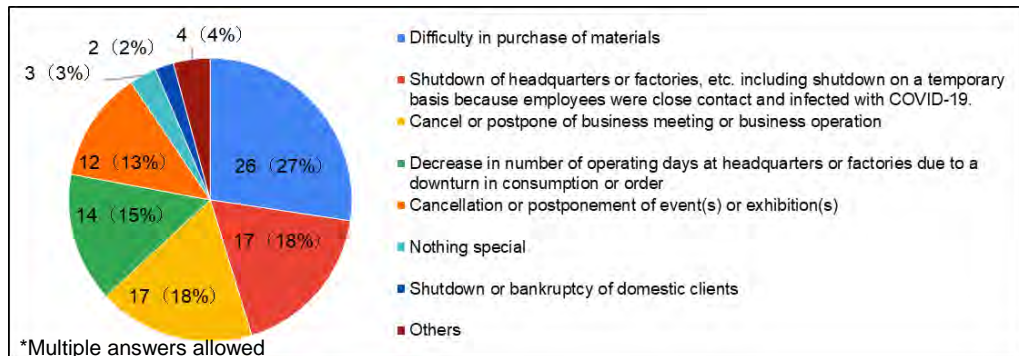
**Figure 2.2.15 Impact on Sales Performance after the Lockdown Period**

**(5) Specific Effects**

The most common answer on the specific impact of COVID-19 was “difficulty in purchase of materials” (26 companies or 27%), followed by “shutdown of headquarters or factories, etc. including shutdown on a temporary basis because employees were close contacts and infected with COVID-19” and “cancellation or postponement of event(s) or exhibition(s)” both getting selected by 17 companies (18%). Other answers are: “decrease in number of operating days at headquarters or factories due to a downturn in consumption or order” (12



companies or 13%) and “shutdown or bankruptcy of domestic clients” (2 companies or 2%). Multiple answers were allowed.

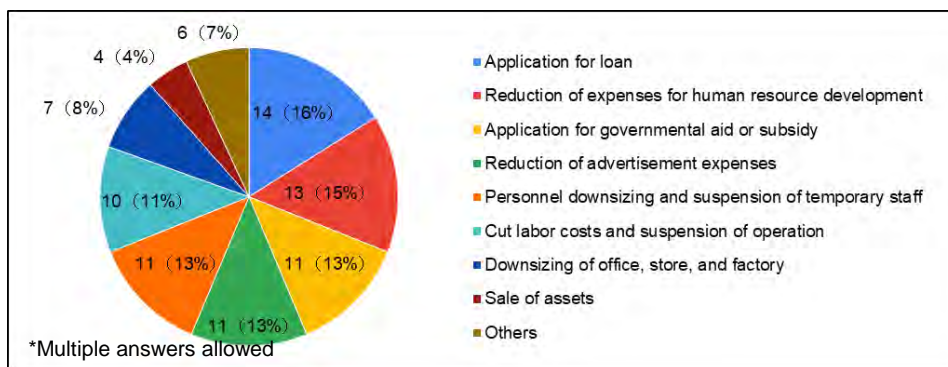


Source: JICA Study Team

**Figure 2.2.16 Specific Impacts of COVID-19 on Business**

**(6) Measures Taken to Respond to the Crisis**

Regarding the business improvement measures to cushion the impact of the COVID-19 pandemic (including a plan), the most common answer was “application for loan” (14 companies or 16%), followed by “reduction of expenses for human resource development” (13 companies or 15%), “cut labor costs and suspension of operation” (11 companies or 13%), and “personnel downsizing and suspension of temporary staff” was 10 companies (11%), “Downsizing of office, store, and factory” was selected by 7 companies (8%), and “sale of assets,” 4 companies or 4%). Multiple answers were allowed.

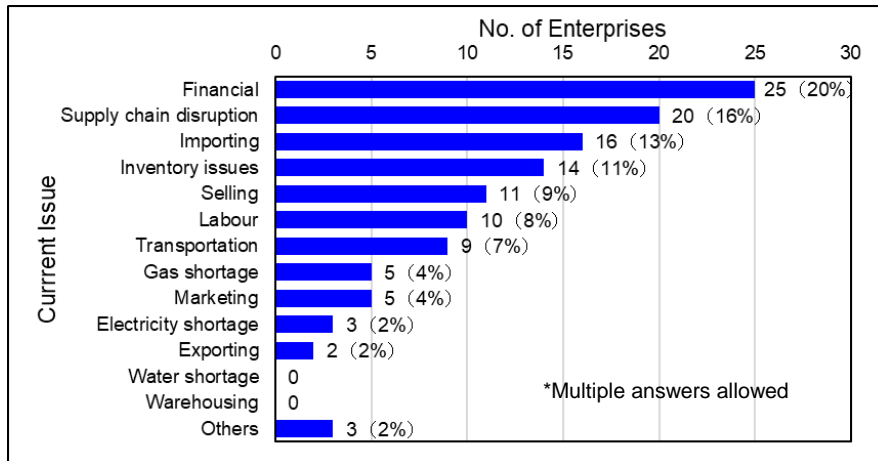


Source: JICA Study Team

**Figure 2.2.17 Measures Taken by PAAPAM Member Respondents to Cushion Impact of Pandemic**

**(7) Current Issues**

Regarding the current issues due to COVID-19 (as of October 2020), the most common answer was “financial” (25 companies or 20%), followed by “supply chain disruption” (20 companies or 16%), “importing” (16 companies or 13%), “inventory issues” (14 companies or 11%), “selling” (11 companies or 9%), “labour” (10 companies or 8%), and “transportation” (9 companies or 7%). These issues accounted for 85% of the total issues. The rest included: “gas shortage” and “marketing” (both 5 companies or 4%), “electricity shortage” (3 companies or 2%), and “exporting” (2 companies or 2%). Multiple answers were allowed.

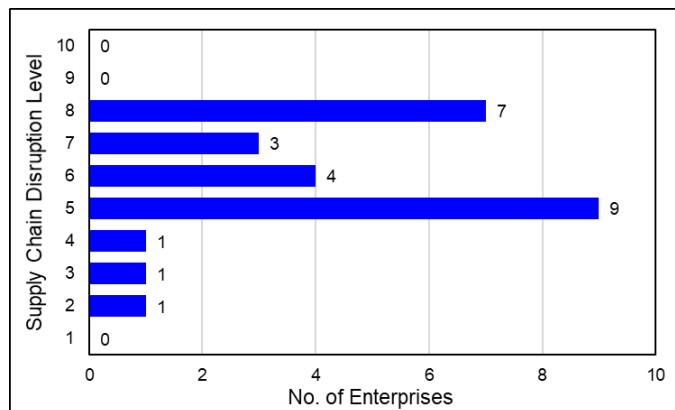


Source: JICA Study Team

**Figure 2.2.18 Current Issues Faced by PAAPAM Member Respondents**

**(8) Supply Chain Disruption Level**

Supply chain disruption level was rated on a scale of one to ten. There was no 9 or 10 level, equal to a “complete disruption of supply chain.” However, the most common answer was level 5 to level 8 (middle disruption of supply chain).

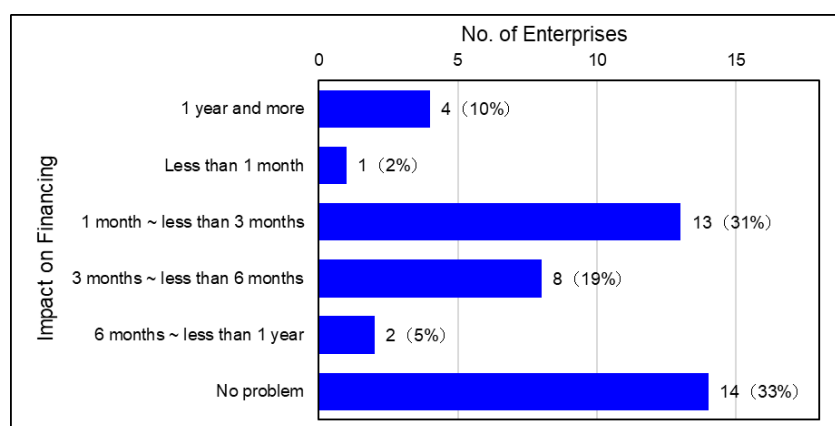


Source: JICA Study Team

**Figure 2.2.19 Disruption Level of Supply Chains**

**(9) Financial Impact**

To the question: If the present revenue trends of your firm were to continue, how long would your working capital last? The most common answer was “no problem” (14 companies or 33%). This was followed by “1 month to less than 3 months” (8 companies or 19%), “1 year and more” (4 companies or 10%), “6 months to less than 1 year” (2 companies or 5%), and “less than 1 month” (1 company or 2%).

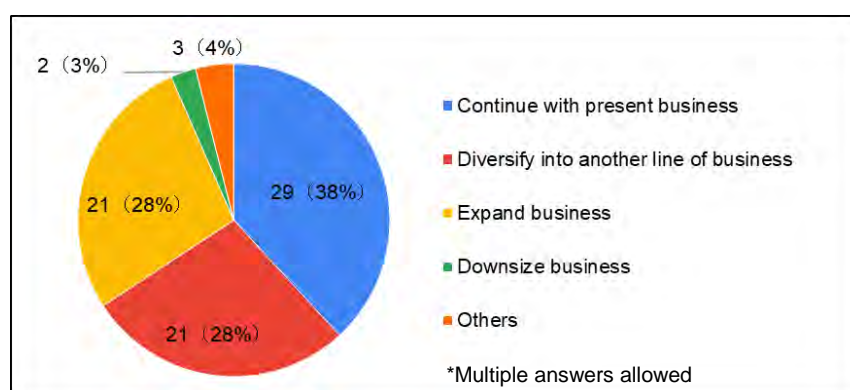


Source: JICA Study Team

**Figure 2.2.20 Financial Impact of COVID-19 Pandemic**

### (10) Business Prospects

As of October 2020, survey respondents answered the following regarding business continuity: 29 companies (38%) answered they would “continue with present business,” followed by “diversify into another line of business” (21 companies or 28%) and “downsize business” (2 companies or 3%). Multiple answers were allowed.

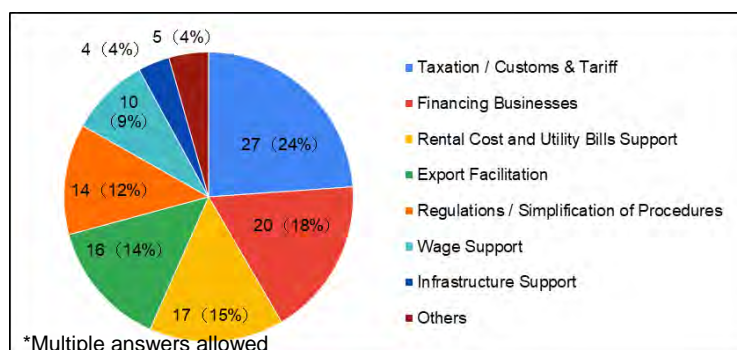


Source: JICA Study Team

**Figure 2.2.21 Business Prospects of PAAPAM Member Respondents**

### (11) Expectations from Government

In response to the question on businesses’ expectation from the government, “taxation / customs & tariff” was the most common answer (27 companies or 24%), “rental cost and utility bills support” (17 companies or 15%), “export facilitation” (16 companies or 14%), “regulations / simplification of procedures” (14 companies or 12%), “financing businesses” (10 companies or 9%), and “infrastructure support” (4 companies or 4%). Multiple answers were allowed.

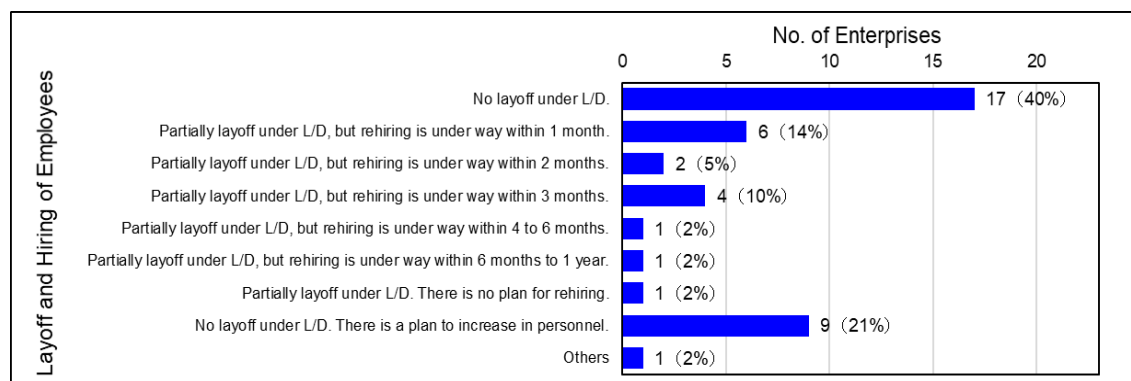


Source: JICA Study Team

**Figure 2.2.22 Businesses' Expectation from the Government**

## (12) Employment

The most common answer to the question of hiring of employees in the midst of the COVID-19 pandemic was “no layoff under lockdown” (17 companies or 40%). There was a plan to increase personnel” (9 companies or 21%), “partial layoff under lockdown but rehiring within 1 month” (6 companies or 14%), “partial layoff under lockdown but rehiring within 3 months” (4 companies or 10%), and “partial layoff under lockdown but rehiring within 2 months” (5 companies or 5%). These answers got 1 response (2%) each: “partial layoff under lockdown but rehiring within 4 to 6 months,” “partial layoff under lockdown but rehiring within 6 months to 1 year,” and “partial layoff under lockdown with no plan for rehiring.”



Source: JICA Study Team

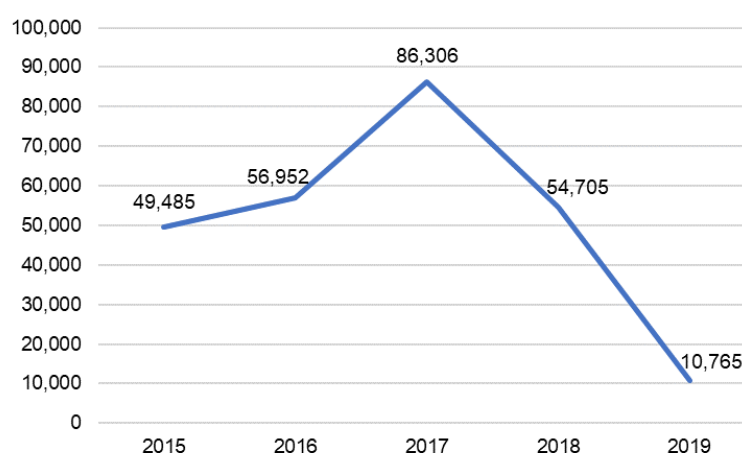
**Figure 2.2.23 Employment Plans during COVID-19 Lockdown**

### 2.2.6 Pakistan's Used Car Market

The Import Policy Order (2016) prohibits the import of used cars as a business in Pakistan, and importation is limited to cases where individuals of Pakistani nationality bring them in as personal possessions or gifts. The age of passenger cars is limited to 3 years, whereas that of commercial vehicles are limited to 5 years. However, it is said the ban on the import of used cars has not actually worked, because there are many used-car dealers who bring used cars for commercial use. In response to this, the Pakistani automobile industry has repeatedly called for stricter legal enforcement because importing used cars hinders market growth.

The exports of used cars from Japan to Pakistan surged from 49,000 units in 2015 to 83,000 in 2017. In July 2018, the Pakistani government implemented a policy in the Financial Act

2018 that prohibits the purchase and registration of new and used cars for non-filers, namely people who have not filed income tax returns, in Pakistan. In the Finance Supplementary (Second Amendment) Act 2019 announced in January 2019, restrictions on the purchase and registration of used cars by non-filers were removed and were applied only to vehicles produced in Pakistan. However, the revised 2016 Import Policy Order, which was announced in January 2019, requires overseas remittances for tax payment to be made from the account of a Pakistani who transports cars from overseas, and overseas remittances would not be received unless it is the account of a Pakistani who transports cars from overseas, or the account of his family in cases where there is no such account. This tighter regulation resulted in a drastic decrease in the number of imported used Japanese cars into Pakistan, i.e., from 55,000 in 2018 to 11,000 in 2019.



Source: PLANETCARS

**Figure 2.2.24 Export of Used Cars from Japan to Pakistan**

## 2.2.7 Sales Practices in the New Car and Used Car Market

### (1) Use of Loans

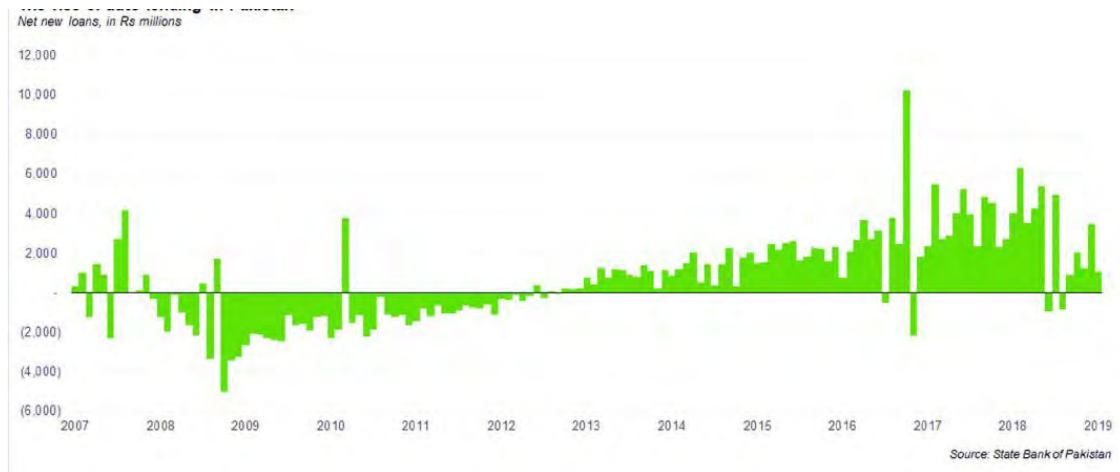
By mid-2018, when car sales were on the rise in Pakistan, 60–70% of new car buyers were said to have taken out car loans<sup>40</sup>, bolstering the demand for new cars. During this period, commercial banks approved car loans at low interest rates (10–15% per annum), leveraging low discount rates with short-term national treasury securities which yielded 5.75%. According to a local media survey, the surge in auto loans could also be explained by the rise of the transportation business, which used new cars, hired drivers, and used ride-hailing apps such as Uber and Careem.<sup>41</sup>

However, in July 2018, the ban on car purchases by non-filers made it impossible for financial institutions to provide car loans to them. It is estimated that the number of loans decreased by 30–35% until March 2019, when the regulation was relaxed with conditions<sup>42</sup>. Furthermore, a series of policy interest rate hikes by the SBP after mid-2018 also may have significantly reduced the number of approved auto loans.

<sup>40</sup> *Profit*, Mar. 11, 2019 (<https://profit.pakistantoday.com.pk/2019/03/11/careem-brought-with-it-a-boom-in-auto-lending-for-the-banks-then-came-the-interest-rate-hikes/>)

<sup>41</sup> The same source as above.

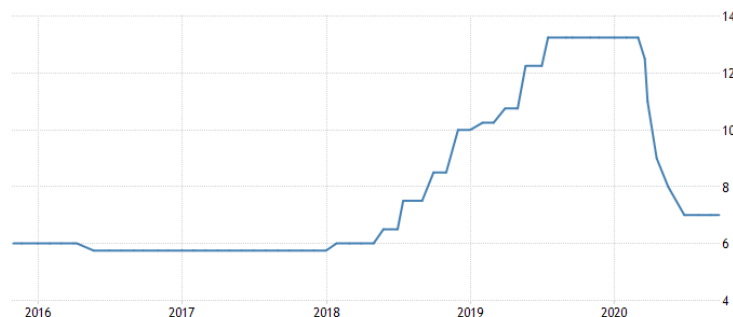
<sup>42</sup> The same source as above.



Source: *Profit*, article as of Mar. 11, 2019 (<https://profit.pakistantoday.com.pk/2019/03/11/careem-brought-with-it-a-boom-in-auto-lending-for-the-banks-then-came-the-interest-rate-hikes/>)

**Figure 2.2.25 Net New Auto Loans**

In early 2020, the policy interest rate dropped sharply and is set at 7% as of October 2020 (Figure 2.2.26). With this low interest rate, the rate of bank loan applicants aiming to purchase new cars increased from 20% before the pandemic to 40% as of October 2020. According to the SBP, auto loans account for 4% of private sector loans or 40% of consumer financing, as of September 2020.



Source: Trading Economics Com.

(<https://tradingeconomics.com/pakistan/interest-rate>)

**Figure 2.2.26 Policy Interest Rates (2016–2020)**

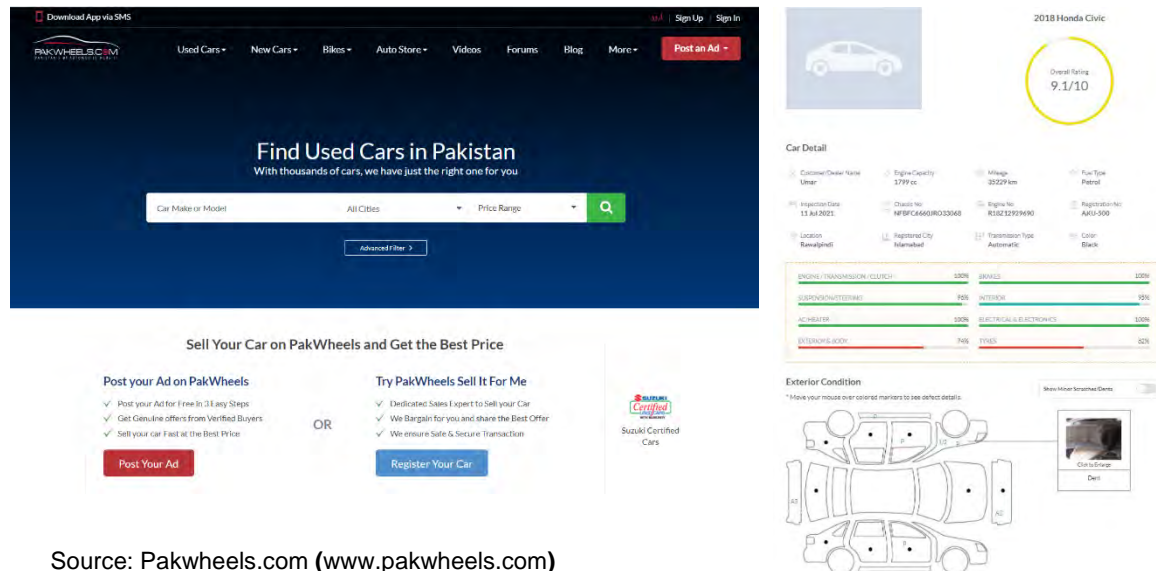
In March 2020, the SBP implemented a one-year deferral of repaying the principal loan amounts to help borrowers who were unable to repay due to the effects of COVID-19. The Pakistani government and the SBP are expected to continue to take measures to financially support the recovery of the automobile industry, such as reducing the tax rates for automobile loans.

In general, used-car loans are set at higher interest rates than new-car loans, so it is widely believed that the rate of used-car loans is extremely low compared to new-car loans. In the case of used cars, loans are used only for high-priced vehicles, and most low- and medium-priced used vehicles are settled in cash.

## (2) Used-car Market

There are no official data on Pakistan's used-car industry due to the large number of unregistered transactions. However, according to local car market experts, most used cars are traded through used car dealers. Used car auctions of various sizes are actively held

not only in cities or regions but throughout the country, and transactions are made on the spot. Used car dealers typically get a commission fee of 10 to 15% of the vehicle price. Used cars are also traded in dedicated websites which have recently grown in popularity. Some website operators provide car inspection services.



Source: Pakwheels.com (www.pakwheels.com)

Figure 2.2.27 Webpage Dedicated to Used Car Trade

In addition, only a few new car dealers sell used cars, and they can only sell the same models as the new cars they sell. The number of sales is several cars per month which shows that they do not focus on selling used cars.

### (3) Rampant New Car Resale Caused by Delivery Delays

In Pakistan, on one hand, the recovery pace of vehicle production has not caught up with the rapidly growing demand for new cars, which has led to delays in delivery time from order. On the other hand, investors, who have gained from the soaring prices of agricultural products and processed products, such as wheat, sugar, vegetables, and dairy products, have poured their money into the automobile market.

Dawn, a prominent local newspaper, confirmed that delivery could get delayed for more than a few months, and investors gain by selling new cars at premium prices with shorter delivery time to customers who want to get their new cars faster. According to the article, Honda Civic, which currently takes 6 to 8 weeks to deliver, is sold with a premium of PKR80,000–100,000. Toyota Yaris, which has a delivery time of 2 to 3 months, is sold with a premium of PKR50,000–60,000. Toyota Fortuner Diesel (vehicle price: PKR9.1 million) has a premium of PKR80,000. The news also reported an increase in customers shifting from imported used cars to less expensive new cars which are domestically manufactured.

In order to prevent the market from overheating, Indus Motor announced in October 2020 the message "No to Premium" after promising to increase production and shorten delivery times. Similarly, Kia announced it would increase its production.

One of the reasons for the bloated prices of new cars could be attributed to the OEMs delaying the importation of CKD and SKD parts, and this situation resulted in reduced purchases to the point where the purchase volume declined by 31.3% in July and August

2020 compared to the same period in 2019<sup>43</sup>.

To protect the customers, the current ADP stipulates that up to 50% of vehicle prices can be paid at the time of delivery, and if the delivery exceeds 2 months, the interbank transaction rate (KIBOR) plus 2% will be multiplied by the number of days exceeding 2 months, resulting in a lower rate. This clause was issued to encourage auto manufacturers to shorten delivery times and should be highly evaluated.

#### **(4) Changes in Sales Form**

During the pandemic, people avoided the risk of infection, and this has become apparent among car buyers: From visiting dealers they have learned to use virtual reality (VR) technology and SNS videos to test-drive cars. Even in Japan, car manufacturers and used car dealers have already introduced VR technology as a sales tool, providing vehicle displays with a 360-degree view on the web and simulated riding experiences with smartphone-mounted goggles. Similarly, in Pakistan, battery giant Atlas has stepped up its e-commerce sales even under city blockades and movement restrictions. It is expected that both Pakistani OEMs and dealers will move toward building a sales network using online content in the near future. The Pakistani government has recommended the implementation of measures to support these trends by matching domestic IT personnel with automobile manufacturers and dealers, providing incentives to promote online payment, and further developing personal information protection laws and regulations.

## **2.3 Issues in Supply Chain and Value Chain**

### **2.3.1 Trade Map Analysis of Auto Parts Export in 2015–2019**

Of the 89 major auto parts, the top 12 export items from Pakistan are shown in Table 2.3.1. The total export value of these 89 items is USD202 million, with the top 12 accounting for 88% of the total, and thus variation of the export items is limited.

The item with the largest export value is "Other Parts" (HS870899), which includes parts for tractors such as hydraulic lift cylinders, planetary gears, and gear reverse cluster. Next is "Drivetrain Parts" (HS870840), which includes drag links, and they are mostly used for tractors<sup>44</sup>.

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<sup>43</sup> Dawn, Oct. 5, 2020 (<https://www.dawn.com/news/1583278/on-the-rise-car-sales-rev-up>)

<sup>44</sup> Hearing from major auto parts suppliers in Pakistan



**Table 2.3.1 Pakistan's Top 12 Export Items**

No	Category	Auto parts product	HS code	Value (2019)		CAGR (2015-2019)	The largest import destination in value
				US\$ million	share		
1	Other Parts	Motor vehicle parts nes (Hydraulic lift cylinder, Gear Planetary Ring, Gear Reverse Cluster, Coupler Planetary Shift, Shaft PTO Driven Gear, Radiator Caps, Fuel Tanks for Cars, Trucks and Tractors, Expansion Tank, Aircondition Duct Assy, Hose Side Demister, Wheel Hubs, Slay Fan Housing, Steering Gear)	870899	7.2	28%	-6	The U.S.
2	Drivetrain Parts	Transmissions for motor vehicles (Drag Link Ends)	870840	6.8	26%	25	Italy
3	Engines and Engine Parts	Parts of : air or vacuum pumps, air or other gas compressors, fans and ventilating or recycling hoods incorporating a fan, n.e.s	841490	2.4	9%	-32	Italy
4	Engines and Engine Parts	Radiators for motor vehicles (Copper Radiators and Cores, Aluminium Radiators and Cores, Cooler Sheet Metal and Others, Tank Assy Water Reserve)	870891	1.2	4%	8	Bangladesh
5	Bodies and Parts	Parts and accessories of bodies nes for motor vehicle (Nozzle Defroster, Windshield Washer Nozzle, Interior Trim Set, Fuel Tank Cover, Cab Mounting, Engine Mounting Bracket, PVC Floor Mat, Door Trim Vacuum, Sun Visor, Seat Assembly)	870829	0.9	3%	-16	The U.S.
6	Automotive Tires/ Wheels	New pneumatic tyres, of rubber, of a kind used for motor cars, incl. station wagons and racing cars	401110	0.8	3%	40	Afganistan
7	Drivetrain Parts	Transmission shafts, incl. cam shafts and crank shafts, and cranks(Camshaft, Gear Assy)	848310	0.8	3%	60	Angola
8	Engines and Engine Parts	Oil or petrol-filters for internal combustion engines	842123	0.7	3%	1	UAE
9	Drivetrain Parts	Gears and gearing for machinery (excluding toothed wheels, chain sprockets and other transmission elements presented separately); ball or roller screws; gear boxes and other speed changers, incl. torque converters	848340	0.5	2%	10	Romania
10	Other Parts	Filtering or purifying machinery for gases nes (Engine Oil Filter, Engine Air Filter)	842139	0.5	1.8%	-5	UAE
11	Other Parts	Plates, separators and other parts of electric accumulators, n.e.s.	850790	0.4	1.7%	-	China
12	Drivetrain Parts	Bearing housings for machinery, not incorporating ball or roller bearings; plain shaft bearings (Wheel Hub Bearings)	848330	0.4	1.6%	48	Qatar
Top 12 items		Total of top 12 items		22.6	88%	-	-
Total of 89 items				25.6	100%	-	-

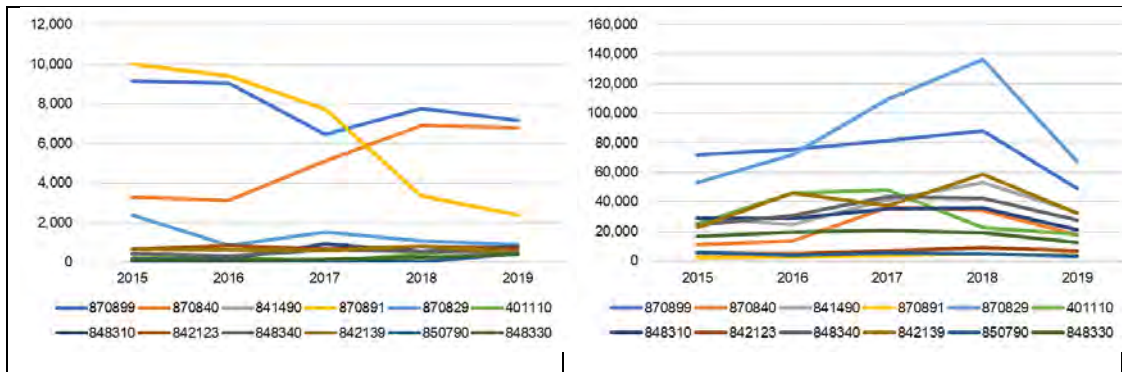
Source: Prepared by JICA Study Team based on interviews with local suppliers and ITC Trade Map.

The value of the largest item, "Other Parts," which includes various parts, is small at USD7 million. Based on this, the JST assumed that exported auto parts are not mass-produced in Pakistan and are used mainly for repairs. As Pakistan does not export passenger cars, the accessories used for passenger cars are limited, and they are mainly used for tractors.

Figure 2.3.1 shows the top 12 auto parts exported by Pakistan and the changes in the corresponding imported auto parts over the past five years. Among the top 12 items, the ones with the largest amount are "Other Parts" (HS870899) and "Drivetrain Parts" (HS870840), and the rest are small with little fluctuations. Only "Drivetrain Parts" (HS870840), including drag links for tractors, is on the rise in terms of export value.

On the other hand, the import value of the above 12 items far exceeds the export value USD290 million and USD22 million, respectively. The import value is about 13 times higher

than the export value. This is because Pakistan's parts industry has a small production capacity, and it is believed that auto suppliers rely on imports to make up for this.



Source: Prepared by JICA Study Team based on ICT Trade Map

**Figure 2.3.1 Value of the Top 12 Exported (left) and Imported (right) Auto Parts (USD thousand)**

As mentioned above, Pakistan's auto parts industry comprises mainly tractor spare parts, and with its small scale, it is not in a position to supply auto parts to passenger cars and HCVs in the global value chain. This shows that Pakistan's parts industry is still not part of the global value chain.

There are several factors that hinder the quality improvement of the local parts industry and allow it to produce quality parts for export<sup>45</sup>. First, Pakistan's auto parts industry is protected by tariff policies and is guaranteed to supply a certain amount of parts to local OEMs. This in turn lessens the motivation of industry players to put resources into research and development. In addition, there are few companies that adopt the ISO certification system, it is not possible to ensure the quality of products above a certain level, which is disadvantageous in international transactions. Further, testing laboratories for certifying quality for export are not fully available, and the standards and certification systems for parts, which are essential to quality improvement, are not sufficient.

### 2.3.2 Auto Parts Manufacturing Chain

The JICA Study Team (JST) surveyed the status of supply chain in Pakistan by interviewing experts living in Pakistan and reviewing JICA's final report on the "Project for Elaboration of Industrial Promotion Plans Using Value Chain Analysis in the Republic of the Philippines."<sup>46</sup>

Table 2.3.2 shows the auto parts and subcomponents produced by Tier 1 companies. Compared to auto parts and subcomponents produced in the Philippines (black letters and blue letters), Tier 1 companies in Pakistan produce less than half of them (blue letters). Regarding important segments, such as engines and drivetrains, most are imported. In addition, OEM parts suppliers produce auto parts and subcomponents (red letters) instead of by Tier 1 companies to ensure high quality, which is one of the reasons Pakistan suppliers cannot increase the types of auto parts and subcomponents that they can produce.

<sup>45</sup> Export Potential of Automotive Parts from Pakistan, PAAPAM, 2017

<sup>46</sup> JICA (2019) The final Report on "Project for Elaboration of Industrial Promotion Plans Using Value Chain Analysis in the Republic of the Philippines."

**Table 2.3.2 Auto Parts and Subcomponents Manufactured by Tier 1 Companies in Pakistan\***

<b>Parts Segment</b>	<b>Part and Subcomponent</b>
Engine	Cylinder block, cylinder head, crank shaft, cam shaft, connecting rod, piston, piston ring, int-manifold, exhaust manifold, water pump, oil pump, catalyzer, <b>radiator</b> , fuel injector, <b>air filter</b> , <b>oil filter</b> , EGR valve, <b>battery</b> , <b>starter motor</b> , alternator
Drivetrain	FR layout transmission (M/T, A/T), FF layout transmission (M/T, A/T), torque converter, clutch, CVT, differential gear, CVJ (constant velocity joint) drive shaft, <b>propeller shaft</b> , <b>tire</b> , <b>wheel</b> , <b>rear axle</b> , universal joint
Chassis	Coil spring, <b>shock absorber</b> , stabilizer, rack & pinion steering, steering column, steering lock, brake caliper, brake rotor, <b>exhaust muffler</b> , <b>fuel tank</b> , <b>brake disc / drum</b>
Body	<b>Engine hood</b> , <b>fender</b> , <b>roof</b> , <b>door</b> , <b>trunk lid</b> , <b>sill</b> , <b>front pillar</b> , <b>center pillar</b> , <b>front roof rail</b> , <b>side roof rail</b> , <b>side member</b> , <b>floor</b> , <b>small body parts</b> , <b>fuel tank</b>
Body Parts	<b>Window regulator</b> , <b>outside handle</b> , <b>door weather strip</b> , door lock, <b>windshield glass</b> , <b>door glass</b> , glass rum, cheek link, <b>T/lid w/strip</b>
Control Parts	Transmission control, <b>parking brake control</b> , <b>brake pedal</b> , <b>accelerate pedal</b> , <b>clutch pedal</b> , <b>steering wheel</b> , hood control cable, trunk lid control cable
Exterior	<b>Bumper</b> , <b>head lamp</b> , <b>rear combination lamp</b> , <b>radiator grill</b> , <b>door mirror</b> , air spoiler, <b>side marker lamp</b> , license plate finisher
Interior	<b>HVAC</b> , <b>instrument panel</b> , <b>center console</b> , <b>seats</b> , <b>head lining</b> , pillar garnish, <b>door trim</b> , <b>sun visor</b> , <b>carpets</b> , air bag, <b>three-pointed seat belt</b>
E&E Component	<b>Wire harness</b> , <b>wiper</b> , printed circuit board, combination switch, horn, car navigation system, ignition coil, <b>meter/clock</b> , <b>audio</b> , <b>radio antenna</b> , fuel sender, ECUs, sensors, actuators

\* Auto parts and subcomponents in blue and red colours are produced by Tier 1 companies and OEM suppliers, respectively, in Pakistan, while those in black and blue by Tier 1 companies in the Philippines.

Based on interviews with experts living in Pakistan, the JICA Study Team categorized the auto parts that are mostly or partly locally produced (Figure 2.3.2). Important parts, such as outer panels with high-tensile steel, are produced in house by OEM parts suppliers because they have to be of high quality. Mould & die related to important parts are imported from Japan. Meanwhile, local production of engines, drivetrains, and electronic parts is low—Pakistan heavily imports these parts—and the materials for these parts are also imported. There is still room to enhance local production by improving quality and the level of manufacturing technology.

Figure 2.3.2 shows the technological process for metal parts in the automobile industry and classifies the number of manufacturing companies in Pakistan by colour in accordance with the process. There are many companies in downstream industries like machining, heat treatment, welding, surface treatment. On the other hand, there are few companies in upstream industries like casting, forging, and stamping. Major casting techniques available in the local industry are gravity die casting and sand mould casting, while few suppliers have processing die casting. There are also few suppliers providing pressure die casting. A relatively large number of companies do stamping, but many only have small and

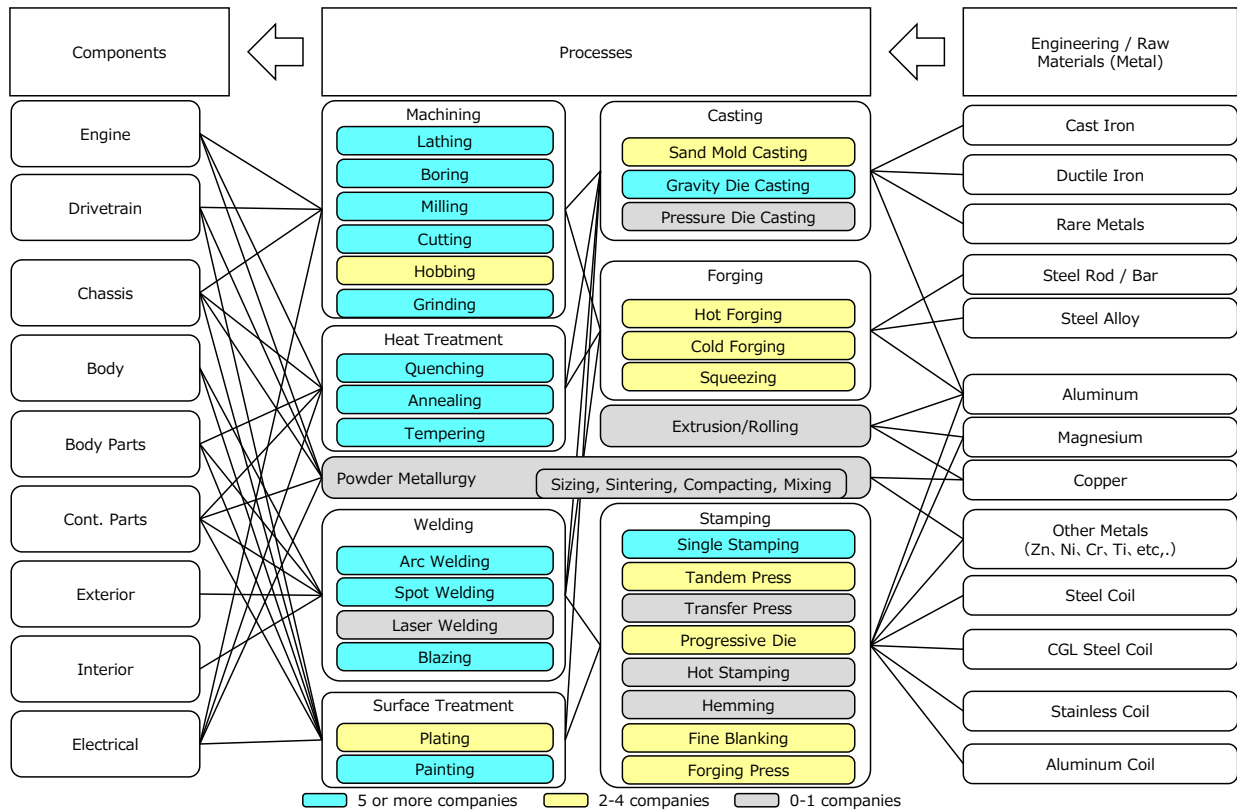
medium-sized clamp and hydraulic presses. There are few suppliers which have over 600-ton hydraulic press machines, but they cannot produce large products like body panels. Some of the suppliers have over 800 to 1,000-ton hydraulic press machine, but they cannot produce products because of low quality control of facilities, even if they use imported die.

	Unit	Major Parts	Components	Material	Mold & Die
Engine & Drivetrain	Engine	5C parts, Injector, Piston	Bearing, Engine bolt, Valve, Piston rod	Casting material (Scrap metal)	Stamping die
	MT (FR)	Starter motor / Alternator	Battery, Air filter	Aluminum ingot	
	MT (FF), AT/CVT (FF/FR)	Radiator	Gear bolt, Ring gear	Metal alloy	
	Drive shaft (CVJ for FF)	Gears/MT housing(FR only)	Spider	Hot rolled steel (HR), Steel rod	
	Prop shaft (for FR)	Universal joint	Differential gear		
	Axle	Axle housing	Hub bolt, Welding bolt		
Chassis & Control	Steering unit	Steering gears	Bracket		Hot rolled steel (HR), Steel rod
	Brakes	Brake disk / Drum	Actuator, Piston, Cylinder, Spring, Sensor		
	Suspension (Leaf spring)		Accelerate, Brake, Clutch pedal		
	Suspension (Coil spring, Shock absorber)	ABS/ESC unit	Steering wheel		
Body, Body Parts & Exterior	White body	Engine hood, Fender, Roof, Door, Trunk lid	Door hinge, Weld bolt & Nut bracket	Cold rolled steel (CRC) Galvanized steel (CGL) Bonding/Sealing	Stamping die
	Head/Rear combination lamp, Door mirror, Wiper	Sill, Front/Center pillar, Front/Side roof rail, Side member, Floor	Lamp valve, Side marker lamp	Plastics: PP (Polypropylene), ABS (Acrylonitrile Butadiene Styrene), PC (Polycarbonate), etc.	
Interior	Bumper, Radiator grill, License plate finisher		Bolt & Nut, Bonding, Fastening clip		
	HVAC	Blower, Evaporator	Plastic mold		
	Instrument panel	Meter, Combination switch			
	Center console, Head lining, Pillar garnish, Door trim				
Seats	Slide rail, Reclining device				
Electric & Electronic Parts	Air bag, 3 pointed seat belt				
	Audio / Car navigation system / Radio antenna	Wire harness	Harness	Silicone, Plastic, Copper, PVC, etc.	
	Meters/ Clocks	LCD	Connector		
	ECUs				
	Sensors	PCB, Metal housing, etc. (Depends on parts type)	IC, Semi conductor, Sensor, Resistor, Stepping motor, etc. (Depends on parts type)		
Horn, Ignition Coil, Actuators					

  Mostly localized  
   Partly localized  
   Mostly imported  
   Imported

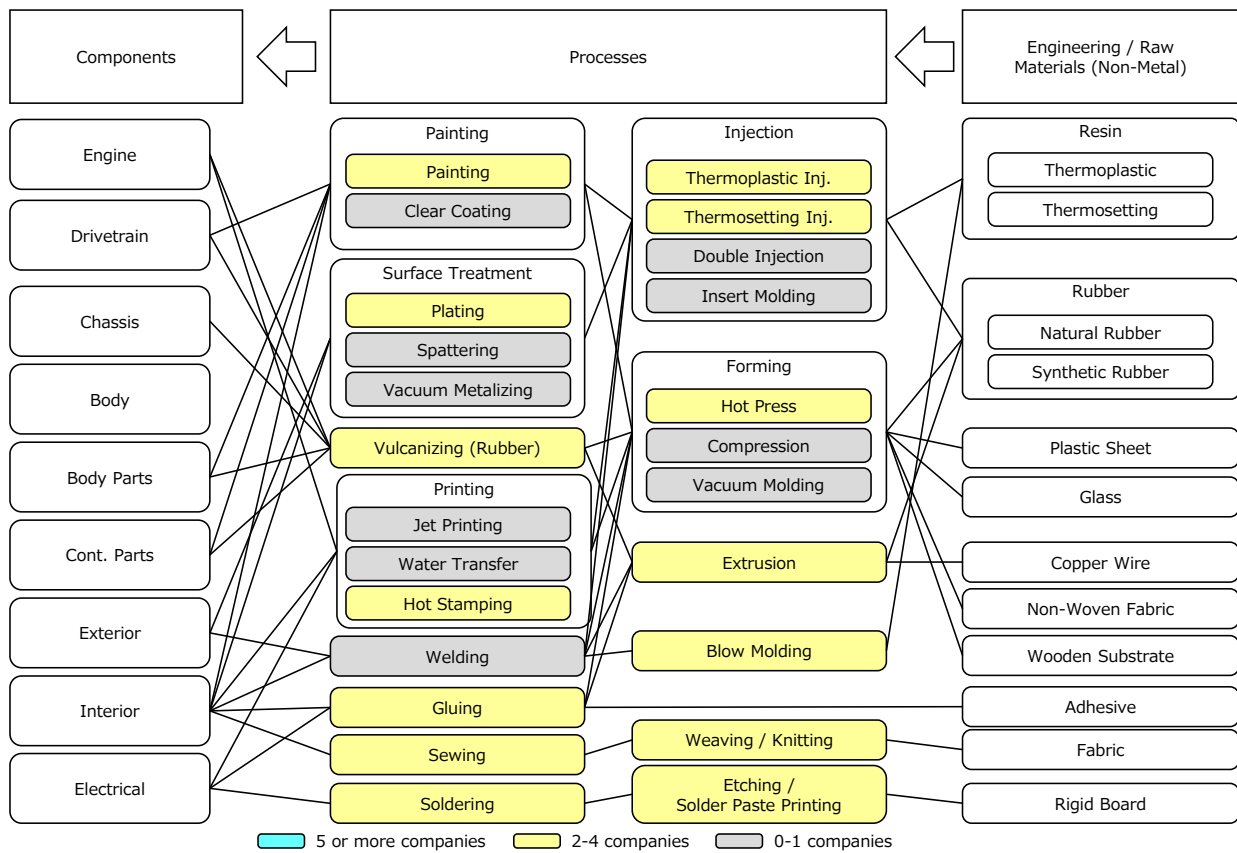
Source: JICA Study Team

Figure 2.3.2 Auto Parts Manufactured in Pakistan



Source: JICA Study Team

**Figure 2.3.3 Manufacturing Chain of Metal Parts**



Source: JICA Study Team

**Figure 2.3.4 Manufacturing Chain of Non-metal Parts**

Out of 89 major automobile parts imported and exported from 2015 to 2019, the Study Team identified eight which showed negative import growth or positive export in terms of their compound annual growth rates (CAGRs) (Table 2.3.3). Finished-vehicle production in Pakistan has been on the rise from 2015 to 2018 and has fallen only once in 2019. The value of auto parts imports has increased or decreased in line with changes in the number of finished-vehicle produced, but the value of auto parts exports has been steadily increasing except for engine parts, suspension parts, and steering parts. It is presumed that the relevant parts industry is growing.

**Table 2.3.3 Values of Imported and Exported Auto Parts in Pakistan (2015–2019)**

Classification	Item	HS code	Import (million dollars)					Export (million dollars)				
			2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Tires / Wheels	Rubber pneumatic tires (for passenger cars)	401110	25,076	46,154	48,075	22,785	18,383	205	246	16	440	822
Engine and its parts	Generator (output is 75 kVA or less)	850211	37,131	45,727	30,515	38,889	13,137	166	91	69	404	135
Body electrical components	Acoustic signal equipment	851230	1,725	2,170	2,749	2,155	1,182	15	61	102	91	167
Powertrain and its parts	Transmission shaft (including camshaft and crankshaft) and crank	848310	28,655	29,018	35,340	35,925	21,019	145	161	928	559	822
Powertrain and its parts	Bearing boxes (excluding those with ball bearings or roller bearings) and plain bearings	848330	16,592	19,488	20,743	19,237	12,500	100	78	125	240	403
Powertrain and its parts	Drive shafts (with differentials) and non-drive shafts and their components	870850	5,706	7,718	9,396	7,603	4,378	17	19	72	21	162
Suspension and its parts	Suspension system and its parts (including shock absorbers)	870880	18,468	18,438	17,383	16,727	13,091	29	149	63	80	48
Steering and its parts	Steering wheel, steering column and steering box and their parts	870894	5,335	5,498	9,249	9,271	3,981	133	88	100	365	71

Source: Prepared by JICA Study Team based on ITC trade map (<https://www.trademap.org/>)

According to interviews with local companies through the local consultants, an aluminum distributor case (HS code: 85119011) was used in 2008, and a fuel tank cock (HS code: 84818020) and a light (HS code: 96138010) manufacturer have switched from importing to domestic production in 2009.

### 2.3.3 Analysis of Supply Chain Disruption

Since early this year, the COVID-19 pandemic has continued, resulting in disruptions to supply chains across the world.<sup>47</sup> The changes in the industry and at the level of products and parts should be analyzed to properly address this disruption, especially in view of the fact that supply chains involve three key variables, namely, production systems, physical distribution, and people's mobility (Figure 2.3.4).<sup>48</sup> Considering the characteristics and composition of supply chains, the issues concerning their disruption, which have surfaced in the course of the COVID-19 crisis, are explained in the next sections.

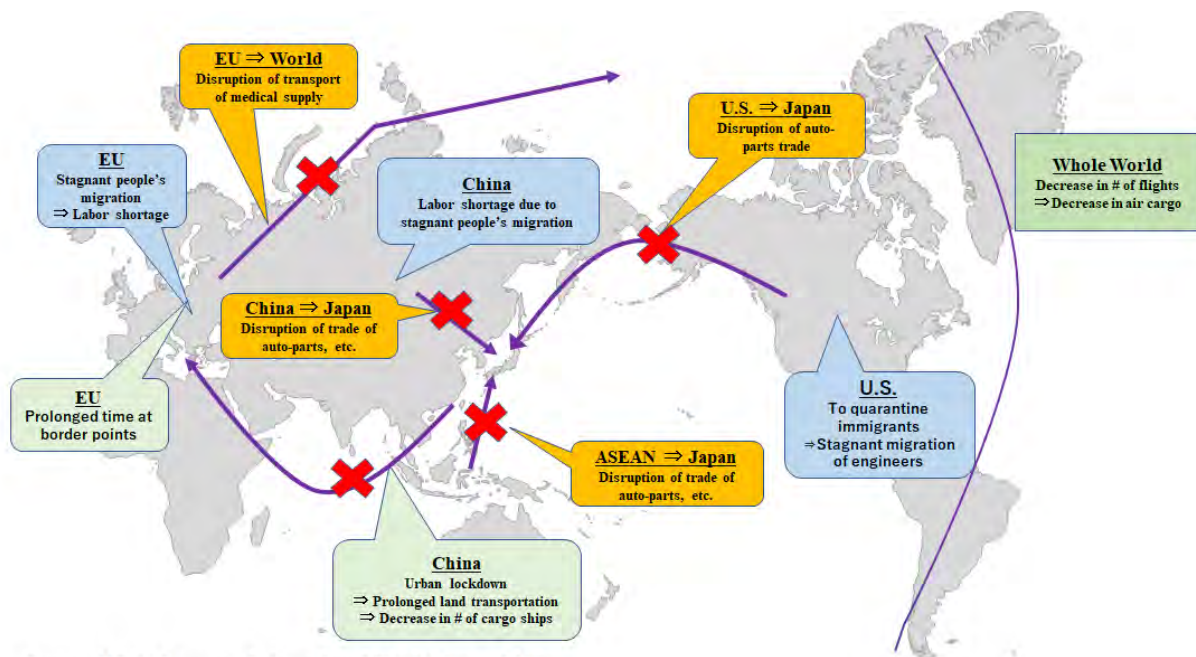
These issues are an extension of those relating to supply chain development and which have already been discussed. Hence, there is a need to deal not only with emerging issues

<sup>47</sup> For details, please refer to the following URL:

[https://scienceportal.jst.go.jp/news/newsflash\\_review/newsflash/2020/04/20200430\\_01.html](https://scienceportal.jst.go.jp/news/newsflash_review/newsflash/2020/04/20200430_01.html) (Access: 10<sup>th</sup> Oct. 2020)

<sup>48</sup> In the Figure, orange part refers to production, green part to physical distribution, and blue part to people's migrant.

but also those that have already been studied so far.



Source: White Paper on International Trade, Japan 2020

**Figure 2.3.5 Cases of Supply Chain Disruption under the COVID-19 Pandemic**

**(1) Characteristics of the Automotive Supply Chain**

The general characteristics of the automotive supply chain are summarized in Table 1.1.2. When it comes to distribution/ logistics, maritime transportation tends to be used because most auto parts are relatively heavy, and thus it takes longer to carry them. Meanwhile, inventories are normally minimized. As for the impacts of COVID-19 on automotive production, entire processes can be disrupted if the supply of a specific part is suspended. Without that part, producing an automobile will not be completed. This is because the production of such part tends to be concentrated in one plant or factory to benefit from economies of scale.

Regarding distribution/ logistics, production activities may continue even if the supply of raw materials and parts is suspended, as long as inventories of raw materials and parts are available. However, production in a factory/ plant can be suspended if there is a shortage of raw material and parts due to prolonged inability to transport them. It takes about two months to transport auto parts between Asia and Europe/U.S. Average inventories of auto parts are equivalent to less than one-month sales in the automotive sector. Therefore, production activities can be continued only for a few weeks by utilizing inventories of raw materials and parts. When difficulties in transporting specific raw materials and parts are prolonged, production activities of factories/ plants which need the affected materials and parts may come to a halt.

During the pandemic, the disrupted supply of raw materials and parts could have resulted from either a disruption to or delay in maritime and land transportation. To avoid these situations, some auto parts manufacturers attempted to switch from maritime to air transportation so that the supply chain could keep running even though the latter channel is costlier.

Manufacturing electric vehicles (EV) is modular, that is, a number of parts can easily be commonized. EVs have over 10,000 auto parts, while automobiles with internal combustion engine (ICE) are said to have 20,000 to 30,000 ones. Currently, plant workers have been told to stay at home to reduce physical contact and the spread of the virus. As a result, one EV manufacturing plant in Shanghai was closed temporarily.

**Table 2.3.4 Characteristics of the Automotive Supply Chain**

Category		Characteristic
Factories/ Plants	Number of Parts and Processes, Ease of Modularization	<ul style="list-style-type: none"> <li>➤ A large number of auto parts</li> <li>➤ For EVs, modularization is easier.</li> </ul>
Physical Distribution	Physical Distribution (sea/land/air)	<ul style="list-style-type: none"> <li>➤ By sea (passenger cars), by air (luxury cars and some kinds of parts), and by land (general).</li> </ul>
	Inventory, Unit Price, and Weight	<ul style="list-style-type: none"> <li>➤ Minimization of inventory is key.</li> <li>➤ Varying levels of price.</li> <li>➤ Most parts are relatively heavy.</li> </ul>
SC before COVID-19 Pandemic		<ul style="list-style-type: none"> <li>➤ Some labor-intensive parts are not produced and used locally.</li> </ul>
SC during COVID-19 Pandemic		<ul style="list-style-type: none"> <li>➤ Suspension of whole production due to difficulties in procuring some parts.</li> <li>➤ Japanese, European, and U.S. plants are suspended due to growing inspection even after Chinese plants resumed operation.</li> </ul>

Source: JICA Study Team

## (2) Main Factors of Supply Chain Disruption

There are three areas where the supply chain has been disrupted during the coronavirus pandemic. These are described briefly in the following sections.

### 1) Production System

Especially in automobile production, some sources of intermediate inputs (i.e., raw materials and parts) are concentrated on particular countries. This overreliance on imports from specific countries has led to the current suspension of production lines of some auto parts makers. For instance, some Korean auto parts manufacturers suspended work due to difficulties in importing wire harnesses from China.<sup>49</sup> Even though the share of wire harnesses in the total intermediate inputs is small, the disruption of its supply has had a negative effect on the whole production.

### 2) Physical Distribution

In general, many industrial sectors (including the automotive sector) procure raw materials and parts by a variety of means of transportation. The outbreak of COVID-19 has provided industry actors an opportunity to recognize that various industrial sectors are dependent on one another, that is, the supply chain is disrupted when one of the components of physical distribution (e.g., maritime and land transportation, air cargo and warehousing) stops. Transaction costs also increase when domestic and international physical distribution is affected, thereby becoming an obstacle to trade (Table 1.1.3).

As mentioned before, some auto parts manufacturers switched from maritime transportation to air cargo to keep the supply chain working. Meanwhile, in other industries, manufacturers of face masks and medical supplies, in particular, have transported by air due to the rapid increase in demand. In view of these changes, maritime transportation and air cargo have become alternative channels for some manufacturers.

<sup>49</sup> Please refer to the following URL: <http://www.koreaherald.com/view.php?ud=20200205000735> (Access: 8<sup>th</sup> Oct. 2020)



**Table 2.3.5 Impacts of Disruption in Physical Distribution or Transportation**

Mode	Impact
Land Transportation	<ul style="list-style-type: none"> <li>➤ Road closures and shortage of drivers.</li> <li>➤ In Europe, delayed truckage due to tighter cross-border inspections.</li> <li>➤ Stagnant physical distribution (i.e., truckage) at border crossings between China and Vietnam.</li> </ul>
Maritime Transportation	<ul style="list-style-type: none"> <li>➤ Increased costs and prolonged transportation due to customs inspections and quarantine processes.</li> <li>➤ Shortage of crew due to COVID-19 pandemic.</li> <li>➤ Decreased number of ships due to shrinking demand.</li> </ul>
Air Cargo	<ul style="list-style-type: none"> <li>➤ Stagnant cargoes due to decreased number of flights.</li> <li>➤ Increased costs and prolonged air transportation due to customs inspections and quarantine processes.</li> </ul>

Source: JICA Study Team

### 3) People's Mobility

In the wake of the COVID-19 pandemic, many border crossings throughout the world have closed. As governments restricted people's mobility, production suffered and physical distribution stagnated, adversely affecting supply chains.

The Association of European Vehicle Logistics, or ECV, pointed out in March 2020 that the suspension of automotive production lines was attributable to citywide lockdowns and to closures of border crossings (or restrictions on people's mobility). The association likewise emphasized that even without restrictions on commodity transport and cargo, the suspension of production lines resulted from labor shortages within the E.U. region.

### (3) Development of a "Resilient" Supply Chain

In the course of the COVID-19 pandemic, supply chain disruptions resulted from production suspension, mobility restriction, and physical distribution stagnation. In particular, medical supplies fell short, while demand increased exponentially. These phenomena have brought to fore the need to balance economic efficiency through economies of scale on one hand and the preparation of a range of responses to the risks of supply chain disruption on the other hand. Supply chain actors, not only in the automotive industry, have to manage various risks and to address emergencies through international cooperation to secure the supply of raw materials and the distribution of end products.

In view of the above, the three following points are discussed here to develop a resilient supply chain which can respond to emergencies:

- 1) Development of flexible measures in accordance with industry-, product-, and part-level characteristics;
- 2) Facilitation of public-private cooperation; and
- 3) Transformation from an efficient to a flexible supply chain.

#### 1) Flexible Measures Appropriate for the Industry, Products, and Parts

It is critical to develop supply chains that can withstand disruptions by increasing supply chain visibility, shortening the supply chain itself, determining the chokepoints of physical distribution, and diversifying procurement sources, among others.

Such supply chains need to be treated with appropriate measures suitable to the types and characteristics of goods and services they carry. When it comes to the automotive sector,

these measures should suit the characteristics of the industry and should go down to the level of products and parts to enable targeted actions.

## 2) Facilitating Public-Private Cooperation

In the wake of the outbreak of COVID-19, flexible public-private cooperation has been carried out (Table 1.1.4). For instance, the Trump administration of the U.S. requested private firms to produce emergency supplies in light of the Defense Production Act. As for automobile industries, the U.S. Department of Health and Human Services entered into a contract with them, and they produced ventilators and related components.<sup>50</sup>

**Table 2.3.6 Cases of Public-Private Cooperation**

Case	Content
Utilization of Defense Production Act (U.S.)	<ul style="list-style-type: none"> <li>➤ Prioritize allocation of resource to designated firms to expand their production base</li> <li>➤ Facilitate inter-industrial cooperation to procure medical supplies, etc. in case of emergencies</li> </ul>
Service Matching for Supporting Production Companies (Japan)	<ul style="list-style-type: none"> <li>➤ Request business organizations to expand production of medical supplies (requested by METI and MHLW)</li> <li>➤ Provide information on regional support schemes to boost medical supply production (e.g., capital investment facilitation)</li> </ul>

Source: JICA Study Team

## 3) Transformation from Efficient to Flexible Supply Chains

Supply chains with transnational production systems have been developed to pursue economic efficiency. After the outbreak of COVID-19, however, the disruption of these supply chains was caused by production suspension, physical distribution stagnation, and restrictions on people's mobility. On top of these, there may be other kinds of risks. For instance, it was observed that some countries prioritized their needs during the pandemic.

Meanwhile, a new trend is emerging (e.g., good use of digital technology) despite ongoing difficulties. So, even when emergencies, which are unpredictable, take place, the resilience of supply chains should be enhanced by responding flexibly to them. Before emergencies happen, supply chain structures should be developed by utilizing digital technologies and the efficiency of supply chains can improve. Such technologies make it possible to visualize what happens to a supply chain. In the event of emergencies, they help to find out immediately which part of the chain is disrupted.

There are two crucial elements that are needed to strengthen the resilience of the supply chain. One is to identify the raw materials and parts indispensable to the supply chain before emergencies happen. The other is to diversify procurement sources and to secure the appropriate level of inventories. When it comes to the optimal location of production bases, disruption risks can be mitigated by diversifying procurement sources before emergencies happen. During emergencies, substitute parts and raw materials can be secured immediately and flexibly by switching sources.

<sup>50</sup> For instance, please refer to the following URL: <https://edition.cnn.com/2020/04/08/politics/general-motors-ventilators-defense-production-act-coronavirus/index.html> (Access: 9<sup>th</sup> Oct. 2020)

### 3 Status of and Issues in the Automotive Industry of Pakistan

#### 3.1 Methodology of Analysis of the Automotive Industry Development

In this section, the JICA Study Team (JST) analyzes the status of and issues in the automotive industry of Pakistan from two different angles: namely, the “8 x 2 approach” or 8 critical policy areas and 2 viewpoints of policy issues.

Considering the experiences of other emerging countries in automotive industry development, the JST defined eight critical policy areas as follows: 1) automotive industrial development policy, 2) investment facilitation, 3) supporting industry development, 4) industrial human resource development, 5) research and development (R&D), 6) infrastructure development, 7) safety and environmental standards, and 8) market expansion. In the analytical framework (Table 3.1.1), each category (i.e., each of the 8 key policy areas) has its own sub-categories.

**Table 3.1.1 Eight Key Policy Areas Concerning Automotive Industry Development**

Category	Automotive Industry Development Policies	Investment Facilitation		Supporting industry	Industrial Human Resource	R&D	Infrastructure Development	Safety & Environment Standards	Market Expansion
Sub-Category	Roadmap	EV		Technology Development	Higher Education (University, technical college, etc.)	R&D Promotion	Transportation, Logistics & SEZ	Type Approval	Domestic Market
	Industry-Academia-Government Collaboration	FDI	Incentive		Vocational Training			Automobile Inspection	Export
		Low-Cost Eco Car							

Source: JICA Study Team

Meanwhile, the two viewpoints of policy issues are (a) policy and its detailed enforcement regulations and (b) operational and other issues. The issues of the 8 critical policy areas are analyzed from the viewpoints of (a) and (b).

#### 3.2 Analysis of Issues

In the following sub-sections, the relevant issues are analysed by using the 8x2 approach toward making policy recommendations in Chapter 5.

##### 3.2.1 Automotive Industry Development Policies

After the second half of the 2000s, there have been two kinds of 5-year automotive industrial development policies in Pakistan, i.e., the Auto Industry Development Programme (AIDP, 2007–2012) and the Automotive Development Policy (ADP, 2016–2021) are reviewed in the following parts.

The AIDP (2007–2012) included seven components: namely, 1) Productive Asset Investment Incentive (PAII), 2) Technology Acquisition Support Fund (TASF), 3) Auto Cluster Development, 4) Auto Industry Investment Policy (AIIP), 5) Human Resources Development, 6) Auto Industry Development Committee (AIDC), and 7) import duties.

Meanwhile, the main component of the ADP is to provide import duties for OEMs.

##### (1) Policy and Detailed Enforcement Regulations

There is neither a medium- to long-term vision nor a decade-long strategy for automotive industry development, while there have been five-year development policies (i.e., AIDP and

ADP). Since there is a decade-long strategy for it, Pakistanis, consumers, policy makers, businesspeople, and investors have difficulty in understanding the auto industry’s major contribution to economic development.

In the meantime, globalization has been progressing due to the advancement of information technology (IT). Corporate management that is responsive to the changes in market demand is needed. The global trend has emerged that more and more businesses have begun to collaborate with central and local government, and universities and public research institutions are regarded by them as a partner in creating innovative technological seeds and as a sub-contractor of R&D, human resource development, etc. In practice, however, the legal and policy systems to facilitate the industry-academia-government collaboration are nonexistent in Pakistan. This may be an obstacle to the facilitation of such collaboration.<sup>1</sup>

## (2) Operational and Other Issues

One of the major issues about the ADP (2016–2021) is the insufficient reflection of feedback about AIDP in it. In addition, because there is neither a basic law nor policy supporting the industry-academia-government collaboration it, there is no issue about operation and management of such collaboration.

The AIDC was one of the AIDP’s components and was also approved by the Economic Coordination Committee (ECC) as an institutional mechanism. The aim of AIDC was to facilitate inter-ministerial and industry-academia-government collaboration. The committee is chaired by the representative of the EDB, and its members include related governmental agencies, OEMs, local auto-component manufacturers, etc. However, there are no members from the academia (i.e., university professors and researchers) except for the Higher Education Committee (HEC), a regulatory body. It may likewise be pointed out that there is no official sub-committee which includes a representative of consumers, journalists, academicians, and other experts.

**Table3.2.1 Issues in Policies on Automotive Industry Development**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Automotive Industry Development Policies	Roadmap	--Insufficient medium- and long-term development strategies and decade-long vision of the automotive industry	--Feedback about AIDP from the private sector is not sufficiently reflected in ADP.
	Industry-academia-government collaboration	--Insufficient policies and regulations to facilitate the three-party collaboration	--For the aforesaid reasons, there are no operational and other issues, either. --Industry-academia-government collaboration is not functioning well due to inadequate institutional mechanisms involving academicians and other private intellectuals.

Source: JICA Study Team

<sup>1</sup> In the case of Japan, MEXT has implemented the Adaptable and Seamless Technology Transfer Program Through Target-Driven R&D, etc. For details, please refer to the Ministry of Education, Culture, Sports, Science and Technology (MEXT) (2015) “Policy Measures on the industry-academia-government collaboration” presentation material in April 2015.

### 3.2.2 Investment Promotion

In the following parts, policies and detailed enforcement regulations are discussed in relation to investment promotion.

#### (1) Policy and Detailed Enforcement Regulations

In June 2020, the draft EV policy was released for heavy commercial vehicles (HCVs) and two- and three-wheelers. Its component is only import duty, and there is neither specific policy measures nor detailed enforcement regulations.<sup>2</sup> In the process of formulating the draft policy, the private sector made comments and requests about it to the government. Nevertheless, according to the results of interviews conducted by the JST, those comments and requests do not seem to be fully reflected in the draft policy.

The EDB should play a central role in discussing which sector to be targeted by using incentives to attract FDIs, since BOI, Pakistan's investment promotion agency, is not a member of AIDC. Meanwhile, FBR's personnel in charge of import duty is a member, while its personnel in charge of FED is not. Another crucial issue to tackle is that there is no incentive for capital investments made by existing manufacturers. A lack of strategic investment policy is one of the major obstacles to domestic market expansion. From a strategic point of view, there is a need to attract specific segments of FDIs. In particular, priority should be given to those auto-component suppliers which have the technological capacity to manufacture components such as those produced in house by OEMs and imported ones with high precision and high function.

One of the main purposes of the ADP is to enhance the line-up of car models and types by attracting new entrants into the domestic market, so that options on car models and types may be widened for local consumers. However, ADP does not have any specific policy target (e.g., segment and model) and therefore there is no investment facilitation measures, either. This goes to show that investment policies and their detailed enforcement regulations are not always consistent.

The JST recommends low-cost eco cars (LCECs) for the Pakistani domestic market because local consumers will be able to afford them, and local demand will facilitate the local production of this environment-friendly car.

#### (2) Operational and Other Issues

It was pointed out by some interviewees that coordination between the EDB and the MOCC in the process of EV policymaking was not smooth. The EDB attempted to reflect the private sector's request in policy making, while the MOCC insisted on environment protection. For these reasons, the EV policy has not come into fruition. Another issue is that there is no standard in EV production. Hence, manufacturers have not been able to produce EVs and their components.

Meanwhile, as for the incentives of FDIs, since the BOI is not a member of AIDC, policy coordination may not be necessarily smooth between BOI and EDB, which is expected to play a leading role in automotive industry development. Since FBR's staff in charge of import duty is a member of AIDC, while that of FED is not, the EDB has a difficulty in

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<sup>2</sup> In December 2020, it was reported by the local media, "The Federal Cabinet on Tuesday approved the new Electric Vehicle (EV) policy for four wheelers." As of the end of April 2021, however, no official documents on EV (for LCVs and passenger vehicles) had been released by the Pakistani government. For details, please refer to the following URL (accessed on 25 April 2021): <https://www.thenews.com.pk/latest/762680-govt-announced-new-electric-vehicle-policy-for-pakistan>

coordinating smoothly with tax authorities except for import duty. As a result of interviews, it was found that the payment for the advance tax has not been refunded and that preferential treatment concerning corporate tax has not been observed. On top of these, no incentive has been provided to existing manufacturers who have made capital investment to expand production.

Because the LCEC concept is still a proposal by the JST, there are no operational and other issues.

**Table3.2.2 Issues in Investment Promotion**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Investment Promotion	EV	--EV component is only on import duty. --No policy on LCVs and passenger vehicles, while draft EV policy released in June 2020 was only about 2- & 3-wheelers and HCVs.	--Inadequate coordination between EDB and MOCC --No standard, preventing manufacturers from production
	FDI	--BOI is not a member of AIDC --Official in charge of FED is not a member of AIDC	--Inadequate coordination with BOI's policy measures
	Incentives	--Few incentives for existing manufacturers --Few differentiated incentives according to priority	--Inadequate collaboration with tax-related agencies (except for FBR) -- No refund on advance tax (withholding tax) --Inadequate preferential treatment as regards corporate tax for SEZ tenants
	LCEC	N/A <sup>3</sup>	N/A

Source: JICA Study Team

### 3.2.3 Supporting Industry Development

The number of Pakistan's auto-component manufacturers (both tiers 1 and 2) is approximately only 350, as discussed in sections 2.2.1 and 2.3.2 of Chapter 2. Since local manufacturers' performance in terms of quality, cost, and delivery (QCD) is short of the level required by Japanese OEMs, these tiers 1 and 2 auto-component manufacturers have inevitably continued to produce several components in-house, as well as to assemble CKD kits imported from Thailand.

In view of the results of the supply chain (SC) analysis in section 2.3 of Chapter 2, etc., one of the most critical issues found is the need to nurture local auto-component manufacturers to switch procurement from current importation and OEM's in-house production to procuring from local manufacturers.

The central issues pertaining to the development of supporting industries (in particular, technology development) are described below.

#### (1) Policy and Detailed Enforcement Regulations

From the viewpoint of technological development, the two following major issues are vital: One is the lack of policies and detailed enforcement regulations to nurture local auto-component manufacturers. It is strategically important to facilitate technological acquisition

<sup>3</sup> N/A stands for "not applicable."

of relatively high value-added components (e.g., drive train-related, electric, and electronics components) among the current imports by attracting foreign direct investments (FDIs). There is a strong need for EDB to have such a strategic point of view. There are only a small number of policies and detailed enforcement regulations either that will give incentives to foreign companies helping to develop local auto-component manufacturers.

The other issue is the lack of cooperation among related agencies, namely, SMEDA, EDB, and the National Vocational & Technical Training Commission (NAVTTTC).

## (2) Operational and Other Issues

When it comes to operational and other aspects, the issues relating to technological development are four-fold: Firstly, there are not many opportunities for facilitating technological development. Although there exist schemes to nurture engineers and technicians, they are not utilized effectively. There are few opportunities to learn and acquire new technologies, as well as existing ones that are unknown to industry players. Secondly, there are not many venues available for technical training in the country; universities and technical colleges are not fully utilized. Thirdly, policy coordination has been inadequate between SMEDA, which is in charge of developing supporting industries, and the EDB. As mentioned earlier, while one of the major issues is the lack of relevant policies and detailed enforcement regulations, this issue is expected to be addressed if there is collaboration between these two agencies.

Fourthly, there are only few schemes to facilitate capital investment. The target of the government's lending scheme with low interest rate aims only to facilitate capital investment. Hence, there are several local auto-component manufacturers who are not able to use it.

**Table 3.2.3 Issues in Developing Supporting Industries**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Supporting Industry Development	Technological Development	--Only a small number of detailed enforcement regulations to develop supporting industries and automotive component manufacturers.	--Few opportunities for learning new technologies as well as existing ones that are unknown to industry players --Few venues for technical training --Inadequate policy coordination between SMEDA and EDB --Few schemes for facilitating capital investment

Source: JICA Study Team

## 3.2.4 Development of Industrial Human Resources

The issues in industrial human resource development (IHRD) are addressed in the following parts.

### (1) Policy and Detailed Enforcement Regulations

The two following aspects are of importance: One is the "National 'Skills for All' Strategy (NSS) 2018." which is a policy document pertaining to IHRD. However, NSS is not compatible with "Industry 4.0"<sup>4</sup>, because it does not keep pace with current technological trends. The government's basic strategy for IHRD is three-fold: 1) IHRD for business

<sup>4</sup> Industry 4.0 is used interchangeably with the fourth industrial revolution and represents a new stage in the organization and control of the industrial value chain. For details, please refer to the following URL (accessed on 19 April 2021): <https://www.i-scoop.eu/industry-4-0/>.

demands, 2) equal and fair access to opportunity, and 3) quality assurance of the contents of education and training. The NAVTTC is responsible for policy making in this field in accordance to NSS 2018.

The other significant aspect to consider is that there is no public system to nurture top and middle management, although such system is available for technicians and shopfloor engineers. Based on the results of interviews carried out by JST, it was pointed out that there is a need to improve and/or change the attitude and mindset of auto-component manufacturers' top management. Therefore, the success or failure of introducing new technology to the company depends on their mindset and attitude. Several others argued that there had been a lack of factory foremen and team leaders. On top of these, interviewees mentioned that there was much to improve in the following technological capacities: basic technology on auto-component manufacturing in accordance with clients' technical specifications and technical levels in element technology (e.g., metal casting, forging and mould and die).<sup>5</sup>

## (2) Operational and Other Issues

As for operational and other issues, two aspects are crucial: One is that each province has a different strategy and/or regulation on IHRD in line with the NSS 2018. The second aspect is that there is only one university in the country offering an automotive engineering course, and that is the NED University of Engineering & Technology. Some graduates of NED University, however, reportedly get a job with other sectors (e.g., garment sector). There is a strong need to prevent these graduates from going to other sectors.

**Table3.2.4 Issues in Developing Industrial Human Resources**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Industrial Human Resource Development (IHRD)	Higher Education (university and technical college)	--"NSS 2018" is not responsive to Industry 4.0 --Few systems to nurture top and middle managers	--Each province has different focus on IHRD --Auto engineering is taught only at the NED University of Engineering & Technology --Some graduates of NED University get a job with other industrial sectors
	Vocational Training		

Source: JICA Study Team

### 3.2.5 Research and Development (R&D)

In the following parts, the issues about R&D are analysed.

#### (1) Policy and Detailed Enforcement Regulations

Based on the results of interviews conducted by the JST, there seems to be a lack of understanding among the stakeholders about the significance of R&D. Therefore, there are no relevant policies and detailed enforcement regulations.

#### (2) Operational and Other Issues

The establishment of the Pakistan Automotive Institute (PAI), which is an implementing agency of R&D, is one of the components of AIDP and ADP. However, this component has not been achieved.

<sup>5</sup> Element technology is also called "factor technology."



**Table 3.2.5 Issues in Research and Development**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
R&D	R&D Promotion	--Inadequate understanding about the importance of R&D	--PAI, which was stipulated in ADP, was not established.

Source: JICA Study Team

### 3.2.6 Infrastructure Development

Based on the results of interviews and literature review conducted by the JST, the supply of electricity, gas etc. turned out to be unstable in the SEZs where Japanese OEMs and auto-component manufacturers are housed; tenant companies are complaining about this situation which exposes the insufficient collaboration in the supply of water, electricity, etc. among the federal and provincial governments, state-owned enterprises (SOEs), and private developers. JICA's "Information Collection Survey for Forming A Sector Program for Improving Investment Environment" (2020) also pointed this issue out.

Considering the above, the issues in infrastructure development are discussed in the following parts.

#### (1) Policy and Detailed Enforcement Regulations

As for physical infrastructure in relation to transportation and traffic, the crucial issues include traffic congestion in Karachi City and its surrounding areas, as well as the deterioration of roads. Regarding port facilities, the Ministry of Communication, Karachi Port Trust (KPT) and Port Qasim Authority (PQA) have jurisdiction over the management of those facilities. Because of the decentralized management system, it is difficult for tenant companies to know which agency to make a request to improve SEZs when they face unstable supply of water, electricity, gas, etc.

When it comes to SEZs, the SEZ Act (2012) stipulates that each province should develop SEZs. On top of this, the country's infrastructure development is characterized by China's strong influence.

#### (2) Operational and Other Issues

Based on the results of interviews conducted by the JST, the unstable supply of electricity, etc. is found to be one of the most critical issues. Another is the lack of information as to which agency is in charge of managing related services (e.g., electricity, gas, and water).

**Table 3.2.6 Issues in Infrastructure Development**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Infrastructure Development	Transportation, Logistics, and SEZ	--No centralized governmental organization in charge of related infrastructure --China's strong influence	--Unstable supply of electricity, gas, etc. --Difficult for tenants to know which governmental organization to consult with due to decentralized jurisdiction over supply of electricity, etc. between federal and local governments

Source: JICA Study Team

### 3.2.7 Safety and Environment Regulations<sup>6</sup>

#### (1) Policy and Detailed Enforcement Regulations

Although one of the main components of the Automotive Industry Development and Exports Plan (AIDEP) would be exportation, there is no testing agency that certifies the quality of export items.<sup>7</sup> At the same time, the system for type approval is non-existent. Currently, inspection is carried out only for commercial vehicles, not for passenger vehicles. The inspection system for passenger vehicles in Punjab province, which is ahead of other provinces in establishing one, is still under review as of this writing.

#### (2) Operational and Other Issues

One of the most crucial issues is insufficient human resources for conducting type approval. When it comes to WP29, there is no implementing organization for this in the country and no external focal point either<sup>8</sup>. Meanwhile, automobile inspection has been conducted only for commercial vehicles.

**Table 3.2.7 Issues in Safety and Environmental Standards**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Safety and Environment Regulations	Type Approval	--Type approval process is nonexistent.	--Short of related human resources. --No focal point with outside and no domestic implementation organization
	Automobile Inspection	-- Automobile inspection is conducted only for commercial vehicles --No inspection of passenger vehicles	-None inspection lines for passenger cars

Source: JICA Study Team

### 3.2.8 Market Expansion

#### (1) Policy and Detailed Enforcement Regulations

As discussed in Section 2.2.1 of Chapter 2, the domestic sales volume went below 200 thousand units for the first time since 2014.<sup>9</sup> According to the portal site of Marklines, the volume of car sales decreased by 33.6% from 192,770 in 2019 to 127,939 in 2020 on a year-on-year basis. Likewise, the volume of production decreased by 37.1% from 186,716 in 2019 to 117,375 in 2020 on a year-on-year basis.<sup>10</sup>

The first issue is consumers' insufficient access to financing such as automotive loans. Another issue is that there are not many models that Pakistani consumers can afford. For instance, although Hyundai Nishat Motor began to sell their cars in 2020, the new model launched by the company was a sports utility vehicle (SUV) named Tucson. The target

<sup>6</sup> In April 2020, Pakistan reached the "1958 Agreement" which enables the country to have vehicle safety assessment in foreign countries when necessary. However, safety assessment has never been done overseas.

<sup>7</sup> Please refer to section 2.3.1 of Chapter 2.

<sup>8</sup> SRO656(I)2006 came into effect in 2006 and includes "Vehicles Performance Testing Facilities" and "Inspection Equipment." This is one of EDB's achievements in the formulation and implementation of safety and environment regulations.

<sup>9</sup> One of the reasons for the 2019 fall in car sales was the depreciation of the Pakistan rupee, which continued from 2018, resulting in an increase in the costs of imported materials and eventually car prices. The other was a hike in federal excise duty (FED) which was carried out without any prior notice by the Federal Bureau of Revenue (FBR). As a result, OEMs had no choice but to raise sales prices.

<sup>10</sup> For the details of recent trends in domestic car production, please refer to section 2.2.1 of Chapter 2.

segment of Tucson was high-income consumers, and the model is far from being affordable for general consumers.<sup>11</sup> Concerning the draft EV Policy (for HCVs and two- and three-wheelers), its focus is on incentives to attract FDIs; the prices of EVs are not discussed.

The other issue is exportation. No policy and detailed enforcement regulations on export are stipulated in the ADP.

## (2) Operational and Other Issues

Several interviewees pointed to the capacity of EDB's staff and to its capability as the secretariat of AIDC. Other interviewees said argued that the outline of AIDEP had not been announced as of January 2021, although its implementation is scheduled to begin in July 2021. It seems that there is slow progress in the formulation and preparation for implementation of AIDEP.

The other crucial issue is EDB's weak authority and inadequate coordination capacity with related governmental agencies. For instance, in relation to fiscal and financial policy implementation, the income tax hike was very problematic, which was conducted without any prior notice. Consequently, the tax hike curbed consumption and domestic economic growth,<sup>12</sup> as well as leading to a decrease in car sales.

In the meantime, based on the results of the interviews conducted by the JST, it seems that the EDB has never carried out a survey to find a potential market for Pakistan's exports. Therefore, it is impossible to narrow down candidate car types (e.g., tractors, three-wheelers, and EVs), countries, and regions (e.g., Middle East and Africa). Similarly, there seems to be no discussion about export strategies among the EDB and other members of the AIDC.<sup>13</sup>

**Table3.2.8 Issues in Market Expansion**

Category	Sub-Category	Issue	
		Policy and Detailed Enforcement Regulation	Operational and Others
Market Expansion	Domestic Market	--No detailed enforcement regulation to achieve the goal of sales and production volume --No detailed enforcement regulation to facilitate automobile purchase --Few car models affordable for general consumers	--Low capability of EDB officials. -- Low capability of EDB as secretariat of AIDC --Slow progress in formulation of AIDEP --Limited authority of EDB and inadequate functions of AIDC
	Export	--No stipulation in ADP about export.	--Small number of suppliers with exportable components. --No detailed information on target market for exports.

Source: JICA Study Team

<sup>11</sup> The price of Tucson was approximately more than 5 million Pakistan rupees (3.3 million yen) when JST confirmed the price on the Internet on 9<sup>th</sup> January 2021.

<sup>12</sup> For details of domestic market, please refer to 2.2 of Chapter 2.

<sup>13</sup> As for third countries' experiences, please refer to 4.3 of Chapter 4.

### 3.3 Priority Issues in Industrial Policy Design

In the previous sections, key issues in eight critical political areas were identified. In this section, four major issues in industrial policy design are discussed in detail.

#### 3.3.1 Implementation Structure

##### (1) Auto Industry Development Committee (AIDC)

In Pakistan, the Auto Industry Development Committee (AIDC) established in line with the 2007 AIDP plays a role in inter-ministerial and public-private coordination to promote the formulation and implementation of automobile industry policies. As a forum for dialogues between the government and the industry, AIDC, with EDB as its chair, aims to promote public-private partnership in the automotive industry by establishing quality and standards, developing trade opportunities, and providing advice on investment.

In the ADP, which was formulated after a four-year gap after the AIDP ended, the AIDC was reorganized through Notification No. 2 (9) / 2013-LED-II issued by the Economic Coordination Committee (ECC) in June 2016. It came into effect the following year. The new AIDC, whose meetings were supposed to be held regularly and chaired by the EDB, functions as a coordinating body to get the stakeholders' consensus and reflect their opinions in the policy. However, the ADP clearly states that the ultimate discretion belongs to the EDB and MOIP, while the AIDC's role remains as an advisory body to the EDB, which is an agency under MOIP.

#### **Roles of AIDC as Stipulated in the ADP**

- Enhance safety and environmental performance of locally produced vehicles and parts. Review and discuss safety and quality standards, as well as consumer protection.
- Analyse emerging global trends and do out-of-the-box thinking to identify opportunities for the local auto industry and define its direction for growth, development, and competitiveness.
- Make recommendations to the government on issues relating to fiscal policy, investment opportunities, export development, trade policy initiatives, FTAs, and other related regulatory and administrative matters.
- Provide vision for the development of the auto sector and continue reviewing the progress and effectiveness of incentive regimes, and to recommend corrections and improvements in the ADP.
- Promote industry-university linkages and create awareness within academia about the needs of the industry.

Source: Summarized from p. 87, ADP 2016-2021.

The AIDC constitutes relevant ministries, OEMs, parts manufacturers, and associations (Table 3.3.1). The process of selecting the committee members is not stipulated. Committee members are eventually authorized by the ECC following the selection by the MOIP and EDB, which is in turn based on recommendations from related ministries.

**Table 3.3.1 AIDC Members**

Sector	Title and Organization	Position
Government	Chief Executive Officer, Engineering Development Board	Chairman
	General Manager (Policy), Engineering Development Board	Secretary
	Joint Secretary, M/o Industries & Production	Member
	Joint Secretary M/o Science & Technology	Member
	Joint Secretary M/o Commerce	Member
	Joint Secretary M/o Climate Change	Member
	Representative from Planning Commission	Member
	Chief Customs (Tariff & Trade), Federal Board of Revenue	Member
	Representative from Higher Education Commission (HEC)	Member
Association	Director General, Pakistan Standards and Quality Control Authority (PSQCA) or his representative	Member
	Chairman PAAPAM	Member
	Vice Chairman PAAPAM	Member
	Chairman PAMA	Member
Company	A representative of Car Assemblers (from leading assemblers)	Member
	A representative of Car Assemblers (from new entrants)	Member
	A representative of Japanese Two/Three-wheeler Assemblers	Member
	A representative of Chinese Two/Three-wheeler Assemblers	Member
	A representative of Tractor Assemblers (from leading assemblers)	Member
	A representative of Trucks/Bus Sector (from leading assemblers)	Member
	One vendor of Sheet Metal on rotation basis for two years	Member
	One vendor of Plastics and Rubber on rotation basis for two years	Member
	One vendor of Casting, Forging & Machining	Member
	One vendor of Electrical and Electronics	Member
	One representative from private sector expert (non-industry)	Member
	One representative from consumer association body	Member

Source: Notification No. 2 (9)/2013-LED-II

The ADP stipulates that the AIDC is to meet regularly, but in practice, the EDB has called for meetings only once in a few months on an irregular basis for the last few years. There is no distinct body in the AIDC that is dedicated to policy implementation, monitoring, and evaluation. It also seems that the agenda of each meeting has been decided beforehand only occasionally.

Although the ADP stipulates that the AIDC should set a TOR for each subcommittee, subcommittees have not been established as of this writing. According to sources, at the time the AIDC was established, subcommittees were set up for each theme such as human resource development and technical improvement. However, travel expenses and labor costs became burdensome especially for company representatives. In order to reduce the number of meetings, the subcommittees were dissolved, and the members met in plenary several months after the AIDC's establishment.

From its establishment in 2007 to November 2020, a total of 33 meetings have been held. In 2020, three meetings were held remotely, and discussions were mainly on the agenda items shown in Table 3.3.2.

**Table 3.3.2 Major Agenda Items in the Last Three AIDC Meetings**

Time	Main Agenda	Remark
The 31st Meeting (Mar. 12, 2020)	Recommendation for waiver of additional customs duty and the FED in the federal budget 2020/21	According to sources, the possibility of a waiver is low.
	Discussion on importation of used cars through misuse of import policy and proposal for amendments in SRO 577	--
	Finalization of EV policy and submission of final draft to MOIP	--
	Discussion on tariff proposals related to EVs for the 2020–2021 budget	--
	Update on adoption of WP 29 regulations	Implementation unit of WP29 had not been arranged yet.
	Preparation of AIDEP and update on SRO Rationalization and Technical & New Technology Committees	--
The 32 <sup>nd</sup> Meeting (May. 6, 2020)	Endorsement of proposals submitted by PAMA and PAAPAM for consideration in the 2020–2021 federal budget	Acknowledgement of submission of the proposal from AIDC to the cabinet.
	Recommendation for waiver of ACD and FED in the 2020–2021 federal budget	According to sources, the possibility of waiver is low.
	Snapshot of achievements under ADP 2016–2021, recommendations	--
The 33 <sup>rd</sup> Meeting (Aug. 20, 2020)	Update on new investment under ADP 2016–2021	Shared information of the new entrants in the industry.
	Update implementation status on EV policy	Dealt with manufacturers of 2-wheelers, 3-wheelers, and HCVs.
	Update on adoption of WP29 regulations	Implementation structure of WP29 has not been formed yet.
	Discussion on standard formulation process for automobiles at PSQCA/MoST.	Discussion on tightening the standards for 4-wheel vehicles and helmets advocated by PSQSA, whom some participants accused of pushing forward without consulting industry stakeholders. EDB suggested holding another meeting between industry players and PSQSA.
	AIDEP 2021–2026, a way forward	The contents have not been published as of Jan. 2021.

Source: JICA Study Team

Roughly speaking, the probability of proposals getting approved by the ECC is around 20%, according to an informant involved in the AIDC. The minutes are available in English at least for the last four meetings and shared within the AIDC.

Based on the minutes, the AIDC seems to be functioning as a platform for public and private

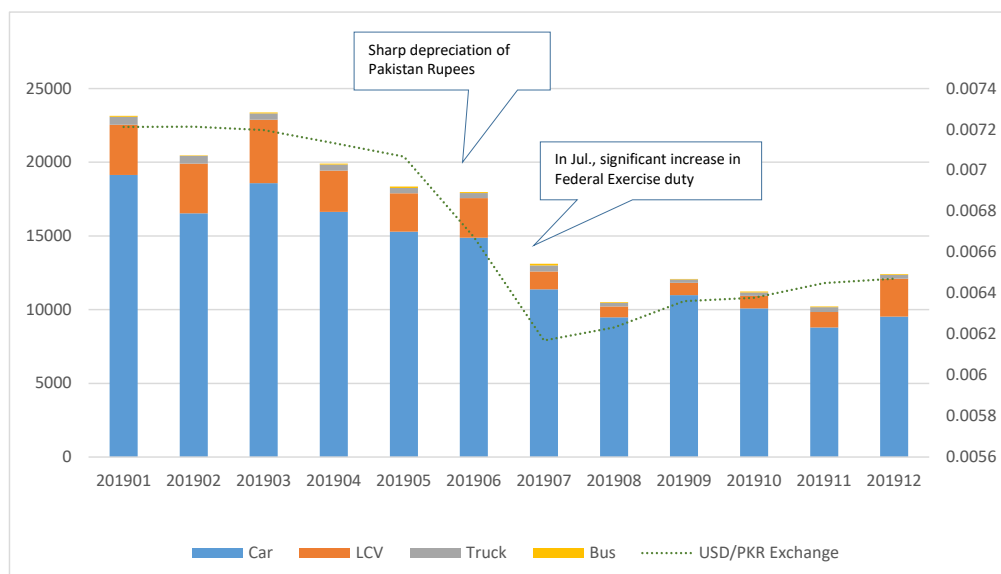
collaboration for the sake of a sustainable development of the automotive industry. The AIDC has often come up with policy recommendations to overcome conflicts of interests among market players and tackled vital issues, such as rectifying the tax regime and restrictions on importing used cars. These observations prove the AIDC's potential to be a driver for industrial development uniting the government, industry players, and academia.

However, there are significant systemic issues within the AIDC, such as the lack of capabilities in realizing proposals and a lack of coordination among relevant governmental bodies. The evidence supporting the former issue can be seen in the low passing rate of proposals, which might stem from the subordinate position of the EDB to the ministries. This hinders the EDB as Committee chair from coordinating effectively with the ministries and even enterprises. This may also explain why past proposals submitted by the AIDC were easily turned down by higher-level agencies, such as the MOIP, FBR, and ECC.

Regarding the lack of cooperation among ministries, although the AIDC is mandated to promote investments in the automobile industry, the BOI, which is the responsible organization for this, is not a committee member. The BOI seems to participate in AIDC meetings every time as guest, but the lack of an official member designation may undermine BOI's commitment.

The most telling proof of the lack of inter-ministerial collaboration is the FBR's large unannounced federal excise tax (FED) increase for the automotive industry in July 2019. Despite being a member of the AIDC, the FBR suddenly raised taxes without prior consultation. This tax increase, coupled with the depreciation of the rupee, caused a sharp drop in automobile demand, and the number of automobiles sold, which had been on an increasing trend, fell below 200 thousand for the first time in five years.

It is not hard to imagine that the excise tax hike by the FBR which occurred immediately after that was a prudent measure to reduce imports to compensate for the sharp drop in foreign currency reserves as a result of the depreciation of the currency. However, if there were advance adjustments regarding the rate and timing of tax increases, it is possible that automakers could have taken appropriate measures, such as systematic price increases, to minimize the negative impact on the automobile industry.



Source: JICA Study Team created from MarkLines's website.

**Figure 3.3.1 Impact of Depreciated Rupee and FED Hike on Car Sales**

Looking back on the agenda at AIDC meetings, there were agendas that seemed to be policy dialogues, such as EV policy and WP29. However, since all agenda items were important, it was unlikely that fruitful discussions could be made in meetings held only once every few months. In particular, there is controversy in the federal cabinet, that is, between the MOCC and the MOIP, as to who has jurisdiction over the EV policy. It is thus unlikely that the AIDC is able to discuss practical policies for the promotion of the automobile industry. Although more than half a year has passed since Pakistan's accession to WP29, its implementation has not yet been decided, and the meeting agenda in this regard has been limited to updating information on WP29. Now that the EDB has already been assigned as the coordinator of the WP29, there is an urgent need for subcommittees or working groups to intensively discuss the establishment of the WP29 implementation system under the AIDC instead of just information sharing. Similarly for other agenda items, such as taxation and policy reviews, the formulation of policies and industry-government-academia collaboration have been limited as a result of irregular Committee meetings.

**(2) EDB**

This study reveals how scarcely the EDB is authorized as the government agency in charge of the formulation of the automotive industry policy. The first and foremost proof is that the EDB does not have a budget. Therefore, it cannot develop human resources alongside the implementation of the automotive industry policy as is usually done in other countries. Moreover, being positioned under the MOIP, its influence over other ministries is significantly weak, thereby its proposals are often turned down or put on hold by ministries like FBR which have stronger clout. Besides its lack of authority, a number of OEMs, auto parts manufacturers, JICA experts, and auto industry experts pointed out the lack of capability of the EDB. The issues EDB is facing are summarized in Table 3.3.3.

**Table 3.3.3 EDB's Issues**

Issue	Description
(a) Limited authority	There is no right to request for budget and is no fiscal source for investment required for implementing automotive industry policies. Given its subordinate position to MOIP, EDB's proposals hardly gets approved.
(b) Inadequate coordination	The implementation of each AIDP promotion program was left to other relevant agencies, and some measures were either unimplemented or the goals were not achieved because of EDB's inadequate ability to coordinate (e.g., understaffing of EDB).
	Inadequate coordination with relevant authorities (e.g., FBR and SBP) from the strategic point of view in order to formulate automotive industry development policies.
(c) Inadequate ownership of automotive industry policies	In AIDC discussions, it was observed that MOIP and MOC made positive statements. EDB is expected to make some positive comments from a different point of view.
	From the perspective of the automobile industry, EDB is an auditing agency for imported parts and parts based on TBS, and its position as a policy implementing agency can be strengthen.
(d) Limited human resources	At the time of the AIDP's formulation, there were only a few people who could commit to help with the improvement of the automobile industry.
	The function and human resources capacity of the unit responsible for automotive industry development are insufficient.
	Although EDB is in charge of the tariffs based on the local procurement rate



	of parts, there is much to be improved in terms of knowledge about automobile parts in order to make an appropriate assessment.
--	---

Source: JICA Study Team

The JST believes that the root cause of these challenges is the EDB's very narrow responsibility for and authority over the formulation of the automotive industry policy. This situation becomes particularly glaring when compared with the implementation of such policies in other countries. As an example, a comparison with Malaysia's MARii is shown in Table 3.3.4.

**Table 3.3.4 Comparison between EDB and MARii**

	EDB Pakistan	MARii Malaysia
Jurisdiction	MOIP	Ministry of International Trade and Industry (MITI)
Parallel Organisation	1) National Industrial Parks (NIP) 2) SMEDA	1) Malaysian Investment Development Authority (MIDA) 2) Malaysia External Trade Development Corporation (MATRADE) 3) Malaysia Productivity Corporation (MPC) 4) Malaysia Industrial Development Finance Berhad (MIDF) 5) Malaysia Steel Institute (MSI) 6) The Department of Standards Malaysia (DSM) 7) Standard and Industrial Research Institute of Malaysia (SIRIM) 8) Malaysia Institute of Microelectronics Systems (MIMOS) 9) EXIM Bank 10) Invest KL
Commitment to Automotive Industry	Supervises engineering sectors besides the automotive industry	Delegates automotive industrial policies and robotics and IoT both related to automotive industry
Budget	None	MARii proposes its own budget plan to the cabinet through MITI. Once it's authorized, MARii spends its budget at liberty.
Departments	1) Policy Group 2) Tariff Group 3) Karachi Office 4) Business Development 5) Sector Development 6) The administration and accounting group	1) Strategic Research Division 2) Technology Development Division 3) Supply Chain Development Division 4) Human Capital Development Division

Source: JICA Study Team

### 3.3.2 Preferred Models for the Next Policy

As discussed so far, the introduction of EVs, which are generally expensive, is premature in view of the people's income levels. In addition, Pakistan does not have the accumulated

technology required for EV production, and it is not possible to localize the production required for price reduction. Based on these facts, the key assumptions when considering the types of vehicles that should be put the most effort into raising the level of Pakistan's automobile industry in the future are: 1) low-priced vehicles that the public can afford, and 2) vehicles with excellent environmental performance. To see how it is possible to manufacture vehicles that meet these two conditions in Pakistan, Chapter 4 exhibits the case of Indonesia where the low-priced eco-car policy was introduced.

ADP, the automotive policy, intended to increase the number of new manufacturers that produce affordable vehicles for the public. Although the policy has certainly increased the number of new entrants, these manufacturers have pursued a different route that is, producing large, luxury vehicles, such as SUVs, making it unrealistic to serve the original purpose. The reason for this failure can be ascribed to the lack of a coherent policy to promote preferred models and its accompanying measures to introduce affordable cars, in addition to the factors on the private sector side such as business strategies and profit structures of each manufacturer.

### **3.3.3 Safety and Environmental Standards**

In 1969, there were 65 vehicle regulations in Pakistan relating to lamps, mirrors, brakes, and exhaust gas to promote safety and environmental standards. This was the time when the number of automobiles worldwide increased rapidly, environmental and safety problems were highlighted, and technological countermeasures began to be developed. Pakistan's current vehicle regulations are outdated and not compatible to current vehicle safety and environmental technology.

There is thus a need to prepare regulations that could introduce the latest safety and environmental technologies in vehicle manufacturing to prevent problems. Since the revision of existing laws and regulations cannot be applied to the ADP, the aim was to harmonize vehicle safety and environmental regulations at a high level internationally and to promote international mutual recognition of vehicle certification. Pakistan has indicated interest to participate in the UNECE World Forum for Harmonization of Vehicle Regulations (WP29), a mutual-recognition agreement for type approval (the 1958 agreement). In line with the ADP, Pakistan joined the 1958 Agreement in April 2020 to introduce UN regulations in phases.

By joining this agreement, it will be possible to raise the safety and environmental performance of vehicles manufactured in Pakistan to the international level through the common UN regulations among the member countries who signed the 1958 agreement. Although the mutual-recognition system can reduce vehicle development resources and simplify certification for individual equipment and parts, Japan has further expanded and proposed an international certification system for vehicle units (International Whole Vehicle Type Approval: IWVTA). If Pakistan participates in IWVTA in the future, it will be possible to further standardize and simplify the vehicles approval procedure between these two countries, making export easier.

Vehicle type approval is a system in which the national government confirms whether a sample vehicle conforms to the technical standards of the same structure, equipment, and performance.

Furthermore, to support the system, a vehicle or parts recall is required to push vehicle

manufacturers to improve quality when the vehicle is recognized as non-conforming or has possibility of non-conforming to the technical standards due to the design or manufacturing process. A vehicle inspection system based on certain standards is also required to check for problems in vehicles in the market.

Therefore, the merits of joining the 1958 Agreement and adopting UN regulations are very clear, but not only have none of the UN regulations been adopted, the establishment of infrastructure, such as organizations, systems, and human resources, also has not progressed and become a big problem.

Table 3.3.5 shows a proposal in countering the above-mentioned issues and in developing the required organizations, systems, and human resources in phases. Currently, Pakistan has started the first step and needs to take the following steps to establish the certification system.

**Table 3.3.5 Steps to Establish a Certification System**

Step	Specific Content
1. Establish Regulations, Systems, and Organizations	<p><b>Establishment of organization for WP29 and 1958 Agreement</b> Summarize national policies and proposals for the UN regulations (draft) to be deliberated at WP29. As a first step, select the UN regulations to be introduced domestically and prepare a roadmap.</p> <p><b>Systems, Review of Organizations and Maintenance related to domestic adoption of UN Regulations and application to vehicles</b> Review and establish a system and organization to enable the application of UN regulations to vehicles and the certification of UN regulations while increasing the selection of UN regulations.</p> <p><b>Expert Training</b> Acquire safety and environment technology and basic certification technology (training at training facility)</p> <p><b>Overseas Certification</b></p>
2. Start Application of UN Regulations	<p><b>Establishment of systems and organizations related to domestic adoption of UN regulations / application to vehicles</b> Realize a system and organization to enable the application of UN regulations to vehicles and the certification of UN regulations while increasing the selection of UN regulations.</p> <p><b>Expert Training</b> Acquire safety and environment technology and certification technology application (training at an overseas third-party organization)</p> <p><b>Overseas Certification</b> <b>Strengthening domestic testing capabilities based on necessity and possibility</b> <b>Establishment of (domestic) certification mechanism</b></p>
3. Start Review Domestic Certification of UN Regulations	<p><b>Maintenance of certification facilities</b> for testing &amp; review of certain certification items</p> <p><b>Expert Training</b> Acquire safety and environment technology and certification technology application (information exchange with certification bodies in third countries, etc.)</p>
4. Start Recall System and Expand Vehicle Inspection System	<p><b>Expert Training</b> Acquire knowledge about the latest vehicle technology related to recall system (overseas training, etc.)</p> <p><b>Start Recall System</b> <b>Expansion of vehicle inspection system (expansion to passenger cars, digitization of registration, etc.)</b></p>

Source: JICA Survey Team

In October 2017, a JICA advisor came out with a business report on vehicle safety and exhaust gas regulations development in Pakistan which proposed that a committee consisting of representatives of vehicle manufacturers, academia, and related government ministries and agencies be established based on the ADP action plan. Table 3.3.6 shows the proposed items to be deliberated by the AIDC. As mentioned above, establishing such a tripartite committee to review UN regulations is the first step in introducing such regulations in Pakistan.

**Table 3.3.6 Items to be Considered by the AIDC**

a	Select UN regulations after considering the necessity of Pakistan vehicle regulations and lead to adoption
b	Prioritize the adopted UN regulations for enforcement
c	Create an administrative system to realize the enforcement of regulations
d	Create a roadmap for the development and enforcement of vehicle regulations

Source: Islamic Republic of Pakistan Vehicle Safety and Exhaust Gas Standards Formulation Advisor Business Report

To strengthen the proposed tripartite committee mentioned above, it is important to develop human resources who are familiar with automobile technology. It is necessary to have knowledge and experience of market analysis, vehicle safety and environmental problems, automobile technology, and test methods of UN regulations.

Taking vehicle safety and frontal collision as examples, it is necessary to understand the actual situation of traffic accidents in Pakistan (frequency of occurrence and injury level of the body parts affected (death/serious injury/minor injury), automobile technology (energy absorbed when an engine crashes and protection of passengers with airbag and seatbelt), and test method (including evaluation of vehicle speed and collision offset amount against accident frequency, and collision test equipment used including crash test dummy, etc.). Without such knowledge, the importance of the UN regulation on frontal collision test, the countermeasures for the vehicle body, the technical difficulty, and the cost of the countermeasures cannot be understood. In addition, the need to adopt UN regulations and the lead time required to apply them cannot be coordinated with the automobile industry stakeholders.

Table 3.3.7 is part of the UN regulations proposed by JICA's advisor in his 2017 report and also acknowledged by the EDB, which have been prioritized according to its importance in UN Regulations. It is advisable to further prioritize those selected UN Regulations.

**Table 3.3.7 Pakistan's Priorities among UN Safety Standards<sup>1</sup>**

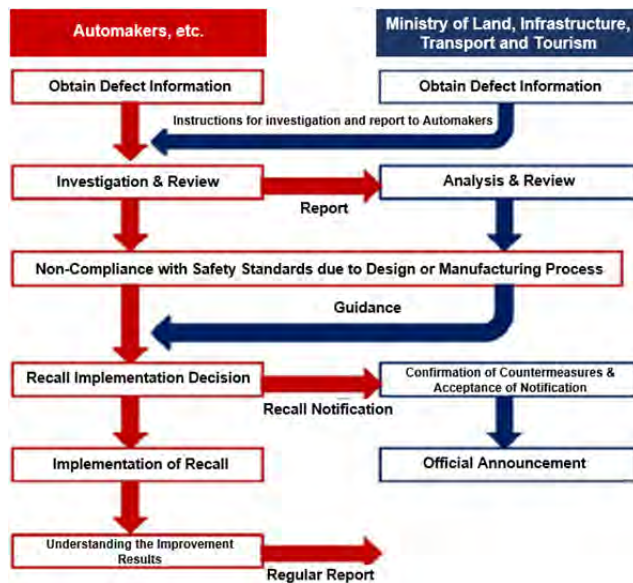
No.	Description	Regulation	Vehicle category
<b>ACTIVE SAFETY</b>			
1	Brakes	R13H,R13	Passenger Cars and Vans + Commercial vehicles and Buses
2	Steering	R79	Passenger Cars and Vans + Commercial vehicles and Buses
3	Tyres	R30	Passenger Cars and Vans
<b>PASSIVE SAFETY</b>			
4	Safety belts anchorages & safety belts	R14, R16	Passenger Cars and Vans + Commercial vehicles and Buses
5	Seats/Head restraints	R17, R25	Passenger Cars and Vans
6	Collision	R94, R95, R135	Passenger Cars and Vans
<b>GENERAL SAFETY</b>			
7	Safety glazing	R43	Passenger Cars and Vans
8	Mirrors & cameras	R46	Passenger Cars and Vans + Commercial vehicles and Buses
9	Antitheft	R18	Passenger Cars and Vans + Commercial vehicles and Buses
<b>LIGHTING</b>			
10	Lighting	R48	Passenger Cars and Vans + Commercial vehicles and Buses

<sup>1</sup> Prepared by EDB.

Source: Islamic Republic of Pakistan Vehicle Safety and Exhaust Gas Standards Formulation Advisor Business Report

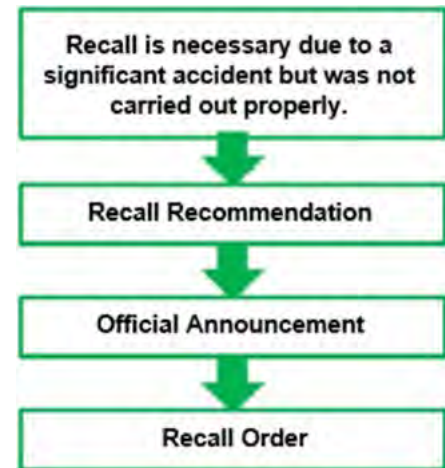
Regarding the recall system, referring to the many proven cases in Japan, the functions are (1) collection and analysis of vehicle defects, (2) investigation of the recall status of vehicle manufacturers, (3) if the status of the recall is inappropriate, provision of guidance or audit, etc.; (4) if the notification content is inappropriate, instructions for improvement; and (5) if the vehicle manufacturer does not voluntarily recall and accidents occur frequently, it is necessary for the government to make recommendations and orders.

For the above cases, an organization needs to be established to implement many tasks such as confirming the overseas recall structure and implementation status, the enactment of recall system, penalties (imprisonment and fines) for violations of the recall notification obligation, the establishment of a recall order system, and preparation for the development of a technical verification system.



Source: Ministry of Land, Infrastructure, Transport and Tourism (Japan)

**Figure 3.3.3 Flow of Recall Notification in Japan**



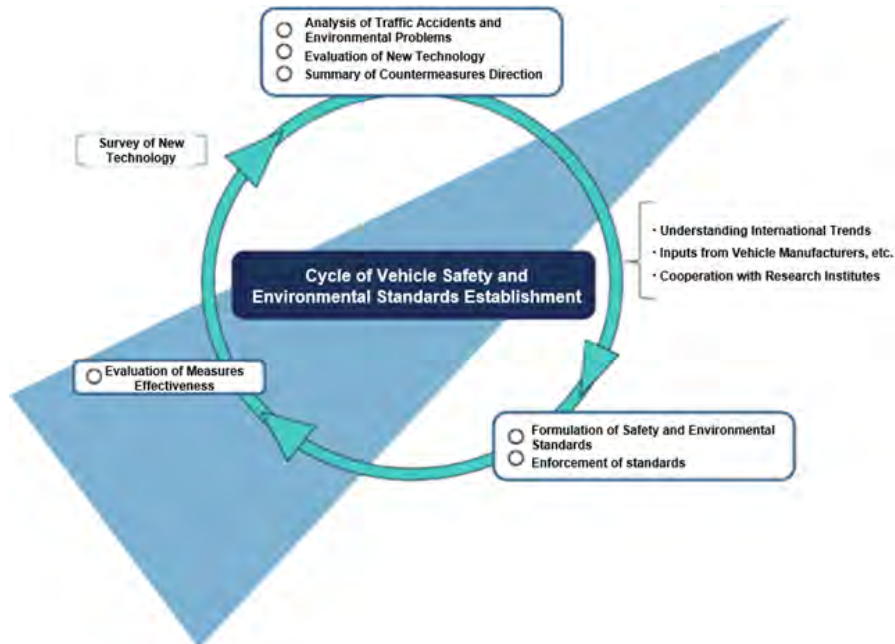
Source: Ministry of Land, Infrastructure, Transport and Tourism (Japan)

**Figure 3.3.2 Recall Recommendations and Orders in Japan**

Regarding vehicle inspection, the government should confirm that the vehicle complies with the standards to move safely and without adversely affecting the environment. There are three types of inspections: a new-vehicle inspection; a continuous, periodic vehicle inspection; and a structural change inspection for modified vehicles when the length, height, width, maximum load capacity, etc. of vehicles are changed.

In Pakistan, VICS (Vehicle Inspection & Certification System) is being conducted for commercial vehicles continuously. In order to upgrade the inspection level, the Punjab Department of Transportation has signed a contract with the Swedish company Opus Inspection (Pvt.) Limited to introduce a new system of vehicle testing facility using the latest equipment and inspectors trained in-house by internationally qualified vehicle inspection specialists. Pakistan's vehicle inspection system is basically already in place, and it is desirable to expand systematically the inspection requirements of passenger cars, new vehicles, structural change areas, and digitization of registration.

If a vehicle certification system (Table 3.3.5) can be realized, the automobile technology related to safety and environment of the country will improve. The cycle of safety and environmental performance as shown in Figure 3.3.4 possibly can be constantly improved on and is being adopted by many advanced automotive countries including Japan. Besides learning new technologies, the needed inputs are an analysis of traffic accidents and environmental problems, an evaluation of new technologies, and the direction of measures. Furthermore, following international trends, the opinion of vehicle manufacturers, collaboration with research institutes, etc. are required to formulate safety and environmental regulations that reflect UN regulations. Several years from now, while the effectiveness of the measures is being evaluated, it is possible to improve the safety and environmental performance of vehicles produced in Pakistan by repeating the same cycle to learn emerging technologies.



Source: Ministry of Land, Infrastructure, Transport and Tourism Lecture Material Onoda Automobile Bureau Technical Policy Division Vehicle Standards Agreement Countermeasure Officer

**Figure 3.3.4 Ideal Cycle to Improve Safety and Environmental Performance in the Automotive Industry**

The final ideal process for the introduction of UN regulations is shown in Figure 3.3.4, but in Pakistan, it is still in the preparatory stage, and it is important to proceed steadily in stages. Chapter 5 proposes a draft roadmap to advance to the fourth stage.

### 3.3.4 Auto Parts Industry

#### (1) Low quality

As mentioned in Section 2.2.3 in Chapter 2, quality improvement is a prerequisite for auto parts industry promotion. In addition to rehabilitation of equipment, improving maintenance technology and managing field work are also important. Especially, there are few manufacturing companies like casting, forging, and stamping in the upstream industry. Therefore, technical support and industrial development should be prioritized.

#### (2) Lack of midlevel managers

In many overseas factories, the organization is completely divided into top management and shop floor workers. Therefore, midlevel managers (supervisors), who are responsible for smooth communication with and connection between top management and floor workers, should be developed. In addition, there is a lack of corporate culture to meet the customer's requirement appropriately. Therefore, the development of management is one of the most important issues.

#### (3) Import dependence

Looking at the domestic auto parts industry, Pakistan heavily relies on imports of engines, drivetrains, and electronic components. They are high value-added products with high precision and high quality. Local procurement of these products has not improved so far. If Pakistan could produce them under a low wage condition and export them to other countries in the future, it would become a strength of their country.

#### (4) In-house production by OEMs

There are high value-added products (body and engine parts) produced in Pakistan, but these are in-house products by OEMs. In general, suppliers produce and assemble these products by themselves. However, these products cannot be outsourced because the quality of local supplies does not meet customers' requirements.

#### (5) Undeveloped parts industry for next-generation cars (HV, PHV, EV)

Table 3.3.8 shows the major parts of EVs<sup>14</sup>. Because existing parts manufacturers do not produce any such parts, when next-generation cars are introduced in Pakistan, repair shops will not have any know-how in fixing them. These are also the issues to be solved.

**Table 3.3.8 Unnecessary and Necessary Parts of EVs**

Unnecessary Part	Necessary Part
<b>[Engine parts]</b> -Engine block, engine head -Piston, accessories -Fuel injection device -Crankshaft, camshaft -Lubrication device, cooling system -Intake and exhaust device (Carburetor, Manifold, Supercharger, Turbocharger, Scarf) -Ignition system (Starter, spark plug) <b>[Drive, Transmission, Control Device Parts, etc.]</b> -Manual transmission (MT) -Automatic transmission (AT) -Transmission parts -Clutch -Fuel tank	-Power electro unit (Drive inverter, DC-DC converter) -In-vehicle charger -Lithium-ion battery -Battery control unit -Power electronic control unit (PCU) -Motor

Source: JICA Study Team based on Japan Finance Corporation (JFC) Report, No.2010-4 "New developments in the automobile industry including EV and Trends of parts suppliers"

### 3.4 EV Policy

This section compares the scope of the draft EV policy and past policies for the auto industry, incentives of the draft EV policy, opinions of motorcycle and three-wheeler manufacturers, and status of EV policy introduction.

#### 3.4.1 Comparison of Scope between EV Policy and Previous Policies for the Automobile Industry

As shown in the draft 2020-2025 EV policy (hereinafter referred to as EV policy) passed by the ECC in June 2020, the views of the Ministry of Climate Change (MOCC) and MOIP's EDP on the promotion of EVs are divided. The former wants to promote EVs in full scale, whereas the latter regards EVs as unrealistic in light of the current state of the automobile industry. The AIDC proposed to include hybrid vehicles, but it was not included in the draft EV policy; only motorcycles/three-wheelers and heavy commercial vehicles (hereinafter called HCVs) are targeted. Two-wheeled vehicles comprise motorcycles (HS Code: 87.11),

<sup>14</sup> Japan Finance Corporation (JFC) Report, No.2010-4 "New developments in the automobile industry including EV and trends of parts suppliers."



and three-wheelers cover three-wheeled rickshaws (8703) and loaders (8704). Meanwhile, HCVs consist of buses and trucks.

In the AIDP and the ADP, four-wheeled vehicles are mainly the focus. Although these policies mentioned that the production and sales of two-wheelers have increased remarkably in recent years with high deletion rate, three-wheelers have not been discussed significantly, and both two and three-wheelers were not eligible for incentives. The EV policy targets motorcycles, three-wheelers, and HCVs that are being domestically produced, while four-wheeled vehicles will be considered in the next ADP.

**Table 3.4.1 Treatment of Motorcycles, Three Wheelers, and HCVs in Pakistan's Automotive Policies**

Item	AIDP	ADP	Draft EV Policy
Position of motorcycle, three-wheeler, and HCV	<ul style="list-style-type: none"> <li>- Motorcycle is mentioned in the Five-Year Tariff Plan.</li> <li>- Three-wheelers and Rickshaw are not mentioned.</li> <li>- HCV (Truck and Bus) is mentioned in the Five-Year Tariff Plan.</li> </ul>	<ul style="list-style-type: none"> <li>- Production Target               <ul style="list-style-type: none"> <li>Motorcycle: 2.5 million units</li> <li>Three-wheelers: N/A</li> <li>Buss: 2,200 units</li> <li>Truck: 12,000 units</li> </ul> </li> <li>- Sales and production trends on motorcycle and three-wheelers are mentioned but they are irrelevant with the policy.</li> </ul>	<ul style="list-style-type: none"> <li>- Motorcycle, three-wheeler, and HCV are mainly considered in order to enforce the EV Policy.</li> <li>Main reasons :               <ul style="list-style-type: none"> <li><b>【Motorcycle, three wheeler】</b></li> <li>i) Most of the parts of motorcycles and three-wheelers have been domestically produced except for the main parts.</li> <li>ii) Batteries for motorcycles and three-wheelers are relatively inexpensive</li> <li>iii) Motorcycles and tricycles move around the city, and investment in related infrastructure is limited.</li> <li><b>【HCV】</b></li> <li>- HCV is expensive. Buses are used on some routes of urban transportation such as BRT to reduce the burden on the environment, and trucks are assumed to be 1-ton trucks that move around the city in the short term.</li> </ul> </li> </ul>
Incentives	N/A	<ul style="list-style-type: none"> <li>- Motorcycle: If motorcycle manufactures fall under Category A (Green field), it is subject to tariff rates under S.R.O693 (I) / 2013. Under the condition that the manufacture complies with the 5-year localization plan that has been officially approved by MOIP, subcomponents and components in the form of kits will be exempt from tax for 5 years from the time new entrants commence production. (S.R.O939(I) /2013, S.R.O 940(I)) /2013)</li> <li>- Three-wheeler: N/A</li> <li>- HCV (Bus, Truck): The tariff rates applied to non-domestic parts are applied to all imported parts for 3 years for both Category A (Green field) and Category B (Brown field).Z6</li> </ul>	<ul style="list-style-type: none"> <li>- There are only tariff policies for motorcycle, three-wheelers and HCVs, and no subsidies are granted for consumers or OEMs.</li> <li>- Motorcycles and three-wheelers: The tariff rate on EV-related parts is 1% which will be maintained until 2025.</li> <li>- HCV: incentives of ADP will be maintained for buses and trucks, and tariff system is expected to be published after the announcement of AIDEP.</li> </ul>

Item	AIDP	ADP	Draft EV Policy
Issues	The Five-Year Tariff Plan was not implemented.	- HCV (Truck, Bus) is imported in large numbers whereas domestic production is small depending on the year.	- Insufficient funds for import substitution (domestic production of EV parts) for the purpose of reducing parts prices. - Equipment standardization, quality and safety - Installation of charging station - Battery processing

Source: AIDP, ADP, EV Policy (draft)

According to the EV policy, the reason why motorcycles and three-wheelers were targeted first is that most of the parts, except for core parts, have already been domestically produced, and some manufacturers have a track record of exports of three wheelers to Sri Lanka and Bangladesh. Expensive batteries are the bottleneck for promoting EVs, but it is recognized that batteries for motorcycles and three-wheelers are relatively inexpensive. In addition, since motorcycles and three-wheelers are mainly used for city movement, it is recognized that related capital investment in infrastructure has been limited. Production of motorcycles increased from 1.7 million units in 2013–2014 to 2.44 million units in 2018–2019, while three-wheelers increased from 50,000 to 120,000 units in the same years. On the other hand, regarding HCVs, the number of buses increased from 780 to 1,100 whereas the number of trucks increased from 3,400 to 6,100 during the same period.

The issues pointed out in the EV policy are lack of funds for import substitution (domestic production of EV parts) for the purpose of reducing parts prices; promoting standards, quality, and safety of equipment; installing charging stations; and treating harmful batteries; and others. As for the standards, WP29 will be adopted for motorcycles and three-wheelers. The PSQCA is expected to formulate standards in line with international standards and to enforce the law.

### 3.4.2 Incentives indicated in the EV Policy

The incentives for motorcycles and three-wheelers listed in the draft EV policy are shown in tables 3.4.2 and 3.4.4. The EV policy mainly focuses on tariff policies and does not propose subsidies for consumers or OEMs. The tariff on EV-related parts for motorcycles and three-wheelers is 1%, which will be unchanged until 2025.

**Table 3.4.2 Preferential Measures for Motorcycles and Three Wheelers in the Draft EV Policy**

Description	Category	Proposal
CKD Non-Localized	Normal	15% customs duty
CKD Localized	Normal	46% customs duty
Motor with differential, gearbox, motor controller, accelerator paddle, battery LiFePO4 or polymer (industrial grade), battery management system, charger	EV-specific	1% customs duty
- Sales tax to be fixed at 1% for locally manufactured 3 wheelers - Sales tax at import stage for CKDs to be waived		

Source: Electric Vehicle Policy 2020-2025 (DRAFT) 2-3 Wheelers & Heavy Commercial Vehicles, June 2020

**Table 3.4.3 Tariff Changes for Motorcycles and Three-wheelers in the Draft EV Policy**

(Unit: %)

	Description	Existing	2020–2021	2021–2022	2022–2023	2023–2024	2024–2025
1	Raw material	1	1	1	1	1	1
2	Component Sub-Component	10	10	10	10	10	10
3	Sub-assembly	20	20	20	20	20	20
4	CKD (EV-specific)	1	1	1	1	1	1
5	CKD (Non-Localized)	15	15	15	15	15	15
6	CKD (Localized)	46	46	46	46	46	46
7	CBU	50	50	50	50	50	50

Source: Electric Vehicle Policy 2020-2025 (DRAFT) 2-3 Wheelers &amp; Heavy Commercial Vehicles, June 2020

On the other hand, HCVs are given a different strategy from motorcycles and tricycles because of their high prices and long mileage. In Pakistan, buses are used only for urban transportation, while BRT systems are being considered for future implementation in Lahore and Islamabad, which means that bus mileages are short. The draft policy mentioned that one-ton trucks would be used in the city in the next two to three years. However, it also mentioned that EV vehicles have not been imported into Pakistan due to the country's underdeveloped infrastructure.

At present, the main incentives for buses and trucks as indicated in the draft EV policy are shown in Table 3.4.4. These are the same as the incentives shown in the ADP, and the contents are common for buses and trucks. The tariff system will reportedly be shown after the publication of AIDEP.

**Table 3.4.4 Incentives for HCVs in the Draft EV Policy**

Bus	Truck
Import of all parts (both localized and non-localized) at 1% customs duty applicable to non-localized parts for manufacturing of electric buses.	Import of all parts (both localized and non-localized) at 1% customs duty applicable to non-localized parts for manufacturing of trucks till announcement of AIDEP.
The electric buses will have no registration fees or annual token tax.	The electric trucks will have no registration fees or annual token, tax i.e., renewal fee.
The sales tax on locally assembled buses to be 1% upon purchase by end user, whereas exemption from sales tax at import stage is to be granted.	The sales tax on locally assembled electric trucks/prime movers to be fixed at 1% upon purchase by end user; the import of inputs/CKDs to be exempted from sales tax.

Source: Electric Vehicle Policy 2020-2025 (DRAFT) 2-3 Wheelers &amp; Heavy Commercial Vehicles, June 2020

### 3.4.3 Views of Motorcycle and Three-Wheeler Manufacturers

Japanese motorcycle manufacturers had a negative view on the feasibility of EV policies targeting motorcycles<sup>15</sup>. Compared to four-wheeled vehicles, the commercialization of electric motorcycles does not see much progress in the world. Unlike four-wheeled vehicles, two-wheeled vehicles do not have much space on which to load batteries, have a mileage of about 30 km, and the price is doubled. Taiwan is the most advanced country in terms of popularizing electric motorcycles. With the support of the government, the installation of charging stations is progressing. Electric motorcycles have gradually become popular due to government subsidy which covers 20 to 30% of the sales prices.

<sup>15</sup> Interview with Japanese motorcycle manufacturers in September 2020.

The draft EV policy states that there is a possibility of using Chinese OEM standards. However, it remains unclear whether three-wheelers in the policy refer to those that are widely used in China for commuting, which have short mileages, or for commercial use or electric motorcycles that move between cities.

The electric tricycle has the same problems as the two-wheeled vehicles, i.e., limited space for mounting the battery, short mileage, and high battery prices. According to a local tricycle manufacturer, although an EV policy was drafted, the problems on charging and safety standards have not been addressed. While the development of EV tricycles in Pakistan is underway, core parts, such as batteries are imported from China, and the local procurement rate is low. In addition, prices are higher than those of existing traditional tricycles, so demand should not be expected at this time.

EVs are not sold in Pakistan. Electric three-wheelers, which are one of the targets of the draft EV policy, are still being developed by local manufacturers and have yet to be introduced in the market<sup>16</sup>. An existing model deploys rechargeable battery, but replaceable battery has also been developed. As the Pakistani government has yet to stipulate battery standards and while the price of electric three-wheelers is still expensive, local manufacturers are not yet ready to sell three-wheelers in the Pakistani market. Batteries, which are a core part, are mostly imported from China and Korea, and the cost accounts for more than half of vehicle prices.



Source: Sazgar Engineering Works Limited

**Figure 3.4.1 Electric Three-wheelers Developed in Pakistan**

### 3.4.4 Status of EV Policy Introduction

In the following parts, the draft provisions of the EV policy for both two-/three-wheelers and HCVs announced in June 2020, are discussed, as well as those for passenger vehicles and LCVs announced at the end of 2020.

#### (1) EV Policy for Two-/Three-wheelers and HCVs

The focus of the draft EV policy is on incentive provision, that is, exemption from import

<sup>16</sup> Interview with local three-wheeler manufacturers on 2 December 2020.

duties, and not the subsidies to facilitate consumers' purchase. It may likewise be pointed out that other EV technologies, such as HEVs and PHEVs, are not included in the policy.

It is doubtful that EV use will become common in Pakistan anytime soon merely because of the existence of an EV policy. Considering the income level of Pakistanis, it is unrealistic to popularize EV use at this stage. In view of local incomes and technological levels, a strategic shift to EV (or xEV) use, which will promote investments and develop supporting industries, industrial human resources, and infrastructure,<sup>17</sup> is sorely needed.

In recent years, several countries (e.g., U.S.A., China, European and ASEAN ones) have attempted to introduce a variety of policy measures to popularize EVs. For instance, in Indonesia, a range of special treatment measures (e.g., luxury-tax exemptions) have been introduced. In Thailand, the rate of commodity tax for EVs was reduced to 2%, and 50% for HEVs and PHEVs. Even in a middle-income country like Thailand, however, there is a low possibility at this stage for EVs to become commonplace among general consumers. In general, the prices of EVs are higher than those of motor vehicles with internal combustion engine (ICE). Even the price of the highest-grade model of Toyota's Yaris, a typical eco-car, is approximately THB619 thousand (approximately USD20,000 or JPY2.1 million), while that of Nissan's Leaf is approximately USD61,545 or JPY6.8 million, which is sold likewise in Thailand. The price of the Leaf is three times that of the Yaris.<sup>18</sup> Obviously, the price gap is very wide between EVs and motor vehicles with ICE, although every country has different import duties, and such gap differs from one country to another. Meanwhile, HEVs are likely to become more common faster than EVs. Table 3.4.5, which indicates the recent trends in ownership in the Thai market, shows that HEVs are more popular than EVs.

**Table 3.4.5 Trends in Ownership of HEVs and EVs in the Thai Market**

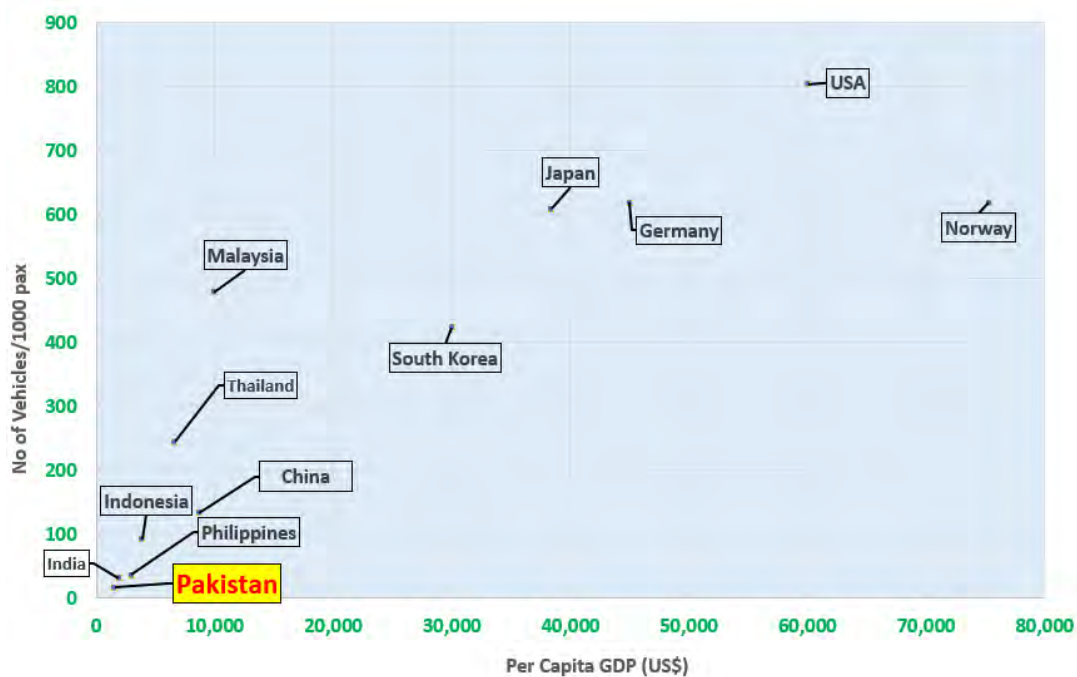
Vehicle	2014	2015	2016	2017
HEV	63,000	70,000	79,000	101,000
EV	36	50	54	82

Source: JICA Study Team (based on Ohta, Shino (2019) "The Impact of Thai EV promotion Policy on the Thai Auto Industry," No.3, July 2019, Economic Institute of the Society for the Promotion of Machine Industry)

Pakistan's EV policy does not include any subsidy to encourage consumers to purchase automobiles. In China, its government has become financially burdened due to this. Therefore, this may not become the case with Pakistan. On top of that, the COVID-19 pandemic has internationally made general consumers more price-sensitive. In view of the relatively high prices of EVs, they are unlikely to become common among consumers in Pakistan which is one of the low-income countries (Figure 3.4.2).

<sup>17</sup> "EVs" normally refers to the battery electric vehicles (BEVs). Meanwhile, xEVs include BEVs, HEVs, FCVs, etc. For details, please refer to the following URL (access: April 24<sup>th</sup>, 2021): <https://www.enecho.meti.go.jp/about/special/johoteikyo/xev.html>

<sup>18</sup> Foreign exchange rate: One Thai baht=JPY 3.38. (October 12<sup>th</sup>, 2020)



Source: JICA Study Team (based on Japan's Ministry of General Affairs [2020] "World's Statistics 2020")

**Figure 3.4.2 Per Capita GDP of Major Automobile-producing Countries and 2017 Automobile Ownership**

**(2) EV Policy for Passenger Cars and LCVs**

The draft EV policy does not mention passenger cars, except for HCVs. According to a report, the provisions for four-wheeled vehicles, which were approved by the ECC, were announced by the MOIP in December 2020<sup>19</sup> and the period will be in effect until 30 June 2026. The incentives are shown in Table 3.4.6.

**Table 3.4.6 Incentives approved by ECC**

<ul style="list-style-type: none"> <li>• Removal of additional customs duty and AST on imports of EV cars</li> <li>• Only 1% tax on import of EV parts for local manufacturers</li> <li>• No registration and annual renewal fee for EVs in Islamabad</li> <li>• 1% sales tax for local made EVs up to 50kwh and light commercial vehicles up to 150 kwh</li> <li>• Only 1% duty on import of charging equipment</li> <li>• No federal excise duty (FED) on electric vehicles</li> <li>• Duty free import of plant and machinery for manufacturing of EVs</li> </ul>
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Source: Govt Announces Massive Tax Exemptions for Electric Vehicles, Pakwheels.com, dated on December 22 2020

AIDEP is also expected to include HEVs, which are not mentioned in the June 2020 draft EV policy. Various incentives will be prepared for vehicles above and below 1,800cc. The EDB also stated that it has made a proposal to eliminate additional tariffs, additional sales tax, and FED for the next ADP.

<sup>19</sup> Government proposes major tax exemptions for Electric Vehicles, Profit, December 23, 2020

## 4 Analysis of Status and Issues in Policies and Implementation Systems

### 4.1 Protection Policy in Malaysia

The automotive industry in Malaysia is domestically oriented, with 85-90% of the two main players', Proton and Perodua's, production being sold locally. In 2002, four of the 13 automotive assemblers in Malaysia, i.e., Proton, Perodua, Hicom MTB, and INOKOM, accounted for 80% of total number of sold commercial vehicles and passenger cars. The dominance of these companies is due to the government's policies of promoting and protecting the local industry. Malaysia is one of several countries restricting the import of auto parts, in tandem with broader restrictions on vehicle imports. Malaysia's automotive industry is protected through the mechanisms listed in Table 4.1.1.

**Table 4.1.1 Malaysia Automotive Industry Protection Policy**

Malaysia Automotive Industry Protection Mechanisms	
1. Approved Permit (AP) (import license)	4. High import tariffs
2. Mandatory Deleted Item (MDI) Policy	5. Manufacturing license restriction
3. Local Material Content Policy (LMCP)	6. Customized incentives

Source: MITI

#### (1) Import License (Approved Permit (AP))

Since the 1970s, importing completely built-up units (CBUs) has required import licenses. To import motor vehicles, an AP (import license) must be obtained from the Ministry of International Trade and Industry (MITI). The government allows holders of open APs to import 6% of the country's total industry volume (TIV) or 35,000 vehicles. Based on quotas, the system effectively limits importing CBUs. However, the type of automotive parts or components requiring import licenses is quite limited. Malaysia also maintains import bans on motor vehicles from some countries, including South Africa and Israel. Since 2010, an open AP is charged with a levy of MYR10,000 (approx. JPY255,800)<sup>1</sup>. Malaysia has collected MYR2.7 billion (approx. JPY69.66 billion) from the open APs' levy for the period between 2010 and 2017, or an average of MYR350 million (approx. JPY8.95 billion) collected every year from 35,000 APs.

#### (2) Mandatory Deleted Item (MDI) Policy

The Mandatory Deleted Items (MDI) Policy was introduced in 1980 and was phased out on 1 January 2004 under the WTO agreement on Trade Related Investment Measures (TRIMs). This MDI policy prohibited car assemblers and franchise holders from importing components listed as 'mandatory' for use in local assemblies. There were 30 items on the list (Table 4.1.2) covering parts and components, which manufacturers and assemblers had to source locally. The regulation was introduced to create a pool of suppliers which manufacturers and assemblers could rely upon for a speedy delivery of parts and components at competitive costs. As a result of this policy, there were a number of manufacturers who have acquired the capability to supply, for example, batteries and seat belts, even to overseas markets.

<sup>1</sup> Exchange rate: MYR1=JPY25.58 (16 December 2020).

**Table 4.1.2 Mandatory Item List**

A. Competitive items (11)	B. Non-competitive items (19)	
1. Coil spring	1. Air filter	12. Starter motor
2. Exhaust system	2. Alternator & voltage regulator	13. Tubeless tire valves
3. External body protective molding	3. Battery	14. Tubing for brake, clutch & fuel
4. Flasher relay	4. Carpet & underlay	15. Tires
5. Fuel tank	5. Horn	16. Wheel nuts
6. Glasses	6. Leaf spring	17. Wiper motor
7. Melt damping sheet	7. Mud flaps	18. Wire harness
8. Seat & slide assemblies	8. Radiator	19. Bolts assemblies comprising spring pins & shackle pins/bolts & shackle assembly for commercial vehicles.
9. Seat pads	9. Radiator hoses	
10. Shock absorbers	10. Seatbelts	
11. Windscreen washer	11. Spark plugs	

Source: MITI

### (3) Local Material Content Policy (LMCP)

The Local Material Content Policy (LMCP) was introduced and adopted in 1992 to enhance the development of a parts and components industry locally. The LMCP only specifies the levels of locally sourced components that must be met by the assemblers in their vehicles but leaves the type of component to be integrated at the discretion of the assemblers (Table 4.1.3). At the time, the required local content for non-national cars was 30-45% and about 80% for national cars, and the local content requirements for non-Proton assemblers included 30 mandatory items. Under the WTO Agreement on TRIMs, the local content requirement of 45-60% for passenger and commercial vehicles, as well as the Mandatory Deleted Item Policy, must be phased out by 1 January 2004. Malaysia received an extension of its TRIMs deadline to remove the local content requirements until the end of 2004. It was also granted a two-year extension on its commitments under AFTA to reduce tariffs on certain vehicles to 20% by 2005 and to reduce all tariffs to 0-5% by 2008. There are about 350 component manufacturers supplying OEMs, as well as the replacement and export markets, and producing more than 3,000 automotive parts.

**Table 4.1.3 Classifications under LMCP**

Classification		Local Content
Category I	▪ Passenger vehicles up to 1,850 cc	60%
Category II	▪ Passenger vehicles 1,851-2,850 cc ▪ Commercial Vehicles up to 2,500 GVW	45%
Category III	▪ Passenger vehicles above 2,850 cc ▪ Commercial Vehicles above 2,500 GVW	Localization of mandatory parts list items only

Source: MITI

### (4) High Import Tariffs

Malaysia has a tax structure (Table 4.1.4) that penalizes imported cars to encourage the setting up of local vehicle assembly plants to create more jobs. In 1993, the ASEAN Free Trade Area (AFTA) was officially initiated, which provides for, among others, a maximum of 5% import tax for goods imported from any of the other six ASEAN member-states by 2003. Malaysia signed it in 2004. To qualify for the low tariff under AFTA, automotive imports must satisfy the local content requirement, and at least 40% of the product's content must originate from any single or cumulative ASEAN member-states. ASEAN has granted a two-year extension on Malaysia's commitments under AFTA and allowed to wait until 2005 to reduce tariffs on certain vehicles to 20% and until 2008 to reduce all tariffs to 0-5% (tables 4.1.5 and 4.1.6).



**Table 4.1.4 Automobile Tax Structure (2000)**

Type of Vehicle	Import Duty		Excise Duty (CKD & CBU)		Sales Tax
	CKD	CBU	Graduated Schedule Based:		
Passenger Car	42–80%	140–300%	- 1 <sup>st</sup> MYR7,000 x 25% - 2 <sup>nd</sup> MYR3,000 x 30% - 3 <sup>rd</sup> MYR3,000 x 35%	- 4 <sup>th</sup> MYR7,000 x 50% - 5 <sup>th</sup> MYR5,000 x 60% - Balance MYR x 65%	10%
4WDs & MPVs	10–40%	60–200%	45%		
Vans	5–40%	42–140%	30%		

Source: MITI

Furthermore, a 50% reduction of the excise tax for national cars was done as well as the above-mentioned protection policies. A 5-30% import duty was imposed on auto parts and components and tied to local content regulations. A 13% import duty was applied to parts and components used in national cars and CKDs. Commercial vehicles were exempted from excise taxes. A minimum 25% deposit to purchase non-national cars was necessary with a maximum loan of 4 years. National car buyers got a maximum 7-year loans. However, Malaysia quietly raised excise duties, which are not covered under the agreement, thus maintaining prices. The only real beneficiary of AFTA were pick-up trucks, which under Malaysian tax laws, were exempted from excise duties because they are considered as commercial vehicles. It also explains why pick-up trucks are the only type of car whose prices mirror the ones sold in countries with liberalized markets. Malaysia also has a free trade agreement (FTA) with Japan, and all Japan-made cars can be imported without import tax. To qualify for import duty exemptions under the Japan-Malaysia FTA, a Japan-made car must have at least 70% of its total parts value originating from Japan.

**Table 4.1.5 Automobile Tax Structure (2004–2005)**

(%)

Vehicle Type	Import Duty CKD				Import Duty CBU				Excise Duty		Sales Tax
	ASEAN		Non-ASEAN		ASEAN		Non-ASEAN		All Vehicle		
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	
PC	25	0	35	10	70–190	20	80–200	50	60–100	90–250	10
MPV/VAN	0–10	0	5–20	5–10	40–120	20	60–130	50	30–90	40–170	10
4WD	10	0	20	10	40–110	20	60–130	50	50–90	60–170	10

Source: MITI

**Table 4.1.6 Automobile Tax Structure (2006–2007)**

(%)

Vehicle Type	Import Duty CKD				Import Duty CBU				Excise Duty		Sales Tax
	ASEAN		Non-ASEAN		ASEAN		Non-ASEAN		All Vehicle		
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	
PC	0	0	10	10	5	5	30	30	75–125	75–105	10
MPV/VAN	0	0	0–10	0–10	5	5	30	30	60–125	60–105	10
4WD	0	0	10	10	5	5	30	30	65–125	65–105	10

Source: MITI

The ASEAN Trade in Goods Agreement (ATIGA) was signed in February 2009 and took effect from May 2010 (Table 4.1.7). The ATIGA replaced the earlier Agreement on Common Effective Preferential Tariff of the ASEAN Free Trade Area (CEPT-AFTA) scheme signed in 1993.

**Table 4.1.7 Automobile Tax Structure (2010–2019)**

Vehicle Type	Import Duty				Local Taxes	
	CBU		CKD		CBU & CKD	
	MFN	ATIGA	MFN	ATIGA	Excise Duty	Sales Tax
Passenger Cars	30	0	10	0	75–105	10
Other Motor Cars	30	0	0–10	0	60–105	10
Commercial Vehicle	30	0	0	0	0	10

Source: MITI

**(5) Manufacturing License Restriction**

All new manufacturing licenses can only be issued after over-capacity in the domestic automotive sector was addressed as stated in the NAP 2006. OEMs were not allowed to let third parties without license use or make available their existing excess capacity to assemble new models that compete directly with those produced by national OEMs. If an increase in production capacity is required, companies in the high-volume and middle-volume segments were encouraged to use existing excess capacity. Only new assembly facilities were allowed on a strictly case-by-case basis. The NAP 2009 came up with the aim of fostering a more competitive industry and a freer market (liberalization). The freeze on the issuance of new manufacturing licenses was lifted for passenger vehicles with engine capacities of 1,800 cc and above and OTR prices of not less than MYR50,000.

**(6) Customized Incentives**

The Government of Malaysia started to move away from menu-based fixed incentives which was the practice of giving specific tax incentives for models to be assembled locally—based on the level of local production of parts and kits—towards customized incentives for potential investments in the auto sector since the launch of NAP 2014. Under this new scheme, the Malaysian Automotive, Robotic and IoT Institute (MARii) was tasked with evaluating applications for incentives and vetting them using cost-based analysis (CBA). The CBA calculation includes the value of investment by the foreign brand, level of local production, export plan, number of jobs to be created, amount of taxes the government will get from the sale of the models, and tax revenue foregone based on the incentives requested. MARii recommends whether a company should be given the tax incentives it requests. Local automotive players generally accepted the move because they were allowed to seek tax incentives directly from the Ministry of Finance (MOF), enabling speedy approvals and clear incentives. However, local assemblers of foreign vehicles received less incentives than they expected.

With higher production and sales, manufacturers receive larger incentives but most of the new manufacturers start with a smaller scale of investment to see the local market potential before deciding on bigger investment. They can apply for new and bigger incentives once they are ready to increase investment in bigger production and sales.

**(7) Status of Protection Policy in Malaysia**

Local car manufacturer protection still exists, although the Malaysian government has announced the liberalization of the automotive industry since NAP 2009 and the participation in ATIGA since 2010. The reasons are the following:

(1) Higher excise duty was imposed since 2010 (after the reduction of import duty, according to ATIGA), but car manufacturers with higher local content are entitled to get more rebates on excise duty which has given huge advantages to Proton and Perodua.

(2) An attempt to increase excise duty for CKD vehicles through "Excise (Determination of value of locally manufactured goods for the purpose of levying excise duty) regulations 2019" gazetted by the previous government (MOF) in January 2020 but was opposed by OEMS, manufacturers etc. This forced the government to hold it until the end of 2020. It is expected to be imposed in 2021 but due to the coronavirus pandemic, the effectivity may be extended. Under the new regulations, importers of CKD vehicles will pay more taxes. This is because calculating the open market value (OMV) of a vehicle has changed; new components have been added into the OMV calculation. Under the new regulations, determining duties will now take into account not just the profit and general expenses incurred in the manufacture of a vehicle but also the sales and marketing costs of a particular model at the distributor level. As excise duty is levied on a car's OMV, the base price's increase will also raise chargeable excise duties and final car prices. A rough figure would be CKD cars costing around 12–15% more with this new way of calculating OMVs.

#### (8) Tariffs for the Automotive Industry in Malaysia, Indonesia, and Thailand

The major items of the current tariffs classified by the Harmonized Commodity Description and Coding System (HS code) in Malaysia, Indonesia, and Thailand are summarized in Table 4.1.8. Since the items are categorized in detail by HS code, the tax rates in some items are shown in a range.

As shown in Table 4.1.7, Malaysia has different tax rates mainly for CKD and others (CBU). Including parts, the tax rate is generally 30%, but the tariff on CKD is about 10%, and by giving preferential treatment to CKD, the country aims to become an automobile production base. Similarly, Indonesia has set a tariff of 10% or less for CKD, which is a preferential treatment compared to CBU. In the case of Thailand, the tariff on passenger cars (8703), including the car body, is extremely high at 80%, which raises the hurdle of the import. Vehicles for transportation and freight with 10 or more people are also 40%, which is higher than that in Malaysia and Indonesia.

**Table 4.1.8 Tariffs by HS Code for the Auto Industry in Malaysia, Indonesia, and Thailand**

HS number	Description	Malaysia	Indonesia	Thailand
8701	Tractors (Other than tractors of heading 8709)	free (agriculture) 5% (other)	single axle 10, 15 or 35% Road tractors/Track-laying tractors 5% Other 15%	5%
8702	Motor Vehicles for the transport of ten or more persons , including the driver	CKD 10%/free others 30%	CKD 5 or 10% others 20or 50%	40%
8703	Motor cars and other motor vehicles principally designed for the transport of persons (other than those of heading 8702), including station wagons and racing cars	CKD 10% (excl. ambulance 5%, motorhome 35%) others 30-35%	CKD(sedan, station wagon, SUV) 10% Other (sedan, station wagon, SUV) 50%	80% (excl. Ambulance 10%)
8704	Motor vehicles for the transport of goods	CKD free others 30%	CKD 5% or 10% others 10% or 50%	dampers 5% others 40%
8705	Special purpose motor vehicles, other than those principally designed for the transport of persons or goods (e.g. Breakdown lorries, fire fighting vehicles, concrete-mixer lorries, road sweeper, spraving lorries, mobile workshops, mobile radiological units)	30%	5%	10% or 40%
8706	Chassis fitted with engines, for the motor vehicles of headings 8701 to 8705	30% (excl. 8701 and ambulance.free)	8701 5 or15% 8702,8703 10% or 40% 8704 10% or 40% 8705 5%	30%
8707	Bodies (including cabs), for the motor vehicles of headings 8701-8705	30% (excl. 8701 and ambulance.free)	8701 5 or15% 8702,8703 40%	8703:80% other:40%
8708	Parts and accessories of the motor vehicles of heading 8701 to 8705	Free, 5-30%	10%	10% or 30%
8709	Work trucks, self-propelled, not fitted with lifting or handling equipment, of the type used in factories, warehouses, dock areas or airports for short distance transport of goods; tractors of the type used on railswai station platforms; parts of the foregoing vehicles	5%	Vehicle 10% Parts free	Vehicle 20% Parts 10%
8711	Motorcycles (including mopeds) and cycles fitted with an auxiliary motr, with or without side-cars; side-cars	CKD free or 5/10% others 30%	CKD 10% others 30 or 40%	60%
8714	Parts and accessories of the vehicles of heading 8711 to 8713	motorcycle 25% (excl. spokes/nipples 30%)	motorcycle 5-20%	Motorcycle 30%

Source: FedEx

## 4.2 Policies on Automotive Market Development

### 4.2.1 Eco Car- and EV-related Policies in Third Countries

In this section, eco car- and EV-related policies in third countries (i.e., Indonesia, Thailand, and China) are discussed.

#### (1) Indonesia

In 2013, the government of Indonesia announced the Low-Cost Green Car (LCGC) policy to promote the domestic industry by reducing the dependence on imports of finished vehicles and parts, and to promote fuel-efficient and affordable vehicles in the automotive market. The main feature of this policy is to provide incentives of zero luxury tax for car manufacturers to domestically produce one-liter class vehicles. Requirements to enjoy this privilege are as follows:

- ◆ Use brand names, logos, and model names that are associated with Indonesia;
- ◆ Engine displacement of 980–1,200 for a gas-fuelled car; engine displacement of 1,500 or less for a diesel-fuelled car. In either case, fuel efficiency rate should be more than 20 km/L;
- ◆ Use gas with an octane value of more than RON 92 for gas-fuelled car; more than CN 51 for diesel-fuelled engines;
- ◆ Prices of vehicles should be kept less than IDR95 million excluding taxes. On top of this, prices of vehicles with automatic transmission could increase up to 15%, while those on which safety functions, such as air bags or ABS, are mounted could see up to 10% increase;
- ◆ Detailed standards for minimum turning radius, minimum height, and others; and
- ◆ 80% of content of parts are locally made.

The tax exemption measures can be divided into three stages according to fuel efficiency and engine displacement (Table 4.2.1).

**Table 4.2.1 Incentives for LCGCs in Indonesia**

Requirement	Luxury Tax Deduction Rate
Displacement of a range from 1,200 cc to 1,500 cc and fuel efficiency rate at 20 km/L or more (excl. sedans and station wagons)	100%
Gas-fueled cars, diesel-fueled cars, bio-fueled cars, hybrid cars (HEVs), and CNG cars with fuel efficiency rates of 28 km/L or more	50%
Gas-fueled cars, diesel-fueled cars, bio-fueled cars, HEVs, and CNG cars with fuel efficiency rates from 20 km/L to 28 km/L	25%

Source: MarkLines website

Table 4.2.2 lists the vehicles certified as LCGCs under the policy.

**Table 4.2.2 Certified LCGC Models**

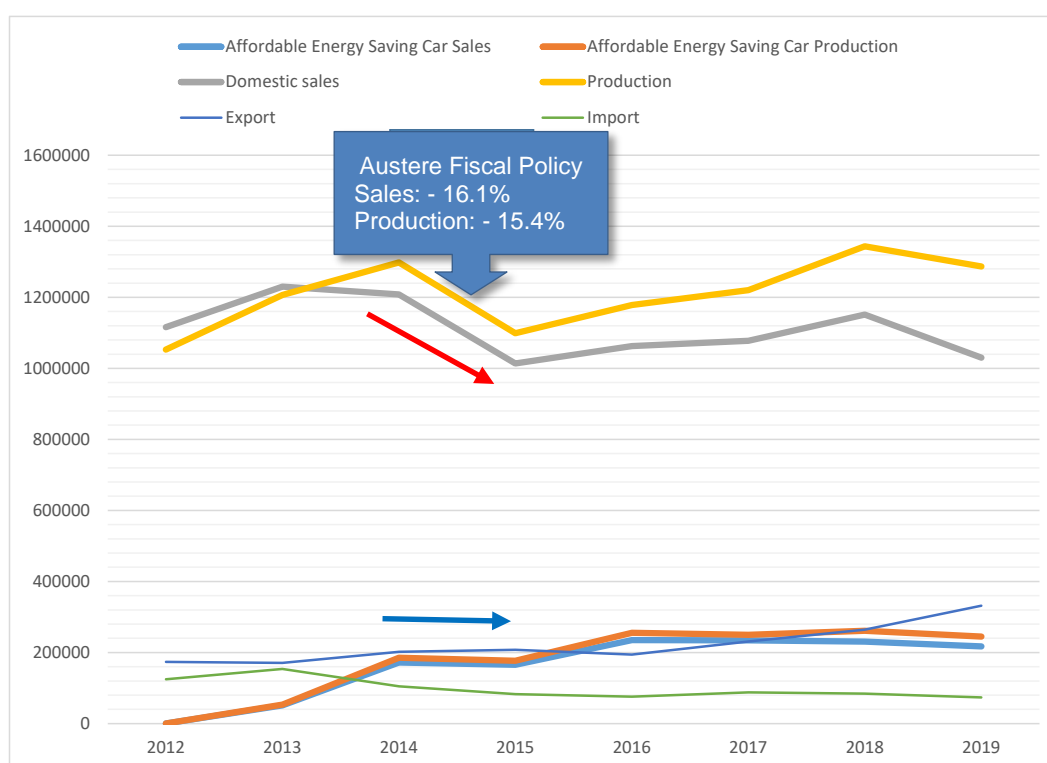
Brand	Model	Sales Price	Other Specifications
Daihatsu	Ayla	For MT Models, IDR76.10 million–97.5 million (approx. USD6,500–8,300); for AT models, up to IDR9 million (approx. USD800) can be added.	Displacement: 998 cc Local content: 84%
	Sigra	-	Typical MPV of A segment with 7 seats

			supplied to Toyota in the name of "Calya". Uses the global A segment platform common with "Ayla"
Toyota	Agya	IDR99 million–120 million (approx. USD8,500–10,300)	Displacement: 998 cc Local content: 84%
	Calya	-	
Nissan Datsun	Datsun Go+	Less than IDR100 million	Displacement: 1,200 cc MPV with 5 doors, 3 row seats, 5 + 2 seats
	Hatchback GoPanca	IDR9.6 million—11 million in Jakarta	Displacement: 1,200 cc
Suzuki	Karimun Wagon R	-	Displacement: 1,000 cc, 5 seats

Source: MarkLines website

The essence of the LCGC policy is to set an upper limit to the selling price range in order to attract customers. Vehicles previously sold for over USD10,000 could be sold for around USD7,500 because of incentives under LCGC policy, making it easier for consumers to purchase cars.

When an Indonesian government official announced the LCGC policy, it was estimated that the sales of LCGC would be 600,000 units in three years and a 15% share in the new car market due to the preferential treatment. Despite the sharp drop of 16% in domestic sales and production volume of all automobiles as a result of an austere fiscal policy in 2015, the sales and production volumes of LCGCs in 2016–2019 stayed strong, selling some 572,725 vehicles, which is significantly close to the estimate, while their share reached 21.7% of the total volume of vehicles sold, which exceeded the estimate (Figure 4.2.1).



Notes: Affordable, energy-saving car sales refers to LCGCs.

Source: Prepared by the JICA Study Team based on GAIKINDO's statistics.

**Figure 4.2.1 Sales and Production of LCGCs in Indonesia (2012–2019)**

The LCGC policy has succeeded in attracting USD30 million in investment from five Japanese companies. In addition, the policy called for the domestic production of 80% or more of parts, including engines and transmissions, within five years from the start of production, so the policy was able to attract new capital investment from major suppliers. During this period, new Tier-1 suppliers, such as ADVICS and NHK Spring, entered the market, and the number of suppliers increased.

In addition, the LCGCs, which went on sale in 2013, have lowered the prices of used cars, which had remained high due to excessive demand. One of the major factors may be that the customer base, who purchased used cars because they could not afford new cars, turned to purchase LCGCs instead.<sup>2</sup>

In 2020, the Indonesian government announced a goal to start EV production in 2022 and to make EVs account for 20% of the total production volume by 2025. It also announced plans to ban the export of nickel ore and promote local businesses to process and commercialize it in the manufacture of EV batteries. In the midst of this trend toward EVs, existing regulations will be revised and will come into effect in October 2021. The real tax rate for LCGCs will be raised from 0% to 3%, and the real tax rate for PHEVs, EVs, and FCVs will be 0%. Preferential treatment will shift from LCGCs to EVs.

Indonesia's LCGC policy is an informative example for Pakistan, where the automotive market is still limited to high-income earners and where motorization has not yet progressed significantly, but which seeks ways to produce environmentally friendly automobiles in the sense that the policy developed a market for new customers, eventually leading to the electrification policy. Currently, in Pakistan, eco car policies, such as the LCGC policy, have not been established; there EV policies only. A silver lining for Pakistan is the Wagon R produced by Pak Suzuki, which is an LCGC-certified model in Indonesia. The JICA Study Team suggests that the first step is for Pakistan to value the low price and low fuel consumption of a local LCGC and to accumulate environmental performance technology and knowledge while aiming to expand the entire automobile market.

## **(2) Thailand**

When it comes to Thailand, its eco car policy (phases 1 and 2) and the promotion of next-generation automobiles are examined in the following subsections.

### **1) Eco Car Policy (Phases 1 and 2)**

The purpose of the 2007 eco car policy (Phase 1) was to provide Thai citizens with eco cars that are cheaper than those available at that time, highly fuel-efficient, and environmentally friendly. Preferential treatment was granted to vehicle makers manufacturing them. The targeted motor vehicles were small cars, which included Yaris (Toyota), Brio (Honda), and Mirage (Mitsubishi). Another aim of this policy was to expand eco car production and promote its export.<sup>3</sup> Meanwhile, its Phase 2 was announced in 2013.

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<sup>2</sup> Mitsubishi UFJ Research and Consulting Co., Ltd., "*shinko Aija shokoku ni okeru jidosha no juyo doko chosa jigyo hokokusho (Report of study on the demands for automobiles in emerging Asian countries)*", Mar. 2016

<sup>3</sup> European emission standards (i.e., Euro 4 and 5) were applied to the target vehicles. Approval was given to them in accordance with size of engine displacement.

**Table 4.2.3 Comparison of Phases 1 and 2 of the Eco Car Policy**

Item		Phase 1	Phase 2
Approval Conditions	Period of Application and Production	Application by Nov 2007	Application by end of Mar 2014 Start of production by end of 2019
	Investment Amount	More than 5.0 billion baht	New entry: 6.5 billion baht Phase-1 applicants: More than 5.0 billion baht (excluding land cost)
	Target Production Volume	Annual production of 100,000 units within 5 years	Annual production of 100,000 units on year 4 & beyond
Eco-Car Standards	Engine Displacement	Gas-powered: Below 1300cc Diesel car: Below 1400cc	Gas-powered car: Below 1300cc Diesel car: Below 1500cc
	Emission Standards	Euro 4	Euro 5
	CO <sub>2</sub> Emission & Fuel Consumption (FC)	Less than 120 g/km (FC: More than 20 km/L)	Less than 100 g/km (FC: More than 23.3 km/L)
Preferential Treatment	Preferential treatment for manufacturers	8-year exemption from paying corporate tax	6-year exemption from paying corporate tax
	Eco-Car Excise Tax	Exemption from tariff for productive equipment Reduced rate of excise tax: 17% (ordinary small cars: 30%) Additional reduction of 14% (2016 and beyond)	

Source: JICA Study Team (based on Mark Lines portal site)

## 2) Thailand's "Automotive Industry: The Next Generation" (Investment Promotion Strategy for EV Production)

The purpose of Thailand's "Automotive Industry: The Next Generation" promotion in 2017 was to promote EV production. The targets covered HVs, PHVs, EV, and core components, e.g., battery management systems (BMSs) and power control units (PCUs). Preferential treatment (e.g., exemption from paying corporate taxes and tariffs on imported production equipment) was given to OEMs and auto-component manufacturers producing vehicle types and key components mentioned in Table 4.2.4.

It can be said therefore that HVs, PHVs, and EVs comprise the third group of priority products (since 2017), following one-ton pick-up trucks and eco cars. The Thai government has intended to promote the production and export of these key products by utilizing the capital from Japanese and other foreign OEMs and auto-component manufacturers.

**Table 4.2.4 New Investment Privileges to Stimulate EV Production (2017)**

Power Train	Exemption from Corporate Tax Payment			Tariff for Production Equipment	Deadline of Application to BOI
	Others	Producers of more than 1 Key Item	Period		
EV	5 to 8-year exemption	1-year exemption per additional item	10 years	Exemption	31 Dec 2018
HV	No exemption				31 Dec 2017 (conditional extension until 31 Dec 2019)
PHV	3-year exemption	1-year exemption per additional item	6 years		31 Dec 2018

Source: JICA Study Team (based on Mark Lines portal site)

The Thai government has intended to establish its own position as the world's production hub of eco cars,<sup>4</sup> even with the knowledge that neighbouring countries have also attempted

<sup>4</sup> For details, please refer to Ota, Shino (2019) "Consider the Impact of Thailand's "The Next-Generation Automotive Promotion" on Thai's Automobile Industry," the Economic Research Institute of Japan Society for Promotion of Machine Industry, Research Paper, No.3 (July 2019).

to formulate policies on EV and eco car production. In March 2018, its National Energy Policy Council (NEPC) released the EV Roadmap<sup>5</sup> which stated that their production volume would increase to 1.2 million units by 2036.

The accumulation of EV technology accounts for only a small part of the conventional Thai automobile market. This was because the target of the Eco-car Project Phase 1 in 2007 was only those vehicles with lower prices, high fuel efficiency, and were environment-friendly. However, more advanced technologies have been introduced to the country because the target of the 2017 promotion included EVs, HEVs, PHEVs, and their key components. Although HEVs have so far been sold by Toyota in Thailand, they have been imported from Japan in the form of CKD kits. Therefore, there is a strong need for the Thai government to smoothly shift from importation to local production.<sup>6</sup>

Thailand's BOI is promoting investments in eco car and EV production in close cooperation with the Ministry of Industry within the overall automobile industry development. For example, the BOI refers to the Thai automobile industry policy in various public relations campaign when promoting investment in the automobile industry.

### (3) China

Among China's EV-related policies, one of the most crucial ones is the New Energy Vehicle (NEV) Mandate (September 2017). In line with it, the Energy-Saving and NEV Industry Development Plan (2012–2020) was formulated. With the NEV IDP 2012-20, the Chinese government has set the goal for cumulative sales and production of EVs and PHVs at 50,000 units in 2015 and 5 million units in 2020. Although HEVs are not included in the category of NEVs, the Chinese government decided to give preferential treatment to HEVs in June 2020 being energy-efficient vehicles.<sup>7</sup>

Meanwhile, in November 2020, the General Office of the State Council of China released the Energy-Saving and NEV Industry Development Plan (2021–2035). The NEV IDP 2021-35 is a succeeding policy of the NEV IDP 2012-20. In this latest plan, EVs are supposed to become the top sales segment of all vehicles by 2035 by raising the ratio of NEV sales among all the segments by 2025 from approximately 5% to 20%.<sup>8</sup>

Figure 4.2.2 shows the sale of EVs, PHEVs, and fuel cell vehicles (FCEVs), as well as the ratio of NEV sales out of all new-vehicle sales, from 2015 to 2019. The production of NEVs climbed from approximately 986 thousand up to 1.0 million in 2019, while its sales volume went down from 984 thousand in 2018 to 972 thousand in 2019. In the period 2015–2018, the sales volume of NEVs increased remarkably due to government subsidies given to buyers. But while more than one million NEVs were sold in 2018, the sale of both EVs and PHEVs fell in 2019. While the decline is attributed partly to reduced subsidies for NEV purchases, it is as expected because the total demand for new cars in 2019 decreased as a whole, specifically by 8.2% from 2018 figures. In 2019, NEV sales accounted for approximately 4.7% of the total volume of new-car sales. This figure was short of the target

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<sup>5</sup> For details, please refer to the following URL: [https://www.marklines.com/ja/global/investment/tha/tha\\_investment#invest\\_3-7](https://www.marklines.com/ja/global/investment/tha/tha_investment#invest_3-7) (access: 2nd November 2020)

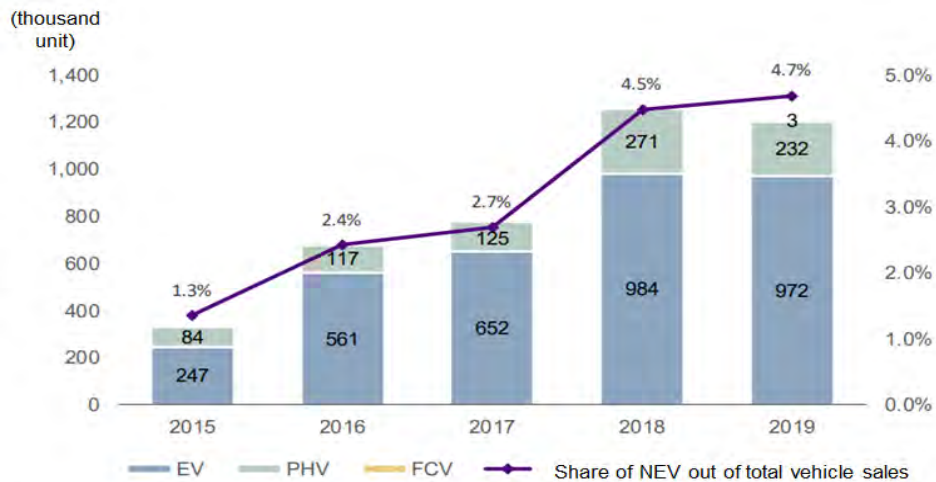
<sup>6</sup> According to the article Nikkei Shimbun Newspaper dated 16 Jan. 2020, BOI approved Toyota's application for production of EVs and PHVs. The company begins their production by the end of January 2023. For details, please refer to the following URL: <https://www.nikkei.com/article/DGXMZ054466590W0A110C2TJ2000/> (access: 2nd Nov. 2020)

<sup>7</sup> For details, please refer to the following URL (access: 15th January 2021): <https://www.nikkei.com/article/DGXKZO65539210Y0A021C2EA2000>.

<sup>8</sup> Mizuho Research Institute (2020) "Mizuho Chinese Policy Briefing" December 2020



NEV sale: namely, 7% to 10% of the total volume of new-car sales.



(Source) MURC (2020)

**Figure 4.2.2 NEV Sales in China (2015–2019)**

In December 2020, the China Association of Automobile Manufacturers (CAAM) reported that the November 2020 volume of car sales increased by 12.6% up to 2.8 million on a year-on-year basis. Since April 2020, the volume had continued to increase for eight months in a row. From May 2020 onward, the double-digit growth of sales continued. The breakdown of the growth is as follows: The sale of passenger vehicles increased by 11.6% to approximately 2.3 million units and that of commercial vehicles went up by 18.0% to approximately 472 thousand units. Although NEV sales have been remarkable since July 2020, the October and November sales doubled on a year-on-year basis. There was a 2.9% decrease in total sales (i.e., approximately 22.5 million units) from January to November 2020, while there was a 4.7% decrease in those from January to October 2020. The sales of NEVs turned from negative to positive (3.9%), resulting in approximately 1.2 million units.

According to CAAM, the domestic economy seems to improve because of the economic (consumption) stimulus package and other policy measures, and market demand likewise continues to recover, while the competition is intense and there are complicated factors to be dealt with in the international auto markets. CAAM also claims that the shortage in semiconductor supply is likely to impact negatively on domestic automotive production in the country, and that there is a possibility the Chinese economy will be affected negatively by the delayed recovery of European and U.S. economies due to the second wave of Covid-19 infections.

According to the International Energy Agency (IEA), China's annual EV sales in 2018 reached a record high of 816,000 units, accounting for about 60% of global EV sales. Presumably, behind this is the Chinese government's subsidy policy which enables consumers to purchase NEVs. What makes the Chinese NEV policy different from Thailand's eco car and EV policies is the large subsidy given to consumers. On top of the national subsidy, they can also use provincial subsidies to purchase NEVs. The expansion of China's EV market has been attributable to the subsidies given by its government. It may be likewise pointed out that the policy measures (e.g., subsidies) of governments are the key to the growth of the EV market in other countries. It is also argued that subsidies seem to be effective in other countries where the sales volume of EVs has increased. In other

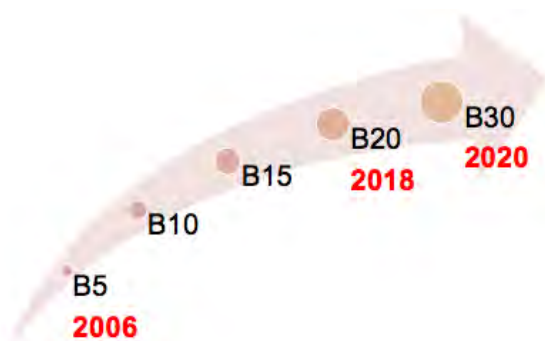
words, it would be difficult for EVs to be adopted by general consumers if government will offer no subsidies.

The credit system has been imposed on OEMs since 2017, while subsidies have served as an incentive to purchase NEVs since the early 2010s. OEMs and automobile importers are obliged by the system to manufacture and/or import NEVs in accordance with the volume of ICE vehicles. The penalty may be imposed on the OEMs and the importers if they fail to fulfil the obligation of NEV production, although the details of the penalty are unknown. The obligation is also related to emission regulations, and the OEMs are encouraged to produce NEVs to meet stringent emission regulations.

#### 4.2.2 Policy on Promotion of Biofuels in Indonesia

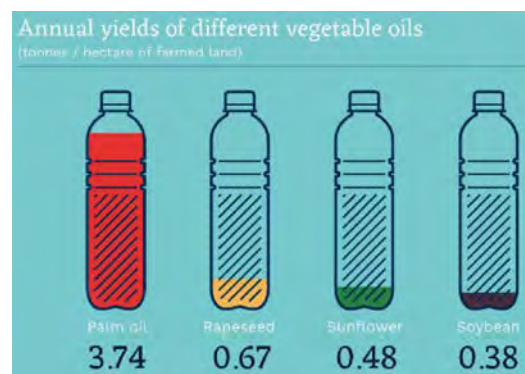
In order to improve environment performance, it is necessary to introduce fuel effectiveness in reducing CO<sub>2</sub> emissions. Indonesia is an oil-producing country; while its oil consumption has been increasing alongside its economic development, its production has been declining since the 1990s. Subsequently, it became a net importer of oil since 2003. The country has changed since the time when PT Pertamina, the state-owned oil company, supported the national budget and was called the "State within the State."

Given that Indonesia is the world's largest producer of palm oil, there have been discussions that it should start producing biodiesel. This idea stems from the concern about energy security and reduction of CO<sub>2</sub>. Since September 2018, the government has widened the coverage on the mandatory use of B20, which is made of 20% biodiesel and 80% diesel (Solar: cetane value of 48, sulfur content of 3,500 ppm). In the past, the mandatory use of B20 was for public service obligation (PSO) activities, and its enforcement was limited to the national railways and other state-owned enterprises. With the presidential decree in place (August 2018), it is now applicable to all users (non-PSOs). Following Solar, Dexlite (cetane value: 51, sulfur content: 1,200 ppm) is also required to have 20% biodiesel in its fuel mix from 1 September 2018.



Source: APROBI, DBSVI, Bloomberg Finance L.P.

**Figure 4.2.3 Bio-diesel Dissemination Program in Indonesia**



Source: Frost and Sullivan Research

**Figure 4.2.4 Annual Yields of Different Vegetable Oils**

As the world's largest producer and exporter of palm oil, Indonesia is gradually increasing the bio-content of biodiesel with the aim of absorbing the growing supply of palm oil and at the same time reducing imports of expensive fuel (refer to Figure 4.2.4). Since the second half of 2018, vehicles sold throughout Indonesia have been required to have a 20% biomix using fatty acid methyl esters (FAMEs) made from palm oil, and the Indonesian government's most recent statement has called for a nationwide sale of B30 since 2020,

and it is on track to commercialize B40 by mid-2021. Therefore, the Indonesian government is investing a large amount of money and human resources in R&D related to biofuels.

**Table 4.2.5 Policy Development on Biofuel Adoption in Indonesia**

Year	Major Contents	Policy Document
2006	Provision and utilization of biofuel as another fuel	Presidential Instruction No.1
2006	Biofuel target of 5% for the proportion of ethanol and biodiesel use within national energy consumption by 2025	Presidential Regulation No.5
2007	The priority of supplying and utilizing new and renewable energy, one of which is biofuels	Law No.30 of 2007
2008	Mandatory utilization of biofuel in the transportation, industrial, commercial and electricity generation sectors	Minister of Energy and Mineral Resource regulation No.32
2013	The first, second and third amendment to the regulation of the Minister of Energy and Mineral Resources No. 32 of 2008 about certain sector industry obligations/ mandatory to use biodiesel and bioethanol as a fuel mixture with certain mixtures from 2015 to 2025	Minister of Energy and Mineral Resource regulation No.25 of 2013, Minister of Energy and Mineral Resource regulation no 20 of 2014, Minister of Energy and Mineral Resource regulation no 12 of 2015
2014	The EBT target in 2025 is 23% of the national energy mix, and biofuel is targeted at 26% of the EBT target	Government regulation No.79
2015	Determination of the market price index of biofuels mixed into certain types of fuels and special types of fuel.	Decree of Minister of Energy and Mineral Resources no 0726K/12/MEM/2015
2015	Establishment of Indonesian Oil Palm Estate Fund Agency (Badan Pengelola Dana Perkebunan Kelapa Sawit/BPDPKS)	Presidential regulation No.61
2018	Provision, utilization of biodiesel fuel under financing by the Indonesia Oil Palm Estate Fund	Minister of Energy and Mineral Resource regulation No.41

Source: JICA Study Team

The acceleration of the biodiesel program is conscious of the fact that it will stimulate domestic demand for 200 million people and improve the dependence on exports to EU countries, as CPO is processed/consumed at home.

By the end of 2018, 16.5 million vehicles were using biodiesel. Furthermore, the policy also expects the B30 Plus program to act as a buffer if the international price of crude palm oil (CPO) continues to decline (USD450 per ton is the threshold).

The B30-B50 program is expected to absorb up to 15 million MT of CPO inventory annually. This will increase total demand by 25% over the current global market of 60 million MT. At the same time, global demand for biodiesel, aimed at reducing the use of crude oil, will increase significantly, which will raise CPO prices in the long run.

Indonesia's export value and trade balance are strongly related to the CPO price, and the industry has been facing a slump as the international price of CPO continues to stagnate at USD500/MT. The new biodiesel policy is a highly urgent policy of the Indonesian government that aims to raise CPO prices.

Another aim of promoting the use of biodiesel is also a strategy from the agricultural side to stabilize the high price of crude palm oil, which has been bought cheaply. This strategy is already pushing up the price forecast for "edible oil" in order to boost demand for palm crude oil at a time when production is expected to decline due to drought and smog caused by forest fires.

### 4.2.3 Government Initiatives to Improve Technological Level in Japan

In the 1950s, the basic strategy of the MITI (now the Ministry of Economy, Trade and Industry) can be summarized in two points: (1) the introduction of technologies from foreign manufacturers and (2) the promotion of competition through the National Car Initiative, which raised the technical level of domestic passenger car production in a short period of time. It is not an exaggeration to say that the goals to promote the automobile industry in the 1950s were achieved by promoting competition.

#### (1) Introduction of Technologies from Foreign Manufacturers

From 1950 to 1954, the inflow of foreign cars into the domestic market greatly exceeded domestic production. This was made in the form of foreign exchange-free imports of U.S. and European cars (with a 40% tariff). Under these circumstances, there was a tendency to introduce foreign capital and to form alliances, especially with European companies. MITI tightened foreign currency quotas and adopted a policy<sup>9</sup> to develop domestic cars while introducing technology from foreign manufacturers. At the same time, it banned foreign investment in sales and allowed investment in production facilities only if the investment would contribute to domestic industries. MITI's stance was not to stand idly by and watch as companies formed alliances with each other, but to actively assist in negotiations and work hard to obtain favorable terms for the Japanese side.

#### "Handling Policy on Tie-up and Assembly Contracts Related to Passenger Cars" (1952)

1. Foreign capital investment in sales is not allowed.
2. Investment in production is considered.
3. Guaranteed remittance of royalties, drawing fees, etc., for the purpose of domestic production of foreign models.
4. At least 90% of the 11 parts must be produced domestically within 5 years of the contract.
5. Transfer of manufacturing rights for the relevant model.
6. Approval for import of raw materials that have not been domestically produced.
7. Manufacturing permission will be given to two or three companies.
8. Importing and assembling foreign vehicles not intended for domestic production is treated the same as importing completely built-up vehicles.

#### (2) Promotion of Competition through the National Car Initiative

To expand the market policy authorities took measures, such as road construction and others, while at the same time developing measures to strengthen the international competitiveness of small passenger cars. However, since it was difficult to immediately improve road conditions and national income, a "national car concept" was formulated to develop cars with the following technical levels in competition with the goal of producing

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<sup>9</sup> The government implemented a variety of industrial policies to foster manufacturing of passenger cars. As a protective policy, the government-imposed tariffs, excise taxes, and foreign currency restrictions to protect the domestic market for small passenger cars. As measures to foster the industry, the government provided low-interest funds through government-affiliated financial institutions, subsidies, special depreciation, exemption from import duties on required equipment, and approval of required technology. The basic strategy of the domestic passenger car development program was decided based on the interaction between the government and the companies to coordinate their common interests.

passenger cars that would be accepted by the public and internationally recognized.

**Technical standards required for the "National Car Initiative" (1955)**

1. Speed: 100 km/h
2. Durability: capable of running 10,000 km (without major repairs)
3. Braking performance: stable at 70 km/h and rapid emergency braking
4. Stable hill climbing performance within 30 minutes
5. Stable driving performance: 80 km/h, straight line driving without letting go of steering wheel
6. Ride comfort coefficient of 6 or less on paved roads at speeds of 50–60 km/h
7. Fuel consumption: 30 km/l or more at 60 km/h on flat roads
8. Acceleration performance: within 15 seconds between stop and 200 m
9. Capacity for 4 persons (including 2 children) or 2 persons and 100 kg load capacity
10. Dead weight: 400 kg or less
11. Engine: 350–500 cc
12. Selling price: JPY250,000; monthly production: 2,000 units

The policy makers (MITI) believed that if competition among several OEMs were to develop, Japan would be able to achieve the same concentration and accumulation of production that had been promoted in the U.S. during the 1920s and 1930s, making it possible to produce internationally competitive passenger cars.

The entry of 350–500 cc models into the Japanese market occurred because OEMs wanted to avoid competition with existing passenger car manufacturers and at the same time did not have to raise large capital investment. And while there were problems in terms of performance—these were not internationally competitive passenger cars—their low prices helped expand the domestic demand for passenger cars.

Although OEMs pointed out the unprofitable nature of the "national car initiative," it created a genre of mass-market cars and gave OEMs the strength to design mass-market cars and develop compact cars for the future. Coinciding with this initiative, the government led a campaign to encourage the purchase and use of domestically produced cars in Japan.



Fuji Heavy Industries, Subaru 360 (360 cc)



Toyota Publica (700 cc)



Daihatsu Midget (249 cc)



Datsun110 (860 cc)

#### Figure 4.2.5 Vehicles Developed and Marketed under Japan's National Car Initiative

MITI's idea of a national car was revised and implemented in the process of reconciling the interests of the manufacturers. Its policy objective of promoting competition<sup>10</sup> among companies in the development of mini-cars and mass-market cars was fully achieved. In this sense, it is no exaggeration to say that the goals of the automobile industry development program in the 1950s were achieved through this pro-competition stance.

Even today, there are mixed opinions about the idea of Pakistan's national car initiatives. According to Pakistani government sources, when the government commissioned an external organization to prepare a master plan to develop the automobile industry in 1992, it was advised that Pakistan should aim to manufacture national cars like those of Malaysia. However, the conditions in Malaysia, which began working on the national car concept in 1983, and Pakistan today are very different. It should be recognized that Malaysia's national car initiatives achieved a certain level of success because of favorable conditions such as (1) smooth introduction of technology from abroad, (2) rapid growth in domestic demand against the backdrop of steady economic growth, and (3) the national car concept did not conflict with international rules.

#### 4.2.4 Economic Stagnation Caused by Brakes on Auto Consumption in Sri Lanka

This section introduces the case of Sri Lanka whose automotive industry policy was not effective. Sri Lanka, plagued by problems, such as a falling currency and a deteriorating balance of payments on top of its budget deficit, has seen a sharp decline in the number of vehicle registrations as the country began implementing policies to strictly regulate vehicle imports with the aim of curbing capital outflow.

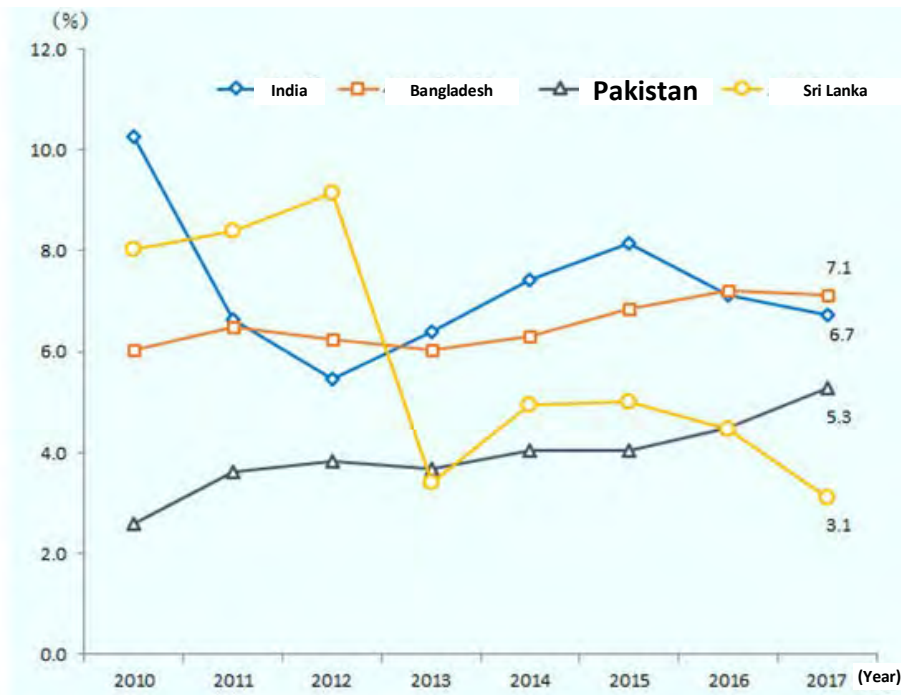
In November 2015, with the budget deliberations for the next fiscal year looming and tax hikes expected, buyers rushed to import cars. Also in 2015, as part of the government's campaign to garner votes during elections, the monthly salary of state employees was raised by SLR10,000, and purchases by state employees led to a slight increase in imports of small cars. While some state employees were able to buy cars and earned extra income by leasing them out, the public became increasingly frustrated with their inability to buy cars.

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<sup>10</sup> Toyota, for example, while waiting for the time when individual demand would increase, proceeded with the development of mass-market cars of around 700 cc for the domestic and Southeast Asian markets to compete with the mini cars that were expected to appear in the market soon. In addition, Toyota introduced new technologies in casting, forging, and machining to automate and speed up the entire production process and to shift to mass production, and completed a plant specializing in passenger cars.

Since December 2015, the central bank has lowered the lifetime value (LTV)<sup>11</sup> to vehicle ratio from 90% to 70% and placed restrictions on imports. While requiring an additional deposit on L/Cs (letters of credit) in trade operations as a way of restricting imports was largely expected—although it violates the bank's obligations to the IMF—the authorities went further and tightened the LTV ratio on auto loans, making it even harder for ordinary citizens with little cash reserves to buy cars.

The number of new vehicle registrations in Sri Lanka (61,864), which peaked in November 2015, fell to about half (31,854) in January 2016 due to higher taxes and tighter regulations on car loans.



Source: IMF

**Figure 4.2.6 Comparison of Real GDP Growth Rates in Some South Asian Countries**

In Sri Lanka, cars and motorcycles are often purchased on loan by the self-employed who contribute to employment in the country. This regulation, which would have deprived the transportation means of employees and the end business, has had the unintended consequence of depriving them of business opportunities and subsequently stagnating supporting industries.

#### 4.2.5 Investment Promotion Policy in Turkey

Turkey's investment promotion policy has the following two major differences from that of Pakistan. Investment promotion measures in Turkey are varied and can be used as a reference for Pakistan's BOI to attract investments in the automobile parts industry in the future.

- In Pakistan, the investment promotion strategy 2020–2023 prioritizes five sectors with potential, and they include the automobile industry, but they are not subject to

<sup>11</sup> LTV is a measurement of how valuable a customer is to a company through the customer's full lifespan.

additional incentives. Turkey, on the other hand, gives investors additional incentives based on a sector's importance. As one of Turkey's core industries, the incentives for the automobile industry varies depending on the characteristics of the investment sector.

- In Pakistan, incentives are the same regardless of the region where investment is made; but in Turkey, the degree of incentive varies from region to region. The less developed a region is, the more incentives are given to investors in such a region.

Turkey's incentives for the automobile industry are roughly classified into four major categories: ordinary investment incentives, regional investment incentives, strategic investment incentives, and project-specific incentives. The degree of incentives for investors differs (see Figure 4.2.7).

Regarding regional investments, incentives are given based on the classification of the regions where investments are to be made, of which there are six. Region 6 is the least developed, and investors there are given the highest incentives to reduce disparities between regions (see Figure 4.2.8).

In relation to attracting foreign automobile component investors, the incentives have the following characteristics:

- Regional investment incentives
  - Medium-High Tech Incentives

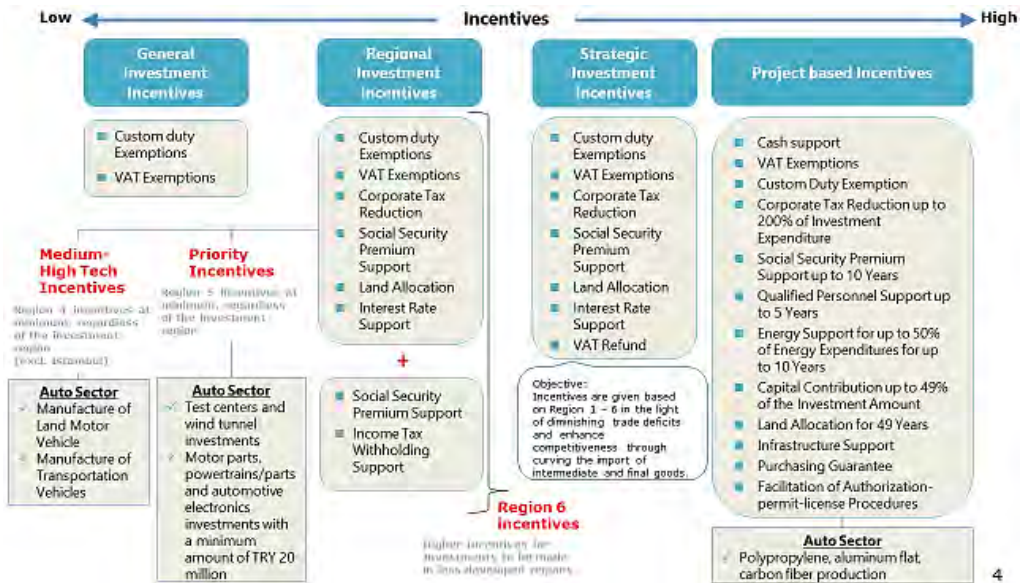
In the medium- and high-tech sector, investors are given at least a Region 4 incentive no matter where they invest in, except Istanbul. The automobile sector includes the manufacture of land vehicles and transport vehicles.
  - Priority Incentives

In priority areas, investors are given at least a Region 5 incentive no matter where they invest. In the automotive sector, investment in test centers and wind tunnels, as well as investments of over TRL20 million for auto parts, powertrains and their components, and automotive electronic components.
- Strategic Investment Incentives

The incentives are granted to reduce the trade deficit and improve competitiveness by curbing the import of intermediate goods and final goods. In addition to regional investment incentives, VAT refunds will be granted.
- Project-specific Incentives

Project-specific incentives provide even more generous incentives, and in the automotive field, materials such as polypropylene, rolled aluminum plates, and carbon fiber, fall under this category.

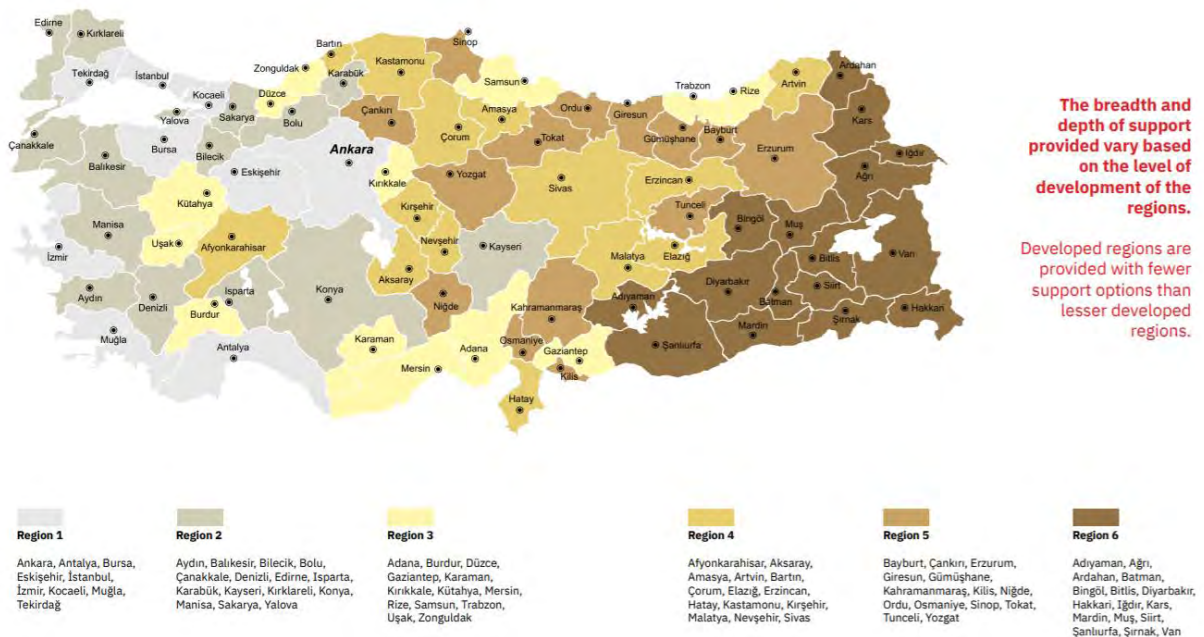




Source: Guide to State Incentives for Investments in Turkey, Presidency of the Republic of Turkey Investment Office (2020)

Figure 4.2.7 Investment Incentives in Turkey

INCENTIVE REGIONS\* (effective as of 1/1/2021)



Source: Guide to State Incentives for Investments in Turkey, Presidency of the Republic of Turkey Investment Office (2020)

Figure 4.2.8 Regional Investment Incentives in Turkey

### 4.3 Sophistication of the Automotive Industry through R&D

Among Southeast Asian countries, there are no other country which have so far produced one million units of automobiles except for Thailand and Indonesia. This section focuses on Thailand's efforts at economic sophistication with the help of OEMs and suppliers.

#### 4.3.1 Production of 1M Units and Economic Sophistication in Thailand

Reportedly, a production volume of one million units was a criterion among OEMs and suppliers to decide on green-field and/or additional investments in a new automotive market. When the Thai auto industry fulfilled this criterion in 2005 (Figure 4.3.1), some people began to insist that it was high time to transfer the processes of product development and planning from overseas to Thailand.

When a certain level of production volume is secured, it is natural that product planning and development may be undertaken even by the Thai subsidiaries of Japanese manufacturers, the target of which is the local Thai market and/or Southeast Asian ones to meet specific local needs. Meanwhile, product planning and development of one-ton pick-up trucks were transferred to foreign subsidiaries in the mid-2000s, considering that the R&D section of Japanese headquarters tackled more technologically advanced subjects (e.g., EEVs and self-driving cars). On top of those, the Thai automobile industry has been well-known for having the most highly developed supporting industry in the region and thus may address the needs of Japanese OEMs which work on product development in close cooperation with their Tier-1 auto-component manufacturers. For these reasons, major OEMs' Thai subsidiaries were selected as regional R&D bases than others in the rest of Southeast Asia.

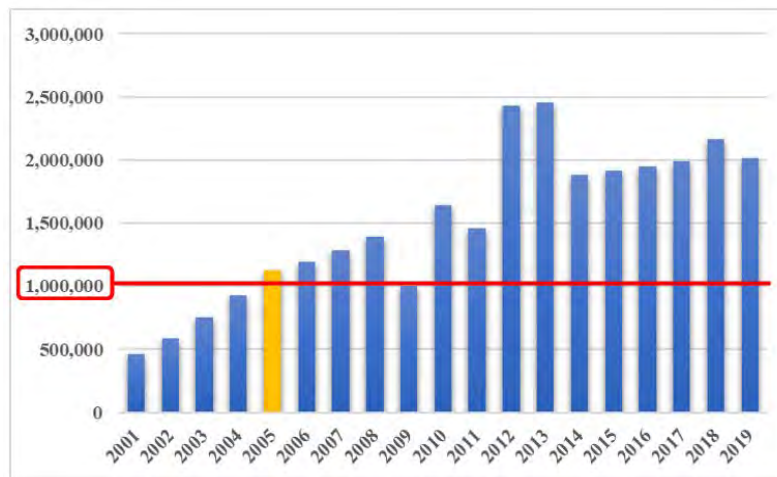
In response to the concerted efforts made by OEMs and auto-component manufacturers, policy environments have also been improved by the Ministry of Industry (MOI) of Thailand and other related governmental agencies. In the 2002–2006 period when the first automobile industry development program was executed, its detailed enforcement regulations and other measures were introduced in order to nurture industrial human resources, facilitate FDIs (e.g., by offering tax incentives), and increase production volume up to one million units by 2006, among other objectives. In March 2007, the MOI commenced the formulation of the second automobile industry development program (2007–2011) after the details of the eco-car (energy efficient vehicle) strategy were decided by the Board of Investment (BOI).<sup>12</sup> The Thai government declared itself as the future “Detroit of Asia” by setting a production volume target of two million units by 2010 and an export-production ratio of 50%. In order to achieve the targets above, the government decided to focus on eco-cars as another target vehicle type and implemented the related policy and measures to attract OEMs that manufacture eco-cars to the country. By introducing incentives (e.g., tax), the government aimed to become the hub of production and of export of eco-cars in the region<sup>13</sup>. As Figure 4.3.1 indicates, the first target was accomplished in 2012<sup>14</sup>.

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<sup>12</sup> For details, please refer to the following URL (access: 7<sup>th</sup> January 2021):  
[https://www.marklines.com/ja/global/investment/tha/tha\\_investment](https://www.marklines.com/ja/global/investment/tha/tha_investment)

<sup>13</sup> For the details of efforts made by BOI on the Phases-1 and -2 Eco-Car policies, in parallel with related policy implementation of MOI, please refer to 4.2.1 of Chapter 4.

<sup>14</sup> Please refer to 5.3.3 of Chapter 5 of the Interim Report (IT/R). The 2018 export-production ratio of one-ton pickup truck was approximately 58%.



Source: JICA Study Team (based on statistical data of TAI and OICA)

**Figure 4.3.1 Trends in Automobile Production in Thailand (2001–2019)**

One Japanese motorcycle OEMs was the first to establish a development hub in Thailand: namely, Honda R&D Southeast Asia in 1997. Yamaha's Motor Asian Centre followed in 2000.

As for four-wheeled OEMs, Toyota Motor Asia-Pacific Manufacturing & Engineering was established in 2007, and the number of its staff and testing capacity have increased gradually. Meanwhile, some Japanese Tier-1 suppliers followed the OEMs' transfer of their product planning and development tasks to Thailand. For instance, Denso established its core technical center in 2007 in Thailand, and it manages other subsidiaries in the Southeast Asian region.<sup>15</sup> Fujikura Ltd. established Fujikura R&D Center Thailand in 2008.<sup>16</sup> In response to these changes, some local suppliers also began to strengthen their development sections.<sup>17</sup>

Although these development hubs first served as hubs for optimal procurement in Southeast Asia during the period of new model development, their development capacities have gradually strengthened, in particular, their testing capacities. In the near future, product planning and development for the Southeast Asian market are expected to be done in Thailand's development hubs.

In the meantime, latecomer developing countries go through four phases in the development process of their automotive industries. In general, the first phase begins with importing CBUs, then CKD parts in the second phase. In the third phase, the local manufacturing of some parts starts, while other parts are still imported. In the fourth phase, R&D is undertaken locally.<sup>18</sup> The Thai auto industry's development is reviewed in Table 4.3.1. In the fourth phase, Thailand reached the target production volume of one million units in 2005. The country became the development hub for motorcycles in the late 1990s and for four-wheeled motor vehicles in the late 2000s.

<sup>15</sup> For details, please refer to the following URL: <https://www.denso.com/jp/ja/news/news-releases/2007/070403-01?> (access: on 15<sup>th</sup> July 2020)

<sup>16</sup> For details, please refer to the following URL: [https://www.fujikura.co.jp/rd/qihou/\\_icsFiles/afiedfile/2009/10/14/116\\_T05\\_low.pdf](https://www.fujikura.co.jp/rd/qihou/_icsFiles/afiedfile/2009/10/14/116_T05_low.pdf) (access: on 15<sup>th</sup> July 2020)  
The company was re-established as "Fujikura Electronics (Thailand) Ltd." in 2010.

<sup>17</sup> Kurokawa, Motohiro (2015) "Historical Changes of the Thai Automotive Industry"

<sup>18</sup> Kawabe, Junko (2007) "Thailand's Automotive Industry Development Policy and Japanese Chamber of Commerce, Bangkok"

**Table 4.3.1 Development of the Thai Automotive Industry**

Phase	Activity	Year/ Period
1 <sup>st</sup>	• Start of CBU import	Early 1960s to mid-1960s
2 <sup>nd</sup>	• Start of CKD production	
3 <sup>rd</sup>	• Start of production of labour-intensive parts and import substitution	Late 1960s
4 <sup>th</sup>	a) Produced one million units b) Conduct R&D for local market	a) 2005 b) Motorcycles: late 1990s Four-wheeled motor vehicles: early 2000s

Source: JICA Study Team

#### 4.3.2 Categorization of Emerging Countries' Automotive Production

As for automobile production, major emerging countries fall under one of the three following categories: namely, Type 1 (domestic market-oriented), Type 2 (export-oriented for developed markets), and Type 3 (export-oriented for emerging markets). As Table 4.3.2 shows, China, India, Indonesia, and Brazil belong to Type 1. Mexico and the Czech Republic belong to Type 2. Thailand belongs to Type 3 because its export is heavily dependent on emerging markets, especially other countries in Southeast Asia and the Middle East. This characteristic makes Thailand different from other emerging countries.

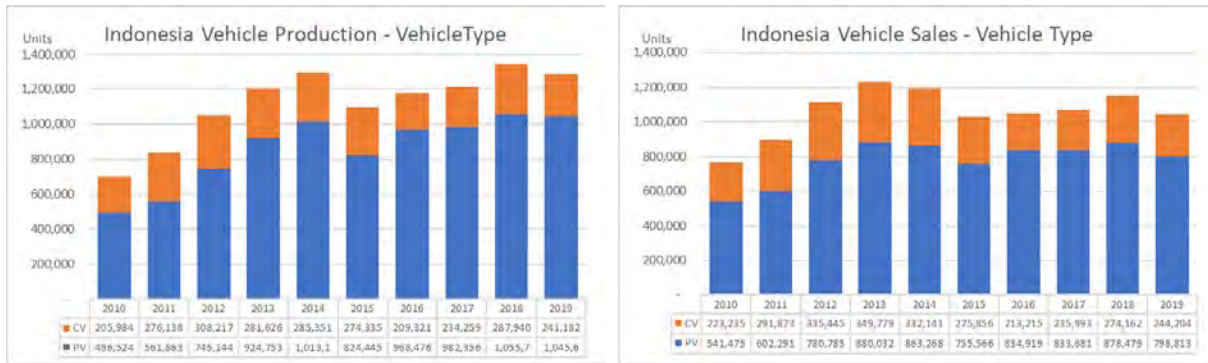
These emerging countries are not competing against one another because their target markets are different (Table 4.3.2). Meanwhile, although Pakistan currently falls under Type 1, it should consider staying in Type 1 or moving to Type 3 in the future.

**Table 4.3.2 Categorization of Emerging Countries' Automotive Production**

Type of Automotive Production	Country of Production	Main Target Market
Type 1	Domestic market-oriented	China, India, Indonesia and Brazil
Type 2	Export-oriented for developed markets	Mexico and Czech
Type 3	Export-oriented for emerging markets	Thailand
		Southeast Asia, Middle East, etc.

Source: Nomura Research Institute Thailand ([https://arayz.com/columns/car\\_business\\_201801/](https://arayz.com/columns/car_business_201801/)) [access: 15<sup>th</sup> July 2020]

A comparison of domestic sales and production volume by vehicle type between Thailand and Indonesia reveals the unique nature of these two countries: Thailand has a large proportion of commercial vehicles, reflecting a high production volume of one-ton pickup trucks, while the share of commercial vehicles is lower in Indonesia. A comparison of their export volumes exhibits the fact that Thailand has long been export-oriented, while Indonesia has started expanding its exports only in recent years after initially focusing on developing its domestic market (figures 4.3.2 to 4.3.5).



Source: OICA

Figure 4.3.2 Sales and Production Volumes by Vehicle Type in Indonesia (2010–2019)



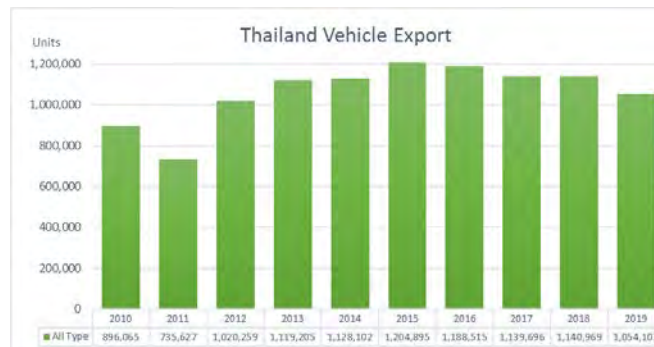
Source: GAIKINDO

Figure 4.3.3 Number of Exported CBUs from Indonesia (2010–2019)



Source: Prepared by JICA Study Team based on the statistics of TAI and OICA

Figure 4.3.4 Sales and Production Volumes by Vehicle Type in Thailand (2010–2019)



Source: TAI

Figure 4.3.5 Number of Exported CBUs from Thailand (2010–2019)

### **4.3.3 Advancement of Parts Industry's Technologies towards Export**

#### **(1) Thailand auto parts industry**

In order to collect detailed information on specific parts related to domestic production, sales volume, import and export of auto parts and related products, it is necessary to interview the relevant company, but this survey is based on the following literature.

#### **1) Progress in domestic production of auto parts**

According to a survey by Kobayashi *et al.* (2005)<sup>19</sup>, Thai CKD imports were initially packaged with parts for one car. Since the latter half of the 1960s, domestic production of parts with common specifications such as tires, batteries, and leaf springs has been attempted. Domestic production of radiators and shock absorbers has also started. In the 1970s, pistons, wheels, press panels, and air conditioners were also domestically produced. In the 1980s, filters, frames, mirrors, lamps and dies / jigs were domestically produced, and in the 1990s, cast and forged parts, clutches, instrument panels, wipers, etc. were domestically produced. In the 2000s, common rail system parts for diesel engine fuel injectors were domestically produced, and other materials such as rubber, plastic, and metal were also domestically produced.

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<sup>19</sup> Kobayashi, H. and Takeno, T. (2005). "Higashi ajia jidousya buhin sanngyou no guro-baru rennkei [Global collaboration in East Asian auto parts industry]"

**Table 4.3.3 Domestic Production of Auto Parts in Thailand by Decade**

Period	Engine	Chassis	Body	Electrical components	Molds & jigs	Others
1960s	61			Car radio		Bolt and nut
	63			Wire Harness		
	65		Leaf spring			
	66			Battery		
	67	Radiator	Tire	Starter		
69		Shock absorber				
		Cushioning rubber parts				
1970s	70		Seat cushion			
			Glass			
	72	Piston	Wheel		Lamp glass	
	73	Piston ring	Bearing metal		Air conditioner	Die
	74	Gasket		Large panel		
	74	Spark plug		Safety glass		
78		Brake parts				
79	Engine valve					
1980s	80			Light bulb		
	81	Air filter	Control cable			
	83	Bush				
	85	Bearing	Aluminum wheels		Lamp	Jigs
	87	Engine	Clutch parts	Pressed parts		
	88	Oil seal		Rear view mirror		
89		Chassis frame				
		Universal joint				
1990s	90	Fuel tube				
		Casting parts				
		Water pump				
	91	Oil seal	Shift lever		Wiper motor	
	93		Clutch	Seat belt		
	94		Steering wheel			
			Brake disc			
			Steering column			
	95		Power steering pump	Instrument panel		
			Strut	Seat Cover		
			Steering	Rubber seal		
		Rubber parts for brakes	Regulator handle			
			Seat			
			Interior			
96	Aluminum radiator	Compressor		Carbon brush		Sealant
	Forged parts	Suspension parts		Horn		
	Sintered metal parts			Switch		
	Hose	Brake				
97		Disc pad		Key cylinder		
		Clutch friction		Door latch		
		Steering linkage				
		Steering handle lock				
98		Clutch facing		Car Audio		
2000s	00		Brake tube	Weather Strip		
	01		Shift lever			
	02	Common rail system				

Source: Kobayashi, H. and Takeno, T. (2005). "Higashi ajia jidousya buhin sanngyou no guro-baru rennkei [Global collaboration in East Asian auto parts industry]"

## 2) Activation of exports of auto parts

Exports of automobiles in Thailand began in 1987 as trial exports. In 1999, it reached 126,000 units, which was a large number of 100,000 units, and it reached 235,000 units in 2003, accounting for 31% of the total production of 751,000 units. With the export of automobiles, new entry of Japanese OEM-affiliated auto parts manufacturers is becoming active. 5 companies in 2000, 8 companies in 2001, and 3 Japanese auto parts manufacturers entered Thailand in 2002.

As a countermeasure to drastically reduce domestic automobile sales after the Asian currency crisis, Thailand transfers the production of some third-country exports of products and auto made in Japan to the Japanese domestic market, provide financial support by increasing Japanese capital, and joint ventures. They actively made it into a completely subsidiary. As for export parts, countermeasures have been started for glass, ignition coils,

wire harnesses, and filters, and the export market of local parts manufacturers is being cultivated due to the improvement of quality level. From 1998 to 2002, the value of parts exports soared 4.3 times.

**(2) Auto parts industry in Indonesia**

**1) Local procurement of auto parts at Toyota IMV**

We describe the progress of domestic production of auto parts in Indonesia based on the survey of local procurement of parts for Toyota IMV by Nomura (2015)<sup>20</sup>. The realization of Tier 1 began in the era of TUV, the predecessor of IMV5, and has progressed gradually over a long period of time since 1977.

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<sup>20</sup> Nomura, T. (2015). "Toyota no shinnkokuokusya IMV [Toyota's emerging country car IMV]"



**Table 4.3.4 History of Local Procurement of Auto Parts by Toyota IMV**

		TOYOTA IMV					
		1st generation	2nd generation	3rd generation	4th generation	5th generation	
Production period		1977-1980	1981-1985	1986-1996	1997-2004	2004-	
Cumulative sales volume		26,806 units	191,668 units	492,123 units	429,128 units		
Engine / Fuel Group	Radiators & fans	Copper	Copper	Copper	Copper	Aluminum	
	Exhaust pipe	Aluminum	Aluminum	Aluminum	Aluminum	Stainless	
	Fuel filter						
	Cylinder head	Aluminum die-cast	Aluminum die-cast	Aluminum die-cast	Aluminum die-cast	Aluminum die-cast	
	Cylinder block	Iron casting	Iron casting	Iron casting	Iron casting	Iron casting	
	Crankshaft & pin	Iron casting	Iron casting	Iron casting	Iron casting	Forging	
	Camshaft & valve	Iron casting	Iron casting	Iron casting	Iron casting	Iron casting	
	Oil filter	Paper filter	Paper filter	Paper filter	Paper filter	Paper filter	
	V-belt	V type	V type	V type	V type	V rib type	
	Alternator	With voltage regulator	With voltage regulator	With voltage regulator	Without voltage regulator : 12V45A	Without voltage regulator : 12V45A	
	Starter	P : 0.8kW, 12V, 220A	P : 0.8kW, 12V, 220A	P : 0.8kW, 12V, 220A	P : 0.8kW, 12V, 220A	P : 1kW, 12V, 275A	
	Oil pump						
	Intake manifold	Aluminum die-cast	Aluminum die-cast	Aluminum die-cast	Aluminum die-cast	Plastic	
	Mounting	Metal insert rubber	Metal insert rubber	Metal insert rubber	Metal insert rubber	Metal insert rubber	
	Exhaust manifold	Iron casting	Iron casting	Iron casting	Iron casting	Iron casting	
	Water pump						
	Ignition coil & cord	Distributor type	Distributor type	Distributor type	Distributor type	Stick coil type	
	Fuel system	Carburetor	Carburetor	Carburetor	Carburetor or Injection	Injection	
	Powertrain chassis group	Tire	Bias tire	Bias tire	Bias tire or tubeless radial tire	Bias tire or tubeless radial tire	Tubeless radial tire
		Absorber	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Spring		Leaf spring	Leaf spring	Leaf spring	Leaf spring	Coil spring	
Clutch & release fork						10.5inch	
Transmission		4-speed M/T	4-speed M/T	4,5-speed M/T	4,5-speed M/T 4-speed A/T	4-speed M/T 4-speed A/T	
Tubes (brake, fuel, etc.)					ISO flare	ISO flare	
Rear axle						Semi-flow banjo	
Disc wheel & cap		Steel wheels	Steel wheels	Steel (STD) or Aluminum wheels (DLX, GL)	Steel or Aluminum wheels	Steel or Aluminum wheels	
Steering wheel		Polypropylene 2-spoke	Polypropylene 2-spoke	Polypropylene 2-spoke	Polypropylene 2-spoke or Urethane 3-spoke	Urethane 4-spoke, no airbag Urethane 4-spoke, with airbag	
Rear brake		Drum brake	Drum brake	Drum brake	Drum brake	Drum brake	
Front brake		Drum brake	Drum brake	Disc brake	Disc brake	Disc brake	
Propeller shaft							
Differential							
Clutch cylinder							
Steering column & shaft		No tilt (up / down adj.)	No tilt (up / down adj.)	No tilt (up / down adj.)	No tilt (up / down adj.)	No tilt (up / down adj.)	
Front brake steering gear		Manual steering	Manual steering	Manual or power steering	Manual or power steering	Manual or power steering	
Body group		Flame					
		Fuel tank			55L	55L	55Lまたは68L
		Use of putty in body assembly	Putty used	Putty used	Use putty (in-house production of pressed parts)	No putty	No putty
		Seat	Fixed	Fixed	Reclining seat + seat belt	Reclining seat + seat belt	Reclining seat + seat belt
	Radiator grill	Metal	Metal	Metal or ABS plastic (painting + plating)	Metal or ABS plastic (painting + plating)	Metal or ABS plastic (painting + plating)	
	Instrument panel	Metal	Metal	Polypropylene	Polypropylene	Polypropylene	
	Roof head lining & pad	None	None	PVC (polyvinyl chloride) or woven fabric pasted	PVC (polyvinyl chloride) or woven fabric pasted	Plastic molding, head lining	
	Mirror	Manual, Plastic molded, Matte housing	Manual, Plastic molded, Matte housing	Manual, Plastic molded, matte housing	Manual, plastic molded, matte Electric, plastic molding, color housing	Manual, plastic molded, matte Electric, plastic molding, color housing	
	Bumper	Painted on metal	Painted on metal	Painted on metal	Painted on metal	Painted on metal	
	Floor mat	None	None	PVC or velor woven or punched carpet	PVC or velor woven or punched carpet	PVC or velor woven or punched carpet	
	Cab & body mounting						
	Cylinder lock						
	Emblem & nameplate	Plastic	Plastic	Paint ABS plastic	Paint ABS plastic	Paint ABS plastic	
	Door regulator & hinge	Manual	Manual	Manual	Manual or power window	Manual or power window	
	Console Box	None	None	None	polypropylene	polypropylene	
	Glass			Tempered glass	Green tempered glass	Green tempered glass	
	Door handle	Metal	Metal	Embossed on plastic	Embossed on plastic	Double embossed on plastic	
	Electrical equipment group	Battery	Standard battery	Standard battery	Standard battery	Standard battery	Standard battery
		Horn	Flat	Flat	Flat	Flat	Flat
		Wire Harness					
Front blinker		Glass lens / Metal housing	Glass lens / Metal housing	Glass lens / Metal housing	Polycarbonate lens, plastic housing, with reflector	Polycarbonate lens, plastic housing, with reflector	
Rear combination lamp		Glass lens / Metal housing	Glass lens / Metal housing	Glass lens / Metal housing	Polycarbonate lens, plastic housing, with reflector	Polycarbonate lens, plastic housing, with reflector	
Car Audio		None	None	Digital display type radio, push button type cassette, 1DIN	Digital display type radio, logic type cassette, CD, 1 or 2DIN	Digital display type radio, logic type cassette, CD, 1 or 2DIN	
Air conditioner		None	None	Double blower R12	Double blower R134	Double blower auto air conditioner R134	
Head lamp		Glass lens / Metal housing	Glass lens / Metal housing	Glass lens / Metal housing	Polycarbonate lens, plastic housing, with reflector	Polycarbonate lens, plastic housing, with reflector	
Interior light		None	None	Glass lens / Metal housing	Polycarbonate lens, plastic housing, with reflector	Polycarbonate lens, plastic housing, with reflector	
Switch & relay							
Wiper				Intermittent wiper Front & Rear	Intermittent wiper Front & rear		
Combination meter					Tachometer, Servo Stepper Motor, Optitron Meter		
EPI							

■ Locally procured parts    ■ Purchased parts in ASEAN area    □ Imported from Japan

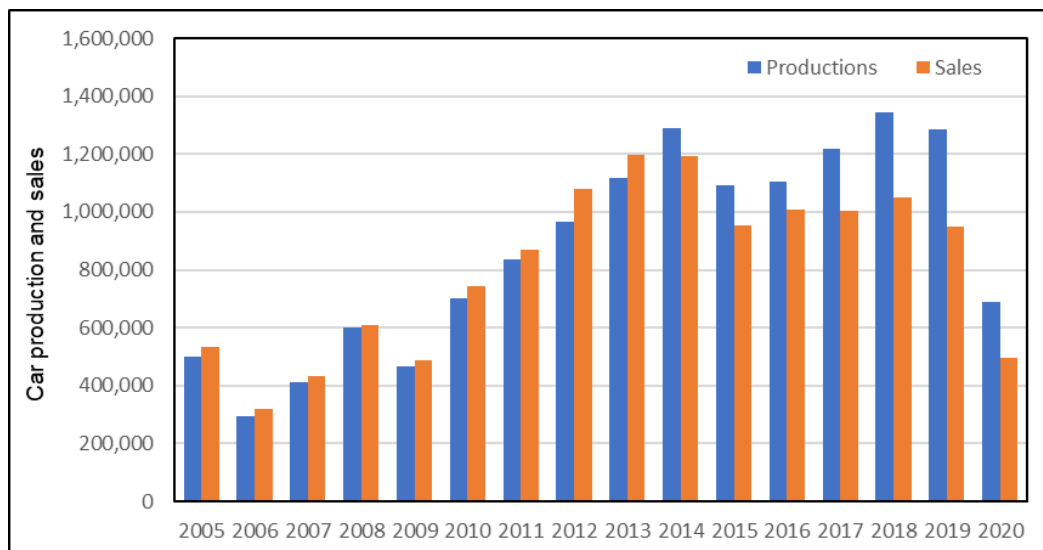
Source: Nomura, T. (2015). "Toyota no shinnkokuksuya IMV [IMV, Toyota's strategic car for emerging countries]"

The local procurement rate of TMMIN (Toyota Motor Manufacturing Indonesia) in IMV5 is as high as 75% on a purchasing basis. The local procurement rate by Tier-1 companies is less than 50% and half of the parts and raw materials they procure are imported. This is

because the localization of Tier-2 has not progressed, but the issue is whether to localize Tier-2 in Japan or switch to procurement from local companies.

## 2) Export of auto parts

The production of automobiles increased from 2014, matching the number of units sold. It is estimated that exports of related auto parts are also increasing. In 2019, the estimated value of exported parts was about JPY306 billion, which was the peak export volume, assuming that the price of automobiles then was JPY1.5 million yen, the parts to cost ratio was 60%, and the difference between the number of automobiles produced and sold was taken as the export volume.



Note: Prepared by the JICA Study Team based on data from the MarkLines website.

**Figure 4.3.6 Changes in Indonesian Automobile Production and Sales Volume**

## (3) Establishment of Private Company's R&D Center

In 2005, automobile production in Thailand surpassed one million units. When a certain production volume is secured, there is a possibility for Japanese OEMs in overseas production bases to plan and produce Thai model cars and East Asian model cars to meet local customer needs, which may be different from Japanese customers. In the countries like Thailand, where major auto-component manufacturers have concentrated, some of them may be able to be involved in the Japanese way of automobile manufacturing. In 2007, Toyota Motor Corporation established Toyota Motor Asia Pacific Engineering and Manufacturing Co., Ltd. Since then, they have expanded their personnel and automotive skills assessment tests. As for parts manufacture, Denso Corporation established Denso International Asia (Thailand) Co., Ltd. in 2007, while Fujikura R&D Center Thailand was established in 2008, in response to the move of automobile manufacturers.<sup>21</sup> For two-wheeled vehicles, Honda Motor Co., Ltd. established Honda R&D Southeast Asia Co., Ltd. in 1997, and Yamaha Motor Co., Ltd. established Yamaha Motor Asian Center Co., Ltd. in 2000, as their respective development bases.

<sup>21</sup> Kurokawa, M (2015). *Tai-koku jidousya sanngyou no rekishi teki hensenn* [Historical transition of Thai automobile industry]. Institute for international trade and investment.

**Table 4.3.5 Automobile Manufacturers Promoting Localization of R&D**

Automobile Manufacturer	R&D Structure
Toyota Motor Corporation	<ul style="list-style-type: none"> <li>- Toyota Motor Corporation established the Toyota Technical Center Asia Pacific (TTCAP) in 2003. The center started to develop upper bodies to meet Asia's needs (including India).</li> <li>- The company was renamed Toyota Motor Asia Pacific Engineering &amp; Manufacturing Co., Ltd. (TMAP-EM) in 2007.</li> <li>- From April 2017, the company was renamed Toyota Daihatsu Engineering &amp; Manufacturing Co., Ltd. (TDEM).</li> <li>- The technical center generates world-class R&amp;D to respond to the diversifying and increasingly sophisticated demands of the Asian market while playing a major role in global R&amp;D.</li> </ul>
Honda Motor Co., Ltd.	<ul style="list-style-type: none"> <li>- Honda Motor Co., Ltd. established Honda R&amp;D Southeast Asia Co., Ltd. in 1997 as a development base for two-wheeled vehicles.</li> <li>- In 2005, Honda R&amp;D Asia Pacific Co., Ltd. (HRAP) was established to develop vehicles for Asia-Pacific, promote local procurement of auto parts, and implement product planning.</li> <li>- Honda R&amp;D Asia Pacific Co., Ltd. (HRAP) constructed an automobile test course at Rojana Industrial Park in Prachinburi Province, Thailand, to reinforce Honda's R&amp;D capabilities to deliver very competitive products which suit its customers' needs and requirements in Asia and Oceania.</li> </ul>
Mitsubishi Motors Corporation	<ul style="list-style-type: none"> <li>- Mitsubishi Motors (Thailand) Co., Ltd. established MMTh testing course to reinforce R&amp;D function in Nhongkham Amphur, Chonburi (eastern of Thailand).</li> </ul>
Nissan Motor Co., Ltd.	<ul style="list-style-type: none"> <li>- Nissan established a research and development base, Nissan Technical Center South East Asia Co., Ltd (NTCSEA) in 2003 as the regional research and development office to design vehicle for the ASEAN region.</li> <li>- NTCSEA added a test course and several testing facilities to accelerate Nissan's R&amp;D activities.</li> <li>- In 2016, Nissan built a new R&amp;D center to accelerate the auto-maker's R&amp;D activities in the ASEAN region.</li> </ul>
Isuzu Motors Limited	<ul style="list-style-type: none"> <li>- Isuzu Technical Center of Asia Co., Ltd. (ITA) was established to develop R&amp;D of pickups, design of vehicle equipment, trial production, experiment, and assessment.</li> <li>- Isuzu promotes localization, including product planning in Japan.</li> </ul>
Suzuki Motor Corporation	<ul style="list-style-type: none"> <li>- In 2011, Suzuki Motor Corporation established the "ASEAN Technical Center" in Automobile Technology Headquarters in Thailand to promote an efficient production system and implement a comparative examination of local products to help improve local procurement.</li> </ul>

Source: Kurokawa, M. (2015)

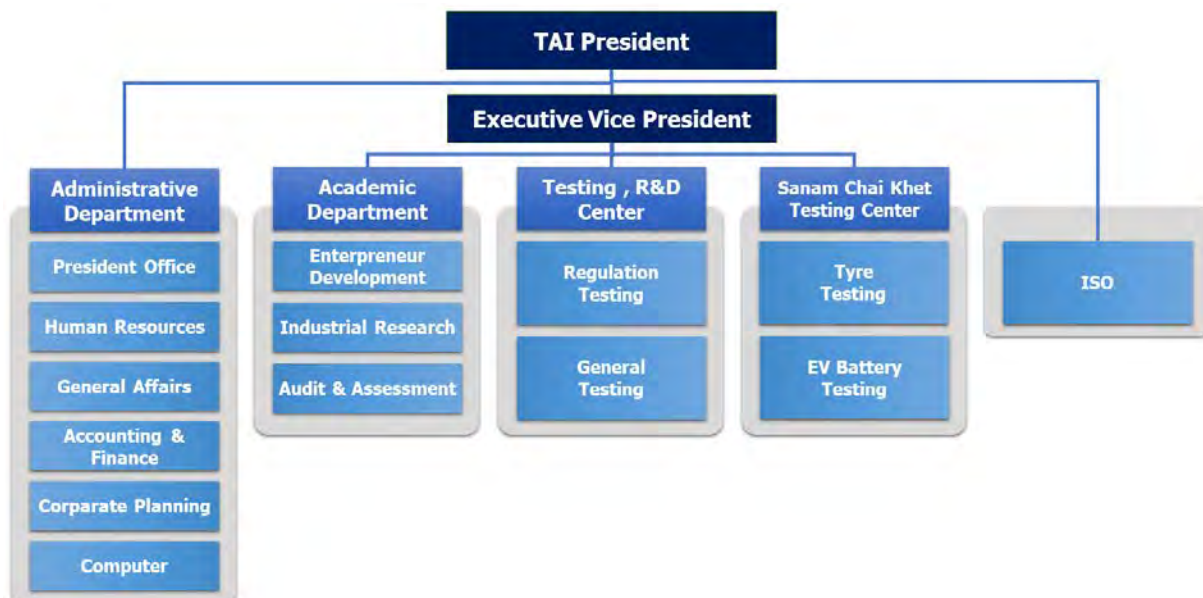
#### **(4) Establishment of Thailand Automotive Institute (TAI) by Public-Private Partnership**

In 1988, the Thailand Automotive Institute (TAI) was established under a public-private partnership with 50:50 ratio between government and the private sector to develop automotive human resources and help the country to recover from the Asian financial crisis. TAI plays the important role not only in human resources development but also in the reinforcement of R&D and supply chain.

**Table 4.3.6 Profile of the Thailand Automotive Institute**

Vision	The leading organization of automotive and auto parts industry development with environmental-friendly business ecosystem and modernization.
Mission	<ul style="list-style-type: none"> <li>➤ To be the knowledge center and expert on automotive industry development.</li> <li>➤ To support the operation of organizations in testing standards, inspection, and innovation.</li> <li>➤ To develop human resources in automotive, auto parts, and related industries.</li> <li>➤ To expand research and development and enhance competence of entrepreneurs for more productivity.</li> <li>➤ To collaborate with organizations in Thailand and overseas on automotive industry development.</li> </ul>
Core Values	<p><b>Synergy:</b> To reach goal with unity and collaboration.</p> <p><b>Mutuality:</b> Stakeholders first with good services from inside-out</p> <p><b>Accountability:</b> Aim for ultimate goal with responsibility and good attitude</p> <p><b>Rounded Specialist:</b> Knowledgeable and self-development from utilizing existing resources efficiently</p> <p><b>Transparency:</b> Good governance, transparency, and reliability of both domestic and international automotive industries</p>
Strategies	<ul style="list-style-type: none"> <li>➤ Increase standard of operator by providing quality testing, evaluation, and consultation services</li> <li>➤ Enhance operator skills to increase productivity</li> <li>➤ Use technology and innovations to develop industry</li> <li>➤ Develop management for excellent and efficient services through good governance</li> </ul>
Services	Testing center, consulting services, automotive engineering, free zone, training, product development, automotive human resources development, study and analysis, automotive intelligence unit

Source: TAI HP



Source: TAI HP

**Figure 4.3.7 Organizational Chart of TAI**

## 4.4 Development of Supporting Industries and Human Resources

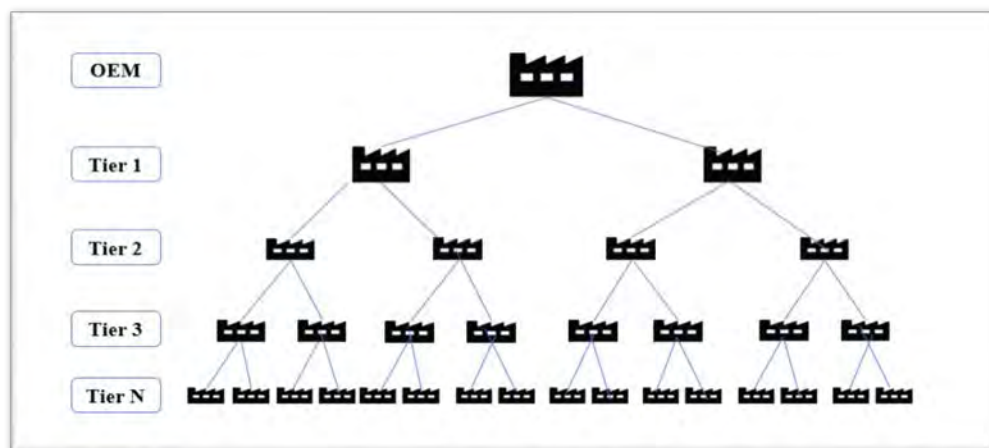
### 4.4.1 Japanese Experiences in Supply Chain Risk Management

The automotive supporting industry and supply chain have been affected by the Covid-19 pandemic. A broad range of issues has arisen in the supporting industries since the mid-2020. Section 2.3.3 of Chapter 2 discusses the characteristics of the automobile SC, and the factors behind SC disruptions are examined. Likewise, in sections 2.3.1 and 2.3.2 of Chapter 2, the issues of the automotive SC in Pakistan are discussed.

In the following parts and in line with the above, the role of the public and private sectors is considered in the context of automotive SC risk management (SCRM) by looking at the Japanese experience.

#### (1) Perspectives on SC Disruptions

As shown in Figure 4.4.1, the supply chain is composed of the production bases (plants, branch offices, etc.) and the network that connects them. It can thus be argued that the supply chain is composed of points and links. Therefore, the impact of a disaster on the supply chain can be felt at two levels: at the production base (PB) and at the network (NW) levels. Even though an emergency (e.g., a fire or an earthquake) occurs and one of the PBs is damaged, it does not necessarily affect the whole supply chain immediately. Even if one of the PBs is suspended, it will also not affect the whole supply chain, or the impact will be mitigated as long as safety stock is secured or alternative PBs for the supply are available. Considering the above, the perspective of a PB-level disaster and recovery and that of a network-level impact and recovery should be discussed at least conceptually.



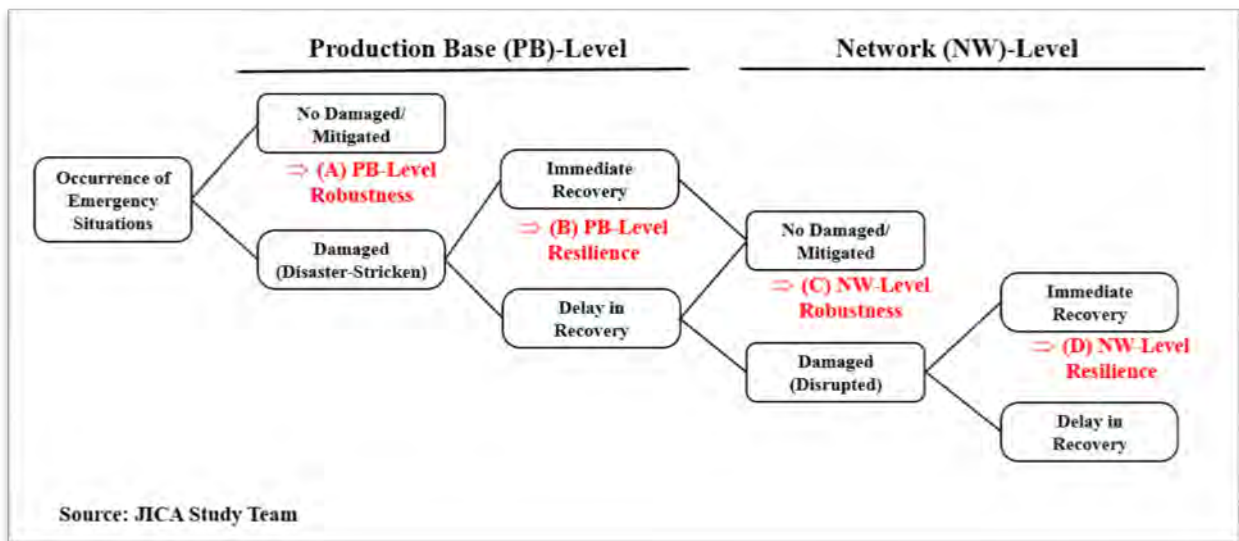
Source: JICA Study Team

**Figure 4.4.1 Conceptual Diagram of a Supply Chain**

Figure 4.4.2 implies the risk of SC disruptions. Both man-made and natural disasters first have their impacts on individual PBs. In such a situation, it can be said that a production base has high robustness if it is less susceptible to external shocks (e.g., earthquakes, typhoons, and floods).

Meanwhile, even though a production base is damaged or its operations become suspended, it has high resilience if it returns to normal operations immediately. In other words, the more resilient a production base is, the less the supply chain is affected by external shocks. The same can be applied to supply chains: Even if some of the production bases are damaged, the supply chain remains robust if it is less susceptible to external

shocks or damages. And even if it gets disrupted, it is resilient as long as it returns to normalcy promptly.



Source: JICA Study Team

Figure 4.4.2 Risk Analysis of SC Disruptions

## (2) Measures against SC Disruptions

### 1) PB-level Robustness

PB-level robustness refers to the degree to which productive operations are not easily affected by natural and man-made disasters. Tangible measures include plant construction, strengthening seismic isolation and seismic isolation of productive equipment, and capital investment in equipment maintenance.

Meanwhile, intangible measures include building up good labor-management relations, maintaining maintenance system, etc. It is likewise important to secure an appropriate level of safety stock. It should be noted, however, that overstocking may also be a sign of inefficient inventory management, implying possibilities of obsolete inventory.

### 2) PB-level Resilience

Resilience is the capability to quickly restore productive operations even though a production base is damaged. According to surveys on past cases of SC disruption in Japan, there are two important points of PB-level resilience. One is the capability for mobilizing human resources. The other is problem-solving capability through improvement activities during normal times.<sup>22</sup>

On top of these, what matters is the technological characteristics of the target products and productive processes to be restored. Opportunistic behaviors of interested parties in the event of a disaster are also important points. As for the above-stated technological characteristics, difficulty in restoration tends to crop up if the target product has specific designs. On the other hand, if opportunistic behaviors are taken by interested parties (e.g., plant workers, customers, and suppliers), compensation issues may arise. Consequently, restoration activities may also be delayed.

<sup>22</sup> For instance, please refer to D.E. Whitney et al. (2013) "Supply Chain Disruption Risk and Recovery: Temporary Diversification and Its Limits" Manufacturing Management Research Center of University of Tokyo, Discussion Paper, No.434

**3) Network-level Robustness**

Network-level robustness refers to the degree to which a specific production base, despite being damaged, is not easily affected by the disruption in the supply chain. For instance, given that the supply of a product or component is heavily dependent on PB "X," a damage to it also causes another to the supply chain. To avoid such a situation, effective measures include securing safety inventory and alternative suppliers that can provide comparable products and components, etc.<sup>23</sup>

**4) Network-level Resilience**

Network-level resilience is the capability to promptly restore supply function in the event of an SC disruption. A prerequisite for utilizing this capability is to ensure SC visibility. There is a need to meet the prerequisite and to build up alternative supply channels that circumvent the disaster-stricken area. In such a situation, what matters is substitutability and portability of design information. The key to finding alternative channels includes reducing threats of opportunism, as well as enhancing capacity for problem-solving and for mobilizing resources.

**(3) The Role of Government**

The first two parts of this subsection discussed how the private sector could respond to or deal with SC disruption. In this subsection, the role of the government is examined in response to SC disruption. In other words, implications for industrial development policy are considered.

From the standpoint of the government, for instance, as a countermeasure for one of the tangible elements (e.g., buildings), the revision of the earthquake resistance standards should be made in accordance with the industrial development policy. Such measures should include providing incentives for businesses to consider corporate capital investment.

The role of the government also includes assisting small- and medium-sized enterprises (SMEs) to prepare business continuity plans (BCPs). The aim of BCPs is to facilitate the recovery of businesses in areas affected by earthquakes. After the 2011 Great East Japan Earthquake (GEJE) and the 2016 Kumamoto Earthquake, some people began to point to the significance of BCPs in the process of reconstruction and restoration.<sup>24</sup> At the same time, however, because BCPs are a form of strategy to spread risks, diversify procurement sources, and decentralize production bases, there is a growing concern among industry players who have long been a part of major OEMs' supply chains about the possible loss of employment or businesses which would be generated by such strategies.

Similarly, there is a possibility that a manufacturing base may shift from other areas. It is assumed that productive supply chains may be geographically restructured and/or reconfigured. On top of the above, since more tasks are located in Japan along the international supply chains, the role of government has become more and more critical in preparing for disasters and in carrying out reconstruction in the context of regional

<sup>23</sup> Tomlin, B. and Wnag, Y. (2012) Operational strategies for managing supply chain disruption risk, (in) Kouvelis, P, et al. (eds) *Handbook of Integrated Risk Management in global supply chain*: Wiley & Sons. Pp.79-101

<sup>24</sup> For details, please refer to Fujita *et al.* (2018) "Spatial Economics of Reconstruction: Local Revitalization in the Era of Falling Birthrate" *Nikkei Shimbun*. Fujita *et al.* (2018) insist that the five following factors are of importance in order to strengthen business continuity during disasters; namely, (i) efforts on business transaction to minimize inventories, (ii) geographical expansion (or internationalization) of SC, (iii) mass production and transportation in designated or limited areas so as to pursue economies of scale for production and transportation, (iv) facilitation of "selection and concentration" and outsourcing in corporate strategy, and (v) minimizing procurement sources and facilitating merger between auto-component manufacturers.

development. In preparation for disastrous situations, the government should encourage local businesses to formulate BCPs so as to make supply chains more disaster-resistant and resilient. However, governmental measures should be ready because the progress in BCP formulation among SMEs is slower than that of large enterprises. As for the post-disaster assistance, the Restoration and Maintenance Subsidy Project for Facilities of Small and Medium Enterprise Groups (group subsidy) was introduced in Japan after the 2011 GEJE. The target of the group subsidy includes not only its members but also the facilities and equipment shared by local businesses and along the supply chains. A maximum 75% of the total costs are covered by the subsidy in relation to relevant reconstruction and restoration activities.<sup>25</sup>

#### (4) Critical Issues in Managing Risks during SC Disruptions

In view of the discussions above, the factors affecting the robustness and resilience of a supply chain's production bases and network are summarized in Table 5.4.1. It is possible to further reduce the risks of SC disruption by considering and combining the elements relating to SC disruption: namely, production system, physical distribution, and people's mobility.

**Table 4.4.1 Factors affecting the Robustness and Resilience of Production Bases and Networks**

	(A) PB-level Robustness	(B) PB-level Resilience	(C) NW-level Robustness	(D) NW-level Resilience
Factors	--Tangible measures: Seismic standards, earthquake-resistant repairs, etc. --Intangible measures: Labor-management relations, maintenance / security system --Safety inventory	--Capacity of mobilizing resources --Problem solving capacity -- Technological characteristics of production processes --Threats of opportunism	-- Concentration of procurement sources --Availability of alternative sources of procurement --Safety inventory	--Visibility of SC --securing alternative supply channel (substitutability and portability of design information) --Capacity of mobilizing resources -- Threats of opportunism

Source: JICA Study Team

Meanwhile, the government should play a role in revising the earthquake resistance standards and in providing incentives to local businesses to make capital investments to mitigate SC disruptions. On top of that, the government should assist SMEs to formulate BCPs in preparation for disasters to make them more resilient and resistant. Likewise, as one of the post-disaster measures of assistance, in view of the aforementioned group subsidy, there is a need for the government to also subsidize the cost of restoring facilities and equipment shared in the supply chain and by local industries.

#### 4.4.2 Auto Parts Supplier's Technology Reinforcement by Public-Private Partnership in Thailand

##### (1) Importance of Human Resources Development in Supporting Industries

The automotive industry is characterized by a pyramid-type supply chain structure,

<sup>25</sup> Fujita *et al.* (2018) assess the innovativeness of wider coverage of this group subsidy for the post-disaster activities. However, they also argue that if post-disaster policy measures are enhanced the moral hazard may be brought about; that is to say, less preparations are made beforehand for possible disasters. In order to lessen the moral hazard to happen, one of the measures is to link the recipient qualification of the subsidy with BCP formulation.



consisting of primary, secondary, and tertiary suppliers of tens of thousands of auto parts. In this structure, auto parts manufacturers play a key role. Based on Sadoi's survey (2009), Table 4.4.2 shows the auto parts suppliers in Thailand classified by product.<sup>26</sup> The number of Japanese auto parts suppliers is large, accounting for 63% to 78% by product. The number of local and non-Japanese suppliers is small. With the rapid development of the automotive industry in Thailand, there is a need to foster skilled human resources.

**Table 4.4.2 Auto Parts Suppliers in Thailand by Product**

Parts classification		No. of suppliers	Japanese suppliers	
			No. of suppliers	(%)
Engine related parts	Engine body parts	31	26	84%
	Engine valve train parts	18	15	83%
	Engine fuel system parts	22	15	68%
	Engine intake / exhaust system parts	36	17	47%
	Engine lubrication / cooling system parts	23	17	74%
	Engine electrical components	16	11	69%
	Others	8	3	38%
	Total	154	104	68%
Chassis related parts	Powertrain parts	37	30	81%
	Steering parts	34	30	88%
	Suspension parts	21	15	71%
	Brake parts	39	29	74%
	Tire / wheel parts	21	15	71%
	Others	3	2	67%
	Total	155	121	78%
Body / equipment related parts	Body exterior	74	52	70%
	Interior goods	76	58	76%
	Body electrical components	38	31	82%
	Supplies	28	23	82%
	Total	216	164	76%
Other parts		102	64	63%
Total		627	453	72%

Source: Sadoi, Y. (2009)

## (2) Technical Assistance by TAI and Other Activities

To recover from the Asian financial crisis, Thailand issued the Industrial Restructuring Master Plan. The master plan pointed out six strategies to strengthen the country's competitiveness, and TAI was established as a core strategy. Aiming at making Thailand a key automotive production hub, TAI has six functions to achieve this goal, i.e., transmission of information, provision of assistance to supporting industries, human resource development, capacity development on product design, testing/inspection/certification, and policy recommendation. TAI hired a Japanese expert who formulated the "Supporting Industry Development Program" (SIDP) which was initiated in 2000. In the SIDP, the Japanese expert selected 150 suppliers recommended by two-wheel and four-wheel assembling companies and gave guidance to them. This expert had a team of three Thai experts and they visited four local parts suppliers every day to analyze and improve

<sup>26</sup> Sadoi, Y (2009). *Tai jidousya buhinn sanngyou ni okeru genchi tai -jinn gijutsusya no sekkei gijutsuryoku bunnseki* [Analysis of design technology capabilities of local Thai engineers in the Thai automobile parts industry]. The Meijo Review.

shopfloor operations, as well as give guidance to realize QCDEM targets. In cooperation with governmental organizations in other countries, they also implemented activities to raise Thailand's industrial technology to international levels (Table 4.4.3).

**Table 4.4.3 Examples of TAI's Activities**

Engineering Development	1. Drafting of Thailand's safety and environment standards.
	2. (ISP/IEC 17025) in 5 group areas both industrial standard and providing service on automotive safety and environment test customer standard: <ul style="list-style-type: none"> <li>• Emissions: motorcycle, passenger and light duty diesel, heavy diesel</li> <li>• Mechanical: industrial standard for metal and plastic</li> <li>• Environment: safety glass, thermal, weathering, vibration, corrosion</li> <li>• Dimensions and Calibration: 3D scanning</li> <li>• Chemical: Volatile organic compound from auto interior</li> </ul>
	3. Industrial Standard Inspection (ISO/IEC 17020)
Training & Consulting	1. Cooperation with EU <ul style="list-style-type: none"> <li>• Automotive Manufacturing Automation System (AMAS) project to enhance productivity toward green manufacturing concept by TAI and GIZ under EU support.</li> </ul>
	2. Cooperation with Japan <ul style="list-style-type: none"> <li>• Automotive Human Resource Development Institute (AHRDIP) project under JTEPA to enhance human resource development in Thailand's automotive industry to compete in the world market; by TAI and JETRO with Thai and Japanese government support.</li> <li>• Toyota Production System (TPS) project to enhance productivity toward a lean production; by TAI and Toyota with AHRDIP support.</li> <li>• Automotive Skill Certification System (ASCS) project to enhance human resource skills and expertise standards (Javada) and certification; by TAI and Nissan with Thai and Japanese government support.</li> </ul>

Source: TAI report "About TAI" (2013)

### **(3) Measures to Promote Local Auto Parts-related Manufacturers in the Market**

In the mid-2000s, Japanese motorcycle manufacturers dominated the Thai market both in production and sales. Local suppliers who successfully delivered auto parts to these Japanese manufacturers<sup>27</sup> are described in this section.

#### **1) Trends in market entry**

All 11 suppliers surveyed began producing motorcycle parts after the Thai government implemented a domestic parts production policy in the late 1970s. Many of the 11 suppliers accumulated technical capabilities and production know-how at the start of their operations with the technical support from Japanese OEMs and have been trading continuously with them for many years.

#### **2) Growth factors**

Auto parts manufacturers who directly dealt with Japanese OEMs were required to have high standards in terms of QCD, etc. to meet the demand of mass production from Japanese OEMs. OEMs screened suppliers based on QCD and commended outstanding companies. Those with low defect rates expanded their trading items and rapidly increased their sales. On the other hand, companies whose grades did not reach the required level implemented improvement measures, and OEMs' quality assurance department provided guidance on improvement and inspection methods.

<sup>27</sup> From September 2004 to December 2005, Sato, Y. and Ohara, M. (2006). "Aija no nirinnsya sanngyou [Motorcycle industry in Asia]" visited 11 local Thai companies and conducted interviews to consider the growth factors, production systems, business relationships, and technological levels of each company.

Many local suppliers tried to acquire know-how in production technology by working on in-house production of molds. One major local supplier established a mold and jig manufacturing and accumulated know-how in production technology internally. Some SMEs set up specialized departments for mold making and began improving their mold skills. Previously, molds were provided by OEMs, but some local suppliers designed molds with the support of OEMs.

There were some local suppliers who were established almost in the same year and have similar business scope, but there was a big difference in their sales growth. One of the reasons for this is that local suppliers who had increased sales hired Japanese advisers on production technology. Furthermore, excellent local suppliers entered into technical tie-ups with foreign companies to produce parts for motorcycles and four-wheeled vehicles, whose demand was expanding at that time, and have moved toward producing core parts as their business focus.

Thai Summit, which boasts of the largest sales among local motorcycle parts suppliers, is involved in the design and development of resin parts for automobiles at a Japanese company with which it has a technical tie-up. Since 2005, they have sent engineers to a Japanese joint venture to produce stamped parts for four-wheeled vehicles. Regarding the manufacture of motorcycle parts, they are actively involved with Japanese companies to acquire know-how in production technology, such as receiving design training at a development company and dispatching engineers to produce prototypes.

Daisin is a company that has grown by making good use of the takeaways from Japanese companies as motivated top managers learn Japanese technology and establish joint ventures with Japanese companies. It has developed designs and proposals on production technology.

### **3) Inhibitors**

The number of Japanese companies expanding to Thailand was small because the recession caused by the devaluation of the baht continued until the mid-1980s. Therefore, local suppliers did not have to compete with Japanese companies. However, this meant that local suppliers had no opportunity to receive technical support from Japanese companies and had to obtain production know-how on their own. For example, regarding molds, production engineering, and process design, they had to improve on their own technology.

### **4) Promotion of Market Entry**

As seen in the case of Thailand, the following four features are common to local suppliers who succeeded in delivering parts to Japanese manufacturers: (1) Local suppliers accumulated technical capabilities and production know-how by receiving technical support from Japanese OEMs after the start of operations and continued to trade with them since then; (2) They were able to do mass production and comply with the QCD requirements of Japanese OEMs. They had a particularly low defect rate and were excellent at dealing with problems; (3) They were not only local Tier-1 suppliers who delivered directly to Japanese OEMs and suppliers but also Tier-2 suppliers who delivered semi-finished parts to other local suppliers; and (4) Many of them acquired production know-how through the in-house production of moulds. In addition, local suppliers who employed Japanese production advisers had higher sales than those who did not.

In order to promote the automobile industry in Pakistan, it is necessary to keep in mind the

above-mentioned cases of Southeast Asian countries and to cooperate with public and private organizations in developing supporting industries and industrial human resources, as well as in promoting investments.

#### 4.4.3 Educational Programs on Automotive Industry Offered by Private Companies

##### (1) Indonesia

PT. Toyota Motor Manufacturing Indonesia (TMMIN), which is a manufacturer in Indonesia under the Toyota Motor Corporation (Toyota), established the “TMMIN Learning Center” to provide training programs on vehicle production techniques in May 2012. The Center also organizes various trainings and offers practical exercises for TMMIN staff to acquire comprehensive know-how on vehicle production. Some courses are open to suppliers and ordinary students in the area, and the Center aims to build human resources for the automotive industry in Indonesia.

**Table 4.4.4 Profile of TMMIN Learning Center**

Facility Name	TMMIN Learning Center
Establishment Date	May 10, 2021
Activity	Training courses and practical exercises to enhance techniques and skills related to vehicle production. *The activities aim to not only enhance capacity of employees but also transfer comprehensive know-how of vehicle production to the country.
Address	Located in TMMIN Karawang factory in north west of Jakarta
Investment	IDR 2.3 Billion
Facility Area	3,700m <sup>2</sup>
Number of Students	5,300 persons/ year

Source: Website of Toyota

In addition, Toyota Ehime introduced a training course for trainers of auto mechanics in BLK (Balai Latihan Kerja: vocational school) Bantaeng through a JICA grassroot project entitled “Project for Training of Trainers for Auto Mechanics in BLK Bantaeng (2016-2018).” The course is a two-year program, and a Japanese trainer was dispatched for the course. Furthermore, four company staffers were sent in turn every three months. After the project, a new JICA grassroot project started in 2019, whose aim was to implement the above-mentioned project on training of trainers in other areas in Indonesia and to build an evaluation and educational system for trainers.

P.T. Isuzu Astra Motor Indonesia (IAMI) introduced an “Isuzu Educational Program” which teaches the latest diesel techniques including common rail, in SMK (Sekolah Menengah Kejuruan: technical school) Mandiri Medan in Medan, North Sumatra. IAMI already established the same educational program in SMK 2 Klaten in Yogyakarta in 2014.

In addition to the above, the Aso College Group, which runs some vocational schools in Fukuoka, Japan, established in September 2014 a Binus Aso School of Engineering

(BASE) in a Binus University whose headquarters are located in Jakarta. The school has two departments, i.e., engineering and design, and provides human resource development programs according to the needs of Japanese companies.

**(2) Thailand**

In Thailand, Toyota established a technical school in 1998. The profile is shown in Table 4.4.5.

**Table 4.4.5 Profile of Thai Toyota Automotive Technical School**

Name	Thai Toyota Automotive Technical School
Location	Cha Choeng Sao (70km east from Bangkok)
Month of establishment	April in 1998
Area	3550m <sup>2</sup>
Number of students	146 (First grade: 89, Second grade: 57) (as of 2000)
Facilities	four classrooms, one place for practical training, one meeting room, one library, office, lodging facility
Others	Soccer ground, tennis court, basketball court

Source: JICA Study Team

The school was originally established as a vocational school under Toyota Motor Thailand to acquire skilled human resources for the company. According to the request for further technology transfer from Thai government, the school was incorporated as a two-year technical school in April 1998. A graduate is qualified to receive a certification from the Ministry of Education for graduating from junior college and national certification for auto mechanics.

The school is the first technical school in Thailand to be run by an auto manufacturer and to introduce a sophisticated educational curriculum and advanced technology and educational materials. Thus, the school is expected by the Thai government and other relevant schools and companies to provide the highest level of education.

In 2000, the school produced its first graduates (57 students), 74% of whom got job offers from Toyota car dealers in Thailand. The rest (26%) went to universities or got jobs from family companies.

Meanwhile, Honda established the Automobile Industry Technical College (AITC) in Ayutthaya with the Department of Occupation under the Ministry of Education. The aim is to develop skilled human resources to support the automotive industry, and the AITC is the first training center for the automotive sector.

In addition, Mercedes-Benz (Thailand) Ltd. signed a partnership agreement with Samutprakan Technical College to accept students with a level of diploma with distinction for an electrical system or machine for vehicles as dual vocational trainees. The students have training courses conducted by experts from the company including practical training and theoretical classes in the Samutprakan Technical College. During the two-year program, the students are paid THB200 per day. Outstanding students are awarded scholarships from authorized dealers as well as support for housing. All students will automatically be hired to work at the after-sales workshops at Mercedes-Benz dealers upon graduation.

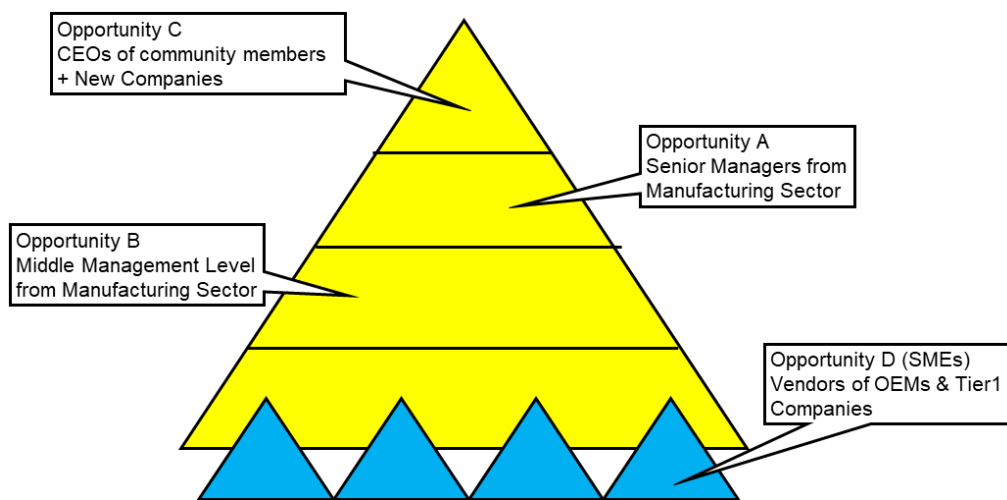
**4.4.4 Executive Management Training in India**

From 2007 to 2013, JICA implemented the Visionary Leaders for Manufacturing Program

(VLFM Program) to create visionary leaders who could transform India's manufacturing industry by promoting the management concept of Japanese manufacturers to senior and middle managers.<sup>28</sup> To acquire practical skills, the program consisted of four courses with 30% lectures and 70% group work and field training.

Conventional manufacturing focuses on the improvement and innovation in production. However, the program had this concept: Manufacturing does not just mean production; it includes a series of activities from planning and designing to after-sales service.

Figure 4.4.3 shows the VLFM Program's four courses which covered a wide range of fields, like executive and SME training. The program started by educating the upper layer and finished by implementing Opportunity D for SMEs based on the idea of Mr. Shiba, who developed the program, which stated thus: "To transform the manufacturing industry, visionary leaders should be created. By improving top management, it is important to promote the manufacturing industry."<sup>29</sup>

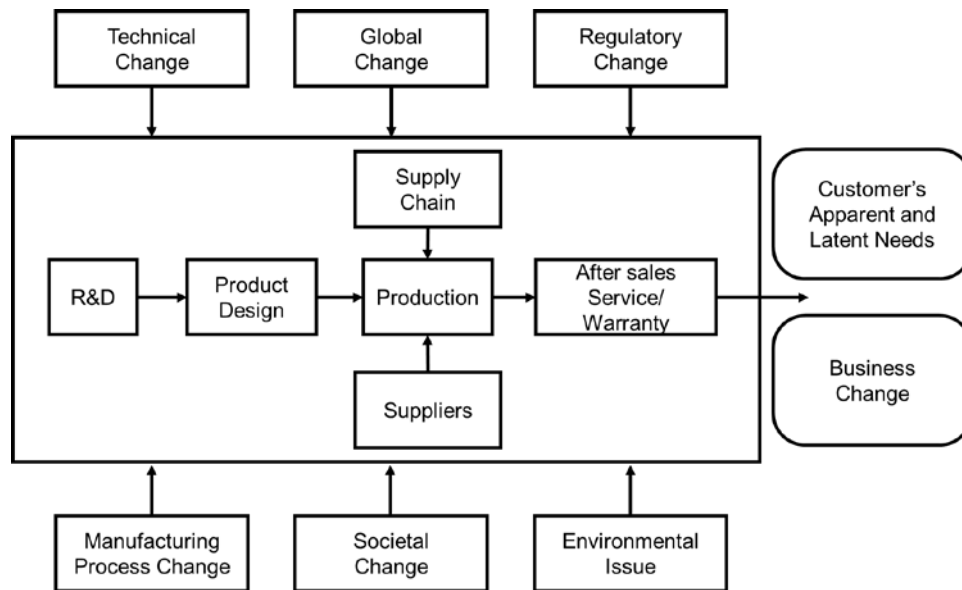


Source: JICA "Visionary Leaders For Manufacturing (VLFM) Project"

**Figure 4.4.3 Four Courses of JICA's VLFM Program**

<sup>28</sup> Please refer to the following URL: <https://www.jica.go.jp/india/english/activities/activity19.html> (Access: 7<sup>th</sup> Dec.2020)

<sup>29</sup> JICA "Visionary Leaders For Manufacturing (VLFM) Project" (2007-2013)



Source: JICA "Visionary Leaders For Manufacturing (VLFM) Project"

**Figure 4.4.4 VLFM Program's Concept of Improvement**

**Table 4.4.6 VLFM Courses**

Name of Course	Quota	Executed by	Execution Detail	Instructional Mode
Senior Managers Course (Opportunity A)	Approx. 50	CII	- Modular system Cluster training with 5 Modules In a year (1 week/Module)	- Skill 70% - Lecture 30%
Middle Managers Course (Opportunity B)	Approx. 30	IIMC, IITK and IITM	- Residential system Learn the strong point of each university moving between three partnering institute and living together for 1 year	Skill 60% Lecture 40%
CEO Course (Opportunity C)	20-30	CII	- Random holding - 1-2 day course for leaders from the VLFM Companies	- Sharing of success cases with VLFM concept among CEOs - Lecture of prominent CEO
VSME Course (Opportunity D)	30-40	CII	- Developing win-win relationship between the Customer and the Supplier - Making changes at the Customer before demanding from supplier thus building trust - Continuous practical guidance on the shopfloor to implement the changes required	- Mindset transformation of customers top management - Collaborative innovation of supplier's manufacturing process with customer and supplier

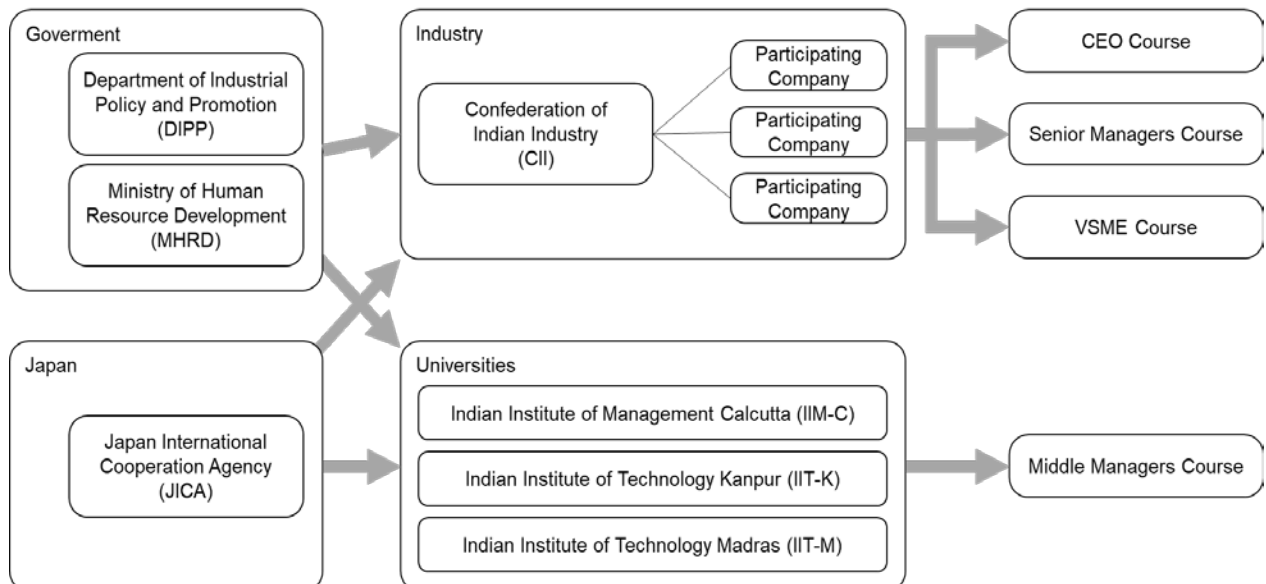
Source: JICA website

**Table 4.4.7 VLFM Results from 2007 to 2013**

Name of Course	Executed by	Training in India	Training in Japan	Graduates						Total
				2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	
Senior Managers Course (Opportunity A)	CII	5 Modules x 1 week	7 days	48	48	48	51	60	80	335
Middle Managers Course (Opportunity B)	IIM IIT	1 Year Residential	10-14 days	30	32	30	29	34	33	188
CEO Course (Opportunity C)	CII	1-2 days (Random)	N/A	-	-	-	21	14	27	62
VSME Course (Opportunity D)	CII	10 Modules x 3 days + $\alpha$	N/A	-	-	6	T1:13 T2:28	T1:46 T2:70	T1:69 T2:70	T1:134 T2:160
<b>Total</b>										<b>879</b>

Source: JICA website

The VLFM Program is India's first project which was supported by India's automotive industry, universities, and the governments of Japan and India. The project was run by Department of industrial policy and promotion (DIPP) and Ministry of Human Resource Development (MHRD), and the implementation was undertaken by Confederation of Indian Industry (CII), Indian Institute of Technology (IIT), and Indian Institute of Management (IIM). On the Japanese side, JICA was in charge of implementing the VLFM Program, dispatching experts from Japan and conducting training in Japan.



Source: JICA "Visionary Leaders For Manufacturing (VLFM) Project"

**Figure 4.4.5 Industry-Government-Academia Collaboration thru VLFM Program**



#### 4.5 Infrastructure Development and Industrial Agglomeration in Vietnam

A successful case of attracting foreign companies by developing infrastructure is proven by the industrial agglomeration in Hanoi, Vietnam.

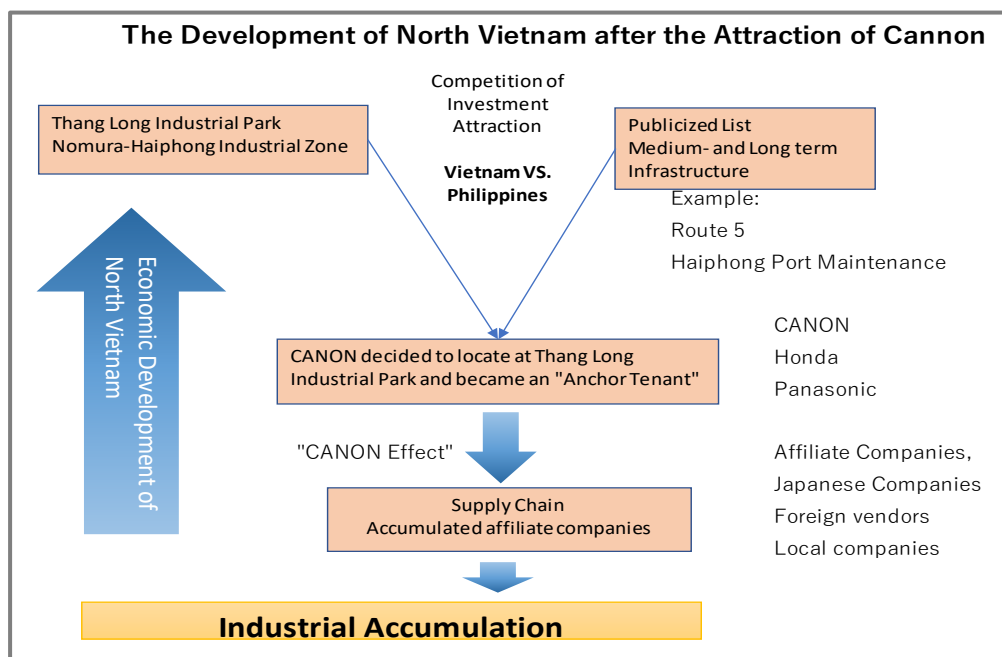
National Highway No. 5 in northern Vietnam is a 100-km highway connecting Hanoi in the west and Haiphong in the east. Along this highway, the Thang Long Industrial Park (TLIP) is located on the Hanoi side and the Nomura Haiphong Industrial Zone (NHIZ) is on the Haiphong side. Vietnam was competing with the Philippines to attract foreign investments and succeeded in attracting Canon. In March 2001, Canon signed a contract to build a bubble jet printer factory in the TLIP at a cost of USD65 million. The investment in TLIP was the first project in Vietnam and the largest and most important project for Canon at that time.

Canon began production in April 2002 and started exporting in May of the same year. Currently, it has three printer factories in an industrial park on the outskirts of Hanoi. In 2000, only two companies located to the TLIP, but in 2001 six companies set up their operations there, followed by 13 companies in 2002. In particular, many companies which provide Canon-related parts transferred to the industrial park. Canon played the role of an anchor company in the area and started an industrial agglomeration. This phenomenon has been called the "Canon effect" (Figure 4.5.1).

The deciding factor for Canon to locate at the TLIP in 2001 was the infrastructure investment plan announced by the Vietnamese government. The investment plan ensured that the business environment for the project site would improve, and Canon put emphasis on the development of National Highway No. 5 connecting Hanoi, Haiphong, and Haiphong Port.

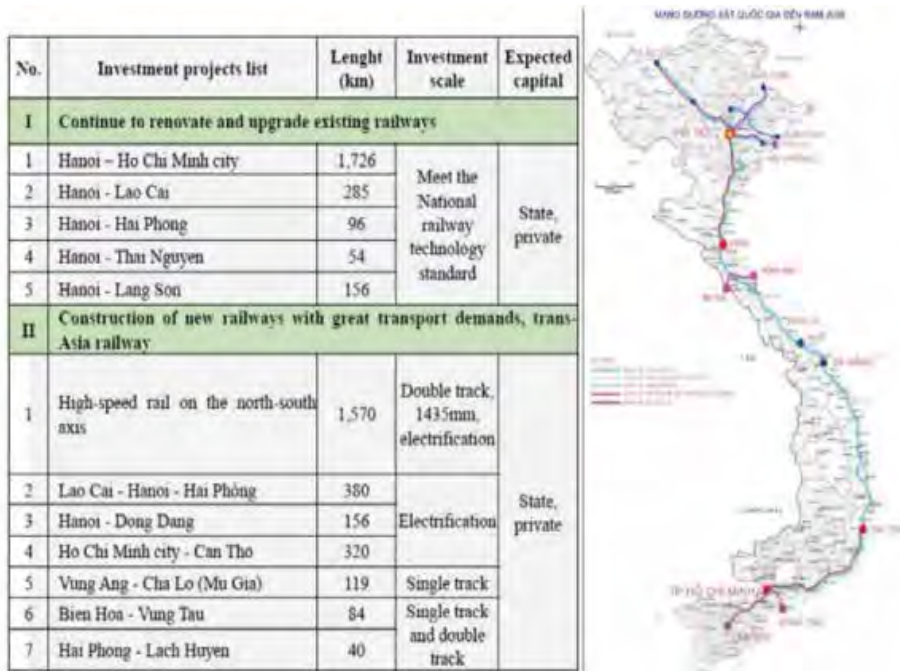
For example, "Infrastructure Vietnam 2019", an event for foreign investors held in 2019 released a list, as shown in Figure 4.5.2, which is important information for investors.

As this case of Vietnam shows, the status of local infrastructure development is an important factor when foreign investors decide to enter a market, and thus it is important to create and disseminate plans to attract companies.



Source: JICA Study Team

Figure 4.5.1 Development of North Vietnam with Canon's Entry



Source: Infrastructure Vietnam 2019

**Figure 4.5.2 Example of an Infrastructure Project List**

## 5 Conclusion and Recommendations

### 5.1 Outline of the New Auto Policy (2021–2026)

As of early July 2021, all the details of the new auto policy (2021–2026), or AIDEP, have not yet been released. However, based on local media announcements<sup>1</sup> and an interview with the EDB on 6 July 2021, an outline of the policy is shown in the table below.

**Table 5.1.1 Outline of New Auto Policy (2021–2026)**

Component	Major Point
Tariff Component	<p>[All Cars]</p> <ul style="list-style-type: none"> <li>● Customs reduction from 7% to 2%.</li> </ul> <p>[660–1000cc Segment]</p> <ul style="list-style-type: none"> <li>● Reduction of general sales tax (GST) from 17% to 12.5% but applicable only for locally assembled vehicles with an engine capacity of up to 1000cc.</li> <li>● Abolition of FED in the manufacture of 1000cc vehicles, etc.</li> </ul> <p>[EVs]</p> <ul style="list-style-type: none"> <li>● Reduction of the GST to 1% to promote environment-friendly vehicles.</li> <li>● Abolition of VAT on the import of CKD kits for EVs, etc.</li> </ul> <p>[Others]</p> <ul style="list-style-type: none"> <li>● Reduction of tax to 5% in Punjab province under the Punjab Motor Vehicle Taxation Act (PMVTA).</li> </ul>
Non-Tariff Component <sup>1</sup>	<ul style="list-style-type: none"> <li>● Export promotion (especially automotive components).</li> <li>● Implementation system and schedule in relation to WP29.</li> <li>● Increase in added value through localization.</li> <li>● Promotion of consumers' welfare (e.g., shortening delivery time).</li> </ul>

<sup>1</sup> EDB stated that the new policy would comprise the tariff and non-tariff components when the JICA Study Team (JST) interviewed them on 6 July 2021.

Source: JICA Study Team

### 5.2 Vision and Roadmap

The previous auto policy, i.e., AIDP, which was in effect in 2007–2012, set comprehensive goals based on an appropriate analysis of the automobile industry, but most of the goals had not been achieved. The latest policy, the ADP, which is for the 2016–2021 period, set more achievable objectives and has been able to attract a lot of new investors and to increase the number of OEMs. However, car sales have continued to decline since 2019 as opposed to the goals of the policy. In 2020, partly due to the influence of COVID-19, the annual production was only about 117 thousand<sup>2</sup>, which was much lower than the 2016 annual production of 215 thousand at the start of the ADP's implementation. Due to the

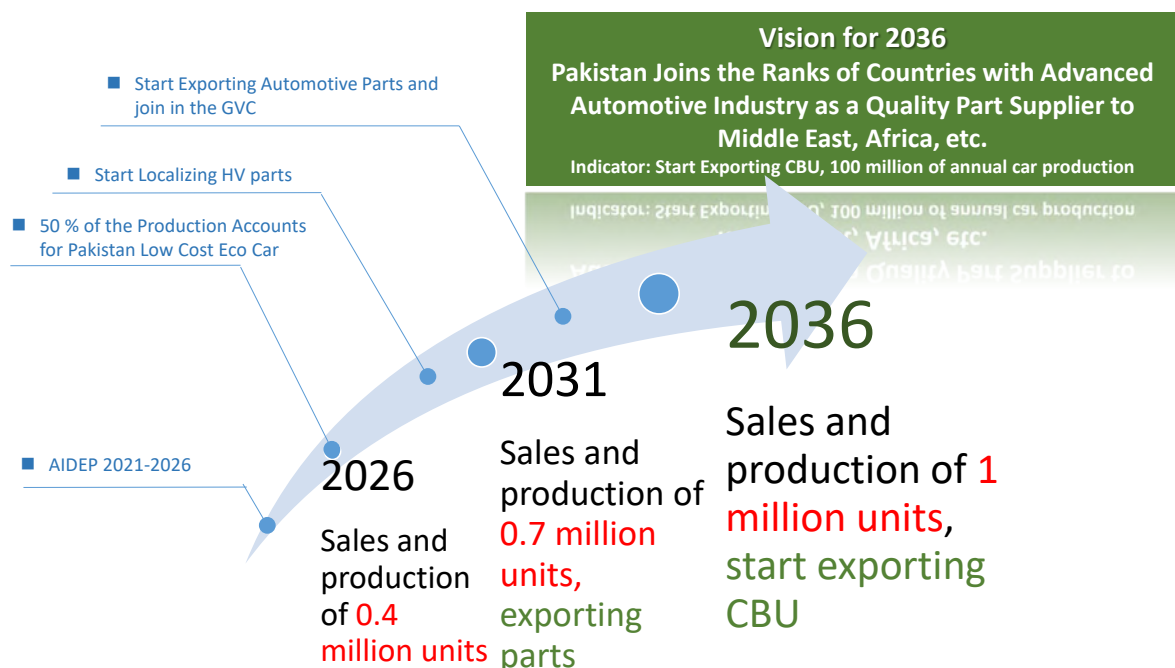
<sup>1</sup> For details, refer to the news website at: <https://propakistani.pk/2021/06/30/the-complete-list-of-highlights-and-big-discounts-for-cars-in-new-auto-policy/> [accessed on Jul. 16, 2021]

<sup>2</sup> The website of Mark Lines shows the production in Pakistan in 2020 was 117,375 vehicles, while sales volume in the same year was 127,939.

aggressive efforts of the automobile industry, production and sales recovered rapidly in the latter half of 2020 (July to December), exceeding the level before the pandemic. The number of cars sold in 2020 reached 128 thousand<sup>3</sup>, outnumbering the production volume. Although the annual production goal of 492,000 was never met, this rapid recovery in sales was a silver lining.

While both AIDP and ADP were developed for a five-year implementation period, the JICA Study Team (JST) recommends that, in line with AIDEP, a longer-term vision or roadmap should likewise be formulated in order to achieve goals of the policy. Indeed, there has been so far a history of moving in different directions due to differences in opinion among stakeholders, especially the implementing bodies. However, given a long-term vision of how to position the automobile industry in the Pakistani economy, it could be easier for the stakeholders to reach a consensus about policy-making and implementation.

For this reason, JST proposes establishing a long-term vision for Pakistan's automobile industry, targeting the year 2036 and using AIDEP, which is scheduled to start in July 2021, as the first five-year plan to pursue the vision. The proposed vision for 2036 is: "Pakistan joins the ranks of advanced automobile-producing nations" to become a "production / export hub for specific parts" and achieving an "annual production of 1 million units" by 2036 (Figure 5.2.1).

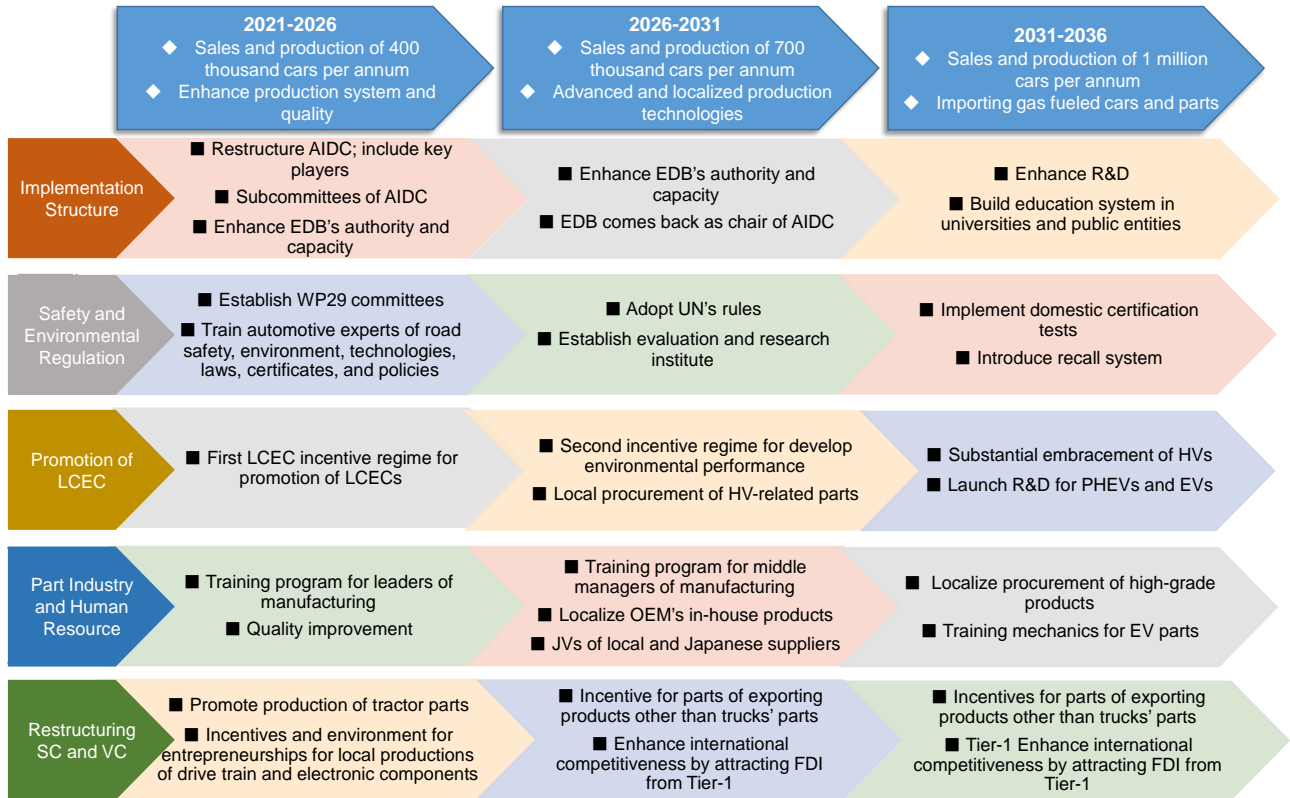


Source: JICA Study Team

**Figure 5.2.1 Vision 2036 for the Automotive Industry of Pakistan (image)**

As a means to achieve the vision above, the five following components are identified, i.e., the implementation structure, safety and environmental regulations, promotion of the Pakistani version of LCECs, development of supporting industries and human resources, and supply/value chain. For this reason, the roadmap below is proposed (Figure 5.2.2).

<sup>3</sup> The website of Mark Lines shows that the production volume in the first half of 2020 increased by 5.5% from the same period in 2019 and that the sales volume increased by 17.7%.



Source: JICA Study Team

**Figure 5.2.2 Roadmap for Vision 2036 (image)**

## 5.3 Proposed Direction of Automotive Industry Development in Pakistan

### 5.3.1 Future Direction of Eight Key Policy Areas

#### (1) Automotive Industry Development Policies

In Chapter 3, it was pointed out that the issues in automotive industry development policies should include formulating the medium- and long-term vision and its roadmap and facilitating the industry-government-academia collaboration. For the coming years, JST recommends that the implementation structure to achieve the vision should take into account stakeholders' opinion.

#### (2) Investment Promotion

The proposed direction of investment promotion are proposed in Table 5.3.1 below. Meanwhile, it is pointed out in Chapter 3 that it is imperative to spread LCEC in the domestic market. In this chapter, however, it is viewed as one of the means to facilitate investment.

**Table 5.3.1 Proposed Direction of Investment Promotion**

Issue	Proposed Direction
-- Inadequate collaboration between AIDC and tax-related agencies (except for FBR). -- Few incentives for existing manufacturers. -- No refund on advance tax (withholding tax) and inadequate preferential tax treatment for SEZ tenants. --Include incentives for LCEC production in the new policy.	--Include BOI as member of AIDC. --For EDB to collaborate with BOI in formulating and implementing incentives. --For EDB to consult with BOI and OEMs about selecting key components and providing incentives.

Source: JICA Study Team

#### (3) Supporting Industry Development (SID)

The proposed direction of SID are briefly described below.

**Table 5.3.2 Proposed Direction of Supporting Industry Development**

Issue	Proposed Direction
--Need to formulate detailed enforcement regulations to develop supporting industries and automotive component manufacturers.	--Formulate and implement detailed enforcement regulations to develop supporting industries and automotive component manufacturers. ---Formulate and implement detailed enforcement regulations to promote capital investment.

Source: JICA Study Team

#### (4) Industrial Human Resource Development (IHRD)

The proposed direction of IHRD are briefly described below.

**Table 5.3.3 Proposed Direction of Industrial Human Resource Development**

Category	Sub-Category	Issue	Proposed Direction
Industrial Human Resource Development	Higher Education (university and technical college)	--"NSS 2018" is not responsive to Industry 4.0. --Few systems to nurture top and middle managers.	--Make next NSS responsive to Industry 4.0. --Discuss automotive IHRD in AIDC. --Increase automotive engineering

	Vocational Training	--Each province has different focus of IHRD. --Few universities have automotive engineering courses.	courses at universities. -- Develop systems to nurture top and middle managers.
--	---------------------	---	--

Source: JICA Study Team

## (5) R&D

The proposed direction of R&D are briefly described below. In view of the results of interviews conducted by JST, it was found that the significance of R&D is not fully understood among interested parties in Pakistan. Thus, there is a need to raise the awareness about R&D by sharing with them the cases of Indonesia and Thailand, as explained in Chapter 4<sup>4</sup>.

**Table 5.3.4 Proposed Direction of R&D**

Category	Issue	Proposed Direction
R&D	--Need to formulate policies and detailed enforcement regulations to promote R&D due to inadequate understanding about the importance of R&D. --Need for public agencies to contribute to R&D and automotive trends --The Pakistan Automotive Institute (PAI) was not established.	--Deepen understanding among AIDC members about R&D promotion cases in third countries. --Establish a sub-committee on R&D promotion in AIDC.

Source: JICA Study Team

## (6) Infrastructure Development

The proposed direction of infrastructure development are briefly described below.

**Table 5.3.5 Proposed Direction of Infrastructure Development**

Category	Sub-Category	Issue	Proposed Direction
Infrastructure Development	Transportation, Logistics, and SEZ	-- The centralized/ governmental agency is needed which can coordinate overall infrastructure projects --Unstable supply of infrastructure.	--Establish sub-committee on infrastructure development in ADIC. --Establish centralized governmental agency to improve infrastructure and/or provide a one-stop service (OSS).

Source: JICA Study Team

## (7) Safety and Environmental Regulations

The proposed direction of safety and environmental regulations are briefly described below.

**Table 5.3.6 Proposed Direction of Safety and Environmental Regulations**

Category	Sub-Category	Issue	Proposed Direction
Safety and Environmental Regulations	Type Approval	--Need to formulate roadmap for WP29. --Inadequate implementation structure on human resources for WP29.	--Discuss details of type approval system. --Formulate an implementation plan for WP29.
	Automobile Inspection	-- Automobile inspection is conducted only for commercial vehicles. --Each province has a different system of automobile inspection.	--Introduce automobile inspection for passenger cars.

Source: JICA Study Team

<sup>4</sup> Please refer to the cases of Indonesia (4.2.2) and Thailand (4.3).

## (8) Market Expansion

The proposed direction of market expansion are briefly described below.

**Table 5.3.7 Proposed Direction of Market Expansion**

Category	Sub-Category	Issue	Proposed Direction
Market Expansion	Domestic Market	--Need to formulate detailed enforcement regulations, inconsistent with other related policies, to achieve sales and production goals. --Few governmental agencies to implement consumption incentives based on market analysis. -- Need to formulate incentive scheme to promote purchases of car models affordable to general consumers.	--Formulate policy measures to achieve the Vision 2036's sales and production goals. --Increase car types and models affordable to general consumers. --Strengthen functions of EDB and AIDC. --Develop capacity of EDB staff.
	Export	--Export-related measures are not stipulated in ADP and other related policies. --Competitiveness of local auto component manufacturers is unknown among stakeholders.	--Include measures on export in AIDEP. --Carry out market research in potential export destinations.
	New Car Types	--Inadequate coverage of EVs and other vehicle types by current policies targeting existing ICE vehicles.	--Facilitate policy discussion in AIDC. --Formulate manufacturing standards for EVs.

Source: JICA Study Team

### 5.3.2 Direction of Automotive Industry Development

In this section, related policies and issues are discussed by examining the components of the proposed roadmap: namely, (1) implementation structures, (2) LCEC, (3) safety and environment regulations, (4) supporting industry development, and (5) restructuring of supply and value chains to consider the direction of automotive industry development. On top of these, the draft EV policy, which was released in June 2020, is likewise discussed.

#### (1) Improvement of Implementation Structure

In this section, a new system within the AIDC and the strengthening of EDB are discussed.

##### 1) Formation of Sub-committees under AIDC

To further enhance the potential of the AIDC as a public-private-academia partnership platform for the promotion of the automobile industry, the industry, government, and academia should work together to overcome individual challenges while understanding the contribution of the automobile industry to the Pakistani economy.

**Table 5.3.8 Indicative Measures to Strengthen AIDC**

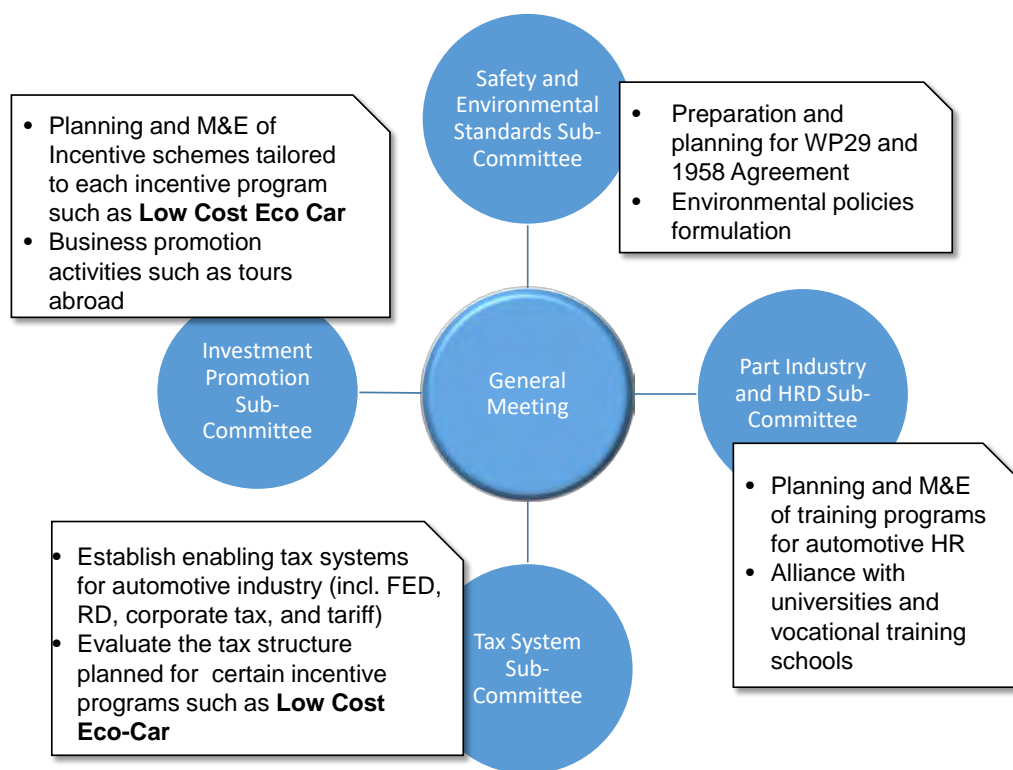
Issue	Direction of Improvement
Inadequate authority and capacity of AIDC in realization of recommendations	<b>1) MOIP to temporarily take over as Chair:</b> Until EDB obtains adequate authority and capacity, MOIP that has more influence on the powerful ministries or agencies such as FBR should chair the AIDC.
Strengthen coordination with tax authorities	<b>2) Include FBR's division in charge of broader tax strategy:</b> Beside the custom duty department, the other departments that delegate FEB, RD, and sales duty, either of which critically influence the automotive



Issue	Direction of Improvement
	industry, join the Committee as members to seek a favourable tax regime for the sake of the whole industry and national economy.
Strengthen coordination among stakeholders/ relevant officials	<p><b>3) Include BOI as a member:</b> Secure consistency with investment promotion policy and discuss the effective measures to contribute to the automotive industry.</p> <p><b>4) Include NAVTCC as a member:</b> Start intensive discussions on strategies to develop automotive human resources in coordination with the agency in charge of vocational training schools.</p> <p><b>5) Include Ministry of Communication (MOC) as a member:</b> Develop coordination with MOC to effectively push forward WP29, which is often lead by the transport authorities in other countries because it deeply relates with transportation laws.</p>
Discuss critical agenda intensively with stakeholders	<p><b>6) Clarify the objectives to meet the goal of the automotive industry policy:</b> Stipulate critical areas such as human resource development, supply chain, R&amp;D, quality improvement, and others.</p> <p><b>7) Establish a subcommittee for each objective:</b> Form sub-committees to continuously discuss each key objective and regularly hold meetings to accumulate experience.</p> <p><b>8) Hold general meetings regularly:</b> Each sub-committee bring along the progress in the regular general assembly of AIDC to peer review the progress of the other subcommittees to monitor and evaluate the policy of automotive industry.</p>

Source: JICA Study Team

Figure 5.3.1 shows the composition of the Committee in line with its priority goals.



Source: JICA Study Team

**Figure 5.3.1 Proposed Structure of AIDC**

The JST proposes the establishment of the four following sub-committees within the AIDC: 1) safety and environment regulations sub-committee, 2) parts industry and HRD sub-committee, 3) investment promotion sub-committee and 4) tax system sub-committee.

The proposed structure of the sub-committees of AIDC is shown in Table 5.3.9. It is expected that technical discussions on each theme can be further developed by including the BOI, NAVTTC, universities, and private companies, which were not previously included in the AIDC, to the relevant sub-committees.

**Table 5.3.9 Proposed Core Members of AIDC**

Meeting	Chair	Public Sector	Industry and Academia
General Meeting	MOIP	All the member organizations	All member organizations
Sub-Committees			
Safety and Environmental Standards	EDB	PSQCA, AT&TC, MOCC	OEMs, parts manufacturers, <b>consumer associations, associations of victims of traffic accidents</b>
Part Industry and HRD		SMEDA, <b>NAVTCC</b> , MOIP, Higher Education Commission	<b>Vocational training schools, universities (faculty of engineering and IT)</b> , PAMA, PAAPAM, OEM, parts manufacturers
Investment Promotion		BOI, MOC, NIP	OEMs, parts manufacturers
Tax System		<b>FBR (management of the divisions of Inland Revenue), the FRB's custom division, BOI, MOC</b>	PAMA, PAAPAM, OEM, parts manufacturers

Note: Organization colored in red indicates current non-member.

Source: JICA Study Team

At the time of its establishment in 2007, the current AIDC set up thematic sub-committees. However, all members were not able to participate on a regular basis because the representatives from the corporate side came from rural areas, and travel expenses became a burden. Since then, it was set that only general meetings would be held on an ad-hoc basis. Given these circumstances, it is necessary to increase opportunities for face-to-face discussions as much as possible. The JST suggests that the new AIDC should fully utilize remote conferencing, which has become more widespread these days, and to rotate the venues in Islamabad, Karachi, and Lahore.

## 2) New EDB

Because the EDB has been given limited authority over automobile industry policy making and promotion, there is a need to strengthen its capacity, as shown in the table below.

**Table 5.3.10 Direction of Capacity Development of EDB**

Issue	Recommendation
Strengthening of Legal Basis	<p><b>1) Enhance legal base as an institution governing the overall automobile industry policy</b> EDB should be officially mandated to have the sole authority and duty for planning, implementation, and evaluation of automobile industry policies and investment plans for the realization of such policies<sup>5</sup>. EV policy would be incorporated in the automotive industry policies. Furthermore, it should be legislated that EDB serves as a coordinator of WP29,<sup>6</sup> and in future, EDB will hold arms of automotive quality control department and standardization and R&amp;D for automotive production department.</p> <p><b>2) Hold the authority of the project budget necessary for implementing the automobile industry policy</b> The system will be revised so that the general budget will contain a budget specifically allocated to EDB.</p>
Enhance coordination function	<p><b>3) Share role in action plans of automotive industry policies:</b> The next automotive industry policy should stipulate EDB as the overall manager and specify a responsive entity for each action plan.</p> <p><b>4) Improve capacities in policy planning, monitoring, and evaluation:</b> EDB's capacities in planning, monitoring, and evaluating programs and projects entailed in the next automotive industry policy. Training in overseas agencies that delegate automotive industry will be implemented. Monitoring and evaluation process with clear KPIs should be constructed. Thus, EDB's influence over other governmental bodies will be enhanced by developing its own capacities.</p>
Develop human resources	<p><b>5) Reinforce automotive industry policy formulation unit:</b> Adequate budget should be allocated to reinforce the department for the automotive industry policies. Prioritize automotive department in recruiting.</p> <p><b>6) Train staff in automotive production processes:</b> Establish a joint training program in coordination with PAMA and PAAPAM, leveraging the platform AIDC</p>

<sup>5</sup> The JST could not obtain a copy of the Gazette Notification (No. 4 (37) PD/I&C/95) which enacts EDB. The EDB was established by Cabinet Decision No. 193/10/95 issued on 15 May 1995.

<sup>6</sup> On 6 July 2021, JST had an online meeting with EDB. In the meeting, a request was made by EDB about training for its staff so that EDB may work properly as an implementation body of automotive safety and environmental regulations. On top of it, please refer to "(c) Assistance in Formulation of Safety and Environmental Regulations" of Table 5.3.21 of this chapter.

Issue	Recommendation
	to develop understanding of EDB staff in automotive industry, production process, and tariff assessment capacity <sup>7</sup> .

Source: JICA Study Team

## (2) Investment Incentives for Low-cost Eco Cars

As discussed in preceding sections, the feasibility of introducing EVs in Pakistan in the short term is low; however, its effect of reducing carbon emissions from the transport sector which is now around 20% of total emission should be acknowledged. Pakistan, which has a population of over 200 million and is increasingly getting motorized, has set the long-term goal of introducing EVs and promoting fuel-efficient eco-cars as the first step of an environmental management initiative. This effort will also alleviate the trade deficit by reducing imports of oil which accounts for the largest share of imported goods every year.

In Pakistan, the owners of four-wheeled vehicles are limited to high-income earners, but it is expected that the number of potential buyers will increase as the average household income rises. At the same time, by making available new cars at affordable prices, those who have not yet purchased new ones may be encouraged to buy used cars, thereby stimulating the market for used cars. The JST believes that it is the most effective way of generating demand to promote Pakistan's own LCECs with superior environmental and economic performance as Indonesia has experienced (described in Chapter 3).

This study proposes the introduction of incentives for small and low-cost vehicles with displacements of less than 1,000 cc, or those so-called "segment A" and "other passenger vehicles."

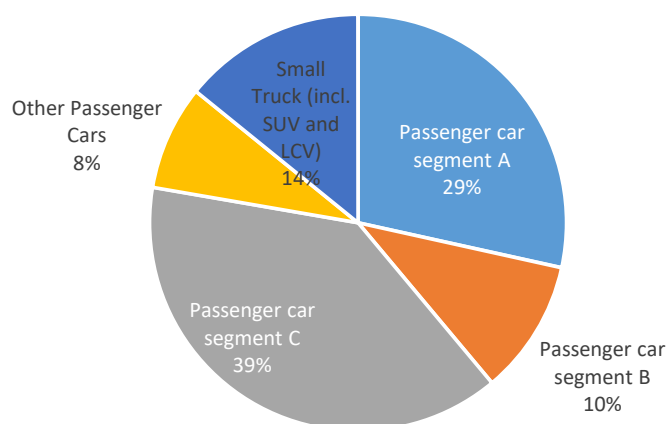
**Table 5.3.11 Car Categories and Prospective Targets for LCECs**

Category	Price (PKR million)	Displacement (rounded)	Current model
Segment A	1.0–1.7	660 cc–1,000 cc	Suzuki Alto, Wagon R
Segment B	1.7–2.4	1,001 cc–1,500 cc	Toyota Yaris, Suzuki Cultus, Swift
Segment C	2.5–4.5	1,800 cc	Toyota Corolla, Honda Civic/City
Small truck (SUV, pick-up)	3.1–6.3	1,500 cc– 3,000 cc	Honda BR-V, Hyundai Tucson, Toyota Hilux
Other passenger vehicle	1.1–1.13	800 cc	Suzuki Bolan

Source: JICA Study Team edited from Mark Lines Portal sites and webpages of respective firm

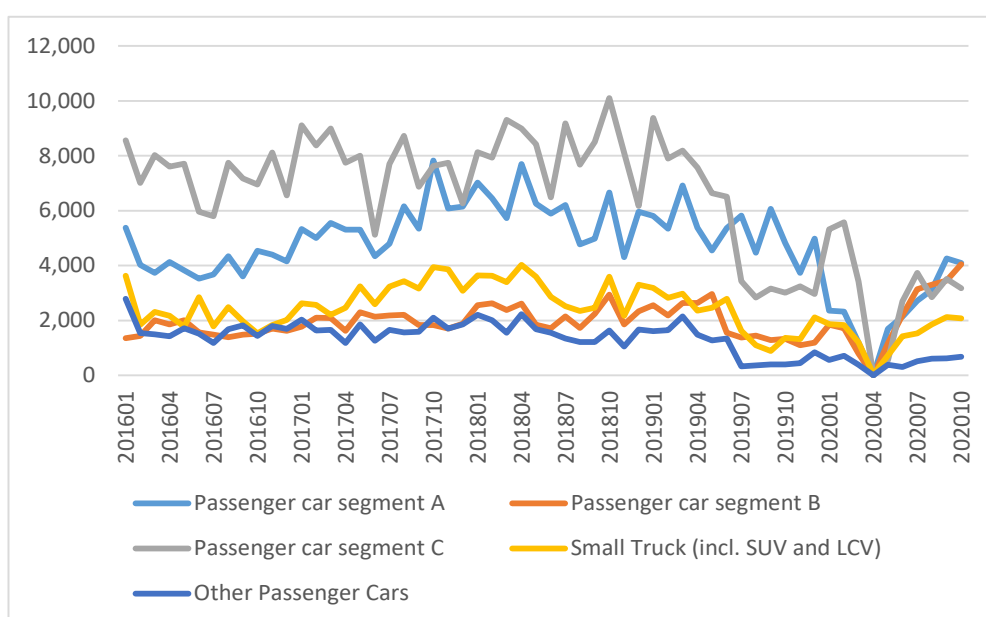
In the last four years before the COVID-19 pandemic, the share of "passenger car A" and "passenger car and others" in total sales was 37%, which was the second-largest after 39% of "passenger car C" and remained almost constant in Pakistan.

<sup>7</sup> For tariff assessment capacity of EDB, refer to table 3.3.4 in Chapter 3.



Source: Mark Lines Portal site

**Figure 5.3.2 Cumulative Production Volume by Category (2016-2019)**



Source: Mark Lines' portal site

**Figure 5.3.3 Trends in Sales Volume by Category**

There are only three models in Segment A and its equivalent, i.e., Alto, Wagon R, and Bolan<sup>8</sup>, out of all 16 models currently in production, all made by Pak Suzuki. Investment incentives are required to increase production lines for this class of vehicles.

**Table 5.3.12 Models by Segment (as of Dec. 2020)**

	Segment	Brand	Type	Model
1	A	Suzuki	Passenger car	Alto
2	A	Suzuki	Passenger car	Wagon R
3	B	Toyota	Passenger car	Yaris
4	B	Suzuki	Passenger car	Cultus
5	B	Suzuki	Passenger car	Swift
6	C	Toyota	Passenger car	Corolla

<sup>8</sup> Although Bolan is shaped like small van and can be categorized as “no specific category,” its’ displacement is below 800 cc that is the same level with segment A. (Web page of Pak Suzuki: <https://www.suzukipakistan.com/automobile-detail?automobile=4r3y9qgcaavppxfn8xt5dy0ccr>)

	Segment	Brand	Type	Model
7	C	Honda	Passenger car	Civic/City
8	n/a	Suzuki	Passenger car	Bolan
9	SUV	Isuzu	Small truck	Unknown
10	SUV	Honda	Small truck	BR-V
11	SUV	Hyundai	Small truck	Tucson (ix35)
12	SUV	Toyota	Small truck	Fortuner
13	Small truck	Toyota	Small truck	Hilux
14	n/a	Suzuki	Small truck	Ravi
15	n/a	Hyundai	Small truck	Porter
16	n/a	JAC	Small truck	JAC

Source: Mark Lines' portal site

Hence, the JST suggests targeting the vehicles of Segment A as candidate LCEC certificate holders and establish a preferential treatment system. The Study Team recommends that the EDB split the LCEC initiative into two phases of 5 years each as seen in the good experience of Thailand. The first phase will be dedicated to increase the number of investors who manufacture LCECs, followed by the second phase which will aim to enhance the environmental performance of vehicle to promote LCECs.

The price ceiling for Segment A and equivalent can be set at PKR1.5 million excluding tax, while the concerned vehicle's energy efficiency rate can be set at 20 km/L and more. Safety equipment may be allowed to increase ceiling price up to 15% of the vehicle's price. The JST proposes to provide LCECs that meet above-mentioned conditions with tax exemptions and preferential treatment for their manufacturers (Table 5.3.13).

**Table 5.3.13 Investment Incentives to Create LCEC Market (First Phase: 2021–2026)**

Class	Requirement	Incentive
Segment A and equivalent	(For vehicles) <ul style="list-style-type: none"> <li>◆ Sales price without tax is less than PKR1.5 million</li> <li>◆ Addition of the price up to 15% of the maximum vehicle price is allowed if safety functions such as air bags are equipped.</li> <li>◆ Fuel efficiency more than 18 km/L</li> <li>◆ Compatible with EURO2 or EURO5</li> <li>◆ More than 60% of parts are locally procured</li> </ul>	(For vehicles) <ul style="list-style-type: none"> <li>◆ 100% exempted from FED (Currently, 2.5% taxed for less than 1,000 cc)</li> </ul>
	(For corporations) <ul style="list-style-type: none"> <li>◆ Investment amount more than PKR5 billion</li> <li>◆ Annual production of more than 25,000 of LCECs within 5 years</li> </ul>	(For corporations) <ul style="list-style-type: none"> <li>◆ Corporate tax deductible for the costs related to LCECs (ex. capital investment, production, and R&amp;D) for 8 years</li> <li>◆ Exempt from tariff for importing facilities and equipment</li> </ul>
Other ICE and HEV (CKD), Bio diesel cars, etc.	(For vehicles) <ul style="list-style-type: none"> <li>◆ Fuel efficiency of 28 km/L or more</li> </ul>	(For vehicle) <ul style="list-style-type: none"> <li>◆ 50% exemption from FED</li> </ul>
	<ul style="list-style-type: none"> <li>◆ Fuel efficiency of more than 20 km/L and less than 28 km/L</li> </ul>	<ul style="list-style-type: none"> <li>◆ 25% exemption from FED</li> </ul>

Source: JICA Study Team

The figures in the table above are for reference only. It is necessary to discuss them in line with the actual situation in Pakistan with stakeholders, such as the FBR and BOI, under the new AIDC system.

In the second phase, based on the evaluation of the first phase, the JST proposes to introduce incentives to improve the environmental performance of LCECs. In addition, from 2031, the JST proposes the strengthening of incentives for the local procurement of HEV parts to kickstart the full-scale local production of related parts including control system parts for HEVs.

**Table 5.3.14 Investment Incentives to Create LCEC Market (Second Phase: 2026–2031)**

Rank	Requirement	Incentive
Segment A and equivalent	(For vehicles) <ul style="list-style-type: none"> <li>♦ Sales price without tax is less than PKR2 million</li> <li>♦ Addition of the price up to 15% of the maximum vehicle price is allowed if safety functions such as air bags are equipped.</li> <li>♦ Fuel efficiency more than 23 km/L</li> <li>♦ Compatible with EURO5</li> <li>♦ More than 80% of parts are locally procured</li> </ul>	(For vehicles) <ul style="list-style-type: none"> <li>♦ 100% Exempted from FED (Currently, 2.5% taxed for 1,000 cc)</li> </ul>
	(For corporations) <ul style="list-style-type: none"> <li>♦ Investment amount more than PKR10 billion (Cumulative amount since the beginning of the 1<sup>st</sup> Phase)</li> <li>♦ Annual production of more than 40,000 of LCECs within 5 years</li> </ul>	(For corporations) <ul style="list-style-type: none"> <li>♦ Corporate tax deductible for the costs related to LCECs (ex. capital investment, production, and R&amp;D) for 6 years</li> <li>♦ Exempt from tariff for importing facilities and equipment</li> </ul>
Other ICE and HEV (CKD), Bio diesel cars, etc.	(For vehicles) <ul style="list-style-type: none"> <li>♦ Fuel efficiency of 28 km/L or more</li> <li>♦ Local procurement rate of the parts of HEV is more than 20%</li> </ul>	(For vehicles) <ul style="list-style-type: none"> <li>♦ 75% exemption from FED</li> </ul>
	<ul style="list-style-type: none"> <li>♦ Fuel efficiency of more than 20 km/L and less than 28 km/L</li> </ul>	<ul style="list-style-type: none"> <li>♦ 25% exemption from FED</li> </ul>

Source: JICA Study Team

This incentive proposal is based on the actual situation in Pakistan, modeled on the eco-car (LCGC) promotion policies of Thailand and Indonesia. The LCGC policy in Indonesia boosted the sales volume of domestic market. The LCGC certified vehicles reached 600,000 units in three years, exceeding 20% of the total sales share.

Pakistan currently has less than half the real GDP per capita compared to Indonesia in 2013 when the LCGC policy was introduced. Indonesia had already exceeded 1 million units as annual production at the time of the introduction of LCGC. Thus, the comparison of both countries is not straightforward. However, in 2017, when the automobile industry was on an upward trend, the annual sales volume of Segment A and similar class models reached 87,347 units until the significant rupee depreciation started in 2018. This past market growth of this segment shows that the demand for small and inexpensive cars in Pakistan is huge.

The JST recommends that the LCEC initiative be completed by 2031, leading to the start

of full-scale production of HEVs that are not CKD units. In parallel with promoting the sales expansion of LCECs, control system engineers should also be involved in the local procurement of HEV parts. Through such efforts, the possibility of producing PHEVs will start after 2031.

The JST proposes that the EDB further develop the incentives for LCEC production in coordination with the stakeholders in the industry, government, and academia, including the FBR and BOI; incorporate its strategies in the next AIDEP; and implement it under the new AIDC.

### (3) Roadmap for Safety and Environmental Regulations

In view of the Malaysian experience, the JST has several proposals covering organizational structure, human resources, and others.

As explained in Chapter 3, applying UN regulations to domestically manufactured vehicles, requires infrastructure development in phases; even other countries have taken long to achieve this.

The specific details of the four steps to introduce the UN regulations as presented in Chapter 3 are as follows.

#### Stage 1: Regulations, Systems, Review of Organizations, Maintenance

Vehicle manufacturers shall take certification tests of UN regulations at overseas testing institutions to obtain approval based on the results, and the government should establish regulations, systems, review of organizations, and maintenance to support the process of approval, subsequently followed by initial selection of UN regulations and the development of the roadmap.

#### Stage 2: Start of UN Regulations Application

While increasing the number of UN regulations for domestic adoption, the plan to strengthen domestic testing capabilities based on necessity and possibility is important, as well as to have an appropriate and economically reasonable testing system and maintenance according to regulations and technical aspects to establish safety and environmental standards. Establish certification mechanism to review the results of certification tests from overseas testing institutions.

#### Stage 3: Review of Domestic Certification of UN Regulations

Realize the testing and review some of the certification items, aiming at the same level as overseas third-party testing institutions.

#### Stage 4: Start of Recall System and Expansion of Vehicle Inspection System

As the technical knowledge about certification is beginning to accumulate, start the implementation of both the recall system (to resolve problems in maintaining safety and environment according to UN regulations) and the expansion of the vehicle inspection system (to include passenger vehicles, digitize registration, etc.) where the function is to confirm the performance of vehicles sold in the market.

Table 5.3.15 shows the important actions to move towards these stages.

**Table 5.3.15 Important Actions to Introduce UN Regulations**

Level	Action
Committee	Committee to establish an overall organization and to support WP29 (national policies and recommendations)

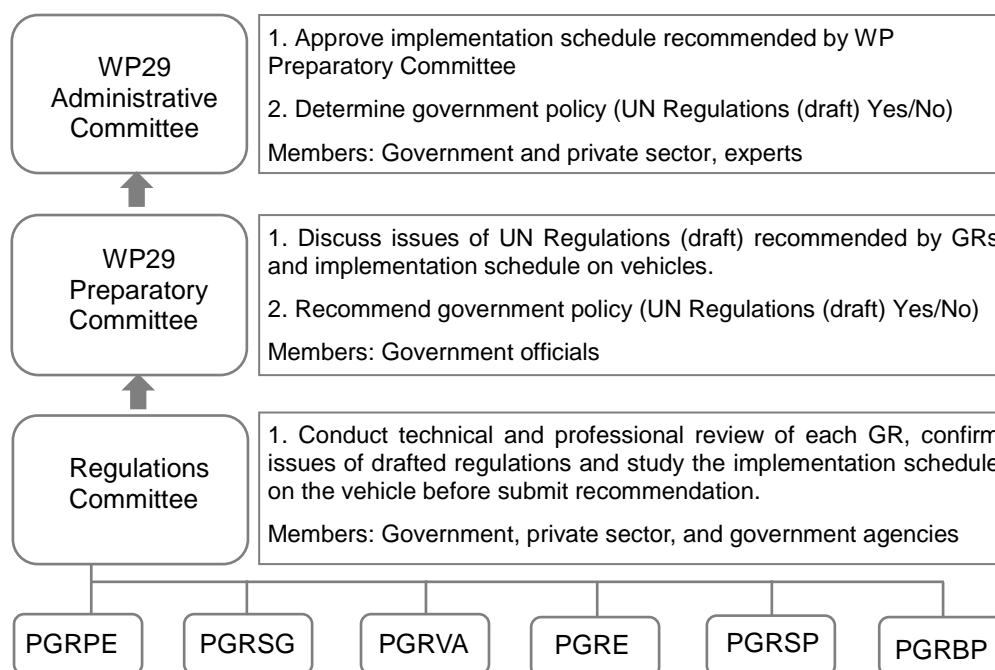


	Committee to focus on domestic adoption of UN regulations
	Committee to consider organizations for certification and systems etc.
Other Organizations	Establish organization to support WP29 and 1958 Agreement
	Establish organization to adopt domestic UN Regulations and application to vehicles
	Establish organization for type approval
	Establish organization for recall
	Strengthen collaboration between industry-government-academia
System	Establish type approval system
	Establish recall system
	Expand vehicle inspection system
Facility	Establish test facility/institute for certain selected certifications
	Expand vehicle inspection centers
Human Resource Development	Develop experts in solving automobile problems (Traffic accidents and Environmental problems)
	Develop experts in automotive technology
	Develop experts in regulation and certification
	Develop experts in automobile policy making

Source: JICA Study Team

Among these priority actions, things that need to be implemented from the beginning are the Committee’s actions that involve organization, system, etc., and the development of necessary human resources for all required actions. The important role of this Committee is to include as members government agencies and the private sector (automobile industry, auto parts industry, experts) that are involved in these actions and work together on the national project.

The following plan on the WP29 committee structure is recommended with reference to Malaysia’s achievement of WP29 participation in 2006.

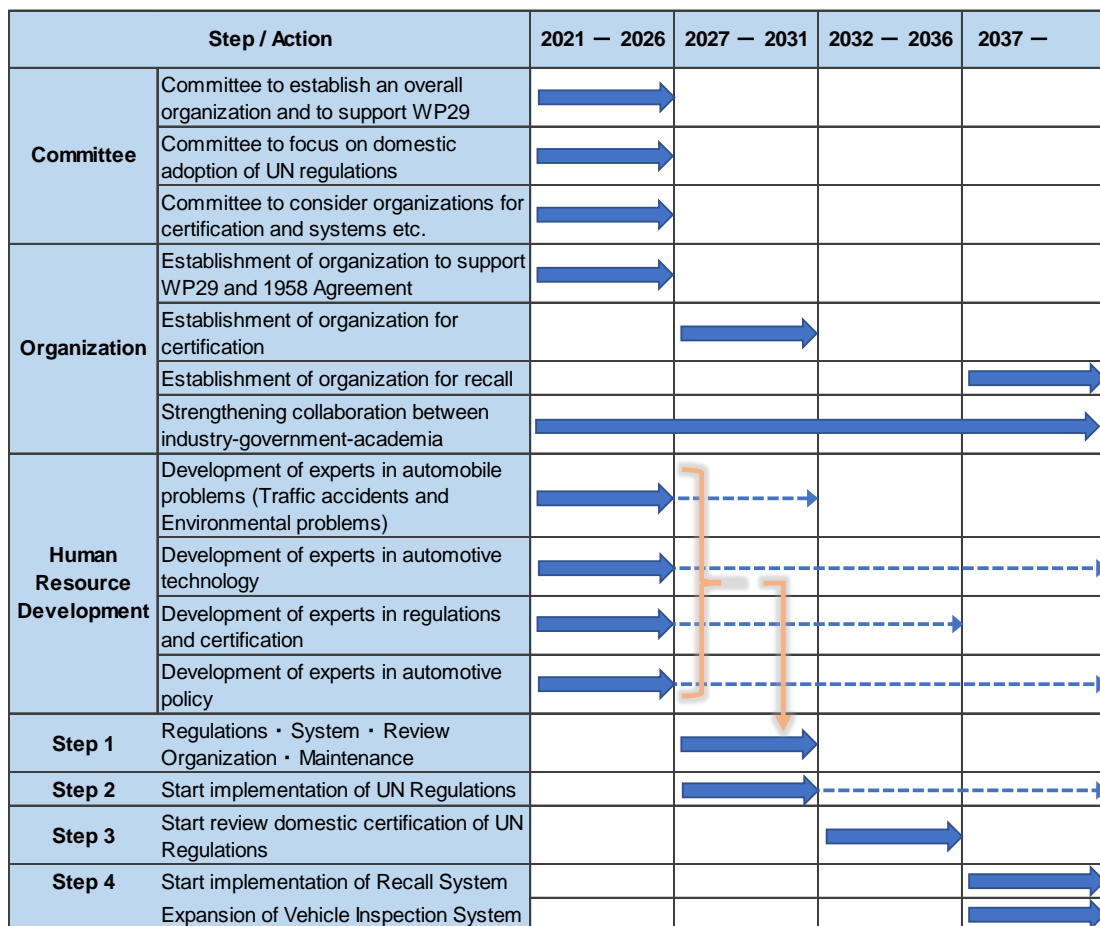


Source: Prepared based on MIROS materials

**Figure 5.3.4 Draft Structure of the WP29 Committee**

Human resource development seems to be difficult because there are only a few people who have experience in safety and environmental problems, technologies, regulations, and certification. Cooperation from Japan, including other advanced automobile countries, as well as seminars and overseas training for government agencies, automakers, testing institutions, etc. to learn need to be implemented on a regular basis. Furthermore, it is necessary to strengthen education at local universities to learn the basic fields. Eventually, it will become necessary to develop human resources from the industry, government, and academia to foster experts who can consistently provide advice on automotive policy making.

In many countries, including Japan, the government agencies for the development of automobile technology and the promotion of the automobile industry are different. Ministry of Science and Technology (MoST) has one agency responsible for advancement of automobile technology, and there should be the WP29 Administrative Committee and entities that will conduct certification (type approval authority, competent authority, and technical service) under it. Figure 5.3.5 shows a draft roadmap based on these actions.



Source: Prepared by JICA Survey Team

**Figure 5.3.5 Proposed Roadmap to Introduce UN Regulations**

#### (4) Measures for the Auto Component Industry

##### 1) Foster Top Management

To expand the automotive industry in Pakistan, the corporate culture that encourages auto parts suppliers to adhere to quality standards due to customer demand should be cultivated

at an early stage. Evaluation standards by top management have a significant degree of influence on field workers, leading to quality of products. To transform the corporate culture, top management's consciousness and behaviour should change as well. As mentioned in Section 4.11 in Chapter 4, the VLFM program for executives and top management achieved certain results in South Asia. It is recommended to introduce this kind of program in Pakistan.

## 2) Provide Technical Assistance to Local Suppliers

The target of technological improvement should be the manufacturing process of upstream industries (e.g., casting, forging, and stamping). Based on the findings of JICA's "Project for Technical Support to Auto Parts Manufacturing Industry," the JST prefers the provision of technical assistance (e.g., training course) to target companies, which should include Japanese OEMs, besides governmental and local suppliers.

## 3) Encourage Technology Transfer from OEMs to Local Suppliers

Some of the auto parts produced in Pakistan are manufactured in-house by OEMs due to the low technical capabilities of local parts manufacturers. Because these products are produced using advanced technology, such technology can be transferred to the local parts manufacturers industry by switching from in-house production by OEM to production by local suppliers. The JST recommends outsourcing current in-house products of OEMs on the premise of improving the quality of the local parts manufacturers mentioned above.

## 4) Attract Investment from Overseas Parts Manufacturers

In addition to in-house OEM products, there are high value-added products that are not produced in Pakistan. Product line expansion can be expected by improving the quality of local supplies. However, to disseminate high precision know-how and promote high quality domestically in a short period of time, joint ventures with Japanese suppliers are the most effective way. To realize joint ventures, the production volume of automobiles should be more than 500 thousand units as a standard.

## (5) Restructure Supply Chain/Value Chain

To restructure the supply chain, the following aspects are critical: 1) strengthen 12 kinds of export items, 2) facilitate import substitution of key components (e.g., drivetrain-related parts), 3) locally source components traditionally produced in-house by OEMs, and 4) diversify sources of components.

**Table 5.3.16 Direction of Supply Chain Restructuring**

Direction	Content
1) Increase in the Production of Tractor-Related Components, New Market Development Competitiveness Enhancement of Other Components	--Critical to formulate policies and detailed enforcement regulations to enhance the competitiveness of tractor-related components, which has the lion's share among export items, from the short-term point of view. It is also important to increase volume of existing export items and to develop new market. --Prioritize those except for tractor-related components and improve their competitiveness by identifying the market needs from the medium- and long-term point of view --Provide tax incentive for example, for those firms which become able to export the said target products and components from the short-, medium- and long-term point of view
2) Import Substitution of Key Components	--Facilitate import substitution and local procurement by prioritizing key components (e.g., clutch, drive shaft and ECU). --Provide tax incentive for example, for those firms which diversify procurement sources from the short-term point of view.

Direction	Content
3) Local Outsourcing of those Components produced in-house by OMEs	-- Facilitate local outsourcing of the components produced in-house by OEMs (e.g., engine hood, fender and car roof) and provide tax incentives, for instance, for local firms that produce the said components in the country. --Consider attracting FDIs of Tier-1 component manufacturers of the above-stated key components from the medium- and long-term point of view.
4) Diversification of Sources of Component Procurement	--Diversify procurement sources and reconsider "Resilience" of SC from the viewpoint of risk management, considering that China and Thailand are the main sources of imported components --Provide tax incentive for example, for those firms which diversify procurement sources

Source: JICA Study Team

### 5.3.3 EV Policy

Pakistan's draft EV policy released in June 2020 targets motorcycles, three wheelers, and HCVs.<sup>9</sup> Although the draft policy focuses on tariffs, when the government exerts effort to promote EVs in the domestic market, the following factors will hinder their demand: technological immaturity, inadequacy of infrastructure, and lack of manufacturing and safety standards. If the government tries to reduce the burden on the environment, it seems that one of the options is to promote EV conversion within a limited range, such as converting some buses on BRT routes to EVs. However, motorcycles and three wheelers, which are the priority areas of EV policy, are challenging, and if the government tries to popularize them in the future, policies in line with the current situation in Pakistan need to be examined with reference to the policies of other countries.

#### (1) Creation of Demand for EVs through Subsidies

The EV policy focuses on motorcycles and three wheelers, but it is assumed that there is already consumer demand. At present, the price is more than double that of existing gasoline-powered motorcycles and three wheelers, but the mileage is short, and thus the benefits to consumers are small. However, subsidies to consumers are not a component in the policy. In general, the customers of motorcycles consider purchasing them because they are normally priced lower than automobiles. Without this price advantage, electric motorcycles will not be a choice. From the manufacturers' point of view, there is no merit in manufacturing products that are not in demand.

China has been one of world's major EV-producing countries, and some insights into EV policy could be drawn from the country's experience. Its EV policy targets four-wheeled vehicles and has aimed to create demand in the EV market across the country by utilizing a wide variety of policy measures. In this country, the market normally consists of the public, corporate, and individual segments. The central government instructed the local governments to generate public and corporate demands in the initial stage. In 2016, 76% of those who purchased NEVs were public and corporate users, whereas 24% were individual users<sup>10</sup>. Of the 24% of individual users in 2016, demand in cities that regulated

<sup>9</sup> According to the result of the interview with EDB conducted by JST on 6<sup>th</sup> July 2021, the incentives (a), (b) and (c) below have been added for HEV and PHEV. For the details, please refer to the following URL (access: 15<sup>th</sup> July 2021): <https://propakistani.pk/2021/06/30/the-complete-list-of-highlights-and-big-discounts-for-cars-in-new-auto-policy/>

(a) 8.5 percent GST for CBU vehicles up to 1800cc

(b) 12.75 percent GST on CBU vehicles between 1801cc and 2500cc

(c) 3 percent Customs Duty on the CKD components of PHEVs while 4 percent Customs Duty on those of the HEVs

<sup>10</sup> Strategic Direction of OEM and Auto-parts Manufactures in Enlarging Chinese EV Market, May 2019, SMBC

the issuance of license plates gasoline-powered vehicles accounted for 17%. From January 2018 to July 2018, the proportion of public and corporate demand decreased to 28% whereas individual demand increased to 72%. About 31% out of 72% were in cities that regulated the issuance of license plates. The JST assumed that EV demand increased even more in cities with no restrictions, but it could be said that restrictions on the issuance of license plates gasoline-powered vehicles helped create a demand for EVs.

Coupled with the restrictions on the issuance of license plates to gasoline-powered vehicles, subsidies were disbursed in China. From 2016 to 2020, subsidies of up to 55,000 yuan for EVs and up to CNY25,000 for PHEVs have been disbursed. The share of EVs in the number of new cars sold in 2019 is 4.9%. However, in 2019, the subsidy became stricter, and the number of vehicles sold decreased by 4% from the previous year, and some OEMs decided to raise car prices. In response to this, China has extended subsidies until 2022, suggesting that subsidies also play a major role in creating demand. Under these circumstances, the EV plan announced in October 2020 has included EVs, PHEVs, FCEVs, and other fuel-efficient vehicles under the category of new energy vehicles (NEVs) to achieve the NEV target of accounting for a fifth of new car sales by 2025. Fuel-efficient vehicles are considered to be hybrid vehicles. China's experience will be an important reference point when considering Pakistan's future EV policy.

## **(2) Technological Maturity and Infrastructure**

Based on the interviews on EV trends in motorcycles and three wheelers, it is not possible to secure the space for battery loading, so it is even more difficult to convert them to EVs compared to four-wheeled vehicles. There are few countries that have launched EV motorcycles in the market. Even then, EV motorcycles are being promoted through government subsidies which are utilized for improving infrastructure such as charging stations. However, they are solely dependent on tariffs. In view of this situation, it seems difficult to popularize EV motorcycles and three wheelers in Pakistan from 2020 to 2025, as specified in the draft EV policy.

Even in Taiwan, which is the most advanced region in terms of EV motorcycle use, the goal is to change all buses and government vehicles to electric vehicles by 2030, ban the sale of motorcycles that use fossil fuels by 2035, and ban the sale of vehicles that use fossil fuels by 2040. In Taiwan, 3,310 charging and battery replacement stations for electric scooter will be installed, of which 1,000 will be fully installed by the government and the remaining 2,310 will be done by private companies. However, due to the short mileage, battery exchange stations will be set up at supermarkets and convenience stores, and a subsidy of TWD300,000 will be paid for each station<sup>11</sup>. The Corporate Average Fuel Economy (CAFE) will be gradually tightened for manufacturers, and thus manufacturers will be directed to the production of electric motorcycles, aiming to achieve the target by 2030.

## **(3) Manufacturing and Safety Standards**

Manufacturers are not in a position to develop and launch EVs into the market without battery and charger standards, as well as safety standards. Although the draft EV policy focuses on tariffs, the PSQCA is required to develop related standards. In the future, manufacturers will need to develop EV products based on these manufacturing and safety

<sup>11</sup> Battery / battery replacement stations for electric scooters, 3,310 locations to be installed within 5 years, Taiwan Today, 4 January 2018, published on the web site of Taipei Economic and Cultural Representative Office in Japan, accessed on 6 December 2020.

standards. Manufacturers also need to take account of timelines for development and bear testing costs to comply with these standards and get approval. These development costs will be a pressure which may increase production costs.

#### (4) Industrial Promotion of Next-Generation Vehicles

There are three issues in the auto parts industry for EVs: (a) companies to produce new necessary parts for EVs, (b) companies manufacturing unnecessary parts for EVs, (c) personnel who identify the causes of EV breakdowns and take appropriate countermeasures. Regarding the new necessary parts for EVs, especially battery, it can be solved by inviting foreign companies. As far as the unnecessary parts for EV are concerned, other countries have the same issues. Table 5.3.17 and 5.3.18 show how Japanese companies are responding to EV production, utilizing conventional technology and developing new products<sup>12</sup>. In Pakistan, it is necessary to strengthen conventional technology for EVs. Through technology support and management education, it is the best shortcut so that existing companies can grow their business with improved quality and better technology. Regarding the third issue, identifying the cause of EV breakdowns and taking appropriate countermeasures need personnel with different fields and education from universities and public institutions. Looking at the manufacturing industry, there are similar products to EV parts. Therefore, it can be listed as a solution to acquire personnel who deal with EV-related parts from different fields. However, from a long-term perspective, it is necessary to improve education, certification examination, and TAI.

**Table 5.3.17 Efforts on Technology Development by Major Japanese Suppliers**

Company Name	Main Product	Activity
Toyota Industries Corporation	Engine Compressor DC/DC converter	Toyota Industries Corporation focuses on not only conventional auxiliary parts, but also running parts as well as advanced development of its system.
NTN Corporation	Bearing	Development of in-wheel motor for EV
Kanemitsu Corporation	Pulley	Utilizing the technology of press working, rotation molding, development of parts for EV and others except for pulley
Nok Co., Ltd.	Engine oil seal	NOK Co., Ltd. started development of lithium-ion battery related parts and materials conducted trial production of flexible printed circuit board for monitoring Battery Voltage and electrode seal.
Nippon Piston Ring Co., Ltd	Piston ring Valve seat	Consideration of new product development like parts for EVs, including suspension parts
Metalart Corporation	Engine parts Transmission parts	Reinforcement of R&D towards new product introduction like power semiconductor and motor field related parts

Source: Japan Finance Corporation (JFC) Report, No.2010-4 "New developments in the automobile industry including EV and Trends of parts suppliers"

<sup>12</sup> Japan Finance Corporation (JFC) Report, No.2010-4 "New developments in the automobile industry including EV and Trends of parts suppliers."

**Table 5.3.18 Main Auto Parts of Next-generation Cars by Process**

Process	Part	Model Company	Tier
Pressing	Lithium-ion battery case for EV	Kuno Kinzoku Industry Co., Ltd.	Tier 2
	Nickel-metal hydride battery case for HEV	—	Tier 2
	Yoke actuator case for HEV	—	—
Cutting	Electric power steering parts for HEV	TOYO Parts. Co., Ltd.	Tier 2
	Consumable goods for production of lithium-ion battery for EV	—	Tier 1
	Oil pump and transmission parts for HEV	Shoda Manufacturing Co., Ltd.	Tier 2
Bending	Cooling unit parts like battery	Sekiguchi Kogyo	Tier 2
Injection molding	Resin case for nickel metal hydride batteries	—	—
	Lithium-ion secondary battery sealing plate	Tohno Precision Co.,Ltd	—
Plating	Lithium-ion secondary battery sealing plate	Toadenka Co., Ltd.	—
Winding	Electronically controlled sensor for HEV and EV	TAMAGAWA Seiki Co., Ltd	Tier 1

Source: Japan Finance Corporation (JFC) Report, No.2010-4 “New developments in the automobile industry including EV and Trends of parts suppliers”

**Data Collection Survey on  
Automotive Industry Development in Islamic Republic of Pakistan**

**Final Report**

**Appendices**

Appendix A: Educational System and Industrial Human Resources in Indonesia and Thailand

Appendix B: Safety Standards and Regulations in Malaysia

Appendix C: Trends in Infrastructure Projects in Pakistan with COVID-19

Appendix D: Status of the Automotive Value Chain in South Asia



## Appendix A: Educational System and Industrial Human Resources in Indonesia and Thailand

### 1. Indonesia

#### (1) Educational System and Academic Background of Industrial Human Resources

Indonesia's educational system covers elementary, secondary, and higher education. Secondary education is divided into two phases, i.e., junior high school and high school. In the latter phase, vocational schools (*Sekolah Menengah Kejuruan* or SMK) are also established to develop human resources for manufacturing industries.

As for higher education, polytechnic academies (polytechnic) which correspond to Japan's technical colleges (*kosen*) are established in addition to universities.

In the engineering departments of universities, courses on mechanical engineering are conducted, while practical exercises and assignments from manufacturing companies are implemented in polytechnic academies. Many graduates from the universities and polytechnics work in upstream processes as designers or managers in manufacturing companies.

In 2014, 70,000 new students were enrolled in 186 polytechnics, accounting for 5 to 6% of the numbers of institutions and new students in higher-education institutions.

According to the World Development Indicators (WDI) data (gross) of the World Bank for the period 2010-2018, the enrollment rate was over 80% for secondary education (junior high school and high school), with 2018 posting a high of 89%. That of higher education (universities and technical schools, etc.) also increased year by year, with 2018 exceeding 36%. Based on this data, it is expected that the quality of the labor force has improved.

On the other hand, regarding the academic background of workers in the manufacturing industry as a whole, Mizuho Bank's "Survey Report on the Development of Indonesia Supporting Industry Development Support Roadmap for Asian Industrial Infrastructure Reinforcement Projects (2017)" shows that the share of university or technical college graduates is very low at around 5%.

#### (2) Quality and Availability of Human Resources

According to the survey results of JBIC's "Investment Environment in Indonesia" conducted in December 2019, when hiring general workers at that time, it was a "buyer's market" for the company, and securing the quantity of personnel did not seem to be a big problem. On the other hand, hiring talented engineers and staff was not so easy because there were few human resources with specialized knowledge and skills. During the field survey, some interviewees mentioned cases of hiring students who worked as interns. In addition, some companies were actively hiring excellent Japanese-speaking Indonesians who could be candidates for executive positions, with the aim of entrusting authority to local staff in the future.

Furthermore, in the interview survey conducted by Mizuho Bank as part of the 2017 "Survey Report on the Development of Indonesian Supporting Industry Development Support Roadmap for Asian Industrial Infrastructure Reinforcement Project," it was found that workers would work well if they were educated in-house and hiring trainable workers was

not difficult for Japanese companies. On the other hand, regarding the management level, interviewees said that there was a shortage of skilled manpower, and as a result, technical guidance was also hindered.

### (3) Salary Levels

Since it is difficult to obtain salary levels in the automobile industry, the average basic salary by job title in the entire manufacturing industry is shown in Table A.1 in comparison with other Asian countries. The table shows that the basic salary of Indonesian workers is the third-highest after Thailand and Malaysia, but that of the engineer is lower than India, and that of the manager is the lowest, lower even than Pakistan.

**Table A.1 Basic Salaries in Japanese Manufacturing Companies (2019)**  
(USD)

Country	Worker	Engineer	Manager
Thailand	446	791	1,685
Malaysia	414	851	1,657
Indonesia	348	512	1,059
India	278	569	1,473
Pakistan	129	444	1,123

Source: JETRO "2019 Survey on Business Conditions of Japanese Companies in Asia and Oceania"

## 2. Thailand

### (1) Educational System and Academic Background of Industrial Human Resources

Similar to Japan, the education system in Thailand is a 6-3-3 system, consisting of 6 years of primary education (elementary school), 3 years of lower secondary education (junior high school), and 3 years of upper secondary education (high school). Up to junior high school is compulsory education. After graduating from junior high school, students either go on to high school and university, or get a diploma at a technical college and then go on to university, or take a vocational training course (about 3 months to 1 year) to acquire skills (Figure A.1).

According to the World Bank's WDI data (gross), the enrollment rate for secondary education in Thailand in 2010 exceeded 80% and has been over 100%<sup>1</sup> since 2014. Regarding higher education, it was 50% in 2010, increased to 52% in 2011, and has remained around 50% since then.

In recent years, the demand from the Thai industry for more excellent and ready-to-work engineers has been growing, and the Thai government is also paying attention to Japanese technical college (Kosen) education which emphasizes the acquisition of practical skills. In December 2016, the National Institute of Technology (NIT) of Japan established a liaison office in the Office of the Vocational Education Commission (OVEC) of the Ministry of Education of Thailand. In May 2018, the NIT established the first five-year technical college courses in Thailand, i.e., an electronics course in Chonburi Technical College and a mechatronics course in Slanary Technical College. This initiative was to open a technical college course in existing schools, but the government is planning to establish a new technical school specializing in Japanese kosen education after 2019. In March 2020, JICA

<sup>1</sup> The gross rate is over 120% but the latest net figure is 77% in 2015.

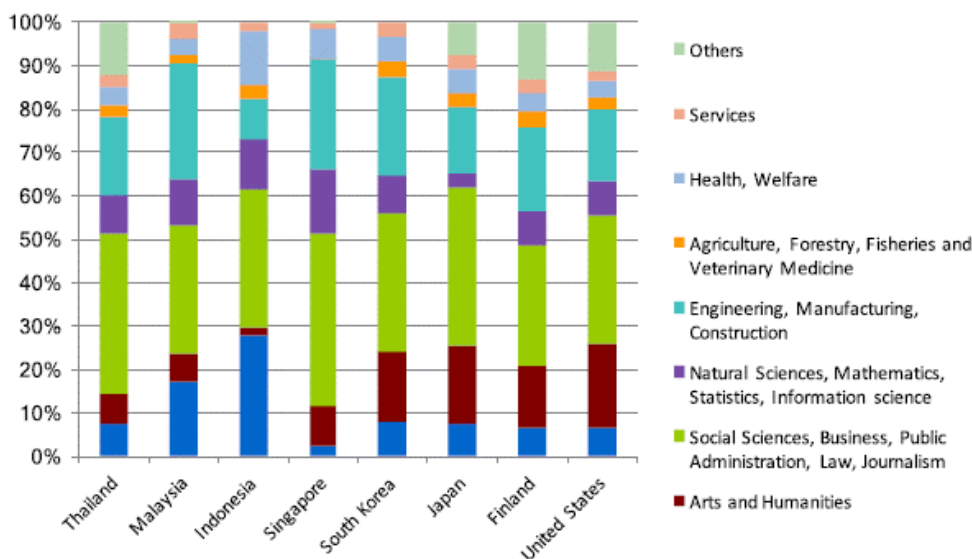
and the Thai government signed a loan agreement for the "Industrial Human Resources Development Project," which includes the establishment of a technical college<sup>2</sup>.

Age	Grade	Education/Training		
22	16	University	University	
21	15		Technical College (Diploma)	
20	14			
19	13	Upper Secondary	Technical College / Vocational School	Vocational Course
18	12			
17	11			
16	10	Lower Secondary (Compulsory)		
15	9			
14	8			
13	7			

Source: Junichi MORI, "Status of Industrial Human Resource Development and Acquisition in Thailand and Vietnam" in APIR-GRIPS collaborative research

**Figure A.1 Educational System in Thailand**

In addition, Figure A.2 shows that the percentage of Thai students majoring in "engineering, manufacturing, construction" in universities is lower compared with developed countries and neighboring Asian countries like Malaysia. It could be pointed out that the layer of engineering human resources who support the manufacturing industry, which leads the Thai industry, has not grown sufficiently.



Source: Evaluation of Assistance in the Industrial Human Resource Development Sector in Thailand

**Figure A.2 University Majors by Country**

The educational background of workers engaged in the automobile industry in Thailand was revealed in a 2004 survey of companies listed in the Thai Autoparts Manufacturers Association (TAPMA) and the automotive industry directories<sup>3</sup>. The survey was part of the

<sup>2</sup> [https://www.jica.go.jp/english/news/press/2019/20200330\\_21.html](https://www.jica.go.jp/english/news/press/2019/20200330_21.html) (Access: 25 July, 2021)

<sup>3</sup> The number of respondents is 213 among 1400 companies. Companies with a capital of less than THB2 million accounted for 32% and others are 68%. As for breakdown by country, 63% is Thai companies, 36% is Japanese companies and 1% is others.

"Technical Human Resource Development Project in the Thai Automobile Industry" under the Japan External Trade Organization's (JETRO) Global Environment and Plant Revitalization Project Survey. Survey results showed that 11% of employees graduated from elementary school, 25% were junior high school graduates, 30% were high school graduates, and 20% were graduates from vocational schools. Skilled workers who reached junior high school or lower accounted for 36%, and the share of college graduates or above was 14%.

Regarding the manufacturing industry as a whole, Mizuho Bank's "Survey Report on the Support for the Development of Indonesian Supporting Industries for Asian Industrial Infrastructure Reinforcement Projects (FY2017)" shows that nearly 20% of workers graduated from universities or technical schools.

## **(2) Quality and Availability of Human Resources**

Based on a survey on employment of Japanese companies in JBIC's "Investment Environment in Thailand" (November 2019), many interviewees stated that there were not so many problems in securing employees at the worker level. However, the shortage of excellent human resources in specialized fields, such as middle managers who graduated from universities, accounting managers, and engineers who graduated from engineering departments of universities or technical colleges, is constant. Thus, the Thai government is also strengthening measures on human resource development.

While educational attainment is a significant factor in employment, especially if one wishes to become a manager, the survey results mentioned above shows that only 20% of workers in the manufacturing industry graduated from universities or higher vocational training schools.

In JBIC's "Survey Report on Overseas Business Operations by Japanese Manufacturing Companies" (FY2018)<sup>4</sup>, 29.9% of companies in Thailand cited "difficulty in securing technical human resources" as an issue, and many companies have difficulty in securing skilled engineers.

On the other hand, a survey in the second half of 2018 among Japanese companies regarding human resources by the Bangkok's Japanese Chamber of Commerce (JCC)'s "Survey of Business Sentiment on Japanese Corporations in Thailand"<sup>5</sup> showed that 66% of the respondents answered that there was a shortage of human resources in the manufacturing industry. In particular, 78% of companies have a shortage of engineers, followed by 45% of executive candidates.

## **(3) Salary Levels**

As shown in Table A.1, the wages given by Japanese manufacturing companies are generally higher than those in neighboring Asian countries. The wages of workers and managers are the highest, that of engineers is lower than Malaysia, but higher than other Asian countries.

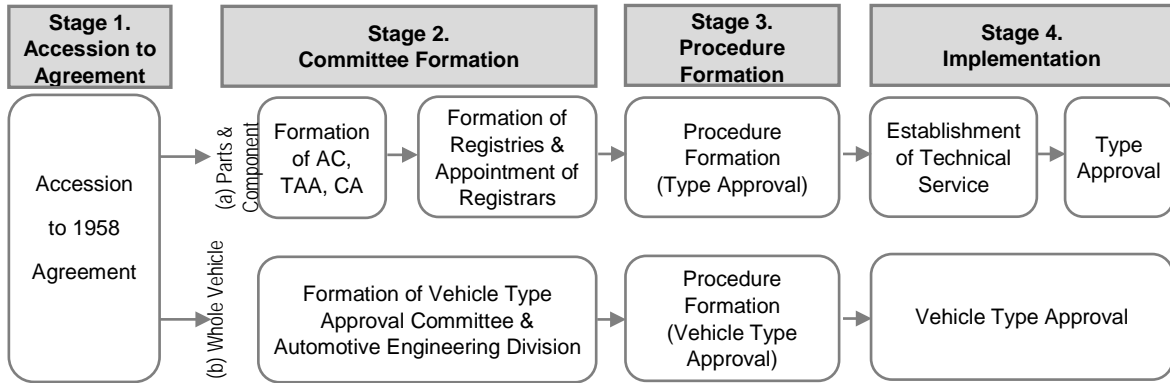
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<sup>4</sup> [https://www.jbic.go.jp/en/information/press/press-2018/pdf/1126-011628\\_2.pdf](https://www.jbic.go.jp/en/information/press/press-2018/pdf/1126-011628_2.pdf)

<sup>5</sup> [https://www.jetro.go.jp/ext\\_images/thailand/e\\_survey/pdf/jccaut18eng.pdf](https://www.jetro.go.jp/ext_images/thailand/e_survey/pdf/jccaut18eng.pdf)

## Appendix B: Safety Standards and Regulations in Malaysia

Malaysia implements the following four stages to adopt WP29 regulations (Figure B.1):



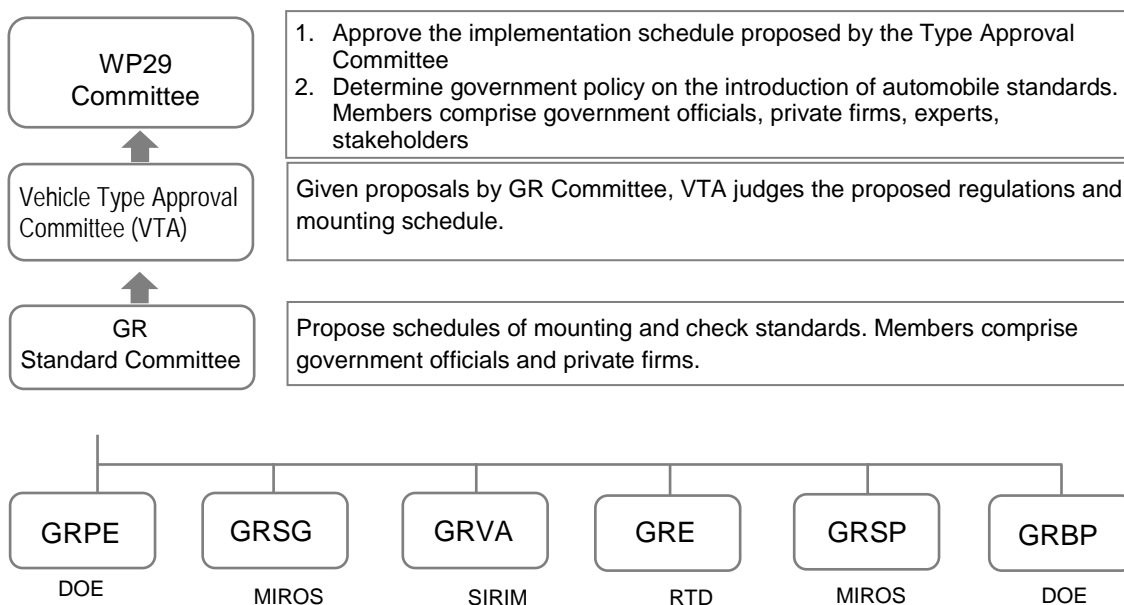
Source: MIROS

**Figure B.1 Four Stages of Malaysia's Adoption of WP29**

UN regulations require a member country to nominate four major committees to adopt UN regulations, as follows:

- 1) Administrative Committee (AC): Ministry of Transport Malaysia (MOT) is responsible for focal point and delegates coordination of works.
- 2) Type Approval Authority (TAA): The authority of a Contracting Party, which is responsible for the approval of wheeled vehicles, equipment, and parts, to issue and withdraw approval certificates. In Malaysia, the Road Transport Department (RTD) is responsible.
- 3) Competent Authority (CA): An appropriate accreditation body acting on behalf of the Type Approval Authority that will assess the Technical Service. In Malaysia, Standards Malaysia is responsible.
- 4) Technical Service (TS): Testing laboratory to carry out tests or the initial assessment and inspections. MIROS (ASEAN-NCAP), MARii (NTSC), TUV Rheinland Malaysia, and other agencies are responsible for this.

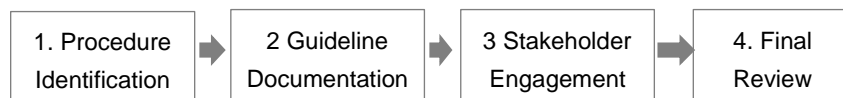
To adopt WP29, the government typically has to nominate the ministry or agency which will be responsible for coordination.



Source: Prepared by JICA Study Team based on the materials of MIROS

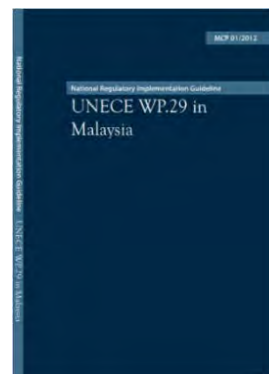
**Figure B.2 Four Stages of Malaysia's Adoption of WP29**

Type approval systems and vehicle standards should be built on a clear process in a harmonized manner. Thus, implementation guidelines should be formulated.



Source: MIROS

**Figure B.3 Process of Adopting Standards**



Source: MIROS

The stakeholders in Malaysia's adoption of WP29 are as follows:

1. Ministry of Transport (MOT)
2. Ministry of International Trade and Industry (MITI)
3. Ministry of Domestic Trade, Cooperatives and Consumerism (MDTCC)
4. Road Transport Department (RTD)
5. Malaysian Automotive Institute (MAI)
6. Department of Standards Malaysia (STANDARDS MALAYSIA)
7. SIRIM and SIRIM QAS International
8. Malaysian Automotive Association (MAA)
9. Motorcycle and Scooter Assemblers and Distributors Association of Malaysia (MASSAM)

Malaysia has incorporated relevant UN regulations to the Road Traffic Act of 1987 and the Environmental Quality Act of 1974. It has been steadily working on WP29 regulations since 2006, approving a total of 100 items from the UN WP29 so far: 19 items by January 2012, 35 since January 2012, one item since September 2012, 23 since January 2015, and 22 since July 2017.



Source: Road Transport Department (RTD)

Figure B.4 WP29's 100 Items Implemented by Malaysia in 2017

## Appendix C: Trends in Infrastructure Projects in Pakistan with COVID-19

The China-Pakistan Economic Corridor (CPEC) is a mammoth USD46 billion investment from China, which was later extended to USD62 billion for the completion of all its projects, set to culminate in 2030 (Ministry of Planning, Development and Reform 2017). Speculations on a slowdown of CPEC projects started way before the pandemic; Covid-19 has added to the delays. For example, a number of SEZ projects in Balochistan, Sindh, and Khyber Pakhtunkhwa should have been inaugurated by 2021, but all of these are behind schedule. The delays are largely attributable to the fact that the partner Chinese firms are facing difficulties in managing human and material resources amid pandemic restrictions, resulting in production delays and higher costs.

Below is a list of some of the projects in which China have a major stake. Projects highlighted in light red are those that have been delayed. Information in the tables below were prepared by the JICA Study Team based on interviews with the procurement director of CPEC.

**Table C.1: CPEC's Energy Priority Projects**

No.	Project Name	MW	Estimated Cost (USD million)	Status
1	Sahiwal 2x660MW Coal-fired Power Plant, Punjab	1320	1912.2	<ul style="list-style-type: none"> <li>Project completed on 28 October 2017.</li> <li>Project has been connected to national grid.</li> <li>Status: Operational.</li> </ul>
2	2x660MW Coal-fired Power Plants at Port Qasim Karachi	1320	1912.2	<ul style="list-style-type: none"> <li>1<sup>st</sup> unit: Inaugurated in November 2017.</li> <li>2<sup>nd</sup> unit: Commercial Operation Date (COD), 25 April 2018.</li> <li>Project completed 67 days ahead of schedule.</li> <li>Status: Operational</li> </ul>
3	HUBCO Coal Power Project, Hub Balochistan	1320	1912.2	<ul style="list-style-type: none"> <li>Groundbreaking ceremony held on 21 March 2017.</li> <li>COD achieved on 14 August 2019.</li> <li>Status: Operational.</li> <li>Prime Minister inaugurated the power plant on 21 October 2019.</li> </ul>
4	Engro 2x330MW Thar Coal Power Project	660	995.4	<ul style="list-style-type: none"> <li>COD achieved on 10 July 2019.</li> <li>Status: Operational.</li> </ul>
	Surface mine in block II of Thar Coal field, 3.8 million tons/year		630	<ul style="list-style-type: none"> <li>Mining work in progress.</li> <li>3.8 metric tons per annum (MTPA).</li> <li>Thar Block II unearthed coal on 10 June 2018.</li> <li>Mining work in progress.</li> <li>3.8 metric tons per annum (MTPA).</li> <li>Thar Block II unearthed coal on 10 June 2018.</li> </ul>
5	Quaid-e-Azam	400	520	<ul style="list-style-type: none"> <li>COD of 4x 100 MW attained in August 2016.</li> </ul>



No.	Project Name	MW	Estimated Cost (USD million)	Status
	1000MW Solar Park (Bahawalpur) Quaid-e-Azam	600	781	<ul style="list-style-type: none"> <li>600MW under construction</li> </ul>
6	Hydro China Dawood Wind Farm (Gharo, Thatta)	49.5	112.65	<ul style="list-style-type: none"> <li>COD: 5 April 2017.</li> <li>Status: Operational.</li> </ul>
7	UEP Wind Farm (Jhimpir, Thatta)	99	250	<ul style="list-style-type: none"> <li>COD: 16 June 2017.</li> <li>Status: Operational.</li> </ul>
8	Sachal Wind Farm (Jhimpir, Thatta)	49.5	134	<ul style="list-style-type: none"> <li>COD: 11 April 2017.</li> <li>Status: Operational.</li> </ul>
9	Three Gorges Second and Third Wind Power Project	100	150	<ul style="list-style-type: none"> <li>COD for Three Gorges Second Wind Farm (TGTWF): 30 June 2018.</li> <li>COD for Three Gorges Third Wind Farm (TGTWF): 9 July 2018.</li> <li>Status: Operational.</li> </ul>
10	SSRL Thar Coal Block-I 6.8 mtpa & Power Plant (2x660MW) (Shanghai Electric)	1320	1912.12	<ul style="list-style-type: none"> <li>LOS issued (under financial closure).</li> <li>First Unit (660 MW) is targeted by Aug 2022.</li> <li>COD of complete project is targeted by Feb 2023.</li> </ul>
11	HUBCO Thar Coal Power Project (Thar Energy)	330	497.70	<ul style="list-style-type: none"> <li>Financial closure achieved on 30 Jan. 2020.</li> <li>Target COD: 31 March 2021.</li> </ul>
12	ThalNova Thar Coal Power Project	330	497.70	<ul style="list-style-type: none"> <li>Target COD: 31 March 2021.</li> </ul>
13	Karot Hydropower Station	720	1698.26	<ul style="list-style-type: none"> <li>Construction of access road/bridge, concrete batching plant, diversion tunnel, spillway, etc. are in process.</li> <li>Work initiated through equity – 50% civil works completed.</li> <li>Expected COD: December 2021.</li> </ul>
14	Suki Kinari Hydropower Station, Naran, Khyber Pukhtunkhwa	870	1707	<ul style="list-style-type: none"> <li>Construction work under way.</li> <li>Expected COD: December 2022.</li> </ul>
15	Matiari to Lahore ±660kV HVDC Transmission Line Project		1658.34	<ul style="list-style-type: none"> <li>Expected COD: August 2021, initial date was March 2021, delayed due to the COVID-19 pandemic.</li> </ul>

No.	Project Name	MW	Estimated Cost (USD million)	Status
16	300MW Imported Coal Based Power Project at Gwadar, Pakistan	300	542.32	<ul style="list-style-type: none"> <li>Groundbreaking done on 4 November 2019.</li> <li>Work under progress; delayed due to the COVID-19 pandemic.</li> </ul>
17	Thar Mine Mouth Oracle Power Plant ( 1320MW) & surface mine	1320	Yet to be determined	<ul style="list-style-type: none"> <li>Feasibility stage tariff obtained for coal.</li> <li>Shareholding agreement on new equity partners in process.</li> </ul>
18	Kohala Hydel Project, AJK	1100	2364.05	<ul style="list-style-type: none"> <li>Tripartite agreement signed on 25 June 2020.</li> <li>Expected COD: 2026</li> </ul>
19	Cacho 50MW Wind Power Project	50		<ul style="list-style-type: none"> <li>LOI stage.</li> <li>Delayed due to the impact of the COVID-19 pandemic.</li> </ul>
20	Western Energy (Pvt.) Ltd. 50MW Wind Power Project	50		<ul style="list-style-type: none"> <li>LOI stage.</li> <li>Delayed due to the impact of the COVID-19 pandemic.</li> </ul>
21	Azad Pattan Hydel Project, AJK	701	1,650	<ul style="list-style-type: none"> <li>Agreement signed on 6 July 2020.</li> <li>Expected COD: 2026.</li> </ul>

Source: JICA Study Team

Table C.2 CPEC's Transport Infrastructure Projects

No.	Project Name	Length (km)	Estimated Cost (USD million)	Status
<b>Road</b>				
1	KKH Phase II (Thakot - Havelian Section)	118	1,315	<ul style="list-style-type: none"> <li>Work commenced in September 2016.</li> <li>Hawalian-Menshera Section inaugurated by Prime Minister on 18 November 2019.</li> <li>Project substantially completed by March 2020.</li> </ul>
2	Peshawar-Karachi Motorway (Multan-Sukkur Section)	392	2,889	<ul style="list-style-type: none"> <li>Construction works commenced in August 2016.</li> <li>Project completed and inaugurated on 5 November 2019.</li> </ul>
3	Khuzdar-Basima Road N-30 (110 km)	110	19.19 Billion Rupee	<ul style="list-style-type: none"> <li>The project Basima Khuzdar has been taken up through PSDP.</li> <li>Physical work under progress.</li> <li>Development has been delayed.</li> </ul>
4	Upgradation of D.I.Khan (Yarik) -	210	76 Billion Rupee	<ul style="list-style-type: none"> <li>PC-I approved by ECNEC on 12 April 2017.</li> </ul>

No.	Project Name	Length (km)	Estimated Cost (USD million)	Status
	Zhob, N-50 Phase-I (210 km)			<ul style="list-style-type: none"> <li>Land acquisition in progress.</li> </ul>
5	KKH Thakot-Raikot N35 remaining portion (136 km)	136		<ul style="list-style-type: none"> <li>Feasibility study for re-alignment is under process.</li> </ul>
<b>Rail</b>				
6	Expansion and reconstruction of existing Line ML-1	1,830	6808	<ul style="list-style-type: none"> <li>PC-1 of ML-1 project approved by CDWP on 6 June 2020.</li> <li>ECNEC approved the project on 5 August 2020.</li> <li>This project has been disrupted and faced a lot of red tape. Covid also played a role in delaying the project.</li> </ul>
7	Havelian Dry port (450 M. Twenty-Foot Equivalent Units)		65	<ul style="list-style-type: none"> <li>Framework agreement signed in May 2017</li> <li>Still under process; delayed due to COVID.</li> </ul>

### CPEC Gwader Projects

#	Project Name	Estimated Cost (USD million)	Status
1	Gwadar East-Bay Expressway	168	<ul style="list-style-type: none"> <li>Groundbreaking ceremony of Eastbay Expressway was held on 22 November 2017 by Prime Minister.</li> <li>Date of completion was October 2020, still under process.</li> </ul>
2	New Gwadar International Airport	230	<ul style="list-style-type: none"> <li>Groundbreaking done by Prime Minister on 29 March 2019.</li> <li>Construction work started on 31 October 2019.</li> <li>Groundbreaking done by Prime Minister on 29 March 2019.</li> <li>Construction work started on 31 October 2019.</li> <li>Lots of delays are being incurred due to shipment delays, then due to the impact of COVID-19. Very important project.</li> </ul>
3	Construction of Breakwaters	123	<ul style="list-style-type: none"> <li>Draft business plan from Chinese firm (COPHCL) is under review by MoP&amp;S and GPA.</li> </ul>
4	Dredging of berthing areas & channels	27	<ul style="list-style-type: none"> <li>Draft business plan from Chinese firm (COPHCL) is under review by MoP&amp;S and GPA.</li> <li>Draft MoU for joint technical and commercial feasibility has also been prepared and being vetted by concerned ministries.</li> </ul>
5	Development of Free Zone	32	<ul style="list-style-type: none"> <li>A number of industries to start construction work soon, but delays due to COVID, road infrastructure, skilled HR and other resources are huge gaps for companies.</li> </ul>

#	Project Name	Estimated Cost (USD million)	Status
6	Pak China Friendship Hospital	100	<ul style="list-style-type: none"> <li>Groundbreaking held on 16 December 2019.</li> <li>Will be completed in time.</li> </ul>
7	Pak-China Technical and Vocational Institute at Gwadar	10	<ul style="list-style-type: none"> <li>Groundbreaking held on 16 December 2019.</li> <li>Completion date: 2022.</li> </ul>
8	Gwadar Smart Port City Master Plan	4	<ul style="list-style-type: none"> <li>Completed and approved in the 9th JCC held on 5 November 2019.</li> </ul>

Source: Prepared by JICA Study Team based on the website of CPEC (<http://cpec.gov.pk/>)

**Table C.3 CPEC Rail-based Mass Transit Projects**

No.	Project Name	Detail
1	Karachi Circular Railway	<ul style="list-style-type: none"> <li>Chinese side requested the government of Sindh to submit financing request in the 9th JCC meeting.</li> <li>Delays from the Sindh government side and also funding issues from FGOP side.</li> <li>Much needed and awaited. Hurdles include encroachment and red tape.</li> </ul>
2	Greater Peshawar Region Mass Transit	<ul style="list-style-type: none"> <li>Feasibility of Greater Peshawar Region mass transit is under process</li> </ul>
3	Quetta Mass Transit	<ul style="list-style-type: none"> <li>Feasibility of Quetta mass transit is under process.</li> </ul>
4	Orange Line - Lahore	<ul style="list-style-type: none"> <li>Completed and operational with a 3-year delay due to the new government taking charge and delaying finances for the completion.</li> </ul>

Source: Prepared by JICA Study Team based on the website of CPEC (<http://cpec.gov.pk/>)

## Appendix D: Status of the Automotive Value Chain in South Asia

In this appendix, the status of the automotive value chain in India and Bangladesh is examined.

### 1 Automotive Value Chain in India

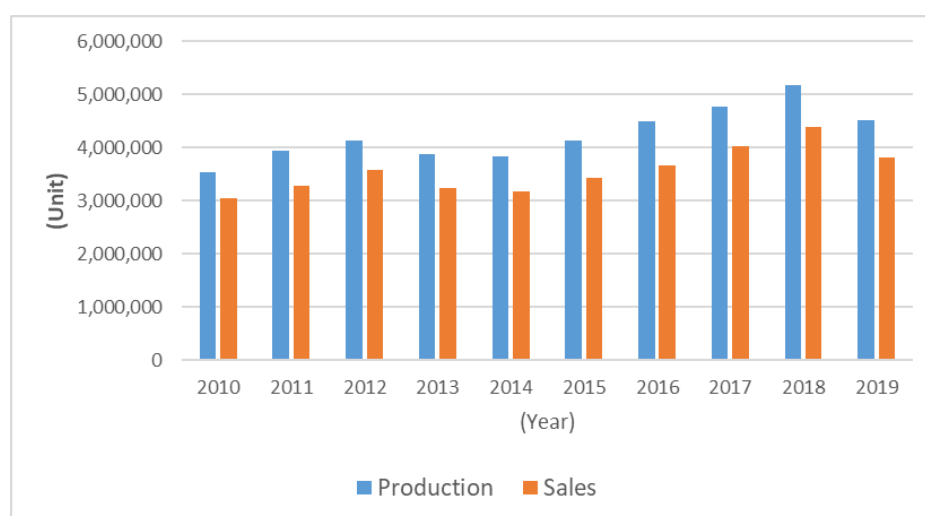
The status of the Indian automotive industry is discussed in this section.

#### (1) Overview of the Indian Automotive Industry

##### (a) Production and Sales

The figure below shows the changes in the number of automobiles produced and sold in India from 2010 to 2019. The annual production volume in 2010 was about 3.5 million units, more than 5 million units in 2018, then about 4.5 million units in 2019. According to the MarkLines' website, the total annual production volume from January to November 2020 was about 2.8 million units, which is a significant decrease from the previous year's figure.

On the other hand, the number of vehicles sold was about 3 million in 2010, reaching a record high of about 4.4 million in 2018, before decreasing to about 3.8 million in 2019. According to the MarkLines website, the total number of vehicles sold from January to November 2020 is about 2.4 million units, which is also a significant decrease.



Source: MarkLines' website

**Figure D.1 Automobile Sales and Production in India (2010–2019)**

##### (b) Competitive Environment of the Domestic Market

According to an article in "Toyo Keizai" magazine (15 May 2020 issue), the top five OEMs in the Indian market as of February 2020 were Maruti Suzuki, Hyundai, Kia, Tata, and Mahindra & Mahindra.<sup>1</sup>

The Indian domestic market is characterized by the predominance of lower-priced small cars (i.e., USD5,000 to 15,000).<sup>2</sup> In particular, Suzuki's main products are compact cars,

<sup>1</sup> For details, please refer to the following URL (access: 19 December 2020): <https://toyokeizai.net/articles/-/345919>

<sup>2</sup> In the India's automotive market, the passenger car segment accounts for 47.7% for sales and for 51.3% for production.

such as the Maruti 800, which costs about USD5,000. The Japanese manufacturer enjoys a market share of 60.3% for sales and of 52.3% for production.

### (c) Automotive Industry Development Policy

In September 2015, the Automotive Mission Plan (AMP) 2016–2026 was released by the Indian government and came into force in April 2016. AMP is summarized in the table below.

**Table D.1 Outline of India’s Automotive Mission Plan (AMP) 2016–2026**

Official Name	The Automotive Mission Plan 2016–2026: AMP 2026
Period	April 2016 to March 2026
Purpose	The auto industry is assumed to play a leading role in promoting the manufacturing sector in line with the "Made in India" quality.
Goal	--To generate 65 million new jobs. --To promote export (increase in export of motor vehicles by 5 times and auto-component by 7.5 times).
Strategy	--To enhance competitiveness of the manufacturing sector. --To implement safety and environment regulations.

Source: Fourin (2018) "Prospects for the Indian Auto Market in 2030 and Trends of Electrification"

## (2) Free Trade Agreements among India, Japan, and ASEAN

The free trade agreements among India, Japan and ASEAN are listed in the table below.

**Table D.2 Free Trade Agreements among India, Japan, and ASEAN**

Name of FTA	Month-Year of Enforcement
ASEAN-India Free Trade Agreement (AIFTA) <sup>3</sup>	December 2012
Japan-India Comprehensive Economic Partnership Agreement (JICEPA)	February 2011
Japan-ASEAN Comprehensive Economic Partnership Agreement <sup>4</sup> (JACEPA)	April 2008
ASEAN Free Trade Agreement (AFTA) <sup>5</sup>	January 1992

Source: JICA Study Team

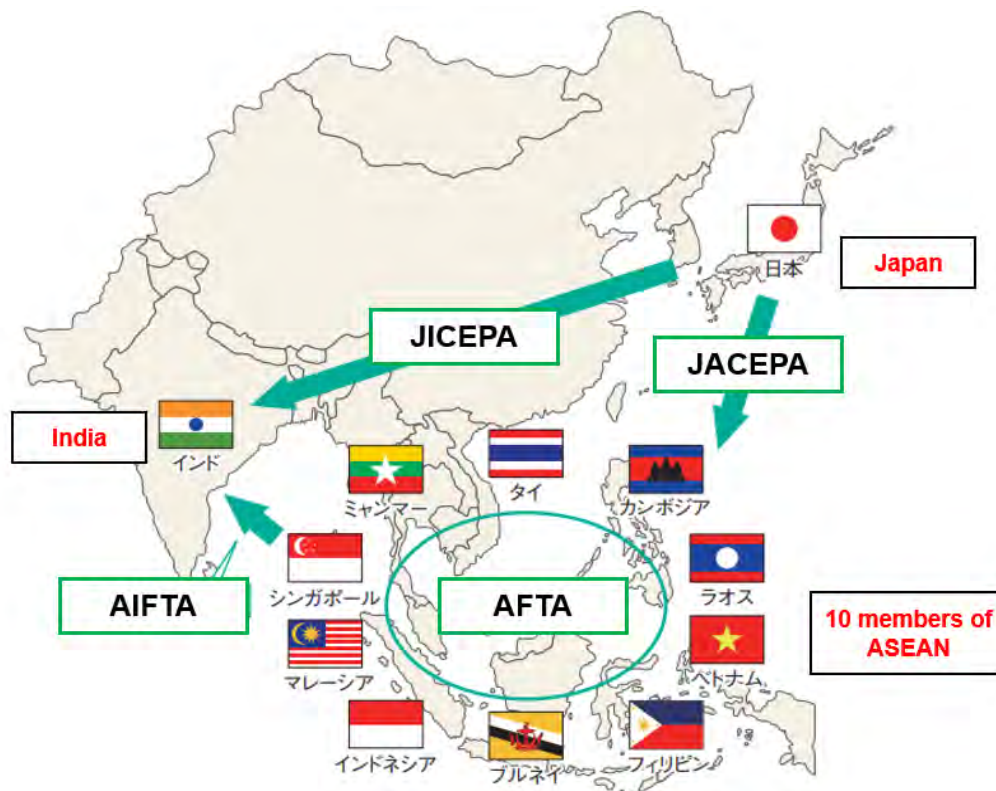
<sup>3</sup> For details, please refer to the following URL (access: 20 December 2020):  
[https://www.marklines.com/ja/global/investment/ind/ind\\_trade](https://www.marklines.com/ja/global/investment/ind/ind_trade)

<sup>4</sup> For details, please refer to the following URL (access: 20 December 2020):  
<https://ja.wikipedia.org/wiki/%E6%97%A5%E6%9C%AC%E3%83%BB%E3%82%A4%E3%83%B3%E3%83%89%E7%B5%8C%E6%B8%88%E9%80%A3%E6%90%BA%E5%8D%94%E5%AE%9A> and  
[https://www.mofa.go.jp/mofaj/gaiko/fta/j\\_asean/](https://www.mofa.go.jp/mofaj/gaiko/fta/j_asean/)

<sup>5</sup> For details, please refer to the following URL (access: 21 December 2020):  
<https://ja.wikipedia.org/wiki/%E6%97%A5%E6%9C%AC%E3%83%BB%E3%82%A4%E3%83%B3%E3%83%89%E7%B5%8C%E6%B8%88%E9%80%A3%E6%90%BA%E5%8D%94%E5%AE%9Ahttps://ja.wikipedia.org/wiki/ASEAN%E8%87%AA%E7%94%B1%E8%B2%BF%E6%98%93%E5%9C%B0%E5%9F%9F>

### (3) India's Automotive Value Chain

The Indian automotive value chain has been developed strategically by each OEM by taking advantage of free trade agreements among India, Japan, and ASEAN<sup>6</sup>, as the figure below shows.



Source: Ichiki, Kei (2012) "How can we cooperate with the growing Indian auto industry: Global Supply Chain Strategy involving ASEAN," Kyoritsu Research Institute

**Figure D.2 Automotive Value Chain among India, Japan, and ASEAN**

When it comes to the global value chain (GVC) of Toyota's three IMVs, two are produced in India, i.e., Fortuner (IMV4) and Kijang (IMV5).<sup>7</sup> As the table below shows, India has the largest production share (9.2%) among supply bases catering to domestic demand. It follows the top four production bases, which are all global supply bases, namely, Thailand, Indonesia, South Africa, and Argentina.

Along the GVC of IMVs, the central role is played by the four global supply bases. On top of these, supply bases for domestic markets (e.g., India and Pakistan) import main components in the form of CKD kits and assemble IMVs in their own countries.

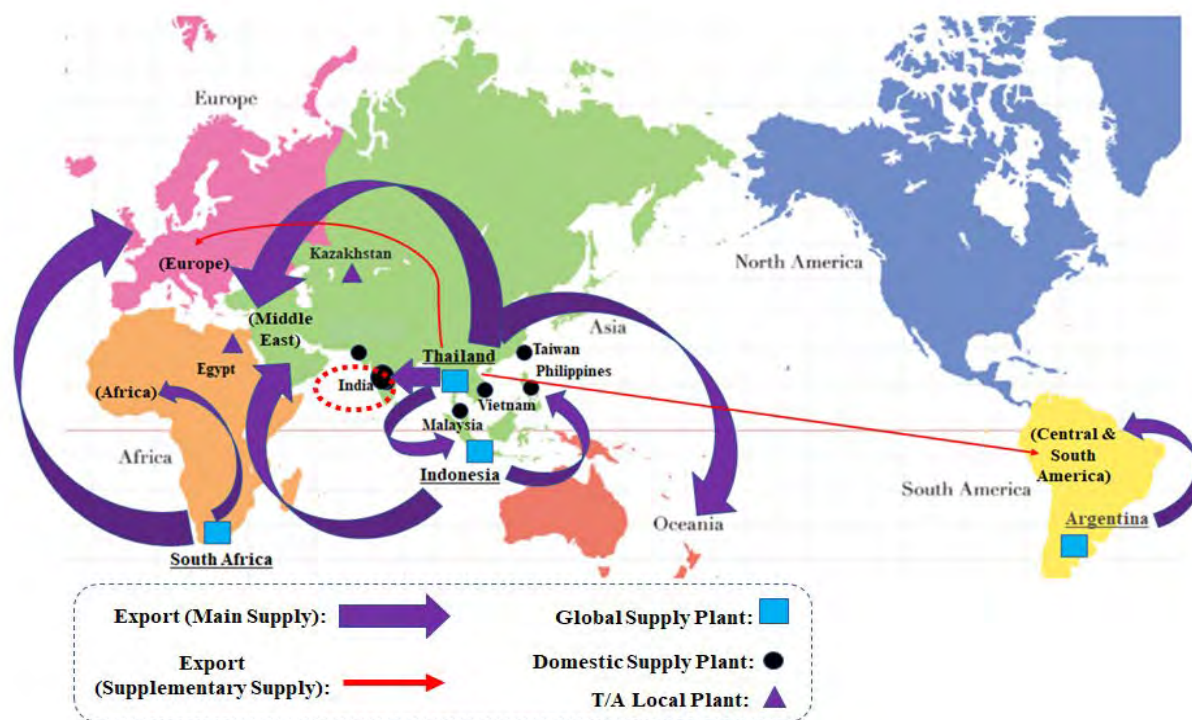
<sup>6</sup> The ten members of ASEAN include Thailand, Cambodia, Laos, Vietnam, the Philippines, Brunei, Indonesia, Malaysia, Singapore and Myanmar.

<sup>7</sup> The other type of IMV is Hilux.

**Table D.3 Production Volume of Toyota IMVs by Country (2019)**

Country	Type of Supply Base and Car Model	Prod'n Volume (2019)	Share (%)
Thailand	Global Supply Base (IMV 1, 2, 3,4)	392,520	46.7
Indonesia	Global Supply Base (IMV 5) + IMV 4	120,372	14.3
South Africa	Global Supply Base (IMV 1, 2, 3,4)	104,308	12.4
Argentina	Global Supply Base (IMV 1, 3,4)	99,618	11.9
<b>India</b>	<b>Domestic Supply Base (IMV 4, 5)</b>	<b>76,857</b>	<b>9.2</b>
Malaysia	Domestic Supply Base (IMV 3, 4, 5)	21,212	2.5
Philippines	Domestic Supply Base (IMV 5)	18,199	2.2
Vietnam	Domestic Supply Base (IMV 4, 5)	n.a.	n.a.
Taiwan	Domestic Supply Base (IMV 5)	n.a.	n.a.
Venezuela	Domestic Supply Base (IMV 3,4)	350	0.04
Pakistan	Domestic Supply Base (IMV 1, 3,4)	6,350	0.8
Total		839,786	100.0

Source: JICA Study Team (based on Mark Lines Portal Site)



Source: JICA Study Team (Nomura, Toshiro (2015) "Toyota's IMV: its Innovation Strategy and Organization")

**Figure D.3 IMV GVC and Production Bases**



## 2 Automotive Value Chain in Bangladesh

The status of the Bangladeshi automotive industry is examined in this section.

### (1) Overview of the Bangladeshi Economy and Automotive Industry Development Policies

The table below gives an overview of the Bangladeshi economy. Since chronic trade deficit is one of the major economic challenges of the country, the export industries, including the automotive industry, are expected to become the engine of economic growth.

**Table D.4 Overview of the Bangladeshi Economy**

Item	Detail
Population	167.6 million (2019, Bangladesh Bureau of Statistics [BSS])
Area	147 thousand km <sup>2</sup> (Bangladeshi Government)
Real GDP	USD210.0 billion (2019, World Bank)
Per Capita GDP	USD1,970 (2019, BSS)
Increase Rate of Consumer Price Index	5.47% (Bangladeshi FY 2019, Bangladesh Bank)
Composition of GDP	--Primary sector (13.4%), Secondary sector (35.4%) and Tertiary sector (51.2%) (Bangladeshi FY 2020, Bangladesh Bank)
Labor Market	--63.5 million: Primary sector (40.6%), Secondary sector (39.0%) and Tertiary sector (20.4%) (Bangladeshi FY 2017, BSS)
Export and Import	--Export: US\$ 40.5 billion (Bangladeshi FY 2019, Export-Import Bank of Bangladesh) --Import 56.0 billion (Bangladeshi FY 2019, Bangladesh Bank)
Automotive Industry Development Policies	--Motorcycle Industry Development Policy (2018) --Automobile Industry Development Policy (2020, Draft)

Source: JICA Study Team<sup>8</sup>

### (2) Automotive Industry Development Policies (Motorcycles and Four-wheeled Motor Vehicles)

#### (a) Motorcycle Industry Development Policy

Since 2018, the Motorcycle Industry Development Policy has been implemented. One of its main components is to develop the motorcycle component industry. The aim of this policy is to expand the domestic market and to increase the annual production volume to 500 thousand units in 2021 and one million in 2027.

According to "The Business Standard," the 2020 production volume was 500 thousand units.<sup>9</sup> Domestically manufactured components include batteries, chains, and motorcycle seats.<sup>10</sup>

#### (b) Automotive Industry Development Policy

As of April 2021, the Automobile Industry Development Policy for four-wheelers has been drafted by the Ministry of Industry (MOI).

<sup>8</sup> For details, please refer to the following URL (access: 11<sup>th</sup> May 2021):  
<https://www.mofa.go.jp/mofaj/area/bangladesh/data.html>

<sup>9</sup> For details, please refer to the following URL (access: 12<sup>th</sup> May 2021):  
<https://www.tbsnews.net/economy/industry/sun-rising-bangladesh-automotive-industry-233557>

<sup>10</sup> For details, please refer to the following URL (access: 11<sup>th</sup> May 2021):  
<http://www.sankeibiz.jp/macro/news/180202/mcb1802020500004-n1.htm>

**Table D.5 Contents of the Draft Automobile Industry Development Policy 2020**

Chapter	Content
1	Introduction
2	Definition
3	Policy Background
4	<p>Policy Statements, Vision, Mission, Objective</p> <p>Vision                      --To grow into a major industrial sector of with a GDP share of 10% by 2030.</p> <p>Mission                      --Develop production bases for automotive components by 2030 through strengthening the domestic supply chain</p> <p>--To achieve the Vision and Mission above, the following subjects are to be strengthened: (a) new policy measures for investment promotion, (b) rationalization of import duties, (c) rationalization of import policies, (d) infrastructure development in relation to quality, safety and environment, (e) securing consumers' welfare and (f) establishment of the Bangladesh Automotive Institute (BAI).</p> <p>Objective                      (i) increase added value, (ii) contribute more to GDP, (iii) improve access to market, (iv) enhance technology and generate employment, and (v) strengthen innovation and R&amp;D.</p>
5	<p>Strategies to Develop Auto Industry</p> <p>(1) promoting local assembly; (2) developing and improving the automobile market; (3) strengthening auto-component production; (4) phasing out used-car imports; (5) strengthening automobile registration and inspection; (6) promoting R&amp;D and strengthening design and inspection; (7) formulating regulations on safety, quality, and exhaust emission; (8) developing industrial human resources; and (9) improving investment environment.</p>
6	Provisions for Eco-friendly Vehicles
7	Monitoring and Evaluation of the Policy
8	Conclusion
9	Time-bound Action Plan

Source: Prepared by JICA Study Team based on Automobile Industry Development Policy 2020, Draft<sup>11</sup>

### (3) Status of the Four-wheeled Automobile and Motorcycle Market

#### (a) Market for Four-wheeled Automobiles

In the official website of the Organisation Internationale des Constructeurs d'Automobiles (OICA),<sup>12</sup> the statistical data of Bangladesh are not available. However, Bangladeshi data about sales are available in one of the private websites,<sup>13</sup> the name of which is "Global Note." In 2019, the sales volume was 4,900 units, ranking 114th out of 144 countries around the world. It was reported in April 2021 that about 12 thousand to 29 thousand motor vehicles are sold annually.<sup>14</sup> As to vehicle registration, according to the data from the

<sup>11</sup> For details, please refer to the following URL (access: 11<sup>th</sup> May 2021): <https://www.mofa.go.jp/mofaj/area/bangladesh/data.html>

<sup>12</sup> For details, please refer to the following URL (access: 21<sup>st</sup> July 2021): <https://www.oica.net/>

<sup>13</sup> For details, please refer to the following URL (access: 21<sup>st</sup> July 2021): [https://www.globalnote.jp/post-2380.html?cat\\_no=110](https://www.globalnote.jp/post-2380.html?cat_no=110)

<sup>14</sup> Please see an article of the "Business Standard" (dated 18<sup>th</sup> April 2021). For details, please refer to the

Bangladesh Road Transport Authority (BRTA), about 4.5 million motor vehicles (including motorcycles) have been registered domestically, comprising 370.5 thousand passenger cars for private use, 105.9 thousand micro buses, and 66.2 thousand jeeps. The rest are motorcycles for private use.

Due to the rapid growth of the Bangladesh economy in recent years, the purchasing power of its consumers has also increased significantly. The country reportedly has a potential middle-income group of about 12 million people,<sup>15</sup> and this has led to the expectation that the automobile market will continue to expand in the future. In recent years, there has been an increasing demand for motorcycles and four-wheeled motor vehicles, which are important means of daily commuting and transport. When it comes to foreign manufacturers, several production plants have been operated, for instance, Mitsubishi Motors and Malaysian Proton for passenger cars, as well as Hino and Indian Tata for commercial vehicles.

#### **(b) Motorcycle Market**

The manufacture of motorcycles in Bangladesh began in the 2000s. The Walton company was the first manufacturer of motorcycles in the country, followed by Runner Automobiles in 2012. Other major manufacturers include Road Master Motors and Jamuna Automobiles. According to the July 2019 article of "The Daily Star," approximately 80% of motorcycles on the road are manufactured and/or assembled in the country. Meanwhile, the motorcycle sector has generated some 200 thousand jobs directly and indirectly.<sup>16</sup> Of the Japanese manufacturers, Honda and Yamaha have been among the bigger employment generators.<sup>17</sup> The number of motorcycle users has also increased rapidly. According to BRTA, the number of motorcycles increased about four times from 759.3 thousand units in 2010 to 2,991.6 thousand units in 2020.<sup>18</sup> According to the management of ACI Motors, motorcycles with 150cc and 110 cc displacements have the largest and second-largest potential for \_\_\_\_.

#### **(4) Value and Supply Chains of Motorcycles in Bangladesh**

The per capita GDP of Bangladesh is USD1,970 (2019). For the past several years, motorcycles have become common among the general consumers in the country,<sup>19</sup> while four-wheeled automobiles are still beyond their reach. In view of this situation, the VC/ SC of Japanese motorcycles is examined in this section.

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following URL (access: 10<sup>th</sup> May 2021): <https://www.tbsnews.net/economy/industry/sun-rising-bangladesh-automotive-industry-233557>

<sup>15</sup> For details, please refer to the following URL (access: 12<sup>th</sup> May 2021):

<https://www.linkedin.com/pulse/overview-automotive-industry-bangladesh-naimul-kader-6%CF%83-certified/>

<sup>16</sup> Please refer to an article of "The Daily Star" dated 13<sup>th</sup> February: <https://www.thedailystar.net/supplements/30th-anniversary-supplements/going-digital/news/brief-look-the-auto-industry-bangladesh-2043941>

<sup>17</sup> In September 2012, Bangladesh Honda Private Limited (BHL) was established, which was the Honda's first affiliate company in Bangladesh. Yamaha's CKD assembly plant was established by Meanwhile, ACI Motors. Its annual capacity of production is 60,000 units.

<sup>18</sup> Please refer to an article of "The Daily Star" dated 9<sup>th</sup> May 2021: <https://www.thedailystar.net/supplements/30th-anniversary-supplements/going-digital/news/brief-look-the-auto-industry-bangladesh-2043941>

<sup>19</sup> Some theorists argue that motorcycles begin to be widespread in a country when per capita GDP reaches US\$ 1,000 and likewise that motor vehicles come into common use in the country when it reaches US\$ 3,000.

### (a) Production Models

The table below summarizes Honda’s production bases and motorcycle models in Bangladesh and India.<sup>20</sup> Models (a) to (d) are common in both countries. It is assumed thus that major components are imported from India to Bangladesh and are assembled in Bangladeshi production bases to be sold in the country.

**Table D.6 Honda’s Production Bases and Motorcycle Models in Bangladesh and India**

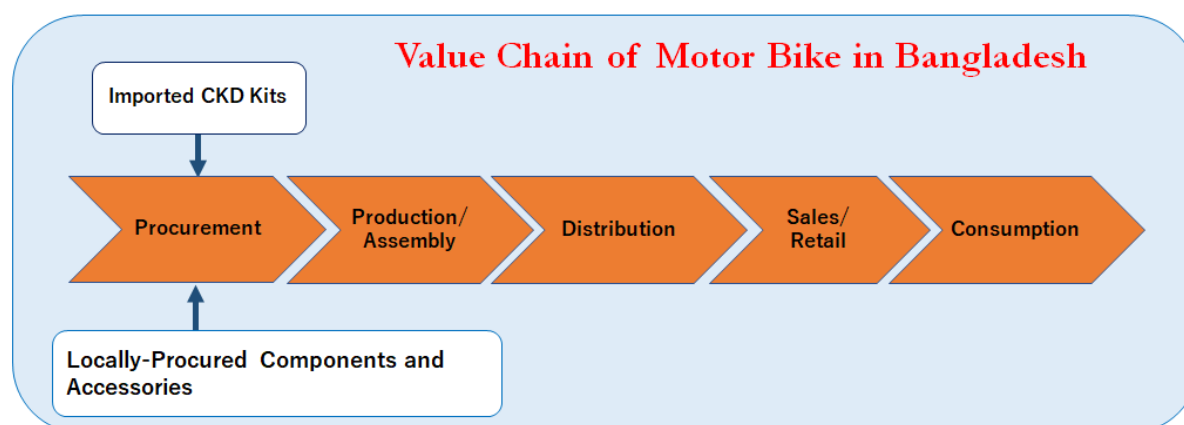
Country	Type
Bangladesh	(a)Dream Neo, CB Shine, (b)X Blade , (c)Livo, (d)Hornet
India	Activa, Dio, Activa125, (b)X- Blade, Unicorn, CB Twister, CD Dream, (a)Dream Neo, CB HORNET 160R, (d)Hornet 2.0 CBR650R, CBR250R, Africa Twin, CB300R, H'nness CB350 NAVI, Shine, SP125, (c)Livo, Shine, SP125, Dream Yuga, Grazia

Source: JICA Study Team<sup>21</sup>

### (b) Local Procurement

The figure below shows the value chain of motorcycles manufactured in Bangladesh by Japanese manufacturers. The main components are imported from India in the form of CKD kits and are assembled in Bangladesh for sale locally.

In 2018, Bangladesh Honda Private Limited (BHL), one of Honda’s foreign affiliate companies, began local procurement by manufacturing body frames and swing arms and expressed its intention to broaden the range of locally procured components in the coming years.<sup>22</sup>



Source: JICA Study Team<sup>23</sup>

**Figure D.4 Value Chain of Japanese Manufacturer’s Motorcycles in Bangladesh**

<sup>20</sup> For details, please refer to the following URL (access: 12<sup>th</sup> May 2021):  
<https://www.honda.co.jp/group/manufacturing-facilities/>

<sup>21</sup>For details, please refer to the following URL (access: 11th May 2021):  
<https://www.mofa.go.jp/mofaj/area/bangladesh/data.html>

<sup>22</sup> For details, please refer to the following URL (access: 11th November 2018):  
[https://www.nikkei.com/article/DGXLRSP495485\\_S8A111C100000/](https://www.nikkei.com/article/DGXLRSP495485_S8A111C100000/)

<sup>23</sup>For details, please refer to the following URL (access: 11th May 2021):  
<https://www.mofa.go.jp/mofaj/area/bangladesh/data.html>