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Department of Agriculture

Lao People's Democratic Republic
Advisor for Rice Seed Management

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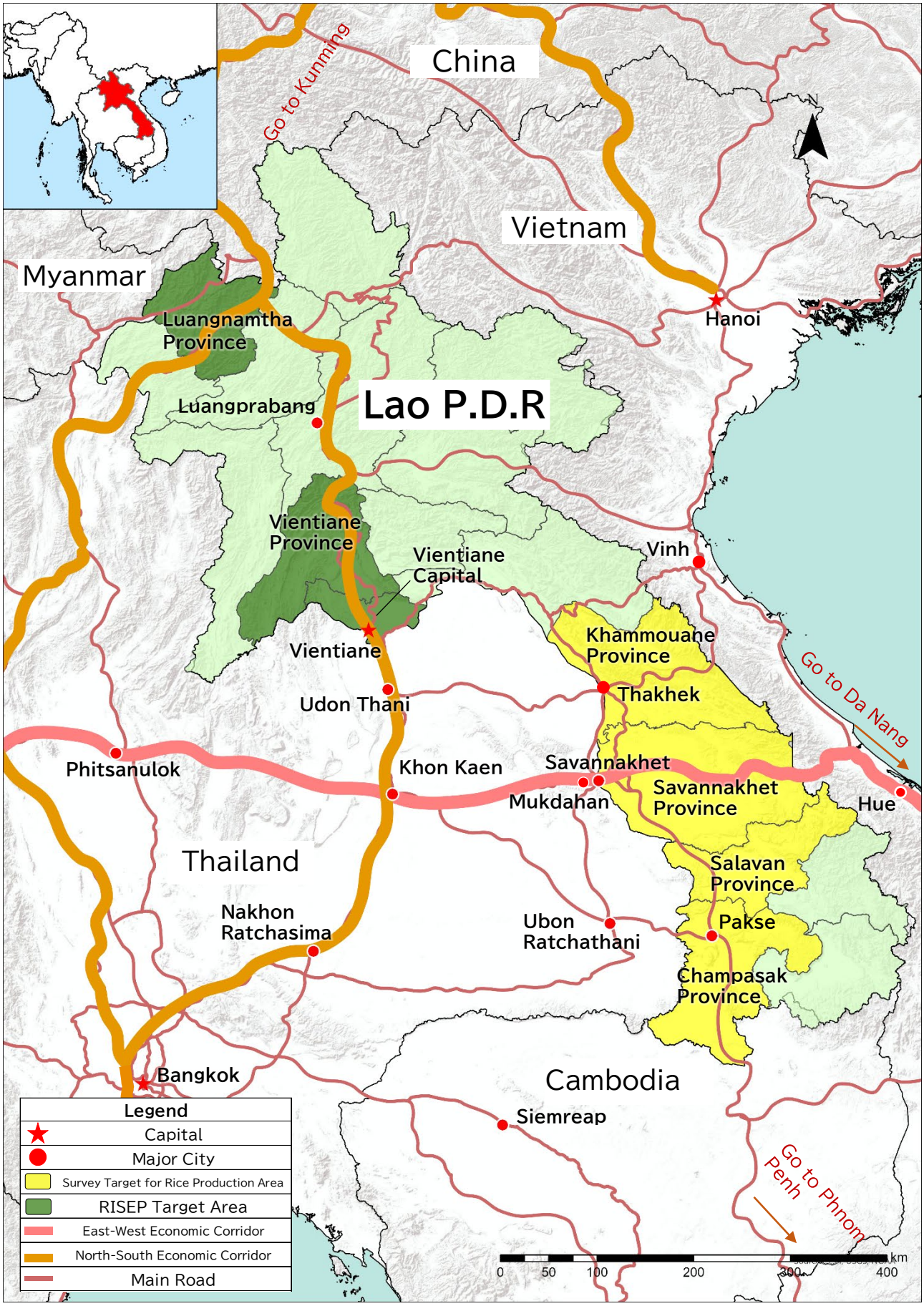
Location Map of the Project Area



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ACRONYMS AND ABBREVIATIONS

ADC	Agriculture Development Center
ARC	Agriculture Research Center
BS	Breeder's Seed
CP	Counterpart
CPI	Consumer Price Index
DAEC	Department of Agriculture Extension and Cooperative
DAFO	District Agriculture and Forestry Offices
DDG	Deputy Director General
DG	Director General
DOA	Department of Agriculture
FAO	Food and Agriculture Organization of the United Nations
FBS	Food Balance Sheet
GDP	Gross Domestic Product
IDP	Indochina Development Partners Lao Ltd.
KOICA	Korea International Cooperation Agency
KDP	Khammouane province Develop Province
LARC	Luangnamtha Agriculture Research Center
LACP	Lao Agriculture Competitiveness Project
Lao PDR	Lao People's Democratic Republic
LECS	Lao Expenditure and Consumption Survey
MAF	Ministry of Agriculture and Forestry
NAFES	National Agriculture and Forestry Extension Service
NAFRI	National Agriculture & Forestry Research Institute
NSEDP	9th Five-Year National Socio-Economic Development Plan (2021-2015)
PAFO	Provincial Agriculture and Forestry Offices
PCC	Per Capita Consumption
PCE	Per Capita Expenditure
RISEP	Rice Seed Multiplication and Distribution System Improvement Project
RRC	Rice Research Center
SAVAN PAD	Project for Participatory Agriculture Development in Savannakhet Province
SMC	Seed Multiplication Center
SMS	Seed Multiplication Station
OECD	Organisation for Economic Co-operation and Development
R1	Foundation Seed
R2	Stock or (Registered) Seed
R3	Extension or (Certified) Seed
TDK	Thadokkham
TSN	Thasano
UNDESA	United Nations, Department of Economic and Social Affairs
VC	Value Chain
WB	World Bank
WS	Work Shop

UNIT CONVERSION

1 lb (pound)	0.453592 kg
1 kilogram	2.205 pounds
1 gallon	4.5461 litre
1 litre	0.2200 gallon
1 inch (in.)	2.54 cm
1 feet (ft.)	30.5 cm
1 meter	3.279 feet
1 kilometer	0.621 mile
1 mile	1.601 kilometer
1 acre (ac)	0.40468 ha
1 hectare (ha)	2.471 ac

CURRENCY CONVERSION (AS AT MARCH 2023)

Country	Unit	Yen
US	1 US$	136.239
Lao PDR	1 LAK	0.00816

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CHAPTER 1 RATIONALE AND GOAL OF THE SURVEY

1.1 Rationale of the Survey

The Lao government has set the goal of becoming a major rice exporter, aiming to commercialize rice through the cultivation of high quality rice and to raise farmers' agricultural income through export promotion.

On the other hand, it is considered that Lao farmers have little understanding of the advantages of using high quality seeds, the production of good rice seeds is not much profitable, and the benefits of entering the market are small. Therefore, the fact that most farmers use their own preserved seeds is the cause of low seed quality and low rice productivity.

The Ministry of Agriculture and Forestry (MAF) believes that the use of high quality seeds is essential for the commercialization of rice, and in order to establish a rice seed production system, with the cooperation of JICA, the Rice Seed Multiplication and Distribution System Improvement Project (RISEP), 2006-2011, was implemented. The project proposed an appropriate system for rice seed production in the target areas, which were Vientiane capital, Vientiane province, and Luangnamtha province. A rice seed production plan was implemented to multiply and expand Breeder's Seed (BS), Foundation Seed (R1), Stock Seed (R2), and Extension Seed (R3). However, the results of RISEP have not yet been fully deployed throughout Laos.

Eleven years have passed since the end of RISEP, and it is necessary to re-examine the establishment and dissemination of RISEP results, the national seed management system, and the legal framework. In addition, as the international supply chain needs to be restructured in response to the disaster of COVID-19, it is necessary to analyze the supply chain and value chain of Lao rice in the with / post COVID-19 society.

1.2 Objectives of the Survey

Based on the value chain analysis of rice in the with / post COVID-19 society in Laos, the survey is going to confirm the possibility of commercialization of rice through the development and management of rice seeds and make policy recommendations.

1.3 Expected Outputs

The following four points are expected to result from this work.

1) The value chain of rice in Laos is analyzed in society with / post COVID-19.

2) The policy and production control system for rice seeds is confirmed and proposed.

3) Understand the potential of the Lao rice market in the domestic and overseas.

4) Based on the results of the survey, policy recommendations for rice commercialization are made.

1.4 The Survey Area

The survey area of the survey is the target provinces of RISEP (Vientiane Capital, Vientiane, and Luang Namta Provinces) and major rice-producing provinces (Savannakhet, Champasak, Salavan, and Khammouane Provinces) and rice-consuming areas (Vientiane Capital and surrounding countries (Vietnam, Thailand, and Cambodia)).

1.4.1 Rice Production Amount by Province

Table 1.4.1 shows rice production by province in 2020. The total rice production in Laos was about 3.5 million tons, of which 83.6% is produced in paddy fields in the rainy season. Dry-season rice production

in paddy fields was 10.9%, while upland rice production in the rainy season was only 5.5%. The main rice production in Laos is in the paddy fields in the rainy season.

Paddy fields are widely developed only in the central and southern plains of Laos which is a mountainous country. Regarding the percentage of total rice production in Laos, 19.0% is produced in the seven northern provinces, 54.3% in the eight central provinces, and 26.7% in the four southern provinces. In terms of rice production by province, Savannakhet province which is located in the central region produced 22.8% of the total rice with the largest share. Champasak province in the south is in second place with 12.2%, followed by Salavan province, also in the south, in third place with 11.2%. Vientiane capital located in the central region is in fourth place with 8.5%, Khammouane province is in fifth place with 7.9%, and then Vientiane province is in sixth place with 7.6%. These areas, one capital and five provinces, were targeted by this survey.

Table 1.4.1 Rice production by province in 2020

Province	Total		Lowland Rainfed		Dry season		Upland	
	Production (ton)	Percentage (%)	Harvested Area (ha)	Production (ton)	Harvested Area (ha)	Production (ton)	Harvested Area (ha)	Production (ton)
Phongsaly	51,670	1.5	8,211	35,822	48	211	8,719	15,637
Luangnamtha	58,123	1.7	9,610	40,364	640	2,859	8,847	14,900
Oudomxay	83,458	2.4	14,779	60,215	564	2,439	9,752	20,804
Bokeo	72,417	2.1	13,052	55,286	709	3,168	7,240	13,963
Luangprabang	103,739	3.0	13,181	54,864	1,811	7,845	26,959	41,030
Huaphanh	103,123	2.9	13,554	64,020	1,658	7,745	14,699	31,358
Xayabury	192,254	5.5	35,574	157,864	2,262	10,292	11,839	24,098
Northern Total	**664,784**	**19.0**	**107,961**	**468,435**	**7,692**	**34,559**	**88,055**	**161,790**
Vientiane. C	297,928	8.5	51,921	235,862	14,074	62,066	0	0
Xiengkhuang	82,928	2.4	16,329	70,151	161	727	7,430	12,050
Vientiane	267,168	7.6	54,547	229,145	8,030	35,623	1,600	2,400
Borikhamxay	143,595	4.1	35,438	134,749	1,699	6,625	1,189	2,221
Khammuane	278,659	7.9	70,494	234,271	12,112	44,209	112	179
Savannakhet	798,140	22.8	161,679	685,519	30,602	112,621	0	0
Xaysombbuon	36,963	1.1	7,868	27,588	110	405	3,431	8,970
Central Total	**1,905,381**	**54.3**	**398,276**	**1,617,285**	**66,788**	**262,276**	**13,762**	**25,820**
Salavan	391,625	11.2	75,776	342,741	13,740	48,884	0	0
Sekong	35,886	1.0	6,800	29,240	794	3,446	1,720	3,200
Champasack	428,339	12.2	117,238	399,185	6,650	29,154	0	0
Attapeu	80,797	2.3	22,471	75,614	529	1,863	1,677	3,320
Southern Total	**936,647**	**26.7**	**222,285**	**846,780**	**21,713**	**83,347**	**3,397**	**6,520**
G.Total	**3,506,812**	**100.0**	**728,522**	**2,932,500**	**96,193**	**380,182**	**105,214**	**194,130**

Source: Agricultural Statistics Yearbook 2020

1.4.2 Situation of rice seed production

R1 and R2 rice seeds are produced at five research centers nationwide under NAFRI, but the three main centers which data were available, Rice Research Center (RRC) in Vientiane capital, Thasano Agriculture Research Center in Savannakhet province, and Agriculture Research Center of Southern Laos in Champasak province, are shown for the three-year period from 2019 to 2021 in Table 1.4.2. All of the centers tended to have large fluctuations in the annual production of R1 and R2 seeds. In particular, production at centers other than the Rice Research Center has fluctuated widely. Although these centers are responsible for supplying R1 and R2 rice seeds within the province and surrounding provinces, they are currently unable to ensure stable production and supply.

Table 1.4.2 Annual Production of R1 and R2 rice seeds (kg)

Type of Rice Seed	R1			R2		
Location/Year	2019	2020	2021	2019	2020	2021
Rice Research Center (Vientiane capital)	28,356	19,123	16,916	282,304	329,968	341,575
Thasano Agriculture Center (Savannakhet province)	12,774	1,500	1,500	220,222	84,004	104,005
Agriculture Research Center of Southern Laos (Champasak province)	0	8,074	6,020	96,584	120,994	100,780
Total	**41,130**	**28,697**	**24,436**	**599,110**	**534,966**	**546,360**

Source: NAFRI

Table 1.4.3 shows the production of R3 rice seed from 2016 to 2021. R3 rice seed production is led by the Agricultural Development Center (ADC) of the Department of Extension Cooperatives (DAEC) under the Ministry of Agriculture, together with a rice seed farmers group. As same as R1 and R2 rice seed production, R3 seed production also fluctuates each year, but production has increased from about 1,850 tons in 2016 to about 2,900 tons in 2021, an increase of nearly 1,000 tons. It is thought that due to the changes in the rice seed production system which began in 2019. Under the new system, R3 rice seed production is higher in the six provinces where ADC is located (Vientiane capital., Vientiane province., Xayaburi province., Khammouane province., Savannakhet province., and Salavan province.), which are in charge of R3 seed production. In addition to these provinces, R3 seed production in Champasak province., where an international company providing support for rice seed production, is also higher than in other provinces. Meanwhile, R3 rice seed production is rather limited in other provinces.

Table 1.4.3 Annual Production of R3 rice seed (ton)

Province/Year	2016	2017	2018	2019	2020	2021
Phongsaly	13.9	5.0	-	-	10.0	16.0
Luangnamtha	48.0	32.0	-	-	63.0	152.0
Oudomxay	54.3	22.0	-	-	12.0	14.0
Bokeo	1.0	5.0	-	-	24.0	15.0
Luangprabang	2.6	14.0	-	-	18.0	32.0
Huaphanh	33.0	12.0	-	-	15.0	40.0
Xayabury	75.2	82.0	120.0	245.6	261.0	145.0
Northern Total	**228.0**	**172.0**	**120.0**	**245.6**	**403.0**	**414.0**
Vientiane. C	378.7	256.0	77.5	318.0	353.0	217.5
Xiengkhuang	11.0	8.0	-	-	20.0	35.0
Vientiane	89.0	92.0	86.0	224.2	270.0	200.0
Borikhamxay	0.5	8.0	-	-	30.0	41.3
Khammuane	412.0	348.0	258.0	218.9	378.0	336.0
Savannakhet	226.8	323.0	105.6	225.0	324.0	271.2
Xaysombbuon	-	-	-	-	-	-
Central Total	**1,118.0**	**1,035.0**	**527.1**	**986.1**	**1,375.0**	**1,101.0**
Salavan	91.1	97.0	180.0	308.7	336.0	540.0
Sekong	0.6	-	-	-	5.0	-
Champasack	45.7	67.0	-	-	117.0	501.3
Attapeu	18.2	23.0	-	-	15.0	40.0
Southern Total	**155.6**	**187.0**	**180.0**	**308.7**	**473.0**	**1,081.3**
Others (enterprise)	350.0	465.0	482.4	815.0	550.0	301.1
G.Total	**1,851.6**	**1,859.0**	**1,309.5**	**2,355.4**	**2,801.0**	**2,897.4**

Source: DAEC

1.5 Survey Plan

1.5.1 Survey Method

This project was conducted in three methods, a) Existing data survey, b) Field survey, and c) Remote survey. a) Existing data surveys were carried out using statistical data, reports of international organizations, reports of rice seed production projects, and interviews with JICA seed production technical cooperation projects in progress. b) Field surveys were conducted in the areas covered by RISEP, a project that has been implemented before, and in major rice-producing provinces, through field visits and interviews with rice seed production and rice value chain stakeholders and related institutions. c) The remote survey was conducted in Vietnam, where statistical data indicated that rice from Laos is being exported, as well as in neighboring countries such as Thailand and Cambodia, where it is not mentioned in statistical data but believed to be exported. The remote survey was carried out by the local surveyors.

1.5.2 Survey Schedule

Initially, this survey was scheduled to be conducted from November 2020 to March 2022, with four in-country works and four field surveys in Laos. However, due to the global spread of COVID-19, entry into Laos and local survey activities were severely restricted. Therefore, the survey period was extended to March 2023, with the following schedule.

- First in-country work: November 2020 - April 2022
- First fieldwork: May-September 2022
- Second in-country work: October-November 2022
- Second fieldwork: December 2022 - January 2023
- Third in-country work: January 2023
- Third fieldwork: February 2023

CHAPTER 2 RICE VALUE CHAIN (VC) UNDER WITH/POST COVID-19 SOCIETIES

2.1 Formulation of the Project Team

To implement this survey, a joint project team consisting of Japanese experts and CP staff was formed. After the kick-off meeting with the CP on 31 May 2022, the project members were selected within DOA. A second meeting was held on 10 June 2022 and a letter was received from the CP that the project members had been selected (see APPENDIX 1). The project members on the CP side are listed below. Once the project team was established, a group was created on the WhatsApp smartphone application to share information. This was necessary because of the need for close communication within the project team, such as sharing the survey schedule and requesting necessary documents.

Table 2.1.1 Member of the Survey Team from CP

No.	Position	Name
1	Deputy Director of Agronomy Management Division	Ms. Phoungeun PHOSALATH
2	Head of Agriculture input Management Sector	Mr. Phomma SOULIYASITH
3	Agricultural Investment Division	Mr. Keooudone SANMANY
4	Technician	Mr. Tiemthong SHIPHANVONG

Source: DOA

2.2 Selection of the Survey Area

The study area for this project was decided by the project team, which included the CP. The original plan was to select only one major rice-producing province in south-central Laos, in addition to one capital city and two provinces in the RISEP target area. However, CP members requested that as many provinces as possible be considered, as the situation is different in each province. The project team, therefore, decided to include four major rice-producing prefectures in the south-central part of the country in the survey. In total, the survey covered one capital city and six prefectures. The survey area is as follows.

Table 2.2.1 Survey Area

Location	Province	Category
Northern Laos	Luangnamthe Province	RISEP Target Area
Central Laos	Vientiane Capital	RISEP Target Area/Rice Production Area
	Vientiane Province	RISEP Target Area/Rice Production Area
	Khammuane Province	Rice Production Area
	Savannakhet Province	Rice Production Area
Southern Laos	Salavan Province	Rice Production Area
	Champasack Province	Rice Production Area

Source: JICA Survey Team

2.3 Data Collection from Governmental Organization

The following government agencies were visited to gather information for this survey. Firstly, the team visited and collected information from government organizations which is concerning rice seed production, such as the Department of Agriculture (DOA), the Department of Agriculture Extension and Cooperation (DAEC), and the National Agriculture and Forestry Research Institute (NAFRI) under the Ministry of Agriculture and Forestry. The project team also visited the Department of Planning and Cooperation, which manages agricultural statistics, the Agricultural Development Center (ADC) under DEAC, and the Provincial Agriculture and Forestry Offices (PAFO) in each target province to collect information. In addition to the above organizations, the team collects information from the Statistical bureau under the Ministry of Planning and Investment (MPI) to provide information on rice demand forecasts. Furthermore, information on rice prices and exports was collected from the Ministry of Commerce and Industry.

Table 2.3.1 List of Visited Governmental Organizations

Vientiane Capital
Ministry of Agriculture and Forestry, Department of Agriculture (DOA), Department of Agriculture Extension and Cooperative (DAEC), Department of Planning and Cooperation, Rice Research Center (RRC) under NAFRI, Nongheo Agriculture Development Center (ADC) under DAEC, Ministry of Industry and Commerce, Ministry of Planning and Investment, Provincial Agriculture and Forestry Office (PAFO), Thangon Agriculture Extension Center under PAFO,
Vientiane Province
Pakcheng ADC, PAFO
Luangnamtha Province
Luangnamtha Agriculture Research Center (LARC) under NAFRI, PAFO
Savannakhet Province
Thasano Agriculture Research Center, LAK35 ADC, PAFO
Champasak Province
Agriculture Research Center of Southern Laos, PAFO
Salavan Province
Nongdeang ADC, PAFO
Khammouane Province
Xebangfai ADC, PAFO

Source: JICA Survey Team

2.4 Confirmation of the Rice Value Chain

The impact of COVID-19 on rice distribution was a temporary supply interruption due to the regional blockade and the resulting price spike, but it did not disrupt the supply chain because rice is a daily necessity and can be stored for a long period. On the other hand, many of the inputs necessary for rice production are dependent on overseas suppliers, and the logistical disruptions caused by the COVID-19 measures had a significant impact, which has been succeeded by today's shortages and price hikes. Prices of chemical fertilizers and other inputs are more than double what they were before COVID-19, and there are concerns that yields will decline as some farmers abandon the use of fertilizers.

Based on the actual rice value chain (VC), a VC map (mapping the distribution flow from agricultural inputs to retail on the horizontal axis and the form of rice, unit sales price, issues, etc. on the vertical axis) was created (see next table), and a work shop (WS) on rice VC analysis was held in August 2022 in four locations (Vientiane capital, Vientiane, Luangnamtha and Savannakhet provinces) to identify bottlenecks in the VC based on the VC map analysis.

Table 2.4.1 Rice VC Map Form

Node	Input dealer	Producer	Collector	Miller	Wholesaler	Retailer
Seed/ Paddy/ Milled rice						
Sales Unit Price (kip/kg)						
Paddy Average Price (kip/kg)						
Value addition (kip/kg)						
Challenges						

Source: JICA Survey Team

Laos is a landlocked country surrounded by other nations and is home to diverse topographies and ethnic groups. As a result, there are significant regional variations in rice cultivation, with a wide range of rice varieties being grown and various rice value chains existing. The purpose of this survey was to clarify the reality of the diverse rice VC in Laos by constructing and analyzing multiple VC maps that capture the regional characteristics. In the WSs in Vientiane capital, Vientiane province, and Savannakhet provinces, the target rice variety was focused on “TDK8”, the most common variety in those areas. In

the WS in Luangnamtha provinces, the target rice variety was focused on “Khao Ta Khied”, the most common variety in the province.

2.4.1 Vientiane Capital

(1) Overview of the VC

In the capital city of Vientiane, it was recognized that one of the key issues is "insufficient drying of paddy rice after harvest, and the lack of drying machines at private rice mills, in general, makes it impossible to dry a large amount of paddy rice. A possible solution to this problem is to "hold discussions with rice mills and farmer groups in each region and make adjustments so that the harvest time is not overly concentrated to secure the time needed for drying. The following is a summary of the information obtained at each stage of the VC. In Vientiane Capital, there was no participation of (milled rice) wholesalers.

VC workshop in Vientiane Capital

(2) Information on each VC segment

Information on the items in the following table was collected from participants at each stage of VC in the WS.

Table 2.4.2 Information Collection Items at the WS in Vientiane Capital

Source of Information	Information Collection Items
Input Dealer	①Status of procurement, ②Problem, ③Proposed countermeasure, ④Characteristics, ⑤Others
Rice Farmer	①Seed paddy procurement, ②Selling price of produced paddy, ③Problem, ④Proposed countermeasures
Rice Seed Farmer	①Production cost, ②Yield, ③Sales price, ④Problem, ⑤Proposed countermeasure
Middleman (Collection)	①Place of purchase, ②Purchase price, ③Sales destination, ④Sales price, ⑤Problem, ⑥ Characteristics
Processor (Mill)	①Purchasing paddy, ②Purchase price, ③Sales destination, ④Sales price, ⑤Problem, ⑥ Proposed countermeasure, ⑦Characteristics, ⑧Others
Retail (Rice Shop)	①Purchasing status, ②Purchase price, ③Sales price, ④Problem, ⑤Others

Source: JICA Survey Team

a) Agricultural inputs (agricultural material dealers): Due to COVID-19, supplies are in short supply. Currently, product prices are rising due to inflation.

① Status of procurement
・Paddy seeds are procured from Vientiane Special City and neighboring provinces. The purchase price (rainy season) is 6,000 kip/kg, and the selling price (rainy season) is 8,000 kip/kg.
・Fertilizers and pesticides are imported from Thailand twice a month.
② Problem: The price of rice and fuel is high.
③ Proposed countermeasure: It is necessary to reduce the production cost of rice.
④ Characteristics: We try to provide high-quality service to our customers.
・The store is located in a convenient location in the village.
・Provide a product delivery service.
⑤ Others: Government support is necessary for high inflation.

b-1) Rice farmers: Representatives of production groups from Kengkhai village and Simmano village participated.

① Seeds are purchased from NAFRI's Naphok and Nongheo centers.
・The purchase price of TDK8 is R3: 6,000 kip/kg, R2: 7,500 kip/kg.
② Selling price of produced paddy
・Wet season and dry season (early harvest): 3,300 kip/kg
③ Problem: Production costs (fertilizer, fuel, labor) are high, but sales prices are low.
④ Proposed countermeasure: Provide financial support and material subsidies to farmers to continue production.

b-2) Rice seed farmer: Representatives of the R3 production group in Nalong Village participated.

① Production cost: Total is about 1.8 million to 2 million kip/rai (1 rai = 40m x 40m = 1,600m2 = 0.16ha).
・Soil improvement: 600,000 kip/rai
・Rice seeds (R2): 50,000 to 65,000 Kip/10 kg/rai (purchased from Naphok Center of NAFRI)
・Compiled fertilizer (produced in Thailand): 900,000 kip/rai (purchased from material store)
・Herbicide (made in China): 30,000 kip/rai (purchased from a supply store)
・Porting: 300,000 kip/rai
・Bundling, drying, transportation: 100,000 kip/rai
・Threshing: 100,000 kip/rai
② Yield: 525 kg/rai = 3.3 t/ha
③ Sales price (wet season and dry season, contract sales also available): 4,000 kip/kg
④ Problem
・Lack of irrigation water (malfunction of irrigation pump).
・Selling prices fluctuate greatly.
・Fertilizer and labor costs (100,000 kip/day) are high.
・There is a lot of insect damage.
・Insufficient funds for production.
⑤ Proposed countermeasure
・Negotiate with rice mills to stabilize the selling price.
・Support for repairing irrigation pumps, cultivation training, and technical guidance by the government.

c) Middleman (Collection)

① Place of purchase: The middlemen purchase in cash from contract farmers/groups of 300 households in 3 counties.
② Purchase price: 2,500-2,600 Kip/kg in the rainy season, 2,800-3,000 Kip/kg in the dry season.
③ Sales destinations: General rice mills, government agencies, and exports to Vietnam.
④ Sales price: 3,500-4,000 Kip/kg (same for both rainy and dry seasons)
⑤ Problem
・Insufficient funding (financial access is difficult).
・Production costs (especially fertilizer and fuel) are high.
⑥ Characteristics
・The middlemen also sell production materials (seeds and fertilizers).
・The middlemen have specialists in cultivation technology.

d-1) Processing (rice mill in Hadxaifong district)

① Purchasing paddy: Purchasing from farmers, groups, and ADC.
② Purchase price of paddy: 3,800-4,200 kip/kg (rainy season), 4,000-5,000 kip/kg (dry season)
③ Sales of polished rice: Sales to wholesalers, retailers, and own stores.
④ Sales price of polished rice: 6,500-7,500 kip/kg (rainy season), 6,700-8,000 kip/kg (dry season)
⑤ Problem

・The moisture content of paddy is high (more than 17%), and the quality of polished rice cannot be improved (difficult to store).
・The general rice mill does not have a dryer, so it is not possible to dry a large amount of paddy rice.
・Paddy is often mixed with foreign matter.
・Variety is mixed (too many cultivated varieties).
・Farmers' cultivation skills are low.
・High fees for collection companies.

⑥ Proposed countermeasure

・It is necessary to introduce a dryer.
・Properly dried paddy is purchased at a high price.
・Consultations will be held with rice mills and farmer groups in each region to ensure that harvest times are not overly concentrated to allow time for drying.

⑦ Characteristics: Introduced dryer and moisture meter.

⑧ Others: When the shipment of paddy concentrates, the drying work at rice mills cannot keep up, and the purchase price has to be lowered.

d-2) Processing (rice mill in Xaythani district)

① Purchasing of paddy: 70% of the amount handled is purchased from contract farmers and 30% from collectors.
② Purchase price of paddy: 5,000 kip/kg
③ Sale of milled rice: Cash is sold to retailers at the Thongkhankham market in the city.
④ Sales price of polished rice: 8,200 kip/kg
⑤ Problem: The moisture content of paddy is high (18~20%, the standard is 14%).
⑥ Proposed countermeasure: I want farmers to dry well.
⑦ Characteristics: Contract farmers tend to use good seeds.
⑧ Others: The milling ratio is 60%.

e) Retail (Rice Shop)

① Purchasing of polished rice: Wholesalers transport the rice by truck. Wholesalers also sell to general consumers in bags (48 kg).
② Purchase price: 12,000 kip/kg (rainy season), 10,000 kip/kg (dry season), 15,000 kip/kg (Non-glutinous)
③ Sales price: 14,000 kip/kg (rainy season), 12,000 kip/kg (dry season), 18,000 kip/kg (Non-glutinous)
④ Problem:

・It is difficult to store polished rice because of its high water content.
・The rice hardens faster after cooking than in the past. (Even after cooking, the soft and beautiful rice sells well.)
・Price of rice is high.

⑤ Others: During the COVID-19 outbreak, traffic was blocked and business was not possible.

2.4.2 Vientiane Province

(1) Overview of the VC

In Vientiane Province, it was recognized that an important issue is that "the rice trade is active, and by solving the problems in VC, the distribution volume can be expected to increase. A possible solution to this issue is to "discuss with rice mills and farmer groups in each region and adjust the harvest time so that it is not excessively concentrated. The following is a summary of the information obtained at each stage of the VC.

VC workshop in Vientiane Province

(2) Information on each VC Segment

Information on the items in the following table was collected from participants at each stage of VC in the WS.

Table 2.4.3 Information Collection Items at the WS in Vientiane Province

Source of Information	Information Collection Items
Input Dealer	①Status of procurement, ②Seed paddy price, ③Problem/ Proposed countermeasure, ④ Characteristics
Rice Farmer	①Seed paddy procurement, ②Selling price of produced paddy, ③Problem, ④Characteristics
Rice Seed Farmer	①Seed paddy procurement, ②Seed consumption, ③Yield, ④Sales price of produced paddy, ⑤ Problem, ⑥Proposed countermeasure, ⑦Characteristics
Middleman (Collection)	①Place of purchase, ②Purchase price, ③Sales destination, ④Problem, ⑤Characteristics
Processor (Mill)	①Purchasing paddy, ②Purchase price, ③Sales destination, ④Sales price, ⑤Problem, (6) Characteristics
Middleman (Wholesale)	①Place of purchase, ②Purchase price, ③Sales destination, ④Sales price, ⑤Problem, ⑥ Characteristics, ⑦Others
Retail (Rice Shop)	①Purchasing status, ②Purchase price, ③Sales price, ④Problem, ⑤Others

Source: JICA Survey Team

a) Agricultural inputs (Agricultural material dealers)

① Status of procurement
- Import (seeds, etc.) from domestically and overseas (Thailand, Vietnam, and China).
- The dealers purchase fertilizers, pesticides (insecticides), nutrients, etc. from Thailand.

② Seed paddy price
- From Pakcheng ADC: The purchase price is 6,500 kip/kg, selling price is 7,000 kip/kg.
- From Naphok RRC: The purchase price is 7,000 kip/kg, selling price is 8,000 kip/kg.

③ Problems/ Proposed countermeasures
- Seed paddy is necessary to increase yield, but farmers are not supplied enough.
- Low-interest loans are necessary so that farmers can respond to the timing of fertilization and when pests and diseases occur.
- Farmers want to exchange information with agriculture-related organizations regarding measures against pests and diseases.
- The dealers would like the sales staff of agricultural materials to participate in public training to improve their knowledge.
- The rice hardens faster after cooking than in the past. (If steamed twice, it will smell putrid.)

④ Characteristics: In addition to general sales, wholesale to about 10 retail stores.

b-1) Rice farmers: A deputy representative of the Thinkham village production group participated.

① Seeds are purchased from seed production groups. The purchase price of R3 is 6,000 kip/kg.

② The produced paddy is sold to rice mills. 3,000 kip/kg in the rainy season and 4,000 kip/kg in the

dry season.

③ Problem

・Production costs (fertilizer, fuel) are high, and work is delayed if fuel is not available.

・The main diseases are leaf dryness, dryness, and head dryness.

④ Characteristics

・Irrigation is carried out over a wide area and mechanization is progressing. Direct seeding and transplanting are half and half.

・The dealers are engaged in farming activities in groups and can receive advice from extension workers.

b-2) Seed producers: representatives of the Cheng Village production groups participated.

① R2 was purchased from NAFRI's Naphok Center at 7,000 kip/kg.

② Seed consumption: 60 kg/ha

③ Yield: 3 to 4 t/ha

④ R3 selling price (wet season and dry season): 6,000 kip/kg

⑤ Problem

・Fertilizer, irrigation fee, and fuel are expensive.

・There is a lot of insect damage.

⑥ Proposed countermeasure: Insect damage should be dealt with by consulting with each other within the group.

⑦ Characteristics

・Near the Nam Ngum River, there is an existing concrete irrigation system.

・The seed producers are engaged in farming activities in groups and can receive advice from extension workers.

c) Middleman (Collection)

① Place of purchase: Central (Vientiane Capital, Vientiane Province, Bolikhamxay Province, and Khammouane Province) goes to purchase, while southern (Savannakhet Province, Salavan Province, and Champasak Province) receive shipments.

② Purchase price: (rainy season and dry season) 5,500 kip/kg

③ Sales destination: Rice mills

④ Problems

・The paddy is not sufficiently dried and has a lot of moisture.

・Soaring fuel prices (Transportation cost before Corona: 10,000,000 kip/4t, Post-Corona: 20,000,000 kip/4t).

⑤ Characteristics: it is possible to choose paddy and easy to purchase from Vientiane Province and Vientiane Capital.

d) Processing (rice mills in Phonhong and Thoulakhom districts)

① Purchasing paddy: Purchasing from farmers, groups, and collectors.

② Purchase price of paddy: 5,800 kip/kg (rainy season/dry season)

③ Sales of polished rice: Wholesale, retail, general consumers (own stores), government agencies (schools, military, government offices), and factories.

④ Sales price of polished rice: 9,600 kip/kg (rainy season/dry season)

⑤ Problems

・The moisture content of paddy is high (30% or more, the standard is 18-20%), and mold occurs.

・Spare parts for rice milling machines (made in China or Thailand), where rice milling costs are high.

⑥ Characteristics: Polished rice with good quality sells well.

e) Middleman (Wholesale) (Participated by wholesalers from Naxaythong and Phonhong districts)

① Purchase location: Rice mill

② Purchase price: 9,500 kip/kg

③ Sales destination: Retail
④ Sales price: 10,000 kip/kg
⑤ Problems
・It is difficult to store polished rice because of its high water content.
・The rice hardens faster after cooking than in the past.
・The impact of inflation is large.
・Transportation costs are rising due to soaring fuel prices.
・Difficult to borrow business funds.
⑥ Characteristics: There is a production base for rice, and the supply is stable.
⑦ Others: Due to COVID-19, prices (especially fuel) soared, and it made sales difficult.

f) Retail (3 rice shops in Viengkham district)
① Purchasing of polished rice: We purchase from wholesalers and rice mills.
② Purchase price: 10,000 kip/kg (rainy season/dry season)
③ Sales price: 12,000 kip/kg (rainy season/dry season)
④ Problems
・Purchase price is high.
・Soft rice sells well.
⑤ Others: Sales volume decreased due to the coronavirus pandemic.

2.4.3 Luangnamtha Province

(1) Overview of the VC

In Luangnamtha province, it was recognized that an important issue is that "there are times when the purchase price of intermediaries increases, but since the selling price is regulated, they are unable to secure profits. A possible response to this issue is to "adopt a pricing policy that takes into account the interests of distributors in addition to the protection of farmers/consumers. The following is a summary of the information obtained at each stage of the VC. In Luangnamtha province, the participation of agricultural inputs and intermediaries (wholesalers) was not obtained.

VC workshop in Luangnamtha Province

(2) Information on each VC segment

Information on the items in the following table was collected from participants at each stage of VC in the WS.

Table 2.4.4 Information Collection Items at WS in Luangnamtha Province

Source of Information	Information Collection Items
Rice Farmer	①Seed paddy procurement, ②Produced paddy sales, ③Problem, ④Characteristics, ⑤Others
Rice Seed Farmer	①Seed paddy procurement, ②Produced paddy sales, ③Characteristics, ④Others
Middleman (Collector)	①Place of purchasing paddy, ②Purchase price, ③Problem, ④Characteristics, ⑤Others
Processor (Mill)	①Purchasing paddy, ②Purchase price, ③Sales destination, ④Sales price, ⑤Problem/ Proposed countermeasure
Retail (Rice Shop)	①Purchasing status, ②Purchase price, ③Sales price, ④Problem/ Proposed countermeasure, ⑤ Others

Source: JICA Survey Team

a-1) Rice farmers: representatives of production groups in Luangnamtha participated.

① Farmer procures the Rice seed (R2) from Luangnamtha Agriculture Center under NAFRI. The price is 8,000 kip/kg (rainy season/dry season).
② The produced paddy is sold to rice mills. The price is 6,500 Kip/kg in the rainy season and 4,000-5,000 kip/kg in the dry season.
③ Problem
・High production costs (fertilizer, pesticide, fuel).
・Agricultural machinery is old and there is no dryer.
④ Characteristics
・Owns paddy fields and has irrigation facilities (annual irrigation fee is 70,000 kip/ha). A workforce is also available.
⑤ Others: Production costs (fertilizer and fuel) soared due to the expansion of COVID-19.

a-2) Seed producers: 3 representatives of the production group in Luangnamtha participated.
① Purchase R1 from NAFRI's Luangnamtha Center at 8,500 kip/kg.
② R2 before sorting is purchased by the center at 5,200 kip/kg. (This is sorted by the center and sold to rice farmers at 8,000 kip/kg. There is no ADC in Luangnamtha province, and most rice farmers use R2 as seed paddy.)
③ Characteristics: the seed producers maintain a good relationship with the NAFRI Center by observing the contract and maintaining close communication.
④ Others: The impact of COVID-19 was not so huge.

b) Middleman (collection) trader (1 trader in Luangnamtha district)
① Purchase location: We purchase rainy-season rice from within Luangnamtha province.
② Purchase price: 5,000 kip/kg
③ Problem: Insufficient drying may cause mold.
④ Characteristics: We have a 2-ton truck for stocking and delivery.
⑤ Others: Due to the COVID-19 outbreak, movement across villages was restricted, making transportation difficult.

c) Processing (rice mills in Luangnamtha district)
① Purchasing paddy: Purchasing from farmers.
② Purchase price of paddy: 5,000 kip/kg for glutinous rice and 4,500 kip/kg for non-glutinous rice in both rainy and dry seasons.
③ Sales of polished rice: Sales to general retailers.
④ Sales price of polished rice: 8,000 kip/kg for glutinous rice and 7,500 kip/kg for non-glutinous rice in both rainy and dry seasons.
⑤ Problem/ Proposed countermeasure
・The moisture content of paddy is high (it has not decreased to the standard), and mold occurs. (There is no dryer.)
・The rice mills can't save money to install a dryer.
・As the amount of paddy decreases towards the end of the year, the purchase price rises, but there is a limit on the price of milled rice, so there is no profit. If the price of polished rice is to be restricted, adjustment to the price of paddy is necessary.
・Polished rice of good quality sells at a high price, but polished rice of poor quality cannot be sold unless the price is lowered.
・It is difficult to do business because the price of rice is unstable.

d) Retail (3 rice shops in Luangnamtha district)
① Purchasing of polished rice: The shops purchase from wholesalers and rice mills.
② Purchase price: 12,000 kip/kg (rainy season/dry season)

③ Sales price: 13,000 kip/kg (rainy season/dry season)
④ Problem/ Proposed countermeasure
・Supply from wholesalers is decreasing due to soaring rice prices.
・Regulations are necessary because excessive competition will occur if a new retail store opens near an existing retail store.
⑤ Others: The shops value the connection with consumers, and regular customers come to buy regularly.

2.4.4 Savannakhet Province

(1) Overview of the VC

In Savannakhet, it was recognized that "the standard values for the moisture content of paddy rice and the purchase price are not well known to farmers, and the aggregators / the rice millers need to explain/negotiate each time they collect rice or purchase rice at a rice mill. A possible solution to this problem is to "set/update the standard values for each province and make them known to farmers. The following is a summary of the information obtained at each stage of the VC. In Savannakhet Province, there was no participation of wholesalers of milled rice.

VC workshop in Savannakhet Province

(2) Information on each VC segment

Information on the items in the following table was collected from participants at each stage of VC in the WS.

Table 2.4.5 Information Collection Items at WS in Savannakhet Province

Source of Information	Information Collection Items
Agricultural Inputs	①Status of procurement, ②Problem, ③Proposed countermeasures
Rice (Seed) Farmer	①Procurement of seed paddy, ②Sales price of produced paddy, ③Problem, ④Proposed solutions, ⑤Characteristics, ⑥Others
Middleman (Collector)	①Place of purchase, ②Purchase price, ③Sales destination, ④Sales price, ⑤Problem, ⑥Characteristics, ⑦Others
Processor (Mill)	①Purchasing paddy, ②Purchase price, ③Sales price, ④Problem, ⑤Characteristics, ⑥Others
Retail (Rice Shop)	①Purchasing and sales status, ②Purchase price, ③Sales price, ④Problem, ⑤Characteristics, ⑥ Others

Source: JICA Survey Team

a) Agricultural inputs (agricultural material dealers): Due to COVID-19, supplies are in short supply. Currently, product prices are rising due to inflation.

① Status of the procurement: Commodities are procured in Lao or imported from foreign countries, Thailand and China.
・Seed varieties are TSN8, TSN11, and TDK8. The purchase price is 6,000 kip/kg and the selling price is 7,000 kip/kg.
・Fertilizer 16-20-0 The purchase price is 590,000 kip/bag (50kg), and the selling price is 625,000 kip/bag.
・Fertilizer 46-0-0 purchase price is 686,000 kip/bag (50kg), selling price is 710,000 kip/bag.
・Fertilizer 15-15-15 purchase price is 705,000 kip/bag (50kg), selling price is 715,000 kip/bag.
・Purchase price of insecticide = 33,000 kip/bottle, selling price is 40,000 kip/bottle.
② Problem

・Most of the products sold are imported from foreign countries and are relatively expensive.
・Prices soared due to violent inflation.
③ Proposed countermeasures
・Promote domestic production so that imports can be reduced.
・Inflation needs to be adjusted and managed.

b) Producers: Participation of rice and R3 producers

① Seeds are purchased from Thasano Rice Seed Production Center, 35 km Agricultural Development Center, and IDP Rice Mill.
・The purchase price of seeds is R3: 6,000 kip/kg, R2: 7,000 kip/kg.
② Selling price of produced paddy
・Rainy season: 2,900 kip/kg (moisture 18 - 20%) ~ 5,000 kip/kg (moisture 14 - 18%).
・Dry season: 2,800 kip/kg (moisture 18 - 20%) ~ 5,000 kip/kg (moisture 14 - 18%).
③ Problem: High production cost. Unstable selling price (no guaranteed price). Serious pest damage.
④ Proposed countermeasure: Establishment of a production group/Improvement of activities. Promote contract sales. Training in production technology.
⑤ Characteristics: TDK8 has a high yield, good grain shape, and color, can be cultivated in both rainy and dry seasons, and is resistant to environmental changes (drought, floods, etc.) and diseases.
⑥ Others: Importing input materials leads to high production costs.

c) Middleman (Collection)

① Purchasing place: Villages of Xaybouli, Cham Phone, and Song Khone Counties.
② Purchase price: 5,000 kip/kg
③ Sales destination: Nyodoi rice mill, IDP rice mill
④ Price: 5,200 kip/kg (same for both rainy and dry seasons)
⑤ Problem
・It is difficult to set a price because there is no association of collectors and no guaranteed price.
・Paddy prices are in an excessively competitive state.
⑥ Characteristics: The rice mill buys a large amount of paddy.
⑦ Others
・Business stagnated during the COVID-19 epidemic.
・The price of rice is not constant and changes frequently.

d) Processing (Rice mill)

① Purchasing paddy: Purchasing from farmers and collectors.
② Purchase price of paddy: 3,000 kip/kg (rainy season), 3,600 kip/kg (dry season)
③ Sales price of polished rice: 5,200 kip/kg (rainy season), 6,200 kip/kg (dry season)
④ Problem: The funds for purchasing are insufficient.
⑤ Characteristics: The rice polishing rate of general rice mills is 58%, but in IDP it is 42% to improve quality.
⑥ Others: Some farmers do not dry enough after harvesting, so 22-25% moisture remains.

e) Retail (Rice Shop)

① Purchasing of polished rice: The rice shops purchase polished rice that has already been packaged from rice mills and sell it to general consumers.
② Purchase price: 9,000 kip/kg (rainy season), 10,000 kip/kg (dry season)
③ Sales price: 12,000 kip/kg (rainy season), 13,000 kip/kg (dry season)
④ Problem: The price of rice fluctuates greatly (The shops want the government to manage it so that it is stable).
⑤ Characteristics: TDK8 has a uniform grain shape, is white and soft, and is favored by consumers.
⑥ Others: The shops appreciated this WS.

2.5 Results of the Rice Value Chain Analysis

The information obtained from the WS was organized and analyzed through the creation of the following rice VC maps. The average price of paddy rice (kip/kg) was calculated for each stage of the VC and is summarized in the following figure. The following five characteristics should be noted.

1) High value added in production and wholesale. (Transportation costs, labor costs, etc. are rising.)
2) Value added in processing is not high. (Competition among rice mills)
3) There is no price difference between Vientiane capital, Vientiane province (and Savannakhet province). (Wide distribution)
4) Luangnamtha Province has high production prices. (Shortage of paddy during the rainy season, intra-regional distribution)
5) Retail price is not high in Luangnamtha province. (Setting of the standard price for milled rice)

(Concerning 1) above)
Value added is expressed as the increase from the previous stage (slope of the line) in each stage in Figure 2.5.1. Behind the high value-added in production and wholesale is, as noted above, the soaring cost of inputs for the rice VC as a whole, of which fuel and labor costs are particularly high in terms of the price increase. The production and distribution stages, which require high fuel and labor costs, are thought to be relatively more affected by these costs.

(Regarding 2) above.)
On the other hand, since the value added at the rice milling stage is not that high (as was the situation before the sharp rise in prices), the structure may be designed to secure profits by raising the processing volume while suppressing the value added per unit. There are a certain number of rice mills nationwide, and it can be assumed that the unit value-added is suppressed beyond the additional cost due to the transportation distance within the region (i.e., there is competition among rice mills).

(Regarding 3) above)
Comparing Vientiane Capital and Vientiane Province, there is almost no price difference, indicating a large and frequent supply of milled rice from the production area to the consumption area, and that the two regions function as a single region (wide-area distribution). After the processing stage (rice milling), the value added in the capital of Vientiane is slightly higher than in Vientiane province, suggesting that the capital of Vientiane is more attuned to changes in demand.

The characteristics of Luangnamtha province, 4) and 5) above are discussed below.

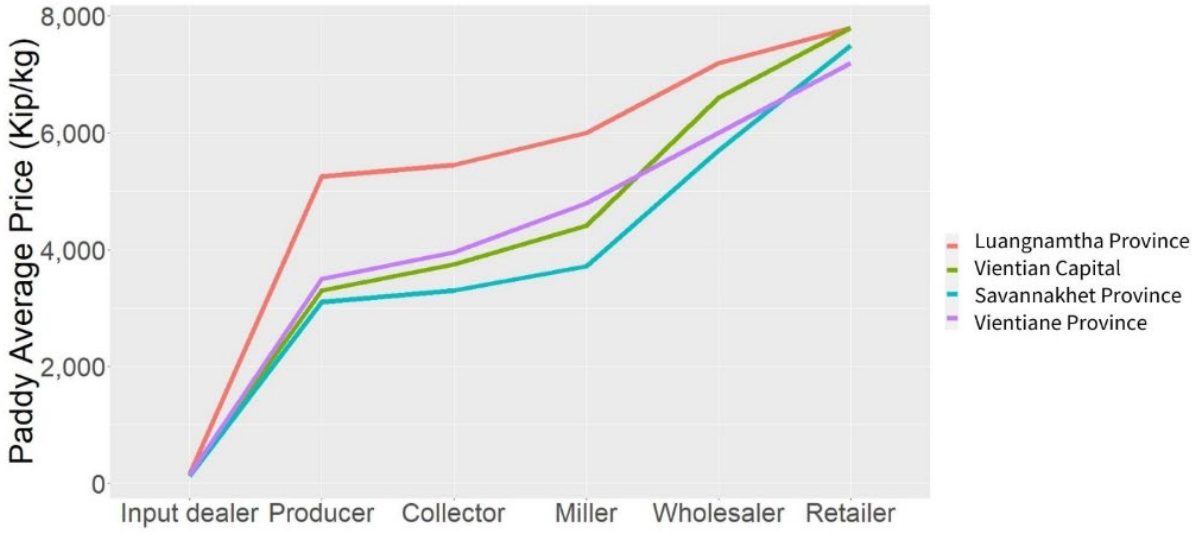


Fig. 2.5.1 Average Paddy Prices at Each Stage of the Rice VC

2.5.1 Vientiane Capital

In the VC map for each region shown below, the six stages of VC are listed in order from the left column (agricultural inputs) to the right column (retail), with the state of rice (seed/paddy/polished rice) shown in the first row and the unit sales price for each stage shown in the second row (in the first step if the row is divided into two steps). The second step shows the unit price per kg of paddy, multiplied by the milling efficiency (assumed to be 60%), to compare with the unit price per kg of paddy before the milling stage.

The third row shows the average unit sales price (second row) and its percentage, and the fourth row shows the value added at each stage (the difference between the average unit price of paddy and the average unit price of the previous stage) and its percentage when the retail unit price is set at 100. Finally, the fifth row shows the main issues for each stage. In the case of the capital city of Vientiane, the situation described in 2.4.1(2)d-1⑤, "The drying of paddy rice after harvest is insufficient and cannot be handled by a typical rice mill" is described as a challenge at the rice milling stage (Miller's Challenges).

Table 2.5.1 Map of Rice VC in Vientiane Capital

Node	Input dealer	Producer	Collector	Miller	Wholesaler*3)	Retailer
Seed/ Paddy/ Milled rice	Seed (Multiplied)	Paddy	Paddy	Milled rice (Paddy)*2)	Milled rice (Paddy)	Milled rice (Paddy)
Sales Unit Price (kip/kg)	8,000 (152)*1)	3,300	3,500-4,000	6,500-8,200 (3,900-4,920)	10,000-12,000 (6,000-7,200)	12,000-14,000 (7,200-8,400)
Paddy Average Price (kip/kg)	152 (2%)	3,300 (42%)	3,750 (48%)	4,410 (57%)	6,600 (85%)	7,800 (100%)
Value addition (kip/kg)	-	3,148 (40%)	450 (6%)	660 (8%)	2,190 (28%)	1,200 (15%)
Challenges	The price of rice and fuel is high.	Production costs are high, but sales prices are low./ Lack of irrigation water./ Selling prices fluctuate greatly./ There is a lot of insect damage./ Insufficient funds for production.	Insufficient funding./ Production costs (especially fertilizer and fuel) are high.	The moisture content of paddy is high, and the quality of milled rice cannot be improved./ Since ordinary rice mills do not have mechanical dryers, they cannot dry a large amount of paddy./ Paddy is often mixed with foreign matter./ Variety is mixed./ Farmers' cultivation skills are low./ High fees for collectors.	-	Difficult to store milled rice because of its high water content./ Price of rice is high.

*1) Converted seed price; 8,000 kip/kg × 10 kg/rai (apply) ÷ 525 kg/rai (yield) = 152 kip/kg
*2) Converted paddy price; milling ratio of 60% was applied to the following conversions.
*3) Figures in the wholesaler; they are based on the information of the retailer.
Source: JICA Survey Team

2.5.2 Vientiane Province

In the case of Vientiane Province, the value-added structure is similar to that of Vientiane Capital, which can be confirmed by comparing the average price of paddy with that of Vientiane Capital. As for challenges, the high moisture content (insufficient drying) of paddy rice at the collection and milling stages (Collector and

Miller Challenges) and the high moisture content at the wholesale stage, even after milling, make storage difficult (Retailer Challenges).

Table 2.5.2 Map of Rice VC in Vientiane Province

Node	Input dealer	Producer	Collector	Miller	Wholesaler*6)	Retailer
Seed/ Paddy/ Milled rice	Seed (Multiplied)	Paddy	Paddy	Milled rice (Paddy)*4)	Milled rice (Paddy)	Milled rice (Paddy)
Sales Unit Price (kip/kg)	7,000-8,000 (133-152)*1)	3,000-4,000*2)	3,950	8,000 (4,800)	10,000 (6,000)	12,000 (7,200)
Paddy Average Price (kip/kg)	143 (2%)	3,500*3) (49%)	3,950 (55%)	4,800*5) (67%)	6,000 (83%)	7,200 (100%)
Value addition (kip/kg)	-	3,357 (47%)	450 (6%)	850 (12%)	1,200 (16%)	1,200 (17%)
Challenges	Seed paddy is necessary to increase yield, but farmers are not supplied enough./ Low-interest loans are necessary for farmers./ Farmers want to exchange information with agriculture-related organizations regarding measures against pests and diseases.	Production costs are high, and work is delayed if fuel is not available./ The main diseases are leaf blight, blight, and head blight.	The paddy is not sufficiently dried and has a lot of moisture. / Soaring fuel prices (Transportation cost became double, compared to before Covid).	The moisture content of paddy is high, and mold occurs./ Spare parts for rice milling machines lift the rice milling cost.	Difficult to store milled rice because of its high water content./ The impact of inflation is huge./ Transportation costs are rising due to soaring fuel prices./ Difficult to borrow business funds.	The purchase price is high.

*1) Converted seed price; 7,000-8,000 kip/kg × 10 kg/rai (apply in VSC) ÷ 525 kg/rai (yield in VSC) = 133-152 kip/kg
*2) Price range of the paddy was adjusted following the paddy's average price.
*3) Paddy average price; 3,300 (paddy average price of collector) – 200 (value addition of collector) = 3,100 kip/kg
*4) Converted paddy price; milling ratio of 60% was applied to the following conversions.
*5) Paddy's average price was adjusted to secure the value addition.
*6) Figures in the wholesaler; they are based on the information of the retailer.
Source: JICA Survey Team

2.5.3 Luangnamtha Province

The structure of value added in Luangnamtha Province is the same as in other provinces, but as mentioned above, it is characterized by high production prices. This is because demand rises toward the end of the year and prices rise as storage volume decreases, which is thought to be the result of seasonal rice shortages. Of course, if rice was brought in from other regions during the shortage season, the shortage would be alleviated, but the fact that the rice market is different from that of other provinces, as evidenced by the fact that the main rice varieties are different, and the geographical distance between the two provinces makes it distinct from the wide inter-provincial rice distribution network (2.5-4)).

If the production price of paddy rice is high and the value added after collection is the same as in other provinces, the retail price of milled rice should also be high, but in Luangnamtha Province, a standard price for milled rice has been set (from the perspective of consumer protection), and the increase in milled rice prices is controlled (2.5-5)). As a result, the price of milled rice is higher than in other provinces, but not outstanding, and the value added at the wholesale and retail levels is suppressed. Although this situation keeps the price of milled rice low and stable, there is a risk that the distribution situation could deteriorate.

Table 2.5.3 Map of Rice VC in Luangnamtha Province

Node	Input dealer	Producer	Collector	Miller	Wholesaler*3)	Retailer
Seed/ Paddy/ Milled rice	Seed (Multiplied)	Paddy	Paddy	Milled rice (Paddy)*2)	Milled rice (Paddy)	Milled rice (Paddy)
Sales Unit Price (kip/kg)	8,000 (152)*1)	4,000-6,500	5,450	10,000 (6,000)	12,000 (7,200)	13,000 (7,800)
Paddy Average Price (kip/kg)	152 (2%)	5,250 (67%)	5,450 (70%)	6,000 (78%)	7,200 (92%)	7,800 (100%)
Value addition (kip/kg)	-	5,100 (65%)	200 (3%)	550 (8%)	1,200 (14%)	600 (8%)
Challenges	-	Production costs are high./ Agricultural machinery is old and there is no dryer.	Insufficient drying causes mold.	The moisture content of paddy is high, and mold occurs./ The miller can't save money to install a dryer./ As the amount of paddy decreases towards the end of the year, the purchase price rises, but there is a limit on the price of milled rice, so there is no profit./ Milled rice of poor quality cannot be sold unless the price is lowered./ Difficult to do business because the price of rice is unstable.	-	Supply from wholesalers is decreasing due to soaring rice prices./ Regulations are necessary because excessive competition will occur if a new retail store opens near an existing retail store.

*1) Converted seed price; 8,000 kip/kg×10 kg/rai (apply)÷525 kg/rai (yield) = 152 kip/kg
*2) Converted paddy price; milling ratio of 60% was applied to the following conversions.
*3) Figures in the wholesaler; they are based on the information of the retailer.
Source: JICA Survey Team

2.5.4 Savannakhet Province

Comparing paddy prices in Vientiane Capital and Savannakhet Province, Savannakhet Province is slightly lower, but the price difference is not so great, indicating that milled rice is supplied from Savannakhet, a major rice production area, to Vientiane Capital, a major consumption area, and that the two regions are complementary. As for challenges, as shown in the collection phase (Collector Challenges), there are no standards for setting prices, and there is a high level of competition for sales and purchases, which is leading to instability in the retail price of milled rice (Challenges in the Retail phase).

Table 2.5.4 Map of Rice VC in Savannakhet Province

Node	Input dealer	Producer	Collector	Miller	Wholesaler*6)	Retailer
Seed/ Paddy/ Milled rice	Seed (Multiplied)	Paddy	Paddy	Milled rice (Paddy)*4)	Milled rice (Paddy)	Milled rice (Paddy)
Sales Unit Price (kip/kg)	6,000-7,000 (114-133)*1)	2,800-3,400*2)	3,000-3,600	5,200-6,200 (3,120-3,720)	9,000-10,000 (5,400-6,000)	12,000-13,000 (7,200-7,800)
Paddy Average Price (kip/kg)	124 (2%)	3,100*3) (41%)	3,300 (44%)	3,720*5) (50%)	5,700 (76%)	7,500 (100%)

Node	Input dealer	Producer	Collector	Miller	Wholesaler*6)	Retailer
Value addition (kip/kg)	-	2,976 (40%)	200 (3%)	420 (6%)	1,980 (26%)	1,800 (24%)
Challenges	Most of the products are relatively expensive./ Prices soared due to violent inflation.	High production cost/ Unstable selling price/ Serious pest damage	Difficult to set a price as there is no association of collectors and no standard of price./ Paddy prices are excessively competitive.	The funds for purchasing paddy are insufficient.	-	The price of rice fluctuates greatly.

*1) Converted seed price; 6,000-7,000 kip/kg×10 kg/rai (apply in VSC)÷525 kg/rai (yield in VSC) = 114-133 kip/kg
*2) Price range of the paddy was adjusted following the paddy's average price.
*3) Paddy average price; 3,300 (paddy average price of collector) – 200 (value addition of collector) = 3,100 kip/kg
*4) Converted paddy price; milling ratio of 60% was applied to the following conversions.
*5) Paddy's average price was adjusted to secure the value addition.
*6) Figures in the wholesaler; they are based on the information of the retailer.
Source: JICA Survey Team

CHAPTER 3 RICE SEED PRODUCTION AND MANAGEMENT SYSTEM

3.1 Systems and policies related to rice seed production

3.1.1 Rice seed multiplication system

The division of responsibilities between the organizations was changed at the end of 2018. NAFRI is now responsible for the propagation of upstream seeds of BS, R1, and R2, while DAEC is responsible for R3, the popularized seeds.

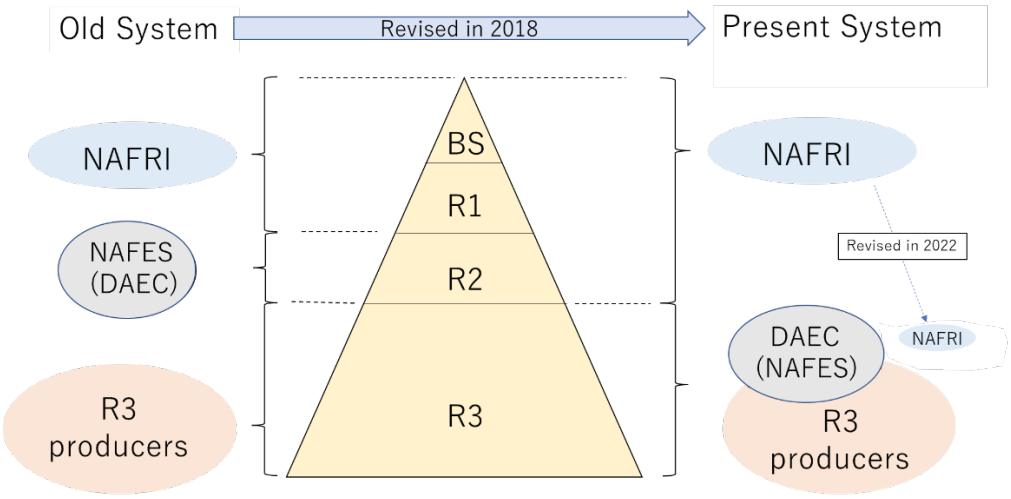


Fig.3.1.1 Changes in the seed production system

DAEC's ADCs were previously responsible for R2 production in the old system. In the current system, ADCs focus on R3 seed production, which appears to be intended to strengthen the production system of disseminating seeds, which are closely related to food rice production. The 2022 revision of the role in the ministry has allowed NAFRI to multiply R3 seeds.

Products that did not pass the seed inspection were traded as lower-class seeds. For instance, products grown as R1 that failed to pass the seed inspection were sold as R2 seeds if they passed the R2 inspection. If they failed again, they were sold as food. With the revision of the role, products that fail the R2 inspection can now be sent to the R3 inspection, allowing NAFRI to contribute to the increase in R3 production.

It was understood that this revision did not authorize planned R3 production by NAFRI, but rather aimed at the effective utilization of seeds that failed the R2 inspection. However, some NAFRI officers are saying that they will take this opportunity to start actively working on R3 seed production, so it is necessary to confirm the details.

(1) Upstream seed multiplication

NAFRI has 5 ARCs in the country (Luangnamtha Province, Luangprabang Province, Vientiane Capital, Savannakhet Province, and Champasak Province), and mainly renews BS/R1/R2 (In both Luangnamtha and Champasak provinces where there are no ADCs, ARCs are in charge of R3 production). Each ARC plans seed production for each class based on the past demand situation (especially in the previous cropping season).

(2) Certified seed production

The R3 seed was mainly produced by six ADCs nationwide belonging to DAEC and R3 seed producer

groups supervised by each ADC.

(3) Planned seed production

Although some R3 seed producers check the stock of R2 seeds and make reservations six months before the start of the cropping season, the ARC forecasts the seed requirements for the next cropping season before the start of the cropping season. Adjustment and planning of production volume are not implemented.

Even if the demand for seeds for the next cropping season is known in advance, there is no guarantee that the farmers who ordered them will buy them. It is also difficult to cope with the situation in Laos, where unpredictable events such as floods and droughts occur frequently in rice-growing regions. (When a disaster occurs in a rice-producing area, the government arranges seeds for the next cropping season for the affected area, which greatly increases the shipment volume).

3.1.2. Rice seed certification system

DOA is responsible for checking the quality of rice seeds. However, since DOA does not have any engineers specializing in rice seeds, NAFRI provides DOA staff with technical guidance on inspection methods. NAFRI, which is in charge of renewal, conducts inspections for high-ranking seeds from BS to R2, which have stricter inspection standards, so DOA is in charge of only R3 seeds.

Regarding inspection technology, in 2019, the World Bank's Lao Agriculture Competitiveness Project (LACP) conducted training on seed inspection methods with NAFRI staff as resource persons, and DOA staff learned the inspection method. In 2022, refresher training programs were implemented.

In addition, DOA conducts training for inspectors in each region as appropriate.

(1) Inspection of R1 & R2 Rice Seed

The Rice Research Center of NAFRI, located in Naphok, conducts top seed renewal and has established a steering committee with technical staff as members. This organization conducts field inspections three times during the cropping season. After harvest and preparation, seed inspection is carried out by five staff members in charge. The inspection items are the same as those used in the R3 inspection, which will be described later.

(2) Inspection of R3 Rice Seed

For R3 seeds, DOA conducts field inspection and seed inspection. In this case, in most cases, it is the field of seed production farmers, and in many cases, the ADC field where R3 is produced is not inspected by DOA. The ADC may receive orders for R3 seeds from donors, and in such cases, documents certifying the quality of the seeds are required, so inspection by the DOA is essential. There is no need for such documents for sales to food rice farmers, so no inspection is performed.

(3) Field Inspection of R3 Rice Seed

According to the manual to check rice seed quality issued by DOA (ຄູ່ມື ການກວດສອບ ຄຸນນະພາບເມັດພັນຂົ້ວ), field inspections are conducted 3 times like the table below.

Table 3.1.1 Outline of field inspection

	Inspection time	Inspection items
1st time	20 ～ 25days after transplanting	Off-types (plant height, leaf color, plant stature), weeding status, disease and pest occurrence status
2nd time	Heading stage	Off-types (heading time, panicle length, panicle neck, panicle color, leaf shape)

	Inspection time	Inspection items
3rd time	5 ～ 7days before harvest	Off-types（plant height, paddy color, angle of flag leaf）

Source: Manual to check rice seed quality

However, visiting many fields multiple times during the cropping season with a limited number of staff requires considerable labor and costs which includes travel allowances for staff. The average number of R3 seed producer groups overseen by the ADCs visited for this study was 13.6. Since each group consisted of five or more farmers, at least nearly 70 farmer fields must be inspected. If cultivars with different growing days, such as early and late maturing, are grown, the heading time and scheduled harvest date will be significantly different, and the number of visits will increase further.

Among the subjects of this survey, only PAFO in Vientiane Province was able to confirm that inspections were being carried out according to the manual. In this province, LACP bears the cost of travel allowances for field inspectors.

In addition, there is a difference in the inspection ability of each PAFO's staff in charge of the inspection. Weeding conditions and occurrence of diseases are relatively easy to understand items, but it takes experience to distinguish differences in leaf color and grass vigor between varieties.

(4) Seed inspection of R3

According to the aforementioned the manual to check rice seed quality (ຄູ່ມື ການກວດສອບ ຄຸນນະພາບເມັດພັນເຂົ້າ), the items and criteria for seed inspection are as shown in the table below.

Table 3.1.2 Seed Inspection Items and Criteria for Each Seed Class

No.	Inspection Items	BS	R1	R2	R3
1	Seed content rate (minimum %)	98	98	98	98
2	Germination rate (minimum %)	80	80	80	80
3	Moisture content (max %)	14	14	14	14
4	Non-seed content (maximum %)	2	2	2	2
5	Seeds of other varieties (number of grains in 500g)	0	2	5	10
6	Weed seed content (maximum %)	0	0	0.05	0.1
7	Red rice content (number of grains in 500g)	0	0	1	2

Source: Manual to check rice seed quality

Inspection items 1 and 4 examine the ratio of seeds of the cultivar concerned and other contaminants in the sample. Inspection item 2 examines the percentage of seeds that germinate within two weeks under an environment suitable for germination. Inspection item 3 measures the amount of moisture contained in the seeds. If the moisture content in the seeds exceeds the specified value, it becomes difficult to maintain germination power during storage in the seed store.

According to the farmers' opinions obtained through interviews, moisture content was the most important factor for R3 farmers to pay attention to. While it may be thought of as a simple process of drying the seeds in the sun after harvesting, the ideal conditions require a space free from people and livestock, dirt, and dust such as fallen leaves blown by the wind. Farmers should spread the seeds on a blue sheet in a suitable place to dry them, stir them appropriately to ensure even drying, and when it suddenly starts to rain, immediately pack them in a bag and store them indoors. Such work requires at least three days to dry one lot.

Many groups do not have a moisture meter and rely on intuition to determine the degree of dryness, making it difficult to determine whether or not the product has been dried as specified. Some kind of support is necessary to improve quality and increase the number of successful applicants. The following

table shows the equipment required for the inspection of seven items.

Table 3.1.3 Necessary equipment for inspection

Equipment	Usage	Remarks
Digital scale	Weighing seeds, non-seeds, and weed seeds	2 digits after the decimal point can be displayed
Digital moisture meter	Moisture content	Crushing the sample during measurement
Desktop magnifier	Selection of seeds of other varieties and weed seeds	
Small rice huller	For confirmation of red rice	
Small sorter	Non-seed, weed seed sorting	

Source: Manual to check rice seed quality

A grain moisture meter, which is one of the most important equipment required for seed inspection, was not installed in Luangnamtha, Saravane, and Champasak provinces during the field visit. As a method for measuring the moisture content, the manual also describes a method using a drying oven, but it takes time to measure, so it is more convenient to use a digital moisture meter.

In Laos, germination is possible even at room temperature except in winter, and an incubator is not necessary. Among the laboratories we visited this time, the LACP was cooperating with drying ovens and incubators, which were provided. It was not used at all because it could not keep up with the power supply.

3.2 Field Survey in the Target Area of the Former JICA Project (RISEP)

In the JICA precedent project (the Rice Seed Multiplication and Distribution System Improvement Project: RISEP) implemented from 2006 to 2011, improvement of each class of seed production was carried out for the facilities shown in the table below.

At that time, NAFRI was in charge of BS and R1 multiplication, and NAFES (DAEC) propagated R2 in SMC. The system was such that seed producers produced R3. ARC multiplied R2 in Luangnamtha where the province without SMS.

Table 3.2.1 Renewal seeds for each facility

Facilities	Organization	Previous functions				Current function			
		BS	R1	R2	R3	BS	R1	R2	R3
Naphok Rice Research Center	NAFRI	○	○			○	○	○	
Luang Namtha Agriculture Research Center	NAFRI	○	○	○		○	○	○	○
Nongheo Agriculture Development Center	DAEC			○					○
Pakcheng Agriculture Development Center	DAEC			○					○

Source: JICA Survey Team

Under the current system, research institutes under the control of NAFRI prepare upstream seeds (BS/R1/R2), while ADCs belonging to DAEC produce certified seeds (R3). In Luangnamtha, where there is still no ADC, ARC is in charge of multiplying R2 and R3 by entrusting contracted farmers.
As mentioned in 3.1.1 above, the 2022 revision of the law allowed NAFRI to send products that fail R2 review for R3 inspection.

3.2.1 Naphok Rice Research Center (RRC)

(1) Overview

At the beginning of RISEP, it was divided into NAFRI's Agricultural Research Center, which produces

BS/R1, and NAFES' Seed Multiplication Center (SMC), which produces R2 at a separate facility.

Currently, they are collectively under the control of NAFRI and have become the Rice Research Center (RRC). Fields that used to multiply BS and R1 now also multiply R2, and R2 production continues in former SMC fields.

Area of R1 multiplication fields： About 5ha

Area of R2 multiplication fields： About 50ha

Main varieties of R2 produced : CR203, HTDK1, HTDK8, TDK8, TDK11, TDK14, XBF1, XBF2, VTE-2, HTDK15, HTDK16, HTDK17, BiO 2

(2) Seed production system

There have also been changes in the production system. During the RISEP period, field management staff acted according to the instructions issued regarding the management of each field, but since 2016, the management of seed production fields has been outsourced to staff with cultivation skills. The outline is as follows.

① Entrust the management of R1 seed multiplication fields to technical staff, with a maximum of 0.5 ha per person. The R2 production field will be outsourced to a production group that includes technical staff members.

② The contracted staff will manage the fields at their own discretion. They procure field management workers who perform transplanting and weeding, and bear the costs of hiring them and fertilizer costs.

③ RRC records the cost of higher-class seeds (BS cost if the consigned field is R1 production field, R1 cost if R2 production field), irrigation fee, usage fee of tractor and combine owned by RRC.

④ After the staff harvests the paddy, RRC purchases that and settles RRC's expenditure incurred in ③ at that time.

Of the 68 staff members, 51 are engaged in seed production field management within the RRC as a side job (2021). According to Dr. Petmaniseng, the director of the center, this system has motivated the staff to work on seed production work, and the production volume has increased.

Due to the deterioration of the irrigation pumps, sufficient water was not pumped from the Nam Ngum River, the water source, and the planted area for dry season crops in 2022-23 was greatly reduced to 1.5 ha for BS and R1, and 10.5 ha for R2. The upstream seed supply will be difficult after the 2023 rainy season.

(3) Inspection

Each inspection to ensure quality is also conducted based on the system.

A steering committee composed of RRC staff conducts field inspections three times during the cropping season. After harvesting and conditioning, the seeds are checked for quality, and if they do not meet the R1 criteria, they are purchased as R2. If it did not meet the R2 standard, it was sold to rice mills as food rice, but as mentioned in 3.1.1, the 2022 revision of the role made it possible to undergo an R3 inspection.

Germination tests are also conducted monthly on the seeds stored in the RRC's seed storage, and varieties that fall below the standard (80%) are sold as food.

During the RISEP period, seed inspection before selling was not institutionalized. Only voluntary self-inspection had been conducted by one staff only. Now, based on the system, the number of staff in charge

has been increased to five. It must be evaluated as a big improvement.

(4) Impression

Since each staff member manages the field based on their own judgment, there is a difference in the management situation depending on the field. Currently, there are fields where weeds grow thickly, and signs that used to be set up in each field with information such as the name of the variety and the date of transplantation are no longer there.

3.2.2 Nongheo Agriculture Development Center

(1) Overview

During the rainy season of 2008, Naphok SMS was flooded and most of the R2 seed fields were submerged. In addition to Naphok, it became necessary to prepare R2 seed supply sources in Vientiane Capital, and from the second half of 2008, Nongheo SMS became the target of project cooperation.

Currently, it has been transferred from PAFO to DAEC management, and has become a facility specializing in R3 production.

The farm area is 4.5ha. The average yield is 4.5t/ha. Cultivation is carried out twice a year.

In the rainy season, there are times when it is difficult to drain water, but in the dry season, it is easy to adjust the water level because a pump is used, and the yield is better in the dry season.

Only one variety, TDK8 is produced.

(2) Seed production system

Similar to Napok RRC, technical staff share the management of seed production fields for each field, and the ADC purchases the product after harvesting.

If the budget allows, ADC may buy seeds from outside seed producers, but even in that case, the variety is limited to TDK8.

When disasters such as floods occur in other regions, the government prepares seeds for the next cropping season in that region. At that time, the government will issue instructions and budgets to purchase a large amount of seeds, and in some cases, multiple varieties will be purchased from seed farmers.

Currently receiving support from KOICA, this year (2022), 3 buildings with air conditioning equipment, including a seed storage and agricultural machinery hangar, a vertical dryer that uses rice husks as fuel, 2 tractors, and 2 rice transplanters, and equipment such as combine harvesters were provided.

(3) Impression

Large weeds can be seen in the fields. There are several places where weeds grow thickly in belts, probably because the plowing depth with the tractor was shallow at these parts.
Also, there are fields where the heading time is not uniform, so it is necessary to check the quality of R2.

3.2.3 Pakcheng Agriculture Development Center

(1) Overview

Seed production field area is about 4.5ha. 2 crops a year. The production volume in 2021 was 33.9t.

The field area was almost unchanged from the RISEP period. Partial land readjustment was done with

mechanization. In addition, the waterway, which was previously an earthen ditch, is now made of concrete, and it seems that the water distribution efficiency has been improved.

In the 2021 rainy season crop, together with the R3 production group, about 158.9 tons of R3 seeds were produced.

Previously, in addition to producing on site at ADC, they had contracts with R3 producers. The contract farming process was as follows.

ADC distributed R2 seeds purchased from Napok RRC to R3 growers. ADC then buys the unconditioned paddy after harvesting by R3 producers. Price of early maturation varieties was 6,500kip/kg and that of late maturation varieties was 7,000kip/kg. The purchased paddy was dried and sorted to produce R3 seeds.

However, the R3 purchase budget was not stable at present, and the number of contracted farmers is decreasing. In addition, irrigation pumps have failed in some R3 farmers' plots, making it impossible to produce rice seed during the dry season.

Cultivated varieties include XBF4, TDK4, PCH1, TDK8, TDK37, etc. (HXBF4, which was released this year, is attracting the most attention. Average yield was 4-6t/ha with good taste and aroma. Polishing ratio was 57.4%).

(2) Seed production system

Thirteen staff members share the responsibility of managing the seed production fields (the same system as the two facilities mentioned above).

As same as Nongheo ADC, it is supported by KOICA. Supported equipment is also same as Nongheo ADC. An air-conditioned warehouse will store seeds of cultivars (photosensitive varieties) once a year.

(3) Inspection

The ADC oversees 17 R3 production groups within its jurisdiction. During the cropping season, the ADC with the PAFO engineer inspects farmer's fields three times.

(4) Impression

Growth of rice plants in the field was generally uniformed. However, there were some growth irregularities. In addition, depending on the variety, diseases such as *Bakanae* appear (about 2 plants per 100m^2). Although there is a suspicion that R2, the original seed, may be the source of infection, thorough hot water disinfection is not carried out before seeding.

In the 2022-2023 dry season cropping, symptoms of seedling damping-off caused by Fusarium fungi were observed in several nursery boxes. Since damping off of seedlings is a seed-infectious disease, it is necessary to dispose of affected seedlings and pay attention to occurrence in the next and subsequent seasons. Seed-borne *Bakanae* disease has also occurred frequently, and it is necessary to provide guidance on appropriate nursery methods including hot water disinfection of seeds.

Although there is feeding damage by apple snails (jumbo snails), the amount is smaller than before (prevention is being carried out by spraying chemicals).

3.2.4 Luangnamtha Agriculture and Forestry Research Center (LAFRC)

(1) Overview

This was the northernmost site in the cooperation target areas of RISEP.

In 2019, it was transferred from PAFO to NAFRI management and renamed the Luangnamtha Agriculture Research Center (LARC). Since NAFRI was in charge of the production of upstream seeds, LARC has stopped outsourcing R3 production to farmers and started selling R2 to general farmers. From 2019, R2 consignment production to outside farmers began, and the on-site farms began to concentrate on BS and R1 renewal. From 2022, R3 consignment production has also resumed.

During the RISEP period, double cropping was employed, but now only one cropping in the rainy season is done. Since there is no DAEC facility in the province, seeds of all classes from BS to R3 were renewed in the LARC.

Due to the expansion of adjacent airport facilities and the construction of plastic greenhouses for vegetable cultivation, the area of paddy fields on the premises has been reduced by approximately 6,070 m2 compared to the RISEP period, and the current cultivable area is about 2.8 ha. The blue color area in the figure below, was a paddy field during RISEP period.

Fig.3.2.1 Field layout of LARC

(2) Seed production system

As with other facilities, two technical staff are in charge of field management, and LARC purchases the products after harvesting. Amount of R1 produced in 2020 was 5.2t. In 2021, it was 6.5t.

Along with the expansion of airport facilities, the paddy fields on the farm were reorganized. Mechanization, such as the introduction of transplanters, has also been implemented, and although the field area has been reduced, it seems that usability has improved. Waterways were also replaced with concrete instead of earthen ditches, improving water distribution efficiency.

In both R2 and R3, unprocessed paddy was purchased from contracted farmers after they have harvested. After purchasing, paddy was dried, sorted, and bagged to be seed.

Seed selection by water and hot water disinfection before sowing have been continued since the RISEP period.

Due to poor leveling in some parts of the field, and recent surge in pesticide prices, feeding damage by apple snails has occurred.

LARC didn't equip with any refrigerators, despite the necessity of longer maintenance of seed germinability was increased, since the number of seed renewals in a year was decreased from two to one.

The moisture meter, which is important for seed quality control, has also broken, so they rely on intuition.

For post-harvest drying, they use a concrete drying floor and a flat-type dryer that the project donated during the RISEP period. The surface of the drying floor has deteriorated due to aging, but it is still being used with a sheet on it.

There are no signboards indicating the name of the variety cultivated and the date of transplanting in each plot.

Five SB varieties were planted in the same plot and could be crossed.

(3) Inspection

It seems that patrol visits to farm fields were conducted about once a month. As for seed inspection, germination power was checked before sale. Neither field conditions nor germination rate inspections have been recorded.

Complaints regarding low germination etc., occur about once a year from R3 users.

There were unsold seeds in the seed warehouse, and the moisture content was found to be 14.0-14.9%.

Presumably, it was stored at a high moisture content (probably 15% or more) but was averagely dried in the warehouse. Although the storage period is expected to be longer than 8 months, 5 of the 7 samples showed a germination rate of 80% or higher, which is the standard.

(4) Impression

By entrusting the production of R2 and R3 rice seeds to farmers, LARC could concentrate on R1 production, and it seemed that they were operating well even with annual renewals. Reducing the frequency of renewal reduces the risk of crossbreeding and mixing different varieties, so in that sense, it can be said to be an improvement.

On the other hand, the demand for seeds within the region is not high, and the value chain from seed production to edible rice production to consumers is completed without competition, so there is no desire to improve quality.

3.2.5 Persistence of technology in RISEP's target areas

The following table summarizes the persistence status of some of the technologies that were introduced during the implementation of RISEP that we were able to confirm this time.

Table 3.2.2 Persistence of techniques introduced by the RISEP

Techniques introduced by RISEP	Issues and Countermeasures (RISEP period)	Current situation
Field leveling before transplantation	Leveling work was introduced because there was a large difference in the height of the paddy field.	Established at each site. Especially in the Luangnamtha ARC field, the situation seems to have improved significantly.
Usage of carbonized rice husk as a material for raising seedlings	To improve the roots development of seedlings, carbonized husks were used as a soil improvement material in nursery beds.	It has been popularized at each site as a material for raising seedlings in nursery boxes.
Saltwater seed selection	It was introduced to control seed-borne diseases (*Bakanae*, Blast, etc.) that were occurring frequently at each site.	At each site, water selection is carried out without using salt water.
Seed disinfection	It was introduced to control seed-borne diseases (*Bakanae*, Blast, etc.) that were occurring frequently at each site.	It doesn't appear to be implemented on any site.
Making nursery beds	Because the entire paddy field was used as a	Raising seedlings in boxes was carried out due

Techniques introduced by RISEP	Issues and Countermeasures (RISEP period)	Current situation
	nursery, it was difficult to extract different varieties and/or weeds. Introduced rectangular shape (1.2m width) for easy nursery management.	to the use of transplanting machine.
Seed rate	Dense sowing of about 300g/m^2 caused poor growth of the seedlings. It was reduced to about 100g/m^2 to grow healthy seedlings.	Thick sowing is practiced in order to avoid missing plants at the time of transplanting. It needs improvement.
Prevention of contamination at nursery beds	In some sites, seedlings of multiple varieties were raised in one nursery. To avoid contamination, making independent nurseries for each variety was introduced.	It has become a habit, and seedling boxes are managed for each variety.
Transplanting method	Randomized planting, which was the mainstream, encouraged differences in growth. Although row planting was introduced as an improvement, there was a large difference in proficiency due to hiring planters from outside.	At each site, transplanting machine was introduced and row planting was carried out. The planting method was also uniformed.
Number of seedlings / hill	The number of seedlings in a hill differed depending on the planter, causing growth differences and mixing of different varieties. Hand transplanting with 2-3 seedlings/hill was introduced.	Transplanted by machines. More than 5 seedlings are planted per plant due to the thick sowing in a nursery box. need improvement.
Prevention of contamination	Transplanting multiple varieties in different fields at the same time was stopped. And transplanting the field one by one was thoroughly tried. Installation of signboards written the varieties, etc. on each field.	Technical staff are responsible for managing each field, which prevents the mixing of different varieties at transplanting time. No signboards have been placed.
Uneven fertilizer application (uneven leaf color) and growth uniformity	Some sites had uneven leaf color due to uneven fertilizer application, but this was improved.	Almost no leaf color unevenness or growth unevenness was observed.
Disease outbreak	*Bakanae* disease used to occur frequently, but the introduction of hot water disinfection of seeds drastically reduced the number.	*Bakanae* disease occurred frequently in nurseries at many sites because seed disinfection was not carried out.
Post-harvest moisture content measurement	It is necessary to check the moisture content of the paddy during drying after harvesting, but it was not possible because there were no moisture meters at multiple sites. Moisture meters were provided to each site to be measured.	At Luangnamtha ARC, the provided moisture meter was broken and no measurements have been taken since then.
Organizing the seed storage	It came to be managed by years of production and by varieties.	Management methods continue.
Germination test	It has been implemented according to the manual.	Although it has been implemented, no record is kept at Luangnamtha ARC.

Source: JICA Survey Team

3.2.6 Progress in achieving the recommendations at the end of RISEP

At the end of the RISEP, the following four recommendations were made. Progress on these was reviewed in this survey.

a) Development of a long-term plan for rice seed multiplication and dissemination

b) Establishment of a National Seed Board within the Ministry of Agriculture and Forestry

c) Establishment of a rice seed inspection system

d) Preparation of rice seed fund to prepare for natural disasters

Long-term plans for rice seed multiplication and extension have not yet been developed. Currently, only production plans for R1 and R2 seeds are prepared for the year by the various agricultural research centers under NAFRI, and for R3 by the seed production and extension department in the DAEC headquarters.

After lengthy discussions, the National Seed Board was established within the Ministry of Agriculture and Forestry, represented by the Deputy Minister of Agriculture and Forestry, in mid-2022. It is expected that under the National Seed Board, the three departments for rice seed production and dissemination (DOA, DAEC, and NAFRI) will coordinate with relevant agencies for rice seed multiplication and dissemination and formulate long-term plans through working-level consultations.

Regarding the establishment of a rice seed inspection system, a rice seed quality check manual (Manual to check rice seed quality ຄູ່ມືການກວດສອບຄຸນນະພາບເມັດພັນເຂົ້າ) was issued by DOA in 2012 and an inspection system has been established.

Rice seed funds for natural disaster preparedness are not prepared in normal years, but are used to purchase and distribute rice seed in the event of a disaster, with support from other donors.

As described above, it has been confirmed that although not all of the recommendations made at the end of RISEP have been implemented, progress has been made despite the limited budget.

In 2005, the seed renewal rate was only 1.3%. However, if all 2,801.0 tons of R3 seeds produced in 2020 were planted using a regular cultivation method of 60 kg sown per hectare, the seed renewal rate would be 5.4%. This is based on the total paddy area of 862,120 hectares under both wet and dry season crops in 2020. Compared to the 2005 RISEP implementation period, the rice seed renewal rate has increased by about four times.

3.3 Related rice seed technologies of government, private companies, and farmers

The survey identified a number of high quality rice supply chains in each province, from rice seed production to rice production, milling, distribution, and marketing. Of these, the most noteworthy initiatives are described below.

3.3.1 Khammouane Model

The activity was carried out to try to increase the production and export of high-quality rice by optimizing the entire process from the production of high-quality rice seeds to the production, milling, distribution, and marketing of rice using these seeds in Khammouane Province. This activity was implemented from 2012-2016 as a part of the World Bank-supported project called Khammouane Province Development Project (KDP).

The Khammouane model established at KDP is shown in Figure 3.3.1. According to the person in charge at KDP at the time, the Khammouane model was developed based on the rice production system

practiced in Thailand. One of the challenges in producing high quality rice in Lao PDR is the coordination between each value chain segment. In this model, the Agriculture Section of the PAFO took the lead in coordinating between rice seed production center (SMC), rice seed farmer groups, rice farmer groups, rice mills and exporters. The agricultural section of the PAFO was also responsible for quality control of rice seeds, for which it issued certificates.

The implementation of the Khammouane model resulted in the production and export of high-quality rice from appropriate rice seed production during the project period. However, the Khammouane model is not being continued at present. The main reason for this, according to the person in charge at the time, was that PAFO no longer coordinated between the different segments of the rice value chain due to the lack of financial support from the project. As PAFO is no longer coordinating, R3 rice seed producers are also unable to sell the rice seed they produce, and more farmers have stopped production. In addition, the change in the rice seed production system in 2019 has restricted the production of R1 and R2 rice seeds to centers under NAFRI, so the SMC (now Xebangfai ADC) in Khammouane Province can no longer produce them. Therefore it is difficult to implement the Khammouane model in just one province, Khammouane.

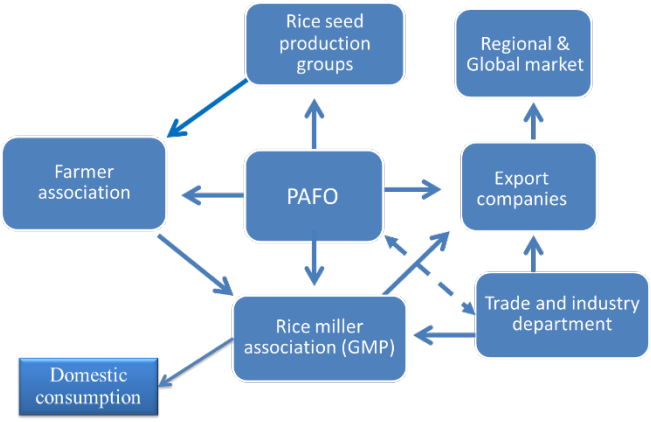


Fig.3.3.1 The Khammuan Model for high quality rice production
Souce: Khammouane PAFO

Another lesson learned from the Khammouane model is that the PAFO was the main actor in the project, so after the project ended, transport and daily allowances were no longer paid to the staff. In order to ensure that the model continues to function after the end of the project, it is important to build a system that can only be implemented with existing financial resources and stakeholders.

3.3.2 Rice Seed and High Quality Rice Production led by Rice Millers

Efforts to produce high quality rice from R3 rice seed in Lao PDR have seen the establishment of supply chains led by rice millers. There are two types of cases, (1) cases where rice millers established their own supply chain and (2) cases where the supply chain was led by a World Bank project.

(1) Rice Millers Established Their Own Supply Chains

In one case a rice miller established its own supply chain, the miller ordered R3 rice seed from the farmer group producing R3 seed before the cultivation season. In response to this order, the R3 rice seed producing farmer groups order the required R2 seed from ADC and receive R2 seed from ADC to produce R3 seed. R3 seed is sold to rice millers, who in turn rent R3 seed to farmers through middlemen. In this case, payment for R3 seed is made from the amount sold after harvest. Rice produced from R3 seed is again sold to the rice mill

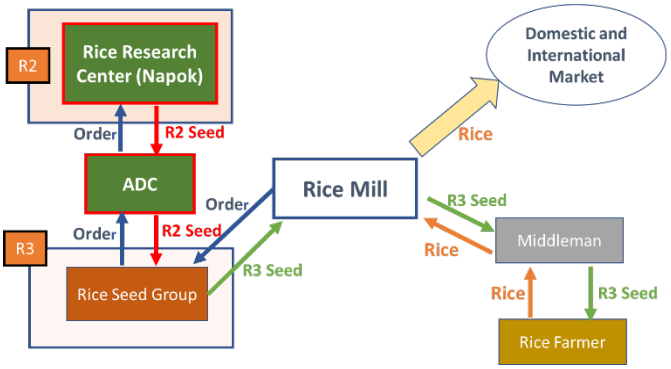


Fig.3.3.2 Diagram of the rice seed and rice production system led by rice millers
Source: JICA Survey Team

through the middlemen.

Various types were observed, including cases where ADCs were not included in the rice seed and rice movement route, where no middlemen were involved, and where no orders were placed with rice seed farmer groups before the R3 seed crop season. However, all rice mills surveyed in the Vientiane capital, Vientiane, Savannakhet, Salavang, and Khammouane provinces were found to have similar rice seed and rice production systems.

On the other hand, some challenges were identified with this production model. In certain cases, farmers did not sell their produce to the rice mills from which they had borrowed R3 seed, despite having received a loan from them. It was also reported that even if farmers signed written agreements to sell their produce to the rice mill, they often sold it to other middlemen or rice mills. Consequently, rice millers who use this type of rice seed and production system only work with relatively large, experienced, and trustworthy farmers. According to the rice millers, the quality of R3 seed production groups can vary, so they only continue to deal with groups that consistently produce high-quality crops in the quantities ordered.

Rice millers have the potential to play a central role in developing a high-quality rice supply chain. However, there are currently only a limited number of large-scale rice mills, which makes it challenging for them to expand their operations and increase the number of farmers they work with independently. To address this issue, it is essential to not only strengthen rice millers, such as by increasing the size of medium-sized rice mills and enhancing the functions of large rice mills, but also to provide support to increase the number of farmers who sign contracts with rice mills in the future.

(2) World Bank Project Established the Rice Supply Chain

Figure 3.3.3. shows the rice seed and rice production model established by the World Bank's ongoing project (Lao Agriculture Competitiveness Project). According to PAFO officials involved in the project, this is an improved model of the aforementioned Khammouane model for a larger area. In this model, the World Bank provides technical and equipment support to rice mills, rice seed production groups, and rice farmer groups.

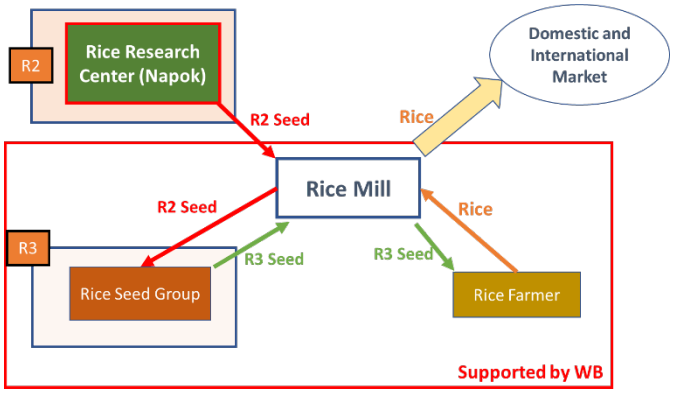


Fig. 3.3.3 Diagram of the rice seed and rice production system led by the World Bank-supported rice miller

Source: JICA Survey Team

According to interviews with rice millers that receive support from the project, they do not place orders for R2 seed but purchase it directly from the RRC. Currently, there is no system in place for ordering R2 seed from the RRC before the cultivation season, which sometimes leads to an inadequate supply. In such cases, rice millers have to purchase R1 seed or other varieties of R2 seed. Furthermore, only farmer groups supported by the World Bank purchase R3 seed, which reduces the sales volume of other R3 seed production groups that are not supported by the project, making it difficult for them to continue producing R3 seed.

Unlike the Khammouane model, this model is likely to continue after the project ends, as the PAFO does not have a coordinating role and is closer to the existing model which leads by rice millers. However, the cost of testing R3 seed is still paid by the World Bank project in the current situation, and there are concerns about the continuity of the rice seed quality inspection system.

3.3.3 Indochina Development Partners Lao Ltd（IDP）

IDP is a major rice milling company that owns rice mills in Champasak and Savannakhet provinces. To maintain the quality of rice, the company prepares upstream seeds of specific varieties in its own research fields and contracts with farmers to renew R2 and R3 seeds. IDP has a fully in-house seed production route.

A technician in charge of Champasak province visits four contracted farmer groups to gather information such as the dates of seed sowing, transplanting, and fertilizer application in each field. At the same time, they provide guidance and supervision to farmers on the weeding and removal of different varieties. Since multiple fertilizer applications are instructed, pests are a frequent occurrence. Technicians also maintain close contact with the ADC in Savannakhet province which has jurisdiction over each region and obtain timely information on the occurrence of diseases and pests in the area.

The quality of the seeds is ensured by intensive instructions during field visits, and only the moisture content of the product is taken care of after harvesting. It is ensured that they do not buy anything unless the moisture content is 14% or less. Until 2016, the moisture content was set at 12%, but it was raised to 14% because many farmers found it unrealistic to adjust the moisture content.

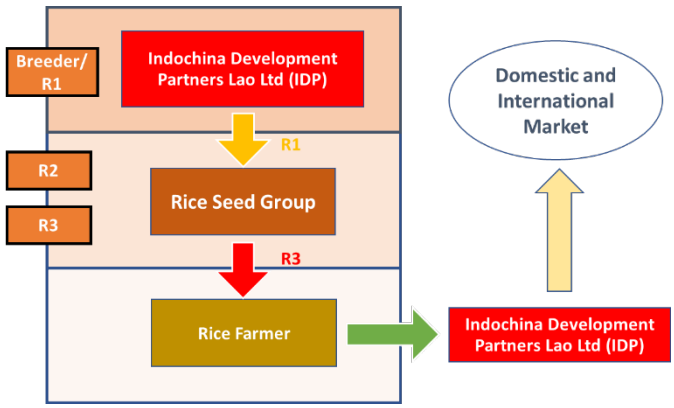


Fig.3.3.4 Diagram of the rice seed and rice production system led by IDP

Source: JICA Survey Team

The purchase price from farmers is at least 500 kip/kg higher than the market price of food rice, which helps to keep farmers motivated. Also, for the same reason, many farmers want to contract with IDPs, but the conditions regarding the field environment and farmer's experience are strict, making it difficult to contract.

CHAPTER 4 MARKET POTENTIAL FOR RICE (INDICA VARIETY) FROM LAOS

4.1 Domestic Market

In order to understand the demand and distribution situation for rice in the country, interviews were conducted with rice mills, traders, and retailers in the capital and five central and southern provinces with high rice production, namely Vientiane capital, Vientiane, Khammouane, Savannakhet, Salavan, and Champasak provinces. The destinations visited are listed in Table 4.1.1.

Table 4.1.1 List of Locations Visited for the Domestic Market Survey

Location	Value Chain Category	Name
Vientiane Capital	Rice Miller	・Somsai Trading Import-Export ・Southat Rice Mill ・Champahom Trade Import-Export ・Xangkham Rice Mill
	Retailer	・Thongkhankham Market ・Bung That luang Market ・Talatlao Market ・Aussie Market
Vientiane Province	Rice Miller	・Mee Bouakhao KHUNTHAVI Rice Mill ・Hung huang Rice Mill ・Buncyong Rice Mill ・Lak52 Rice Mill
	Trader	・Ban Naang Rice Trader
	Retailer	・Phonehong Market ・Thaalat Market
Khammuane Province	Rice Miller	・Vanida Rice Mill ・SayBua Rice Mill ・Bunmii Rice Mill
Savannakhet Province	Rice Miller	・Sangkhom Rice Mill ・Khamphonphed Rice Mill
	Trader	・Ban Khongphai Rice Trader
	Retailer	・Savanxay Market
Salavan Province	Rice Miller	・Ban Phuthamphuvang Rice Mill ・Sinxay Rice Mill
	Trader	・Ban Phuthamphuvang Rice Trader
Champasak Province	Rice Miller	・Sahaseng development sole co.,Ltd. ・Chalernphan Rice Miller ・Indochina Development Partners Lao Ltd.(IDP)
	Retailer	・Pakse New Market

Source: JICA Survey Team

4.1.1 Vientiane Capital

Vientiane capital is the largest rice consuming area in the country, and the rice in the market is produced in several areas. The main production area is in the Vientiane Plain and is also transported from other areas of Laos, particularly in the south-central provinces, as well as the mountainous provinces in the northern part, which includes short-grain sticky rice and upland rice varieties. Moreover, polished non-glutinous rice is imported from neighboring countries such as Thailand and Vietnam.

The rice most commonly sold by retailers is indica sticky rice, the staple food of the Lao people, which is mainly produced and transported to the Vientiane capital, Vientiane province and the plains of south-central Laos. The sold Indica variety of sticky rice is not classified by variety, but is priced according to the name of the production area and the grade of the rice at the time of milling (less crushed rice, whiter rice, longer grains, etc.). The rice transported from other regions was mainly a short-grain variety of

glutinous rice produced in northern Laos, a short-grain variety of non-glutinous rice imported from Vietnam, and an Indica variety of non-glutinous rice with aroma produced within Laos and in Thailand.

According to the interview of sales situation with a number of retailers, the best-selling rice at present is the low-priced Indica variety of glutinous rice. It is thought to have been affected by the deteriorating situation of general households due to the rapid price increases in recent years and the rising cost of fuel.

Interviews with several rice millers also found that rice produced in the Vientiane capital and Vientiane province, located on the Vientiane plain, is milled immediately after the harvest. However, the amount of this region is not sufficient, so the paddy is purchased from the provinces of Khammouane, Savannakhet, and Salavan provinces, and transported to the rice millers. Each rice miller has connections with specific middlemen and traders, and rice millers contact these to have rice sent from the south-central provinces. Recently, it has become more difficult to purchase rice due to the increasing number of competing rice millers and the decline in rice production in the Vientiane Plain. However, there is still plenty of capacity for rice mills to mill rice, and they are hoping to increase rice production in Lao PDR.

One rice miller located in the Vientiane capital has started exporting the Indica variety of non-glutinous rice to Europe from 2022. According to this rice miller, one of the reasons for the decline in rice quality is the drying process after harvesting, and it was difficult to produce rice of high quality to be exported if paddy was bought from farmers, as the quality would be inconsistent. Therefore, dryers and combine harvesters were introduced, and drying the paddy in the dryers led to an improvement in quality. A color sorter made in South Korea was also introduced, which enabled the miller to produce high-quality rice that could be exported even if the paddy quality is unequal. However, the millers strongly hope that farmers will be able to produce high quality paddy, as the higher quality of rice produced by farmers will result in a higher yield when milling and fewer times the rice has to be passed through the sorting machine.

According to interviews with a large Chinese-owned rice miller, paddy is mainly transported from Savannakhet Province in central Laos and milled. Although most of the rice milled here is Indica variety glutinous rice, the aromatic variety of Indica variety non-glutinous rice is fully sorted after milling and exported to China and Vietnam. The quality of aromatic rice from Laos is lower and more expensive than that from Thailand, but because chemical fertilizers and pesticides are used less, it can be sold as semi-organic rice and is sold to the wealthy in China. However, the miller was faced with the problem that the paddy sent to the miller was a mixture from various production areas and varieties, resulting in a low amount when milled, and some of the rice was of low quality due to inadequate drying of the paddy.

4.1.2 Vientiane Province

As same as the Vientiane capital, it is located on the Vientiane Plain and is the sixth largest rice producer among of all provinces, with 7.6% of total rice production. A survey for retailers in Vientiane province found that the number of variety of rice was lower than in the Vientiane capital. The reason is that most of the customers in the Vientiane Province are farmers who produce rice, and those who buy rice are mainly limited to workers and officers. Some shops sell more non-glutinous rice from Vietnam because workers from Vietnam buy low-priced Vietnamese rice.

Interviews were also conducted with medium- and small-scale millers In Vientiane Province. Two types of medium-scale millers were identified, one run by Lao nationals and the other by Chinese nationals. The rice being milled was mainly from Vientiane Province, but as the amount was not enough, paddy was also purchased from Khammouane and Savannakhet Provinces and transported. As same as the miller in the Vientiane capital, it has become increasingly difficult to obtain rice from the central and southern provinces in recent years, and the miller would like to see rice production increase further.

4.1.3 Savannakhet Province

Savannakhet is both the most populous and the largest rice-producing province in Lao PDR. A population and household census conducted in 2015 identified a population of 987,907 (493,473 males and 494,434 females), with an estimated population of 1,117,490 in 2023. Rice millers and retailers were interviewed in Savannakhet province.

When the team checked rice sales with several retailers, there are several types of rice from Laos (Indica variety of glutinous rice and non-glutinous rice) and they also handled rice from Thailand and Vietnam. Thai rice was mainly purchased from rice millers in Mukdaharn, a city on the other side of the Mekong River from Savannakhet city, and transported. Thai rice was identified as Khao Chao Mali, an Indica variety of non-glutinous rice with aroma, and RD6, an Indica variety of glutinous rice. All rice from Vietnam is non-glutinous rice, which is sold by Lao traders to retailers. There were no significant price differences between rice types or regions, but Thai rice was the most expensive, followed by Lao rice and the least expensive item was Vietnamese rice.

According to the interview with several rice millers, Savannakhet rice is transported domestically to the capital Vientiane, and also middlemen from Vietnam come to buy Indica variety glutinous rice for export. The method of exporting rice to Vietnam is that orders are received in advance by a phone call from the Vietnamese and they sent a large truck to pick up the rice. Rice for export to Vietnam must be of a high grade (Grade A), so it may go through a sorting machine more than once after milling. The destination and volume of exports varied from miller to miller, but one miller exported a third of its total sales volume to Vietnam, indicating that a significant amount of Lao rice is currently exported to Vietnam. The period of high export amount to Vietnam is from around November after the rainy season harvest to around January before the Vietnamese New Year. The reason is that Lao glutinous rice is used to make traditional rice cakes for the Vietnamese New Year. The common destinations for Lao rice within Vietnam were Hanoi, Vinh City, Hue City and other cities in northern and central Vietnam.

All rice millers interviewed said they still have much capacity to mill rice and are willing to buy as much rice as they can get. In particular, there was a high demand for rice for export to Vietnam, but the rice millers were refusing to sell rice because they could not get it. As there are no concerns regarding unsold rice due to increased production, it is hoped that efforts will be made to further strengthen rice production capacity.

4.1.4 Champasak Province

Champasak Province produces 12.2% of the total rice in Laos and is the second largest rice producing province after Savannakhet province. Several retailers and rice millers were interviewed in this province. Although the province is a major rice producer, retailers sold Thai rice as well as rice from Savannakhet province.

The most commonly sold rice was from within the province, but rice from Savannakhet and Salavan provinces as well as short-grain glutinous rice and black rice from the northern region of Laos were also sold. Although not as widely as in the Vientiane capital, a diverse range of rice was on sale. In addition to the different provinces, sold rice was classified according to quality, such as Grade A, Grade B, and broken rice at the market.

Interviews with rice millers revealed that all rice was milled within the prefecture and transported to the prefecture and neighboring prefectures after milling. As same as the Savannakhet province, there are many exports to Vietnam, but none to Thailand or Cambodia.

The head office of Indochina Development Partners Lao Ltd (IDP) is located in Champasak Province and the survey team were able to interview the company. IDP is an international company for rice export

that handles everything from rice seed production to rice production, milling and export under its own management. Although there is no ADC under DAEC in Champasak Province, IDP is heavily involved in rice seed production and contributes to the supply of R3 seed in Champasak Province. In addition to R3 seed production, the company also has its own experimental station in NaaKeo village, Sanasomboun district, where it breeds and produces upstream seeds such as BS, R1 and R2. According to interviews with the company, they have decided to start with rice seed management and production in order to produce high quality rice for the export purpose. In addition to their own production system, due to the high demand for exports and the fact that the production of their own contract farmers is not enough, they are constantly buying paddy from ordinary farmers in and outside the prefecture, but the quality of the rice is not very high. IDP officers want farmers to mechanize their farming, especially the introduction of rice transplanting machines in order to produce high quality rice. There was also a strong request for training for farmers on post-harvest processing methods, including drying of the paddy, as inadequate drying of rice is one of the factors for the decline in quality. Furthermore, as there is a high demand for organic rice in Europe, IDP would like to increase the number of organic-certified plots and increase rice production in the future.

4.1.5 Salavan Province

Salavan province produces 11.2% of the total rice production in Laos and is the third largest rice producer in the country. Small and large-scale millers and rice traders were interviewed in Salavang Province. As in other provinces, the small-scale millers were engaged in rice milling for the surrounding farmers. On the other hand, the large-scale miller was producing high-quality rice by lending rice seeds purchased from Thailand to farmers and deducting the price of the rice seeds when the rice was purchased. In addition to selling rice within Laos, the miller also exported rice to Vietnam, as same as Savannakhet and Champasak provinces. The miller mainly handles rice produced in the province, but as the miller does not have a dryer, it is difficult to produce high quality rice.

The rice trader was at the same time the manager of the small miller mentioned above. The trader bought paddy from several villages in the district and sold and transported it to the millers in Vientiane capital, and to IDP millers in the Savannakhet district. As there are so many rice millers that want to buy rice, there is no difficulty in selling the rice. The trader contacts several rice millers in advance and sells to the miller that offers the highest price, so the trader does not have any contract with a specific rice miller. The millers are willing to purchase rice even if it is a blend of several different regions or varieties, so this is not a concern for the trader.

4.1.6 Khammouane Province

Khammouane Province is located north of Savannakhet Province and produces 7.9% of the total rice production in Lao PDR, making it the fifth largest rice producer in the country. Three millers which are considered to be the largest in the province were interviewed. The results showed that all three millers sell rice to middlemen from Vietnam, confirming that the demand for rice exports to Vietnam is very high.

One rice miller was exporting Indica variety non-glutinous with aroma rice to Thailand. This miller had a contract with a Thai company to export milled Indica variety non-glutinous rice with aroma, packed in plastic bags prepared by the Thai company and marked in Thai. This Lao rice was also exported as Thai rice to Southeast Asian countries and Europe. In order to produce high quality rice, this miller lends R3 seeds to farmers. However, the number of contracted farmers has not increased, as the loaning is only carried out with reliable farmers.

Another rice miller was exporting Indica variety non-glutinous rice with aroma to China and the Netherlands, in addition to exporting Indica variety non-glutinous rice to Vietnam. Exports abroad are limited in quantity and have to be of good quality. In addition, the costs of transportation and chemical

treatment for export are added, so the actual profit is not very high. The quality of Lao rice is still low, and the yield from milling and sorting is also low. Therefore, the rice miller wants farmers to be able to produce high quality rice.

4.2 Market Potential in the Surrounding Countries

In order to ascertain the export potential of Lao rice, rice sales were checked in the markets of neighboring countries Thailand, Vietnam and Cambodia. Two surveys were conducted, one in October-November 2022 (before the rainy season harvest) and the other in January 2023 (after the rainy season harvest). The survey covered retailers or traders, with at least 10 shops in each city surveyed.

4.2.1 Thailand

In Thailand, surveys were carried out in two cities. Khon Kaen, at the intersection of the East-West Economic Corridor and the North-South Economic Corridor, and Mukdaharn, located on the East-West Economic Corridor and on the border with Laos. In Khon Kaen, 13 shops were interviewed in the first survey and 12 shops in the second survey. In Mukdaharn, 12 shops were interviewed in both the first and second rounds of the survey.

The survey found that more than 95% of the rice sold in the markets in both cities was Indica variety (long-grain) rice, with glutinous rice accounting for about 40% of the total. Khon Kaen and Mukdaharn both belong to the Northeast region of Thailand, and the people who live in this area are called Isan people. Their roots are Lao and many households have relatives on the Lao side. However, approximately 60% of the rice handled in this region is non-glutinous rice, and even though the Northeast Thai region has a large Isan population, the proportion of glutinous rice handled is lower than in Laos.

The rice shops in both cities do not handle Lao rice and have no experience in handling it. Moreover, not only Laotian rice, but also Vietnamese and Cambodian rice were unavailable, and only Thai rice is in the market. Thailand is a major rice producing country and the quality of rice is known higher than that in Laos. Therefore, it is found that there is no demand for rice exports from Laos to Thailand. However, the field survey confirmed that Lao rice is packaged in Thai language packages and handled as Thai rice, so it is possible that Lao rice is sold as Thai rice in the border area.

The characteristics of good non-glutinous and glutinous rice sold by rice shops in two cities were surveyed, and the results are presented in Figures 4.2.1 and 4.2.2. The results showed that more than 80% of respondents, for both non-glutinous and glutinous rice, identified the following characteristics as indicative of good rice: 1) long grains, 2) white color, 3) aroma, and 4) softness. Nearly half of the surveyed outlets also mentioned that new or freshly milled rice was a characteristic of good quality rice. Overall, the characteristics of good quality rice were similar between the two cities. However, in Mukdahan, around 40% of stores mentioned the following additional characteristics of good rice: low price, locally produced rice, and not causing hunger quickly when consuming glutinous rice. In interviews conducted in Laos, some stores also mentioned low price and satiety as characteristics of good quality rice. It was apparent that in Mukdahan, which is located adjacent to Laos, there was a stronger inclination to consider the same characteristics of rice as those in Laos to be indicators of good quality.

Table 4.2.1 Situation of Sold Rice and Rice from Laos in Thailand

Survey	1st Survey		2nd Survey	
City	Khon Kean	Mukdahan	Khon Kean	Mukdahan
No. of surveyed shops	13	12	12	12
Ave. no. of handling rice variety	3.4	4.4	5.6	4.8
% of handling long-grain rice	95.5	96.2	95.5	96.6

Survey	1st Survey		2nd Survey	
City	Khon Kean	Mukdahan	Khon Kean	Mukdahan
% of handling glutinous rice	43.2	34.0	40.3	37.3
% of experience in selling Lao rice	0	0	0	0
% of current Lao rice in selling	0	0	0	0

Source: JICA Survey Team

Fig.4.2.1 Characteristics of Good Rice in Khon Kean

Source: JICA Survey Team

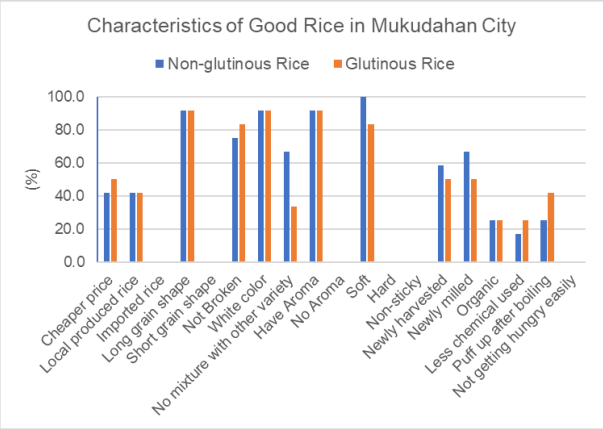


Fig.4.2.2 Characteristics of Good Rice in Mukudahan

Source: JICA Survey Team

4.2.2 Vietnam

The survey in Vietnam was conducted in Vinh City and Hue City, which were identified as destinations for transporting rice in the interviews conducted in Laos. Vinh City is situated approximately 100 km from the border with Laos and is located on the distribution route from Laos to the capital city of Hanoi. On the other hand, Hue City is located along the East-West Economic Corridor and is situated close to the Lao border at a distance of approximately 150 km by road.

Table 4.2.3 shows the results of the survey. The two surveys were conducted in Vinh City and Hue City, where 10 and 12 shops were surveyed respectively. On average, the number of rice varieties handled by a single shop ranged from 7.7 to 9.4. More than 90% of the rice handled was Indica variety (long-grain) rice, of which 8.0% to 18.4% was glutinous rice. The reason for the increased handling of glutinous rice in the second survey as compared to the first may be attributed to the timing of the surveys. The second survey was conducted in January, just prior to the Vietnamese New Year, which typically sees a greater demand for glutinous rice. In Vietnam, traditional rice cakes made from glutinous rice are prepared during the Vietnamese New Year, leading to high demand for glutinous rice just prior to the holiday.

The percentage of shops that had experience selling Lao rice was 40% in Vinh City and 75% in Hue City, with a higher percentage in Hue City. At the time of the survey, less than 5% of the total rice handled was Lao rice, which was a relatively small proportion in terms of the total volume handled. On the other hand, a certain amount of Thai rice was sold in Vietnam, which is a rice-exporting country, ranging from 5.9% to 21.0% of the total rice handled. Glutinous rice accounts for 8.2%-13.5% of the total, and it is not widely traded in the Vietnamese market, where non-glutinous rice is the staple food. Despite this, Lao rice makes up approximately 40% of the total volume of glutinous rice handled. In some shops, only Lao rice is offered as glutinous rice. Even in Vietnam, where rice production is high and non-glutinous rice is the staple food, there is a significant demand for Lao glutinous rice.

The characteristics of good rice in Vietnam are: 1) long grain, 2) not broken, 3) white color, 4) not mixed with other varieties, 5) Aroma, 6) soft, and 7) newly milled rice (Figure 4.2.3 and 4.2.4). The characteristics of good rice were similar between non-glutinous rice and glutinous rice. On the other

hand, all shops in Vinh City answered that the low price of glutinous rice was a characteristic of good rice. This suggests that there is considerable sales potential if the supply of low-priced sticky rice from Laos becomes available.

Table 4.2.2 Situation of Sold Rice and Rice from Laos in Vietnam

Survey	1st Survey		2nd Survey	
City	Vinh	Hue	Vinh	Hue
No. of surveyed shops	10	12	10	12
Average no. of handling rice variety	8.2	9.4	7.7	8.3
% of handling long-grain rice in rice variety	92.6	96.4	93.4	91.2
% of handling glutinous rice in rice variety	12.3	8.0	18.4	11.8
% of experience in selling Lao rice	40	75	40	75
% of handling amount of Lao rice in the total handling rice amount per month	4.5	3.5	2.0	3.9
% of handling amount of Thailand rice in total handling rice amount per month	18.5	7.4	21.0	5.9
% of handling amount of Vietnam rice in total handling rice amount per month	74.1	87.9	68.5	90.2
% of handling amount of glutinous rice in total handling rice amount per month	11.7	8.2	13.5	9.9
% of handling amount of Lao rice in the total glutinous rice amount per month	44.5	42.0	14.6	39.2
% of handling amount of Thai rice in the total glutinous rice amount per month	18.1	17.8	70.8	22.2
% of handling amount of Vietnam rice in the total glutinous rice amount per month	37.4	40.1	14.6	38.6

Source: JICA Survey Team

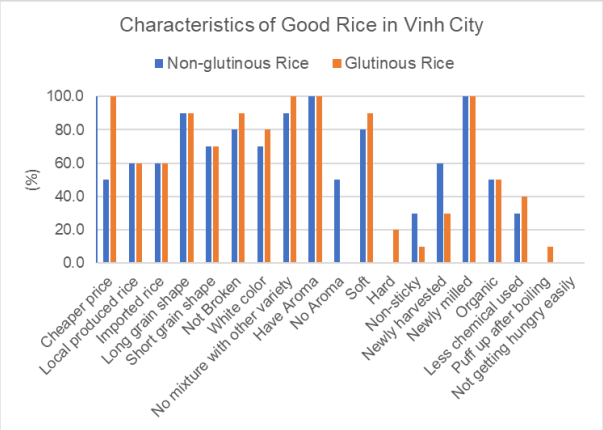


Fig.4.2.3 Characteristics of Good Rice in Vhin City

Source: JICA Survey Team

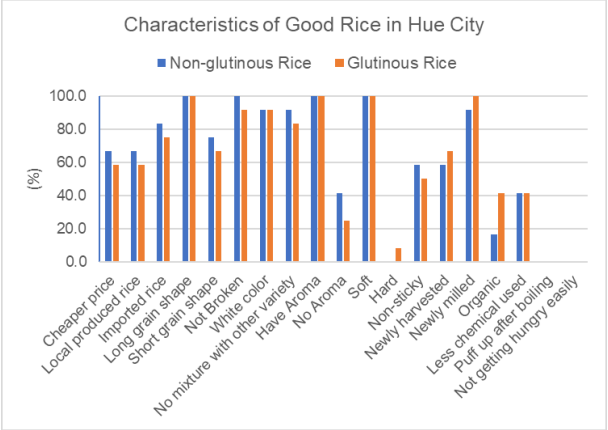


Fig.4.2.4 Characteristics of Good Rice in Hue City

Source: JICA Survey Team

4.2.3 Cambodia

The survey in Cambodia was conducted with 10 rice retailers located in the capital city of Phnom Penh. The results showed that, on average, there were five to six varieties of rice, more than 90% of which were Indica rice variety (long-grain). In Cambodia, where non-glutinous rice is the staple food, the proportion of glutinous rice sold was around 10% of the total. Only one shop reported having experience selling Lao rice, but they were not currently selling it. The survey conducted in Laos did not confirm rice exports to Cambodia, although there had been a previous export from Champasak Province.

The characteristics of good rice in Cambodia are shown in Figure 4.2.5. Good rice in Cambodia should be 1) locally produced, 2) long-grain, 3) white color, 4) Aroma, 5) soft, 6) freshly milled, and 7) organic. Compared to Vietnam, short-grain varieties were less available in Cambodia, and consumers were more

likely to prefer long-grain varieties. In addition, there was a preference for organic rice, as reflected by the survey conducted in the capital city, which indicates the urban residents' consumption orientation towards organic crops. Although the consumption of glutinous rice is not high, Lao rice, which is grown almost entirely organically, has the potential to become a sales channel for export to Cambodia, depending on its strengths and how it is marketed.

Table 4.2.3 Situation of Sold Rice and Rice from Laos in Cambodia

Survey	1st Survey	2nd Survey
No. of surveyed shops	10	10
Ave. no. of handling rice variety	5.4	6.1
% of handling long-grain rice	96.3	90.2
% of handling glutinous rice	13.0	6.6
% of experience in selling Lao rice	10	10
% of current Lao rice in selling	0	0

Source: JICA Survey Team

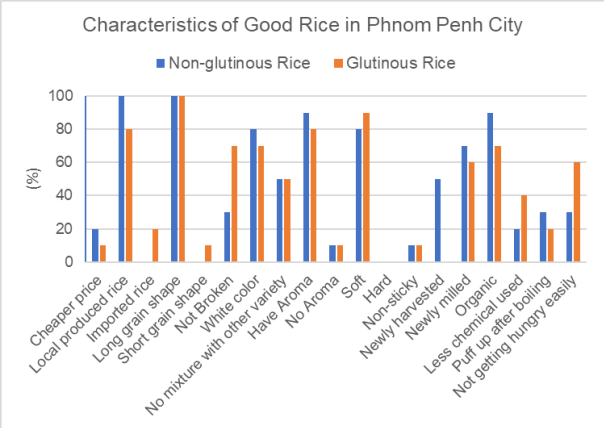


Fig.4.2.5 Characteristics of Good Rice in Phnom Penh

Source: JICA Survey Team

4.3 Demand Projection for Rice and Rice Seed

In this section, the future demand amount of rice and rice seed for producing that amount in Lao PDR is predicted. The demand projection of rice and rice seed would become the foundation to establish the long-term framework for food security in Lao PDR. In addition, it is also important for grasping the export potential of Lao PDR, which is pressing forward with the commercialization and export of rice. The long-term demand projection of rice and rice seed provides the basis for understanding the gap between the current condition of the production system and the future demand for rice seed, then considering the direction of the development or assistance.

In the following parts, the rice demand projection will be implemented from 4.3.1 to 4.3.3, and then rice seed demand will be predicted in 4.3.4.

4.3.1 Methodology for Rice Demand Projection

The rice demand projection will be done by collecting some statistical data and applying different statistical analysis procedures. Although Lao's own data published by the government were adopted as much as possible, in some cases international organizations' data were selected as variables from the viewpoint of the consistency of the analyzing process.

Figure 4.3.1 shows the flowchart of rice demand projection.

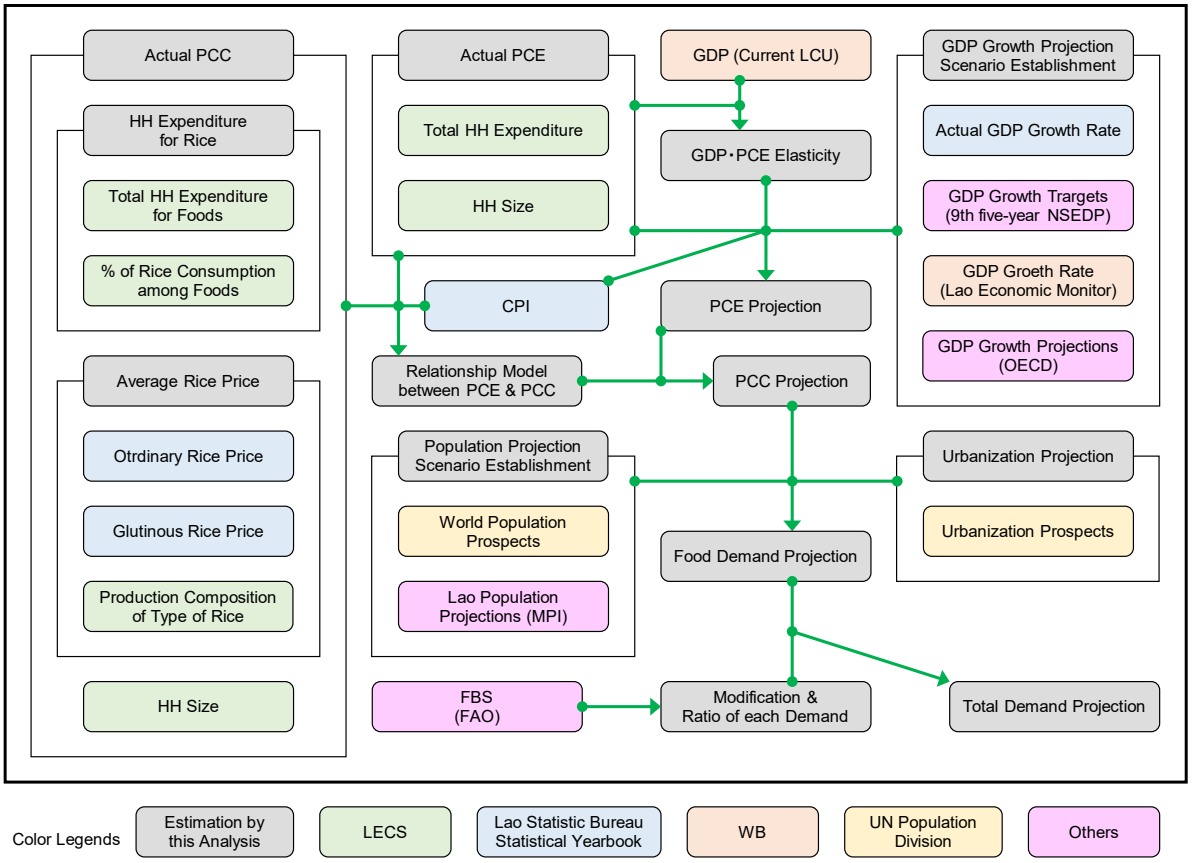


Fig. 4.3.1 Flowchart of rice demand projection

Source: JICA Survey Team

The following parts are divided into 2 analyzing stages, namely "Food Demand Projection" and "Total Demand Projection" in which the amounts of other demands, such as Feed or Seed, are taken into account as well.

4.3.2 Food Demand Projection of Rice

The understanding of the current value of Per Capita Consumption (PCC) was the first step of the food demand projection. Secondly, the PCC in the future was predicted by applying the estimation model for Per Capita Expenditure (PCE) depending on the economic growth, and the relationship model between PCE and PCC. After that, by multiplying the predicted value of PCC and the predicted future population in urban and rural respectively, the food demand of rice was calculated up to 2040. Therefore, main parameters were values of the PCC projection, the economic growth projection, the population projection and the urbanization projection.

(1) Actual Value of Per Capita Consumption (PCC)

The actual value of PCC (milled rice base) was calculated based on Lao Expenditure and Consumption Survey (LECS) which is conducted around every 5 years. Although there were 6 datasets from LECS1 of 1992/1993 to LECS6 of 2018/2019, some differences were identified in the survey method and the published data between each survey.

LECS provided data of daily rice intake based on the nutrition module. However, it was not possible to get that data in the latest LECS6, and the reliability of that data was supposed to be low because of the estimation method of that data which depends on the consumption amount of cooked rice balls[1].

[1] Eliste Paavo and Santos Nuno (2012) *Lao People's Democratic Republic Rice Policy Study*

Therefore, instead of that data, expenditure data of 3 different time points from LECS4 to LECS6 ware adopted as alternative datasets for estimating PCC in this analysis. The PCC estimation based on expenditure data would be done as follows.

a) The household expenditure on rice was calculated by multiplying the household expenditure on foods and the ratio of the expenditure on rice to all foods. (All data were collected from LECS.)

b) With annual average prices of ordinary rice and glutinous rice and the consideration of the production composition ratio between ordinary and glutinous rice at each LECS year, the annual weighted average rice price at each LECS year was calculated. (Data of rice price were collected from Lao Statistical Yearbook, while the production composition ratios were from LECS.)

c) The actual PCC was calculated by dividing the household expenditure on rice by annual average rice price at each LECS year, and then by household size. (Data of household size were collected from LECS.)

As a result, annual PCC of Lao PDR in LECS 6 was estimated as 175.8kg.

(2) Economic Growth Projection

The actual value of Lao's economic growth rate (growth rate of Gross Domestic Product: GDP) was described in Lao Statistical Yearbook. In term of the target of economic growth in the future, target values from 2021 to 2025 were set in 9th Five-Year National Socio-Economic Development Plan (2021-2015, NSEDP). In addition, WB's Lao PDR Economic Monitor presented target values of economic growth rate up to 2024[2].

As a first trial to predict economic growth rates up to 2040, approximate expressions were established by applying above two targets. Although both of them led to high R-squared values as a result of polynomial regressions, both projections forecasted that economic growth rates would turn significantly negative within the analysis period up to 2040. Considering GDP growth trends worldwide and Loa's GDP transition so far, the equation from polynomial regression was rejected because it is unrealistic that the economic growth rate of Lao PDR would drop significantly below 0.0% within 20 years (refer to Appendix 4).

As an alternative parameter, OCED's long-term GDP projection was adopted. Because there was not the projection of Lao PDR itself in OECD's long-term projection, data of "World" and "G20 emerging economies", which were supposed to be comparatively similar with the GDP trend of Lao PDR among the published data, were selected, and then annual change of growth rates were calculated. With these 2 annual change rates combined with above 2 target values of GDP growth rate, 4 different GDP scenarios were established (Table 4.3.1). Among these 4 scenarios, Scenario B which predicts the highest growth rate and Scenario C predicting the lowest growth rate were selected for the following analysis.

Table 4.3.1 Scenario establishment for GDP growth projection

Scenario CODE	Level	Scenario Description		
GDP Scenario A	-	～2020 Lao Statistical Yearbook	2021～2025 9th five-year NSEDP	2026～2040 Annual Change of Growth rates of "G20 emerging economies" (OECD Projection)
GDP Scenario B (G1)	**High**	**～2020 Lao Statistical Yearbook**	**2021～2025 9th five-year NSEDP**	**2026～2040 Annual Change of Growth rates of "World" (OECD Projection)**
GDP Scenario C (G2)	**Low**	**～2020 Lao Statistical Yearbook**	**2021～2024 WB Economic Monitor**	**2025～2040 Annual Change of Growth rates of "G20 emerging economies" (OECD Projection)**

[2] WB (2021) *Lao PDR – Economic Monitor, A Path to Recovery*

Scenario CODE	Level	Scenario Description		
GDP Scenario D	-	～2020 Lao Statistical Yearbook	2021～2024 WB Economic Monitor	2025～2040 Annual Change of Growth rates of "World" (OECD Projection)

Source: JICA Survey Team

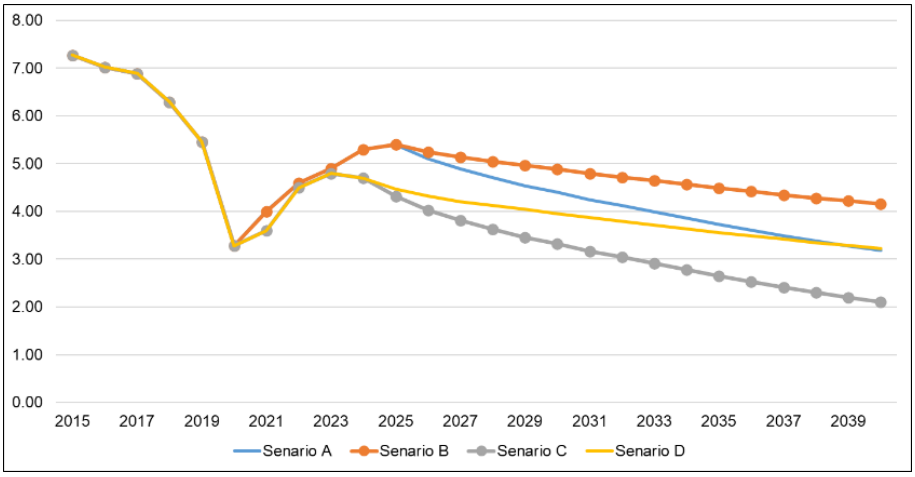


Fig. 4.3.2 Projection of GDP growth rates (%)

(3) Per Capita Expenditure (PCE) Projection

The increase of PCE effects the consumption amount of rice through the increase of purchasing power of households. The GDP elasticity[3] of PCE was applied for the calculation of the future projection of PCE.

To acquire the relational expression of the GDP elasticity of PCE, the nominal PCE of Lao PDR between LECS2 and LECS6 and the nominal GDP corresponding to each LECS year were sorted. Figure 4.3.3 shows the result of the regression analysis using the function of the double-log model, taking the logarithm of the nominal PCE[4].

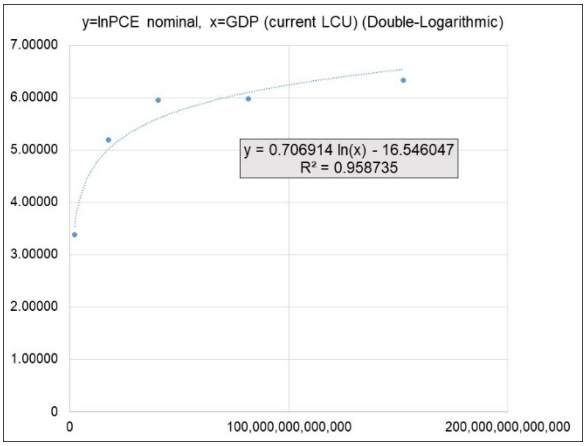


Fig.4.3.3 Relational expression of the GDP elasticity of PCE

Source: JICA Survey Team

The GDP elasticity of PCE was found to be 0.706914 from the above expression, meaning that the rate of change of PCE when GDP changes by 1% should be 0.706914%.

By multiplying this elasticity value and annual growth rates of GDP Scenario B and C adopted above, annual PCE growth rates were obtained up to 2040. In addition, the PCE in the baseline year (2018) were set based on LECS6 for both urban and rural area, and then they were converted into real values using Consumer Price index (CPI). The future PCE values were predicted up to 2040 by multiplying real PCE in 2018 and annual PCE growth rate.

[3] In this analysis, the concept "elasticity" is introduced. Elasticity is the ratio of the rate of change of a variable to that of the other variable. Here, it means the rate of change of PCE relative to that of GDP (= GDP growth rate), i.e. rate of change of PCE divided by GDP growth rate.

[4] Although the regression analysis is attempted using the function of the double-log model with the combination of the real PCE and the real GDP converted by CPI, the elasticity of the relational expression using nominal values is adopted as a more acceptable expression with high R-squared value.

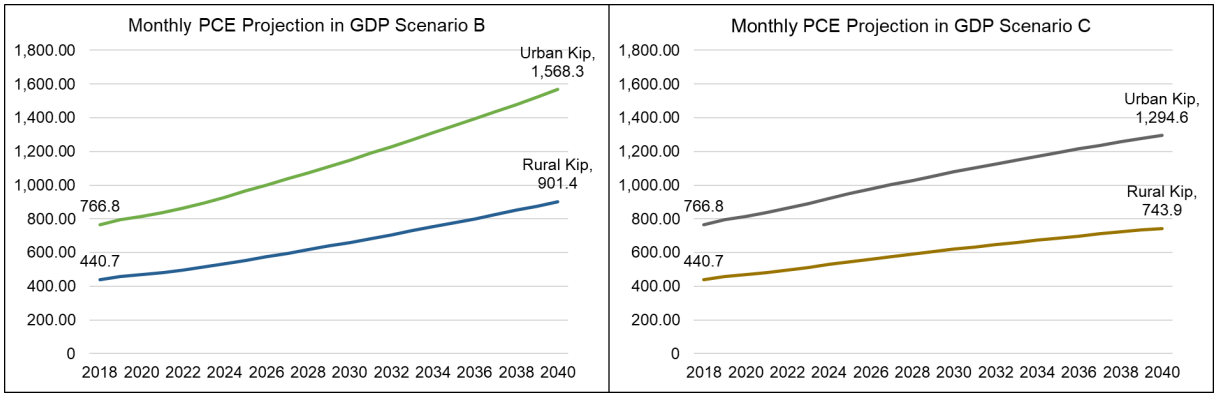


Fig. 4.3.4 PCE projection values by GDP Scenarios (per capita, per month)

Source: JICA Survey Team

(4) Per Capita Consumption (PCC) Projection

The future projection of PCC (milled rice base) was implemented by the relational expression between PCC and PCE. In this PCC projection process, some different models were considered including linear approximation, polynomial expression, and also elasticity which was adopted for the aforementioned relational expression between PCE and GDP.

As datasets for establishing the relational expression, real PCE values converted by CPI from nominal PCE values of 3 time points based on LECS4, 5 and 6 were combined with PCC values of the same time points by provinces. Although the regression analysis of almost all models with data of all the provinces and all the time points showed no clear relationship, only the polynomial regression showed a relatively high R-squared value, and it might be consistent with findings from previous research[5]. Thus, this result was adopted for the following analysis as "Poly model".

Previous studies indicated that the relationship between PCE and PCC varies depending on the extent of economic growth or urbanization[6]. Bearing it in mind, provinces were divided into the urban group and rural group with some criteria, and then additional trials to establish relational expressions were conducted by these groups. The summary of subject provinces, category criteria, and adopted regression models (shown by grey color and bold) of candidate models were listed as follows.

Table 4.3.2 Analysis criteria of candidate models and adopted regression models

Model CODE	Subject Province / Category Criteria	Regression Model	Applied for
Poly	**All Provinces**	**Polynomial**	**Both Urban & Rural**
Center	Provinces in Center Area	Linear	Urban
North & South Suburb	Provinces in South Area and North Area	Linear	Rural
Urban①	Provinces whose Rural areas are less than 70%	Linear	Urban
Rural①	Provinces whose Rural areas are 70% or more	Linear	Rural
Urban②	**Provinces whose Rural areas are less than 70%**	**Double-Logarithmic**	**Urban**
Rural②	**Provinces whose Rural areas are 70% or more**	**Double-Logarithmic**	**Rural**

Source: JICA Survey Team

[5] Ito et al. (1989) "Rice in Asia: Is It Becoming an Inferior Good?", American Journal of Agricultural Economics 71(1)
[6] Ibid.

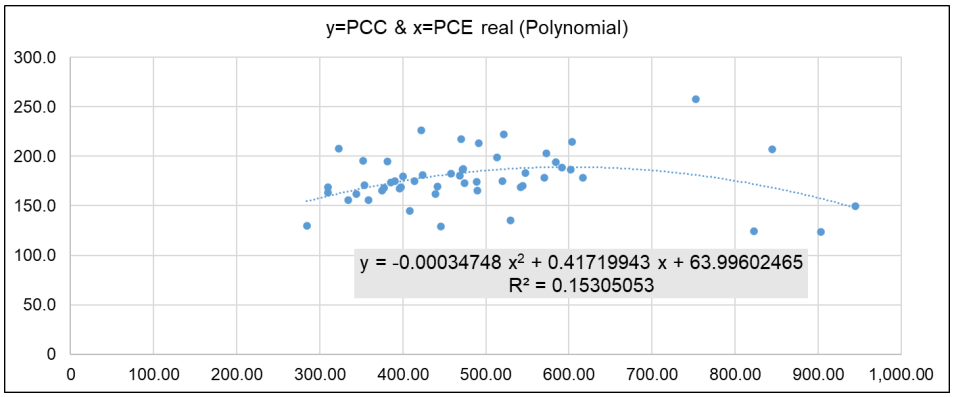


Fig. 4.3.5 Relational expression between PCE and PCC by "Poly model"

Source: JICA Survey Team

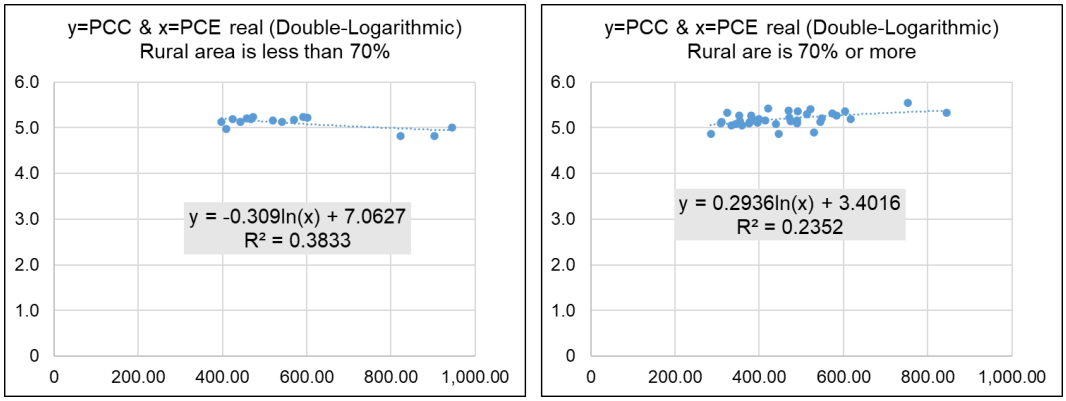


Fig. 4.3.6 Relational expression between PCE and PCC by "Urban② model" and "Rural② model"

Source: JICA Survey Team

By using each model exemplified above, the future PCC values were predicted based on the future PCE values by GDP Scenario B and C. After confirming the predicted results up to 2040, "Urban② model" was selected as the single model applied for the projection for urban areas. In terms of rural areas, additional considerations were required. "Poly model" and "Rural② model" seemed to be relatively appropriate. However, it was decided that both models were not acceptable as they were because "Poly model" predicted a lower rural PCC in 2040 than 2020, and "Rural② model" forecasted that rural PCC would continue to increase with no ceiling along with the economic growth[7]. For the following analysis, "Combined model", which takes annual average PCC between "Poly model" and "Rural② model", was introduced as a more moderate model.

[7] See appendix for trial estimation results which adopted "Poly model" and "Rural② model" as they were for the projection of rural areas.

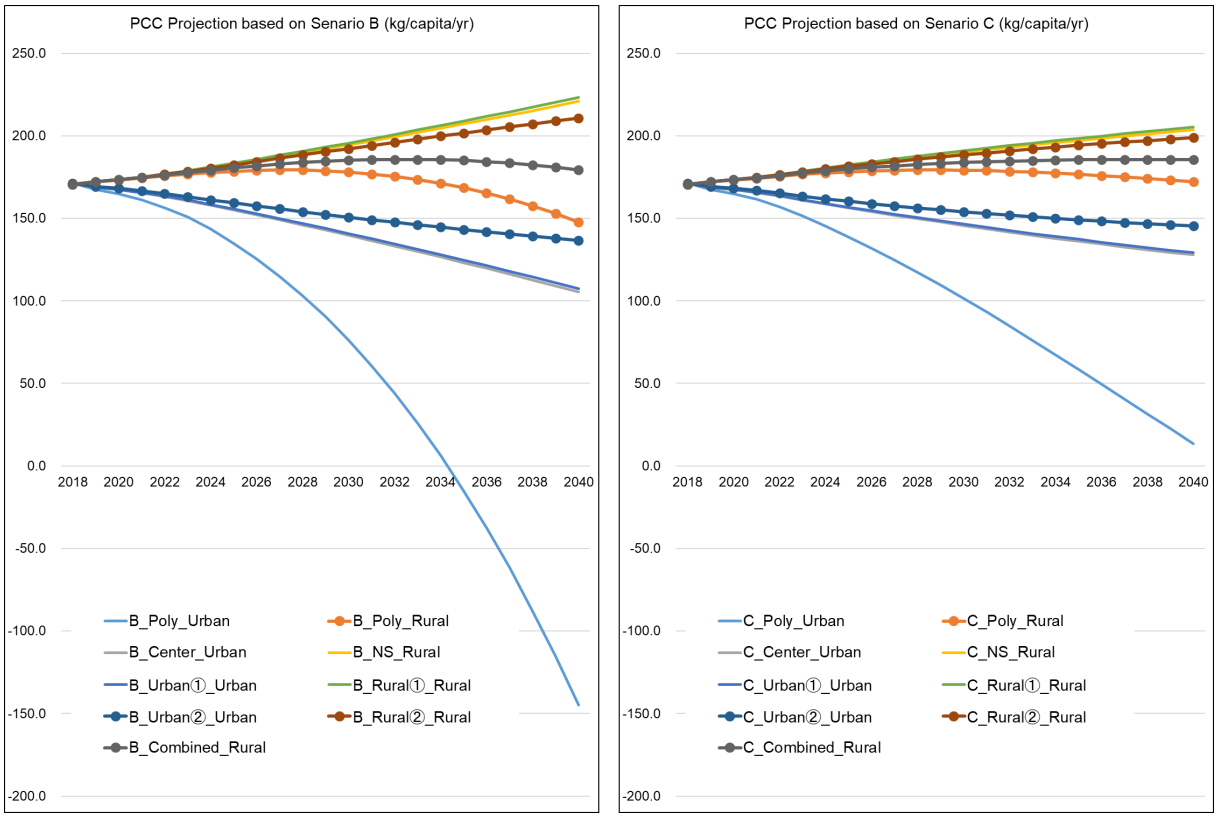


Fig. 4.3.7 PCC projections of each model by GDP Scenarios

Source: JICA Survey Team

(5) Urbanization Projection

In order to predict the food demand of urban and rural areas separately, the urbanization (the ratio of the urban population to the total population) projection is required for estimating the urban population and the rural population up to 2040. As Figure 4.3.7 shows, "Urban② model", which indicates the relationship between PCC and PCE in urban areas, predicts the decrease of rice consumption along with the economic growth. In this way, the urbanization effects the food demand with the relative decrease in the rural population and the absolute increase in the urban population.

In terms of the urbanization in Lao PDR, United Nations' Department of Economic and Social Affairs (UNDESA), Population Division published World Urbanization Prospects providing projection values of every 5 years up to 2050. Annual rates of urbanization up to 2040 were obtained by the linear approximation regression using projection values of every 5 years.

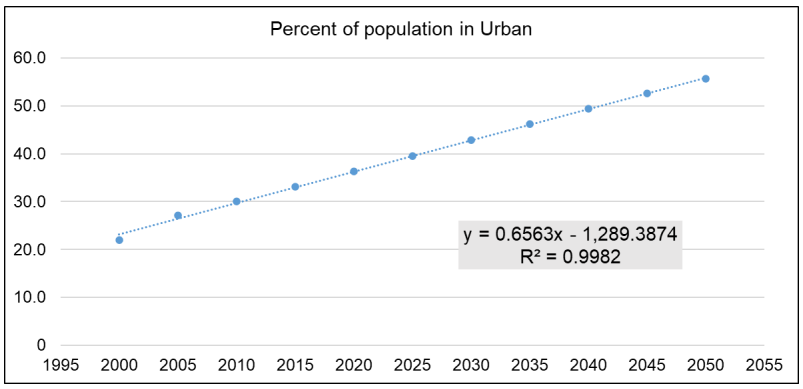


Fig. 4.3.8 Linear approximate expression based on World Urbanization Prospects

Source: JICA Survey Team

(6) Population Projection

The population is the most important variable in the food demand projection. This analysis adopted both projection values of Lao PDR government and the international organization.

As the projection of the future population by Lao PDF government, there is Lao Population Projections 2015-2045 issued in 2018 by Lao Statistic Bureau of Ministry of Planning and Investment (MPI). The total population is predicted up to 2045 by 3 levels (High, Medium, and Low) with the baseline number 6,671,680 as 2015's total population. As the projection made by the international organization, World Population Prospects 2019 by UNDESA was referred. UNDESA also provides 3 level projections (High, Medium, and Low).[8] Table 4.3.3 summarizes 6 Scenarios from 2 institutions mentioned above.

Table 4.3.3 Population projection Scenarios

Scenario CODE	Level	Scenario Description	
P1	Very High	High Variant in UNDESA Prospects	UN High
P2	High	High Variant in MPI Lao Statistic Bureau Projections	MPI High
P3	Upper-Medium	Medium Variant in MPI Lao Statistic Bureau Projections	MPI Medium
P4	Lower-Medium	Medium Variant in UNDESA Prospects	UN Medium
P5	Low	Low Variant in MPI Lao Statistic Bureau Projections	MPI Low
P6	Very Low	Low Variant in UNDESA Prospects	UN Low

Source: JICA Survey Team

Figure 4.3.9 shows the total population trends by 6 Scenarios of the population projection. All Scenarios predicted a continuous increase in the total population from 2020 to 2040, but the difference of predicted populations as of 2040 between "UN High Scenario (Very High)" and "UN Low Scenario (Very Low)" was more than 1 million.

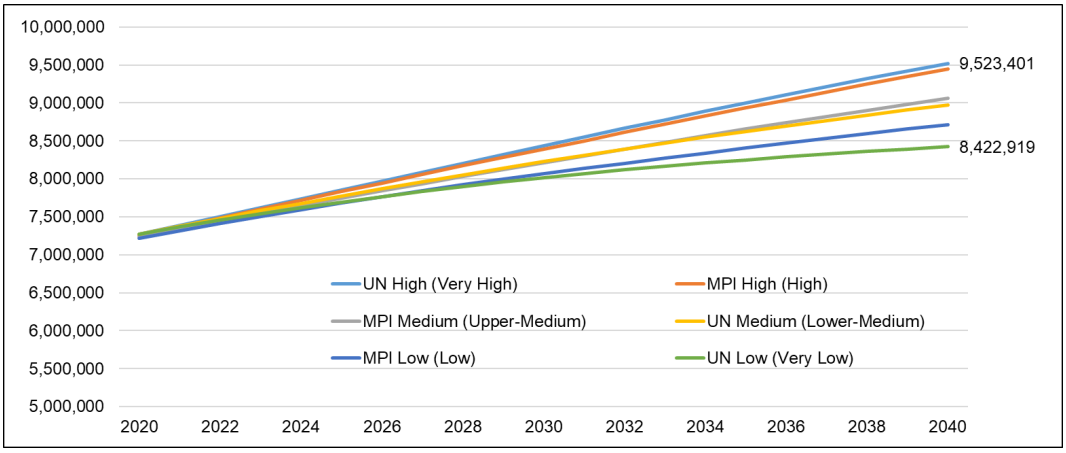


Fig. 4.3.9 Projection of the future population

Source: JICA Survey Team

Figure 4.3.10 and Figure 4.3.11 shows annual urban and rural populations in each Scenario up to 2040 based on population projections of above 6 Scenarios and the rate of urbanization calculated in (5). Regarding the urban population, all Scenarios indicated continuous increases up to 2040 in the same way as the total population. Very High Scenario predicted that the population in 2040 would exceed 4.7 million which is more than double the number in 2020. Even in Very Low Scenario, the urban population

[8] In addition to MPI and UNDESA, WB provides Population estimation and projection as well. However, WB's projection value is almost the same as Medium projection of UNDESA. Thus, WB's projection was not adopted for the following analysis.

in 2040 was estimated over 4 million. On the other hand, in terms of the rural population, only Very High and High Scenario indicated that the population in 2040 would be bigger than 2020, and the other Scenarios predicted smaller populations in 2040 than 2020 due to the progress of the urbanization.

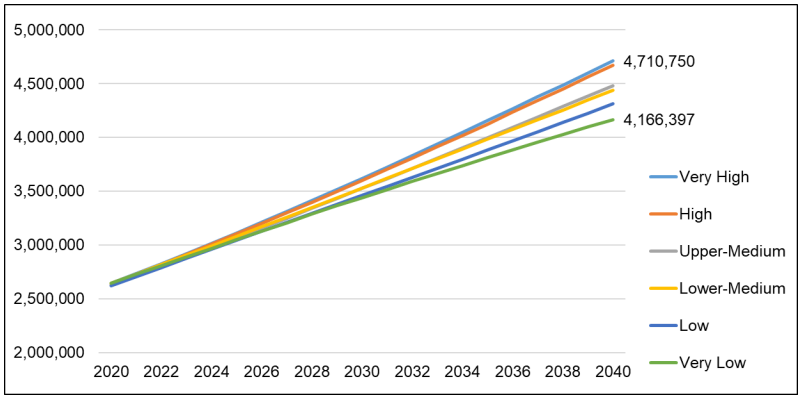


Fig. 4.3.10 Projection of the future population in urban areas

Source: JICA Survey Team

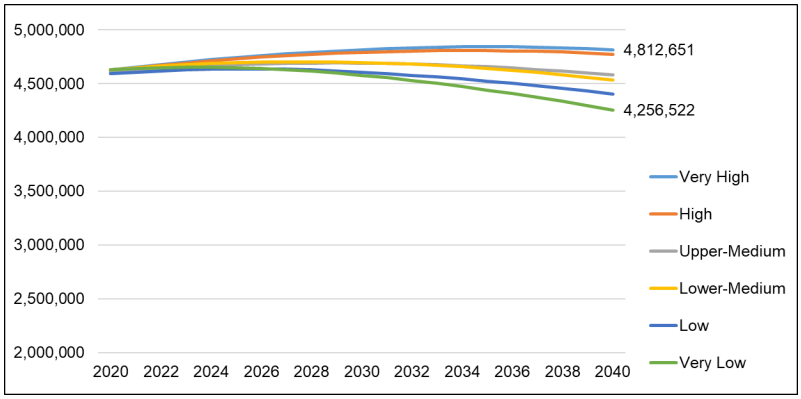


Fig. 4.3.11 Projection of the future population in rural areas

Source: JICA Survey Team

(7) Food Demand Projection

Table 4.3.4 summarizes 12 Scenarios by combining 2 GDP Scenarios and 6 population Scenarios.

Table 4.3.4 Summary of 12 Scenarios

Scenario CODE	GDP Growth	(Reference)	Population Growth	(Reference)
G1-P1	High	GDO Scenario B Statistical Yearbook × 9th five-year NSEDP Targets × OECD Word Forecast	Very High	UN High
G1-P2	High		High	MPI High
G1-P3	High		Upper-Medium	MPI Medium
G1-P4	High		Lower-Medium	UN Medium
G1-P5	High		Low	MPI Low
G1-P6	High		Very Low	UN Low
G2-P1	Low	GDP Scenario C Statistical Yearbook × WB Lao PDR Economic Monitor Targets × OECD G20 emerging economies Forecast	Very High	UN High
G2-P2	Low		High	MPI High
G2-P3	Low		Upper-Medium	MPI Medium
G2-P4	Low		Lower-Medium	UN Medium
G2-P5	Low		Low	MPI Low

Scenario CODE	GDP Growth	(Reference)	Population Growth	(Reference)
G2-P6	Low		Very Low	UN Low

Source: JICA Survey Team

Figure 4.3.12 shows the projection value of the food demand up to 2040 which was estimated by applying urban and rural projection values of PCC by different GDP Scenarios (based on "Urban② model" and "Combined model" respectively, and estimated in (4)) as well as the future population predicted by urban and rural areas (estimated in (6)). As of 2040, the food demand projection (paddy rice base) in G2-P1 Scenario was the biggest (about 2.63 million tons), while G1-P6 Scenario predicted the smallest demand (about 2.22 million tons). Note that the following analysis will be done by paddy rice base, though PCC was estimated by milled rice base. For that aim, the projection value of food demand was converted into the milled weight by using 60%[9] as milling rate.

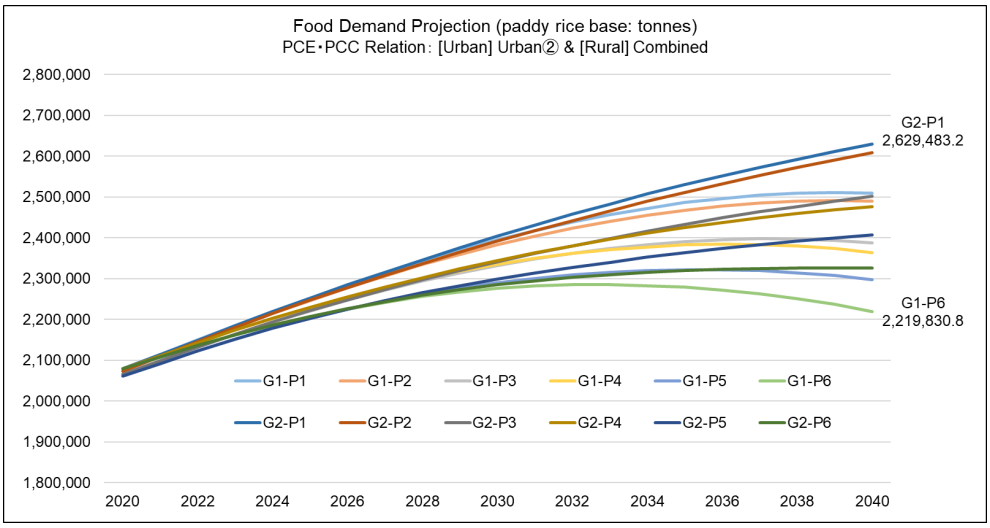


Fig. 4.3.12 Food demand projection

Source: JICA Survey Team

4.3.3 Total Demand Projection of Rice

In this part, the total demand projection, in which not only food but also export or feed and so on are considered, will be implemented. The ratio of other items' demand to the food demand will be calculated at first, then that ratio should be multiplied by the food demand to predict the total demand up to 2040.

(1) Demand and Supply based on Food Balance Sheet (FBS)

In order to estimate non-food demands, Food Balance Sheet (FBS) on rice was referred. FBS is a statistical data published by Food and Agriculture Organization of the United Nations (FAO) in which the supply amount and utilization amount are shown by crops. It is possible to capture the comprehensive picture of demand and supply of each crop from FBS.

Items included in FBS are categorized as follows, and as a premise, 3 categories should be balanced with each other. Namely, the value of "Supply" calculated by deducting Export quantity from the sum of Production and Import and adding Stock Variation means "Domestic Supply Quantity", then furthermore it matches with the sum of all items under "Domestic Utilization (Demand)".

[9] The milling rate, meaning the change of weight from paddy rice to milled rice, varies depending on the variety of rice or the production method. In this analysis, 60% was adopted as average milling rate based on some information including the field survey.

Table 4.3.5 Demand and Supply in FBS

Domestic Supply Quantity	Supply	Domestic Utilization (Demand)
・Domestic Supply Quantity	・Production ・Import Quantity ・Export Quantity ・Stock Variation	・Food ・Feed ・Seed ・Losses ・Processing ・Other Uses (non-food) ・Tourist Consumption ・Residuals

Source: Prepared by JICA Survey Team from FAO data.

(2) Modification of FBS and Ratio of each Demand to Food Demand

In the estimation of the total demand, 8 items under "Domestic Utilization (Demand)" were referred, and some modifications were required for this analysis.

First, as for the value of "Food", the food demand values estimated in 4.3.2 were adopted instead of statistic values in FAO's FBS. The food demand in 2018 calculated by the latest LECS6 was 199.57 million tons[10], while the corresponding value of FAO's FBS was 171.70 million tons. The ratio between 2 values, 1.1623, was identified as a modification coefficient. The modified values of food demand in each year were obtained by multiplying FBS's value of "Food" in each year by that modification coefficient.

Secondly, instead of statistic values in FAO's FBS, the value of "Seed" should be estimated using 60kg/ha as the required volume of seed for rice production in Lao PDR. The modified values of seed demand in each year were obtained by multiplying annual harvested areas published by FBS by 60kg/ha.

Finally, because a balance must be taken between demand and supply in FBS, the differences caused by the modifications above were absorbed in "Other Uses (non-food)".

Given the modifications above, the ratio of each demand to the modified food demand is listed below. Note that ratio is static and annual fluctuations are not considered.

Table 4.3.6 Ratio of each demand to the food demand

Food	Feed	Seed	Losses	Processing	Other Uses (non-food)	Tourist Consumption	Residuals
100.0	20.0	2.9	7.8	9.8	54.3	0.2	0.0

Source: Prepared by JICA Survey Team from FAO data.

(3) Total Demand Projection

Figure 4.3.13 shows the total demand of rice which was predicted by multiplying annual projection values of food demand by 12 Scenarios (shown in Figure 4.3.12) by each demand's ratio in Table 4.3.6. As of 2040, the total demand projection (paddy rice base) in G2-P1 Scenario was the biggest (about 5.13 million tons), while G1-P6 Scenario predicted the smallest demand (about 4.33 million tons).

[10] The average value between some different Scenarios.

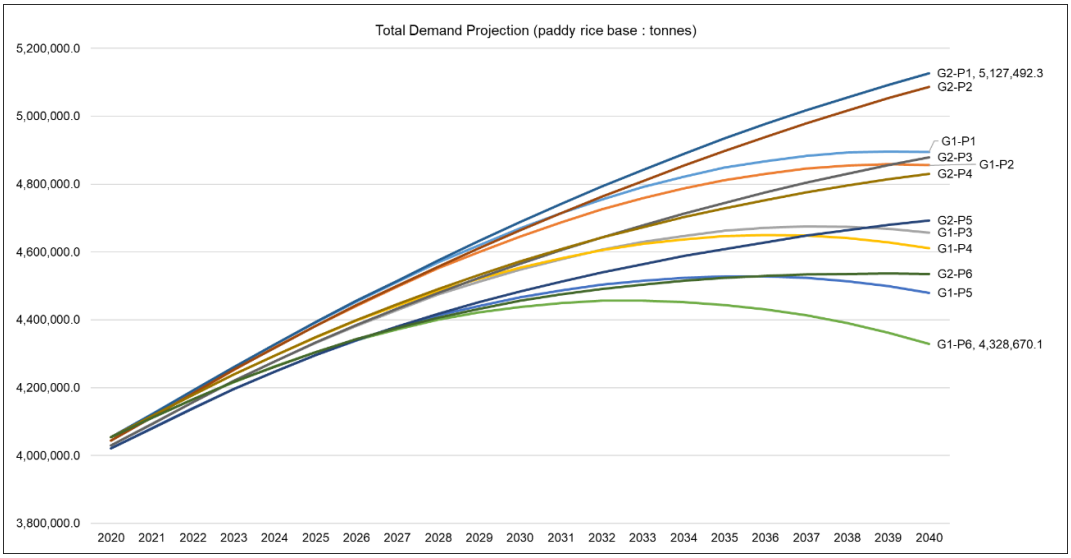


Fig. 4.3.13 Total demand projection

Source: JICA Survey Team

The accuracy of the demand projection depends on the availability of reliable data. This analysis mainly depended on LECS, and faced several difficulties. The biggest challenge was the lack of intake data covering the long period. If it is possible to obtain rice intake data by different regions which covers the long period including the latest year, the accuracy of the projection would be significantly improved. This analysis had to adopt expenditure data as the basis for estimating PCC, leading to the limitation for the accurate projection.

In addition, as for the economic growth projection, the long-term GDP prospect for Lao PDR itself was not available. If there is the long-term GDP prospect by regions or urban and rural, more detailed analysis might be possible. Moreover, regarding the projection value of the population which has the biggest influence on demand, periodical updates should be made based on the monitoring for improving the accuracy of the analysis.

(4) Implication for Export

Among the total demand, the predicted demand for "Other Uses (non-food)" was extracted and shown in Figure 4.3.14. As of 2040, the demand projection (paddy rice base) in G2-P1 Scenario was the biggest (about 1.43 million tons), while G1-P6 Scenario predicted the smallest demand (about 1.21 million tons).

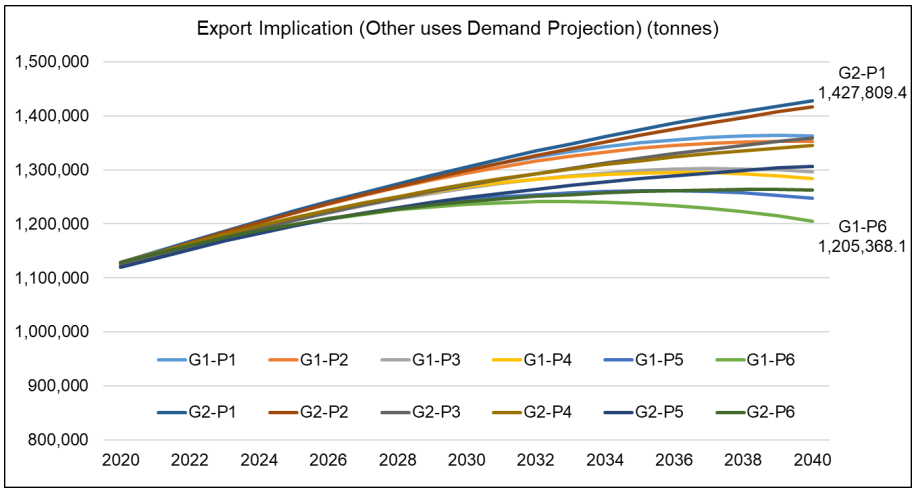


Fig. 4.3.14 The demand projection for Other Uses

Source: JICA Survey Team

Seo (2018) argued that the amount equivalent to "Other Uses (non-food)" in Table 4.3.5 was supposed to be the amount of informal rice export, based on FAO's FBS approach[11]. According to that idea, the amount of informal rice export was over 1.10 million tons as of 2020, and the potential amount for rice export in 2040 could be said between 1.21 and 1.43 million tons. However, it might be difficult to regard the 100% of projection value of "Other Uses (non-food)" by this analysis as the export amount, because actually "Other Uses (non-food)" is considered to have a function to adjust errors caused by the calculation of each item.

4.3.4 Demand Projection of Rice Seed

(1) Rice Seed Demand Projection

The future demand of rice seed was already estimated in the analyzing process above. Among the total demand, the predicted demand for "Seed" was extracted and shown in Figure 4.3.15. As of 2040, the demand projection (paddy rice base) in G2-P1 Scenario was the biggest (about 76 thousand tons), while G1-P6 Scenario predicted the smallest demand (about 64 thousand tons).

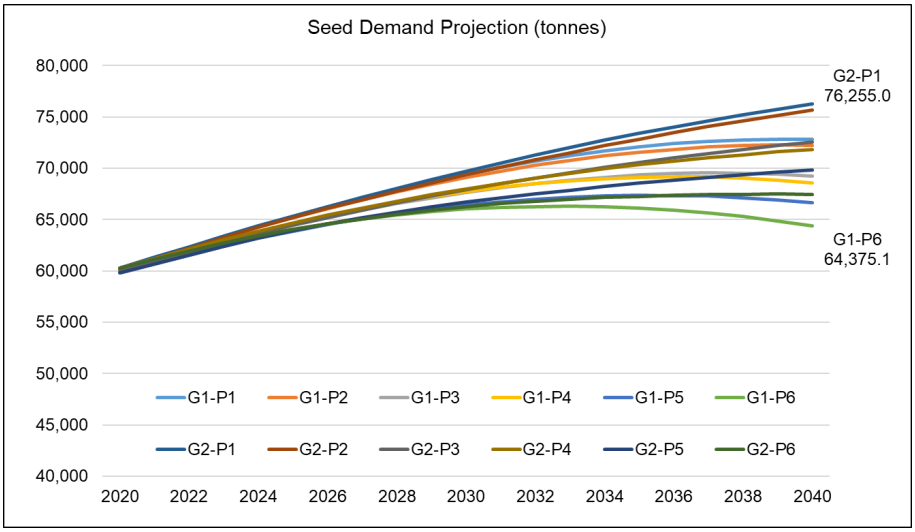


Fig. 4.3.15 The demand projection for Seed

Source: JICA Survey Team

(2) Production Area Projection of Rice Seed

The required area for producing the rice seed demand was predicted by dividing the rice seed demand above by yield data (paddy rice base). Data from Lao Agricultural Statistics Year Book was adopted as a yield data, and then required area was estimated.

The 10-year average yield based on data of Agricultural Statistics Year Book was calculated as 4,008.5kg/ha. As of 2040, the area projection in G2-P1 Scenario was the biggest (about 19.0 thousand ha), while G1-P6 Scenario predicted the smallest area (about 16.1 thousand ha). Note that this number is about required area for producing the demand amount of rice seed equivalent to the total rice production. If farmers update rice seeds every 3 years, one third of estimated area above would be the required area for producing R3 seeds, namely between 5.4 and 6.3 thousand ha as of 2040.

[11] Seo Takashi (2018) *A study on informal rice export in Lao PDR*

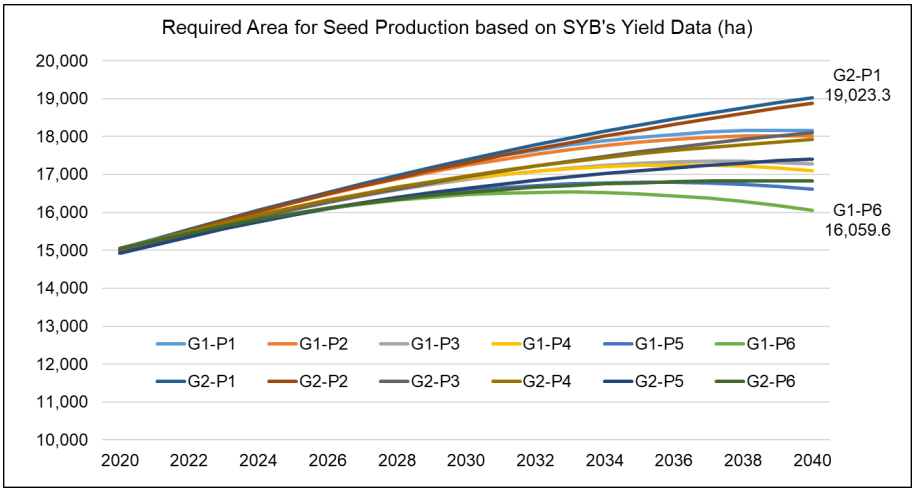


Fig. 4.3.16 The production area projection of rice seed based on yield data of Agricultural Statistics Year Book

Source: JICA Survey Team

CHAPTER 5 POLICY RECOMMENDATIONS

5.1 Policy Recommendation for Rice Seed Production, Multiplication, Management, and Sharing System

Based on the results of this survey, the following three recommendations are made to optimize rice seed multiplication.

(1) Confirmation of roles and identification of organizations for rice seed multiplication (NAFRI, DAEC, DOA/PAFO/DAFO, etc.)

Due to changes in the role of departments in the MAF at the end of 2018, NAFRI is responsible for producing upstream seeds, while DAEC is in charge of extension seeds. However, this survey revealed that NAFRI is not only selling R2 seeds to farmers but also R1, and other departments under PAFO (agricultural centers) are producing R3 rice seeds. The biggest challenge in promoting rice seeds currently is the unsold R3 seed. Therefore, it is crucial to reconfirm and reorganize the roles of each government office to avoid overlapping responsibilities that compete with the sale of R3 rice seed.

Consultations between the organizations concerned are needed when identifying and organizing their roles. Fortunately, the National Seed Board was established, represented by the Deputy Minister of Agriculture and Forestry, in mid-2022. It is suggested to consult and decide on this issue at the working level as a tripartite body of DOA, DAEC and NAFRI.

(2) Implement rice seed production after confirming and understanding demand

Rice seed production of upstream seeds such as BS, R1 and R2 is produced by centers under NAFRI, while centers under DAEC and farmer rice seed production groups working with DAEC are responsible for R3 seed production. However, NAFRI does not currently have systems to determine the amount of upstream seed required, and production is not based on demand, so a committee within the organization determines the amount of upstream seed to be produced, taking into account past experience, availability, and recent trends. As a result, when farmer groups that produce R3 seed purchase upstream seed, they may not be able to purchase the varieties they are looking for, or they may have to transport the seed from a distant center outside of their area. To solve this challenge, each center under NAFRI should introduce an ordering system to determine the amount of upstream seed needed in the region before planting and to plan planting.

(3) Strengthen rice seed inspection system

In the current seed inspection system, the agricultural division of the PAFO is in charge of all R3 rice seed inspections. However, it was confirmed that there is a large difference in inspection accuracy among PAFOs due to inadequate inspection equipment and poor skills of the officers in charge of inspections in some PAFOs. In order to ensure proper rice seed inspection in the future, it is desirable to strengthen the rice seed inspection system by 1) improving inspection equipment and laboratories, and 2) providing technical training for inspection staff.

5.2 Policy Recommendations for Rice Commercialization

This survey confirmed that Laos has great potential for rice export, even though the country is surrounded by rice exporting countries such as Thailand, Vietnam, and Cambodia. Most farmers in Laos grow rice as their staple food. Therefore, increasing rice exports can contribute to increasing farmers' income from rice sales. On the other hand, projections for rice demand suggest that a total of 4.33-5.13 million tonnes of rice will be required in 2040, with a potential export volume of 1.21-1.43 million tonnes at that time. In order to achieve to increase in rice exporting, it is necessary to establish and strengthen the supply chain from rice seed production to rice production, milling, and export. The challenges and their solutions are described below.

(1) Strengthen the rice supply chain led by rice millers

The survey found out that the supply chain for producing high quality rice is limited in number, but the supply chain led by rice mills is functioning. Laos still has weak distribution and production infrastructure, which needs to be improved. In addition, the expansion and strengthening of the rice supply chain, with rice mills at its core, will enable the production of high-quality rice in Laos and an increase in rice exports. By expanding and strengthening this supply chain, it will be possible to increase the production of high quality rice and rice exports in Laos. In order to achieve this, it is important to strengthen the following aspects in the supply chain.

a) Strengthening the capacity of rice millers

In this survey, several cases were identified where rice mills are playing a central role in building a rice supply chain to produce high-quality rice for export. All of these cases are led by medium or large scale rice mills. Therefore, by developing and expanding the size of rice mills and the sales channels for export, the entire supply chain for high quality rice can be strengthened and rice commercialization can be accelerated. In particular, support should be provided to medium and larger scale rice mills, many of which do not currently export rice, as they have the potential to lead a high quality rice supply chain and export rice.

For medium and large scale rice mills, it is necessary to support both equipment and management capacity at the same time. In order to produce high quality milled rice for export, equipment such as dryers and post-polishing sorters are required. They also need bags to pack the milled rice and storage space. On the other hand, management skills will be needed to manage rice seed producers, rice farmers, exporters, and transporters, and also to acquire management skills related to business management as the scale of the rice mill will increase. Regarding capacity building for rice millers, it is anticipated that a significant amount of money may be necessary to upgrade their equipment. This would entail obtaining bank loans, which could potentially be obtained from a government-owned bank, such as an agricultural bank, that offers lower interest rates, or a credit guarantee from the government. Furthermore, combining government assistance with training to enhance management skills would be beneficial.

b) Support for rice exporting by the Department of Agriculture (DOA) of the Ministry of Agriculture and Forestry

The survey also identified rice mills that are relatively large scale but do not export rice, so far. These rice mills sell to large customers such as the military and police offices on a contract basis, or to mass consumption areas such as the market in the Vientiane capital. The Department of Agriculture under the MAF, which manages the export of agricultural products, should provide support so that rice mills of this scale can export their products. Specifically, DOA should provide introductions to export customers and support for export procedures.

c) Organization and implementation of agricultural extension by DAEC

Strengthening the rice supply chain requires organization in each segment of the value chain and coordination between segments. This part of the rice supply chain should be supported by DAEC. The rice millers have an existing rice miller group, but in reality it does not function well. By strengthening this rice miller group, DAEC will promote rice exports as a group, establish linkages with the R3 rice seed production group, organize rice farmers who use R3 seed, promote the R3 seed loan program, and expand production of high quality rice for export purposes. In addition, DAEC should expand rice production by providing advice on appropriate cultivation technics to R3 rice seed producers and rice farmers.

(2) Production and extension support for R3 rice seed farmers

The biggest challenge for increasing R3 rice seed production, as found out in this survey, is that R3 rice seed

remains unsold even if it is properly produced. When natural disasters such as floods and droughts occur in Laos, the Lao government purchases R3 seed for distribution to the affected areas, creating a large temporary demand. However, in a normal year, the sales channel for R3 rice seed is left to the rice seed production groups, and unsold R3 rice seed is a major problem, so it is important to ensure a sustainable sales channel for R3 rice seed.

On the other hand, some farmers who purchase R3 rice seed said that the quality of R3 rice seed produced by rice seed farmer groups is low and they do not see the advantage of purchasing R3 rice seed, and some of them do not know where R3 rice seed is sold. In order to produce high quality rice so that rice farmers can feel the merit of purchasing R3 rice seed, it is necessary to clarify the challenges that rice seed farmer groups currently face in production and to provide technical support on cultivation techniques and rice seed management techniques needed to overcome these issues. In addition, most rice farmers in Laos produce rice for their own consumption and sell the surplus. It is also important to create a continuous demand for R3 rice seeds by encouraging farmers to shift their mindset to market-oriented rice production, where they produce rice to sell rather than produce and then sell, and by raising awareness of the need to purchase R3 rice seed in order to produce high-quality rice.

(3) Rehabilitation of existing irrigation facilities and strengthening of water management and maintenance systems

The survey found many cases where irrigation facilities had failed, resulting in a drastic reduction in the area under production, a reduction in production due to severe drought damage during the rainy season, and the inability to grow rice during the dry season. Irrigation is essential for rice production, but it is often poorly maintained and managed in Laos. To ensure the production of high-quality rice, the focus will be on rehabilitating existing irrigation facilities and strengthening water management and maintenance systems and capacities rather than constructing new irrigation facilities. Since the irrigation cannot be addressed solely by the Ministry of Agriculture and Forestry organisations involved in rice seed and rice production (DOA, DAEC and NAFRI), the Irrigation Department of the Ministry of Agriculture and Forestry is responsible for irrigation, and these organisations will make recommendations to ensure that key rice seed and rice production sites are targeted for rehabilitation of irrigation facilities and strengthening of water management and maintenance systems and capacity.

APPENDIX

APPENDIX-I

Letter of confirmation of project members

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນະຖາວອນ

ກະຊວງ ກະສິກຳ ແລະ ປ່າໄມ້
ກົມປຸກຝັງ

1038----
ເລກທີ...../ກປຝ
ນະຄອນຫຼວງວຽງຈັນ, ວັນທີ 28 JUN 2022

ຂໍ້ຕົກລົງ
ວ່າດ້ວຍ ການແຕ່ງຕັ້ງຄະນະທີມງານວິຊາການ ລົງເຮັດວຽກຮ່ວມກັບ ທີມງານຊ່ຽວຊານ JICA

- ອີງຕາມ ຂໍ້ຕົກລົງ ຂອງລັດຖະມົນຕີ ກະຊວງ ກະສິກຳ ແລະ ປ່າໄມ້, ສະບັບເລກທີ 0078/ກປ, ລົງ ວັນທີ 12 ມັງກອນ 2022 ວ່າດ້ວຍ ການຈັດຕັ້ງ ແລະ ການເຄື່ອນໄຫວຂອງ ກົມປຸກຝັງ.
- ອີງຕາມ ການປະຊຸມປຶກສາຫາລືກັນ ລະຫວ່າງ ກົມປຸກຝັງ ກັບ ຄະນະທີມງານ ຈາກອົງການ **JICA** ໃນຄັ້ງວັນທີ 31/05/2022.

ກົມປຸກຝັງ, ກະຊວງ ກະສິກຳ ແລະ ປ່າໄມ້ ອອກຂໍ້ຕົກລົງ:

ມາດຕາ 1 ແຕ່ງຕັ້ງຄະນະທີມງານວິຊາການລົງເຮັດວຽກຮ່ວມກັບທີມງານ JICA ເພື່ອສຶກສາສຳຫຼວດການຜະລິດເຂົ້າເປັນສິນຄ້າ ໂດຍຜ່ານການພັດທະນາ ວຽກງານການຄຸ້ມຄອງແນວພັນເຂົ້າ ເພື່ອກຳນົດ ແລະ ສະເໜີເປັນແນວທາງນະໂຍບາຍການຜະລິດເຂົ້າເປັນສິນຄ້າ ຫຼັງ COVID 19 ລະບາດ ເຊິ່ງລາຍລະອຽດມີດັ່ງນີ້:

1.	ທ່ານ ນ. ພູເງີນ ໂພສາລາດ	ຮອງຫົວໜ້າ ພະແນກລົງທຶນດ້ານການປຸກຝັງ	ເປັນຫົວໜ້າ
2.	ທ່ານ ພົມມາ ສຸລິຍະສິດ	ວິຊາການ ພະແນກລົງທຶນດ້ານການປຸກຝັງ	ເປັນຮອງ
3.	ທ່ານ ຕຽມທອງ ສີພັນວົງ	ວິຊາການ ພະແນກລົງທຶນດ້ານການປຸກຝັງ	ເປັນຄະນະ
4.	ທ່ານ ແກ້ວອຸດອນ ແສນມະນີ	ວິຊາການ ພະແນກລົງທຶນດ້ານການປຸກຝັງ	ເປັນຄະນະ

ຄະນະດັ່ງກ່າວ ມີໜ້າທີ່ລົງເຮັດວຽກຮ່ວມກັບທີມງານຊ່ຽວຊານ JICA ພ້ອມກັນການສຶກສາສຳຫຼວດພື້ນທີ່ການຜະລິດເຂົ້າເປັນສິນຄ້າ ແລະ ວຽກງານການຄຸ້ມຄອງແນວພັນເຂົ້າຢູ່ ສປປ ລາວ ໃຫ້ມີປະສິດທິຜົນ. ໃນການຈັດຕັ້ງປະຕິບັດຕົວຈິງ ຕາມແຜນຂອງທີມງານຈາກຊ່ຽວຊານ JICA ຄາດວ່າ ຈະດຳເນີນການຈັດຕັ້ງປະຕິບັດຢູ່ ຫຼວງນ້ຳທາ, ແຂວງວຽງຈັນ, ນະຄອນຫຼວງ, ສະຫວັນນະເຂດ, ຈຳປາສັກ, ສາລະວັນ ແລະ ແຂວງ ອື່ນໆ ໃນຂອບເຂດທົ່ວປະເທດ ໂດຍກຳນົດໄລຍະເວລາໃນການລົງສຳຫຼວດ ພາກສະໜາມ ອອກເປັນ 3 ໄລຍະຄື: 1) ໄລຍະທີ 1 ເດືອນ ພຶດສະພາ-ກັນຍາ 2022; 2) ໄລຍະທີ 2 ເດືອນ ພະຈິກ-ທັນວາ 2022 ແລະ 3) ໄລຍະທີ 3 ເດືອນ ມັງກອນ-ກຸມພາ 2023. ຄະນະທີມງານດັ່ງກ່າວຈະໄດ້ລາຍງານຜົນການຈັດຕັ້ງປະຕິບັດວຽກງານໃນແຕ່ລະໄລຍະໃຫ້ການນຳກົມປຸກຝັງຊາບ.

ມາດຕາ 2 ມອບໃຫ້ບັນດາທ່ານທີ່ຖືກແຕ່ງຕັ້ງຕາມ ມາດຕາ 1 ຂອງຂໍ້ຕົກລົງສະບັບນີ້ ຈົ່ງຮັບຮູ້ ແລະ ພ້ອມກັນຈັດຕັ້ງປະຕິບັດວຽກງານດັ່ງກ່າວ ໃຫ້ມີປະສິດທິຜົນສູງ.

ມາດຕາ 3 ຂໍ້ຕົກລົງສະບັບນີ້ ມີຜົນສັກສິດ ແລະ ນຳໃຊ້ໄດ້ ນັບແຕ່ມື້ລົງລາຍເຊັນເປັນຕົ້ນໄປ.

ຫົວໜ້າກົມ

ບຸນຈັນ ກົມບຸນຍະສິດ

ສຳເນົາສົ່ງ:

- ທ່ານ ຫົວໜ້າກົມ, ຮອງກົມ ທ່ານລະ 1 ສະບັບ
- ຜູ້ທີ່ຖືກແຕ່ງຕັ້ງ ທ່ານລະ 1 ສະບັບ
- ເກັບມ້ຽນ 1 ສະບັບ

APPENDIX-II

Status of organizations involved in rice seed production and testing

Rice seed certification and production organization by province

Rice seed production/management / Province	Rice seed certification	BS/R1/R2 Rice prodction	R3 Rice production
Vientiane Capital	PAFO/DAFO	RRC	Nongheo ADC
Vientiane Province	PAFO/DAFO	—	Pakcheng ADC
Luangnamtha Province	PAFO/DAFO	Luangnamtha ARC	—
Savannakhet Province	PAFO/DAFO	Thasano ARC	LAK 35 ADC
Champasak Province	PAFO/DAFO	ARC of Southern Laos	—
Salavan Province	PAFO/DAFO	—	Nongdeang ADC
Khammouane Province	PAFO/DAFO	—	Xebangfai ADC

Source: JICA Survey Team

Status of plots and agricultural machinery in each rice seed production organization

	LARC	RRC	Thasano ARC	Phongum ARC	Pakcheng ADC	Nongheo ADC	35㎞ ADC	XBF ADC	Nongdeang ADC
Location	**Luangnamtha**	**Vientiane Capital**	**Savannakhet**	**Champasak**	**Vientiane provinc**	**Vientiane Capital**	**Savannakhet**	**Khammouane**	**Salavan**
Center's seed field	About 2.8ha	R1: About 5ha R2: About 50ha	About 15ha	About 2.5ha	About 10ha	About 4.5ha	None	About 12ha	About 15ha
Tractor	Kubota 4-wheel tractor. Cultivator with paddy wheels.	2 units of Kubota 4-wheel tractor.	More than 1 unit.	4 units (1 is for transportation)	2 units of Kubota 4-wheel tractor.	2 units of Kubota 4-wheel tractor.	None	Kubota M7040 and JINMA 4- wheel tractor. 2 units of cultivator.	2 units of Kubota 4-wheel tractor. A cultivator.
Combine harvester	Kubota Combine	Kubota Combine 2 units	Kubota Combine DC-70	Kubota Combine DC-60	Kubota Combine 2 units	Kubota Combine 2 units	None	Kubota Combine DC-70	Kubota Combine DC-60/DC-70
Dryer	Flat dryer	Large dryer installed in the 1980s	Flat dryer	Unconfirmed	Vertical dryer (Korean made, 2021)	Vertical dryer (Korean made, 2021)	A Laotiane vertical dryer, a flat dryer	A flat dryer (dries 3 to 4 tons in 3 days)	Chinese grain dryer (500 kg/2 hours). It doesn't seem to be used much.
Threshing machine	throw-in type threshing machine	throw-in type threshing machine	Unconfirmed	Unconfirmed	throw-in type threshing machine	throw-in type threshing machine	Unconfirmed	throw-in type threshing machine	throw-in type threshing machine
Sorter	Japanese sorting machine granted by RISEP	2 units of Japanese sorting machine granted by RISEP(for R1/R2). Indian sorter(for R1). Another one	Large sorter (same model as Phongum ARC) and other medium-sized sorters available	Large sorter (same model as Thasano ARC) and other medium-sized sorters available	Japanese sorting machine granted by RISEP	Japanese sorting machine granted by RISEP/Laotiane seed sorter	Laotiane seed sorter	Laotiane seed sorter	A total of 4 units, including a Italian made, an Indian made and others. They are used according to the variety.
Transplanting machine	Kubota six-line planter	3 units of Kubota six-line planter (one needs to be repaired, One doesn't work)	Kubota four-line planter	None	2 units of Kubota driving type planter	2 units of Kubota driving type planter	None	Kubota six-line planter/four-line planter	Kubota six-line planter(need to repair)/four-line planter
Drying floor	About 400m^2 The surface was rough.	About 350m^2 for R1 About 930 m^2 for R2.	Unconfirmed	Unconfirmed	More than 1700 m^2	Morre than 2200 m^2	About 400m^2	About 250m^2	About 200m^2
Seed store	Seed storage funded by RISEP	A refrigerator for R1 and a warehouse for other class seeds.	A big store for R2/An air- conditioned seed store	Seed store without AC.	Seed storage (large refrigerated seed storage	Seed storage and large refrigerated seed storage	A large warehouse (not only for seeds).	Seed store without AC.	A large warehouse (not only for seeds).
Moisture meter	None	Kett X 1, Satake X 1	Available	Unconfirmed	Kett X 1, Satake X 1	Korean meter	Unconfirmed	Available	Kett X 1

Status of hand tools for rice seed testing in each organization

	Vientiane Province PAFO	Vientiane Capital PAFO	Khammouane PAFO	Savannakhet PAFO	Salavan PAFO	Champasak PAFO	LARC	RRC	Thasano ARC	Phongum ARC
Location	Pak Cheng	Vientiane Capital	Khammouane	Savannakhet	Salavan	Champasak	Luangnamtha	Vientiane Capital	Savannakhet	Champasak
Laboratory	Available	Available	Available	Available	None	Available	A room was used as a laboratory in the past, but it is not functioning currently.	Available. Samples are taken from each field. Tested before and after sorting.	Available	Unconfirmed
Incubator	Available	Available	Available	Available	None	None	It was available in the past, but it broke down.	Available	Available (Broken)	Unconfirmed
Petri plates and etc.	Using sealed containers. Frequency of water supply is less.	Using sealed containers. Frequency of water supply is less.	Using sealed containers. Frequency of water supply is less.	Available	None Using ordinal tray.	Using expensive filters for germination test, but it seemed to be unnecessary.	Using petri plates, but the number of them is small.	Using sealed containers. Frequency of water supply is less.	Unconfirmed	Unconfirmed
Moisture meter	-One unit of Kett -One unit of the other company	-One unit of Kett -Three units of the other companies.	Two units	One of the units is made by Kett	None	One of the units was made by Kett, but it was submerged during the flood and was unusable.	One unit was provided by RISEP, but it broke down.	-One unit of Kett -One unit of Satake (It is old and nearly broken.)	Available	Two units

	Vientiane Province PAFO	Vientiane Capital PAFO	Khammouane PAFO	Savannakhet PAFO	Salavan PAFO	Champasak PAFO	LARC	RRC	Thasano ARC	Phongum ARC
Other equipments	Drying oven, Rice specific gravity sorter, Digital scale, etc.	Drying oven, Rice specific gravity sorter, Digital scale, etc.	Digital scale, Sorter, Rice hulling machine, Drying oven, etc.	Digital scale, Sorter, Drying oven, etc.	None	Clean benches, a lot of stereomicroscopes	None	Two sorters, Drying oven, etc.	Digital scale (Broken), Rice hulling machine for testing.	Unconfirmed
Skills of technicians	Experienced technicians	Unconfirmed	Experienced technicians	Unconfirmed	Germination tests can be conducted.	Germination tests can be conducted enough.	Germination tests can be conducted enough.	Three experienced technicians	Unconfirmed	Unconfirmed

Situation of Nursery Preparation in each Location for 2022/23 dry season cultivation

Sites	Nursery	Seed selection	Seed disinfection	Sowing rate	Disease occurrence
Thasano ARC	Seedling box	Done	Non	150-200g/box(thick)	Non
XBF ADC	Seedling box	Done	Non	150-200g/box(thick)	NA
Nongdeang ADC	Seedling box	Done	Non	150-200g/box(thick)	NA
Pakcheng ADC	Seedling box	Done	Non	150-200g/box(thick)	Damping off/Bakanae
Nongeo ADC	Seedling box	Done	Non	150-200g/box(thick)	Bakanae
Haduashinhon	Seedling box	Done	Non	150-200g/box(thick)	Non
Ban Ko	Nursery bed	Non	Non	150g/㎡ (thick)	NA
Ban Somsaat	Nursery bed	Done	Non	144.1g/㎡ (proper)	NA
Ban Huei hee	Nursery bed	Done	Non	150g/㎡ (proper)	NA
Ban Nonxay	Nursery bed	Done	Non	96g/㎡ (proper)	Non
Ban Charanpohn	Nursery bed	Done	Non	86.7g/㎡ (proper)	NA
Ban Tun	Broadcast	Done	Non	60kg/ha	NA
Ban Hakamuhyan	Broadcast	Done	Non	100kg/ha	NA

Source: JICA Survey Team

APPENDIX-III

Survey sheet for the
rice-consuming area in the
surrounding countries

Survey Sheet for the Rice Consuming Area No.:

Survey Date:_____, Survey City:_____, Photo No. of the Shop:_____

Type of survey target:(☐Rice Trader /☐ Rice Retailer / ☐Others (specifically:)

Name of the Interviewee: (Name: _____, Age:_____, Gender: M / F,

Phone Number:(_____)

Number of years for engaging in this job:_____years, Name of the Shop:_____,

Latitude and Longitude (GPS Data)(N:_____,E:_____)

1. Type of Handling/Selling Rice

a) How many types of rice are you handling/selling currently?: (count the number) types/ varieties

b) Are you handling/selling rice from Lao P.D.R. currently ?: ☐ Yes, ☐ No

c) Have you ever handled/sold rice from Lao P.D.R.? ☐ Yes, ☐ No

d) If yes above question c), when did you handle /sell the rice from Lao P.D.R.?:_____

e) If yes above question b) or c), how is/was the characteristic of rice from Lao P.D.R.?

(specifically)_____

2. Current Handling/Selling Rice

No.1

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.2

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.3

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.4

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.5

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.6

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.7

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.8

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		

Photo No. of Rice	

No.9

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.10

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Cake, ☐ Others (specifically)		
Photo No. of Rice			

3. Characteristics of good Non-glutinous Rice (multiple answers allowed)

☐ Long grain shape, ☐ Short grain shape, ☐ Not Broken, ☐ White color, ☐ No mixture with other variety,
☐ Have Aroma, ☐ No Aroma, ☐ Soft, ☐ Hard, ☐ Non-sticky, ☐ Newly harvested, ☐ Newly milled,
☐ Organic, ☐ Less chemical used, ☐ Puff up after boiling, ☐ Not getting hungry easily,

☐ Others(specifically) _____

4. Characteristics of good Glutinous Rice (multiple answers allowed)

☐ Long grain shape, ☐ Short grain shape, ☐ Not Broken, ☐ White color, ☐ No mixture with other variety,
☐ Have Aroma, ☐ No Aroma, ☐ Soft, ☐ Hard, ☐ Non-sticky, ☐ Newly harvested, ☐ Newly milled,
☐ Organic, ☐ Less chemical used, ☐ Puff up after boiling, ☐ Not getting hungry easily,

☐ Others(specifically) _____

5. Characteristics of Rice that you want/wish to deal with/sell (multiple answers allowed)

☐ Long grain shape, ☐ Short grain shape, ☐ Not Broken, ☐ White color, ☐ No mixture with other variety,
☐ Have Aroma, ☐ No Aroma, ☐ Soft, ☐ Hard, ☐ Non-sticky, ☐ Newly harvested, ☐ Newly milled,
☐ Organic, ☐ Less chemical used, ☐ Puff up after boiling, ☐ Not getting hungry easily,

☐ Others(specifically) _____

6. If you can handle/deal with the rice from Lao P.D.R., what characteristics are you expecting to have?

End of the survey sheet.
Thank you for your cooperation!!

2nd Survey Sheet for the Rice Consuming Area No.:_____

Survey Date:_____, Survey City:_____, Photo No. of the Shop:_____

Type of survey target:(☐Rice Trader /☐ Rice Retailer / ☐Others (specifically:)

Name of the Interviewee: (Name:_____, Age:_____, Gender: M / F,

Phone Number:(_____)

Number of years for engaging in this job:_____years, Name of the Shop:_____,

Latitude and Longitude (GPS Data)(N:_____,E:_____)

1. Type of Handling/Selling Rice

a) How many types of rice are you handling/selling currently?: (count the number) types/ varieties

b) Are you handling/selling rainy season rice in 2022?: ☐ Yes, ☐ No

c) Are you handling/selling rice from Lao P.D.R. currently ?: ☐ Yes, ☐ No

d) If yes above question c), is it the rainy season rice in 2022? : ☐ Yes, ☐ No

e) Have you ever handled/sold rice from Lao P.D.R.? ☐ Yes, ☐ No

f) If yes above question c), when did you handle /sell the rice from Lao P.D.R.?:_____

g) If yes above question c) or e), how is/was the characteristic of rice from Lao P.D.R.?

(specifically)_____

2. Current Handling/Selling Rice

No.1

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)_____		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)_____		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others_____		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)_____		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)_____		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)_____		
Photo No. of Rice			

No.2

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)_____		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)_____		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others_____		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)_____		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)_____		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)_____		
Photo No. of Rice			

No.3

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.4

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.5

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.6

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.7

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.8

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.9

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

No.10

Name of Rice		Sales Ranking in the Shop	
Area of Production	☐ Thailand, ☐ Vietnam, ☐ Lao P.D.R., ☐ Cambodia, ☐ Others(specifically)		
Purchased from	☐ Trader, ☐ Rice Mill, ☐ Retailer, ☐ Farmer, ☐ Others(specifically)		
Place of Purchase	☐ Within city, ☐ Outside city, ☐ Outside Prefecture, ☐ Outside Country, ☐ Others		
Type of Rice	☐ Non-glutinous, ☐ Glutinous, ☐ Black, ☐ Red, ☐ Others (specifically)		
Grain shape of Rice	☐ Long-grain, ☐ Short-grain, ☐ Others (specifically)		
Price of Rice per kg	/ kg	Sales amount /month	/ kg
Main way of eating	☐ Boil, ☐ Steam, ☐ Making Rice Cake, ☐ Others (specifically)		
Photo No. of Rice			

3. Characteristics of good selling Non-glutinous Rice in your city(multiple answers allowed)

☐ Cheaper price, ☐ Local produced rice, ☐ Imported rice, ☐ Long grain shape, ☐ Short grain shape,
☐ Not Broken, ☐ White color, ☐ No mixture with other variety, ☐ Have Aroma, ☐ No Aroma, ☐ Soft,
☐ Hard, ☐ Non-sticky, ☐ Newly harvested, ☐ Newly milled, ☐ Organic, ☐ Less chemical used,
☐ Puff up after boiling, ☐ Not getting hungry easily,

☐ Others(specifically) _____

4. Characteristics of good selling Glutinous Rice in your city (multiple answers allowed)

☐ Cheaper price, ☐ Local produced rice, ☐ Imported rice, ☐ Long grain shape, ☐ Short grain shape,
☐ Not Broken, ☐ White color, ☐ No mixture with other variety, ☐ Have Aroma, ☐ No Aroma, ☐ Soft,
☐ Hard, ☐ Non-sticky, ☐ Newly harvested, ☐ Newly milled, ☐ Organic, ☐ Less chemical used,
☐ Puff up after boiling, ☐ Not getting hungry easily,

☐ Others(specifically) _____

5. If you can handle/deal with the rice from Lao P.D.R., what characteristics are you expecting to have?

End of the survey sheet.
Thank you for your cooperation!!

APPENDIX-IV

Data for rice and rice seed demand projection

1. Price of Rice

1.1. Price data

Item	Year	1	2	3	4	5	6	7	8	9	10	11	12	Average	Unit	Source
Glutinous rice	2001	1,964						2,138					1,813	1,972	Kip/kg	LSB SYB 2001
	2002	1,778						2,226					1,988	1,997	Kip/kg	LSB SYB 2002
	2003	1,983						2,584					2,475	2,347	Kip/kg	LSB SYB 2003
	2004	2,633						2,919					2,439	2,664	Kip/kg	LSB SYB 2005
	2005	2,456						2,897					3,022	2,792	Kip/kg	LSB SYB 2005
	2006	3,056						4,069					3,961	3,695	Kip/kg	LSB SYB 2006
	2007	3,988						4,663					4,472	4,374	Kip/kg	LSB SYB 2007
	2008	4,514						4,972					4,636	4,707	Kip/kg	LSB SYB 2008
	2009	4,625						5,144					4,917	4,895	Kip/kg	LSB SYB 2009
	2010	4,917						7,458					6,944	6,440	Kip/kg	LSB SYB 2010
	2011	6,528	6,503	6,506	6,615	6,656	6,654	6,762	6,798	6,784	6,967	6,319	6,231	6,610	Kip/kg	LSB SYB 2011
	2012	6,205	6,252	6,039	6,319	6,170	6,111	5,972	5,972	5,903	6,054	6,048	5,870	6,076	Kip/kg	LSB SYB 2012
	2013	5,732	5,750	6,017	6,217	6,524	6,453	6,801	7,119	7,345	7,381	7,082	6,923	6,612	Kip/kg	LSB SYB 2013
	2014	6,909	7,084	7,146	7,207	7,207	7,287	7,505	7,491	7,543	7,515	7,479	7,364	7,311	Kip/kg	LSB SYB 2014
	2015	7,328	7,342	7,372	7,469	7,450	7,550	7,640	7,660	7,797	7,797	7,758	7,666	7,569	Kip/kg	LSB SYB 2015
	2016	6,728	6,730	6,728	6,768	6,789	7,179	7,196	7,367	7,419	7,432	7,409	7,399	7,095	Kip/kg	LSB SYB 2016
	2017	6,829	6,638	6,603	6,627	6,596	6,624	6,634	6,662	6,700	6,660	6,544	6,514	6,636	Kip/kg	LSB SYB 2017
	2018	6,577	6,762	6,729	6,706	6,728	6,757	7,074	7,148	7,365	7,238	7,030	6,840	6,913	Kip/kg	LSB SYB 2018
	2019	7,089	7,161	7,180	7,331	7,418	7,542	7,824	8,642	9,178	9,367	9,689	9,335	8,146	Kip/kg	LSB SYB 2019
	2020	9,224	9,146	9,199	9,427	9,382	9,319	9,397	9,454	9,351	9,314	9,092	8,923	9,269	Kip/kg	LSB SYB 2020
	2021	8,722	8,343	8,521	8,859	8,864	8,873	8,793	8,813	8,822	8,809	8,623	8,520	8,714	Kip/kg	LSB SYB 2021

1.1. Price data

Item	Year	1	2	3	4	5	6	7	8	9	10	11	12	Average	Unit	Source
Ordinary rice	2001	2,568						2,409					2,284	2,420	Kip/kg	LSB SYB 2001
	2002	2,297						2,683					2,839	2,606	Kip/kg	LSB SYB 2002
	2003	2,850						3,425					3,744	3,340	Kip/kg	LSB SYB 2003
	2004	3,840						4,201					3,589	3,877	Kip/kg	LSB SYB 2005
	2005	3,617						4,139					4,172	3,976	Kip/kg	LSB SYB 2005
	2006	4,361						4,875					4,533	4,590	Kip/kg	LSB SYB 2006
	2007	4,653						5,256					4,869	4,926	Kip/kg	LSB SYB 2007
	2008	4,867						7,306					6,617	6,263	Kip/kg	LSB SYB 2008
	2009	6,694						7,389					7,056	7,046	Kip/kg	LSB SYB 2009
	2010	7,111						7,917					7,500	7,509	Kip/kg	LSB SYB 2010
	2011	6,785	6,965	6,768	6,813	6,938	6,740	6,853	6,850	6,908	6,800	6,831	6,672	6,827	Kip/kg	LSB SYB 2011
	2012	6,708	6,756	6,967	6,883	7,222	7,336	7,392	7,392	7,519	7,681	7,783	7,653	7,274	Kip/kg	LSB SYB 2012
	2013	7,422	7,429	7,676	7,764	7,701	7,731	7,982	8,025	8,231	8,168	8,068	7,954	7,846	Kip/kg	LSB SYB 2013
	2014	7,931	7,999	7,973	7,924	8,134	8,090	8,017	8,116	8,147	8,075	8,026	7,960	8,033	Kip/kg	LSB SYB 2014
	2015	7,944	8,044	8,061	8,343	8,389	8,494	8,683	8,811	8,836	8,885	8,868	8,823	8,515	Kip/kg	LSB SYB 2015
	2016	8,330	8,459	8,453	8,538	8,431	8,621	8,692	8,745	8,749	8,672	8,579	8,579	8,571	Kip/kg	LSB SYB 2016
	2017	8,351	8,203	8,145	8,179	8,227	8,228	8,221	8,146	8,173	8,138	8,063	8,047	8,177	Kip/kg	LSB SYB 2017
	2018	8,169	8,357	8,281	8,416	8,390	8,693	8,777	9,179	9,555	9,396	9,481	9,271	8,830	Kip/kg	LSB SYB 2018
	2019	9,206	9,269	9,237	9,277	9,303	9,323	9,463	9,860	9,923	9,923	10,117	9,849	9,563	Kip/kg	LSB SYB 2019
	2020	9,813	9,761	9,637	9,900	9,930	9,989	10,008	10,081	10,082	10,063	9,991	9,931	9,932	Kip/kg	LSB SYB 2020
	2021	9,976	9,794	9,960	10,172	10,156	10,110	10,197	10,141	10,272	10,290	10,197	10,171	10,120	Kip/kg	LSB SYB 2021

Source：Statistical Yearbook

1.2. Production composition of type of rice

LECS Number	Financial Year	Area	Wet season				Dry season			
			Glutinous rice		Ordinary rice		Glutinous rice		Ordinary rice	
			Harvested Area 1000ha	Production 1000ton	Harvested Area 1000ha	Production 1000ton	Harvested Area 1000ha	Production 1000ton	Harvested Area 1000ha	Production 1000ton
LECS3	2002	Lao PDR	792	1,730	80	160	86	220	9	17
		Urban	118	280	10	20	17	50	2	6
		Rural with road	515	1,150	40	80	56	140	4	7
		Rural without road	159	310	30	60	13	30	3	4
		Rural	674	1,460	70	140	69	170	7	11
LECS4	2007	Lao PDR	897	1,963	132	281	76	206	4	12
		Urban	166	375	12	25	20	55	2	8
		Rural with road	644	1,420	95	208	52	144	2	4
		Rural without road	87	169	25	49	3	7	-	-
		Rural	731	1,589	120	257	55	151	2	4
LECS5	2012	Lao PDR	953.824	2,073	102.970	229	90.362	213	5.742	14
		Urban	137.776	309	10.388	27	16.092	41	0.885	2
		Rural with road	770.729	1,667	83.963	186	70.155	162	4.165	11
		Rural without road	45.319	97	8.619	16	4.116	10	0.692	1
		Rural	816.048	1,764	92.582	202	74.271	172	4.857	12
LECS6	2018	Lao PDR	810.295	2,969	91.319	282	36.256	67	5.644	8
		Urban	117.499	388	12.134	68	4.881	13	1.603	3
		Rural with road	614.811	2,469	65.133	185	28.790	49	3.543	4
		Rural without road	77.985	111	14.055	29	2.585	5	0.497	1
		Rural	692.800	2,580.5	79.200	213.8	31.400	53.9	4.000	4.7

1.2. Production composition of type of rice

LECS Number	Financial Year	Area	Total - All season							
			Glutinous rice		Ordinary rice		Rice total		Rate (Production basis)	
			Harvested Area 1000ha a	Production 1000ton b	Harvested Area 1000ha c	Production 1000ton d	Harvested Area 1000ha e=a+c	Production 1000ton f=b+d	Glutinous rice % g=b/f	Ordinary rice % h=d/f
LECS3	2002	Lao PDR	878	1,950	89	177	967	2,127	91.7	8.3
		Urban	135	330	12	26	147	356	92.7	7.3
		Rural with road	571	1,290	44	87	615	1,377	93.7	6.3
		Rural without road	172	340	33	64	205	404	84.2	15.8
		Rural	743	1,630	77	151	820	1,781	91.5	8.5
LECS4	2007	Lao PDR	973	2,169	136	293	1,109	2,462	88.1	11.9
		Urban	186	430	14	33	200	463	92.9	7.1
		Rural with road	696	1,564	97	212	793	1,776	88.1	11.9
		Rural without road	90	176	25	49	115	225	78.2	21.8
		Rural	786	1,740	122	261	908	2,001	87.0	13.0
LECS5	2012	Lao PDR	1,044	2,286	109	243	1,153	2,529	90.4	9.6
		Urban	154	350	11	29	165	379	92.3	7.7
		Rural with road	841	1,829	88	197	929	2,026	90.3	9.7
		Rural without road	49	107	9	17	58	124	86.3	13.7
		Rural	890	1,936	97	214	987	2,150	90.0	10.0
LECS6	2018	Lao PDR	847	3,036	97	290	944	3,326	91.3	8.7
		Urban	122	401	14	71	136	472	85.0	15.0
		Rural with road	644	2,518	69	189	713	2,707	93.0	7.0
		Rural without road	81	116	15	30	96	146	79.5	20.5
		Rural	724	2,634	83	219	807	2,853	92.3	7.7

1.3. Yearly average price of rice

LECS Number	Survey Period	Rice Type	Rice Price (Unit : Kip/kg)														
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
LECS3	2002. 3 ～	Glutinous rice	-	-	-	2,226	-	-	-	-	1,988	1,983	-	-	-	-	-
	～ 2003. 2	Ordinary rice	-	-	-	2,683	-	-	-	-	2,839	2,850	-	-	-	-	-
LECS4	2007. 4 ～	Glutinous rice	-	-	-	4,663	-	-	-	-	4,472	4,514	-	-	-	-	-
	～ 2008. 3	Ordinary rice	-	-	-	5,256	-	-	-	-	4,869	4,867	-	-	-	-	-
LECS5	2012. 4 ～	Glutinous rice	6,319	6,170	6,111	5,972	5,972	5,903	6,054	6,048	5,870	5,732	5,750	6,017	-	-	-
	～ 2013. 3	Ordinary rice	6,883	7,222	7,336	7,392	7,392	7,519	7,681	7,783	7,653	7,422	7,429	7,676	-	-	-
LECS6	2018. 6 ～	Glutinous rice	-	-	6,757	7,074	7,148	7,365	7,238	7,030	6,840	7,089	7,161	7,180	7,331	7,418	7,542
	～ 2019. 6	Ordinary rice	-	-	8,693	8,777	9,179	9,555	9,396	9,481	9,271	9,206	9,269	9,237	9,277	9,303	9,323

LECS Number	Financial Year	Area	Glutinous rice		Ordinary rice		Weighted
			Average price Kip/kg	Percentage %	Average price Kip/kg	Percentage %	Average price Kip/kg
			a	b	c	d	e=a*b+c*d
LECS3	2002	Lao PDR	2,065.7	91.7	2,790.7	8.3	2,126.0
LECS4	2007	Lao PDR	4,549.7	88.1	4,997.3	11.9	4,603.0
LECS5	2012	Lao PDR	5,993.2	90.4	7,449.0	9.6	6,133.1
LECS6	2018	Lao PDR	7,167.2	91.3	9,228.2	8.7	7,346.9

2. Consumer Price Index

2.1. Consumer Price Index data

Item	Year	Base (=100)	1	2	3	4	5	6	7	8	9	10	11	12	Average	Source
Consumer Price Index	1990	1995 Dec	49.8	51.9	51.9	53.8	55.4	56.7	58.3	58.1	58.3	59.1	58.4	58.5	55.85	BASIC STATISTICS 1975-2005
	1991	1995 Dec	57.3	57.3	59.1	61.1	64.2	65.4	66.2	65.8	66.1	66.4	65.5	64.5	63.24	
	1992	1995 Dec	64.5	64.6	65.3	66.3	68.7	70.0	73.5	74.5	74.3	73.3	70.3	68.4	69.48	
	1993	1995 Dec	68.6	68.8	69.3	71.3	72.2	73.7	76.7	78.4	79.1	78.2	75.2	74.5	73.83	
	1994	1995 Dec	73.8	73.8	75.7	77.0	77.5	78.8	80.6	82.3	83.8	82.4	80.6	79.6	78.83	
	1995	1995 Dec	79.6	80.1	83.7	88.4	93.9	93.7	96.4	102.6	106.5	104.6	102.2	100.0	94.31	
	1996	1995 Dec	101.4	103.3	105.6	107.5	109.5	110.0	111.2	111.3	113.9	112.5	111.8	112.8	109.23	
	1997	1995 Dec	113.0	115.7	118.7	120.7	127.3	127.5	133.0	139.9	145.4	142.7	139.9	142.8	130.55	
	1998	1995 Dec	148.3	167.3	172.9	196.1	207.3	257.0	271.1	279.1	300.1	303.3	330.5	345.4	248.20	
	1999	1995 Dec	372.0	419.0	461.7	508.4	529.4	577.5	639.0	670.4	668.0	670.7	642.3	644.1	566.88	
	2000	1995 Dec	653.9	665.2	670.8	685.6	693.7	701.1	706.5	714.8	732.2	726.7	713.2	712.1	697.98	
	2000	1999 Dec	101.5	103.3	104.2	106.4	107.7	108.9	109.7	111.0	113.7	112.8	110.7	110.6	108.38	LSB SYB 2007
	2001	1999 Dec	111.8	112.6	113.0	114.7	116.2	116.1	117.3	120.0	120.8	120.8	119.8	118.9	116.83	
	2002	1999 Dec	119.8	120.7	121.1	123.3	124.0	126.7	130.8	135.1	138.6	138.1	136.6	136.9	129.31	
	2003	1999 Dec	138.2	139.6	142.7	145.3	146.6	147.8	150.0	155.2	158.5	158.0	155.3	154.2	149.28	
	2004	1999 Dec	155.6	157.6	159.8	162.6	164.7	166.4	168.2	169.5	170.2	168.7	167.9	167.6	164.90	
	2005	1999 Dec	168.1	168.7	170.1	173.0	174.6	175.5	177.2	180.6	183.2	184.6	182.6	182.3	176.71	
	2006	1999 Dec	181.7	183.2	184.1	187.4	188.5	189.7	190.9	193.1	193.2	191.5	190.7	190.8	188.73	
	2007	1999 Dec	191.7	192.2	192.6	194.1	195.0	196.3	197.7	200.0	201.4	202.2	202.6	201.3	197.26	
	2005	2010 Dec	73.6	73.8	74.4	75.7	76.4	76.8	77.5	79.0	80.2	80.8	79.9	79.8	77.33	LSB SYB 2011
	2006	2010 Dec	79.5	80.1	80.5	82.0	82.5	83.0	83.5	84.5	84.5	83.8	83.5	83.5	82.58	
	2007	2010 Dec	83.9	84.1	84.3	84.9	85.3	85.9	86.5	87.5	88.1	88.5	88.6	88.2	86.32	
	2008	2010 Dec	89.0	89.5	90.8	92.3	94.1	94.7	95.1	95.9	95.6	94.2	92.7	91.0	92.91	
	2009	2010 Dec	91.2	91.0	91.4	92.1	92.6	92.9	93.7	93.7	93.9	94.1	94.1	94.5	92.93	
	2010	2010 Dec	95.0	95.2	95.9	96.6	97.1	97.5	100.1	101.2	101.6	101.5	100.4	100.0	98.51	
	2011	2010 Dec	100.7	101.6	103.3	105.5	106.5	106.8	107.2	107.6	108.0	108.3	108.3	107.7	105.96	
	2011	2015 Dec	81.06	81.74	83.08	84.89	85.71	85.93	86.26	86.57	86.91	87.15	87.17	86.65	85.26	LSB SYB 2021
	2012	2015 Dec	86.48	86.73	87.51	88.60	88.94	88.99	88.77	89.47	90.10	90.21	90.10	90.75	88.89	
	2013	2015 Dec	91.40	91.97	92.59	93.43	94.01	94.56	95.37	95.58	96.28	96.27	96.36	96.79	94.55	
	2014	2015 Dec	96.88	97.17	97.52	98.34	98.46	98.58	98.90	99.04	99.21	99.19	99.07	99.11	98.46	
	2015	2015 Dec	98.86	98.57	98.68	99.27	99.63	99.93	100.06	100.31	100.43	100.49	100.32	100.00	99.71	
	2016	2015 Dec	99.69	99.86	99.79	100.23	100.79	101.55	102.04	102.17	102.28	102.36	102.42	102.49	101.31	
	2017	2015 Dec	101.95	101.53	101.54	101.75	101.88	101.97	102.01	102.33	102.60	102.85	102.66	102.64	102.14	
	2018	2015 Dec	102.92	103.30	103.47	103.66	103.88	104.20	104.50	104.96	105.73	105.06	104.86	104.16	104.23	
	2019	2015 Dec	104.46	104.93	105.19	105.95	106.52	106.79	107.64	108.46	109.88	110.67	111.06	110.71	107.69	
	2020	2015 Dec	111.71	111.47	111.65	112.13	112.34	112.43	113.15	114.79	114.97	114.69	114.22	114.24	113.15	
	2021	2015 Dec	114.00	113.65	114.42	115.81	116.38	116.93	118.51	119.21	119.81	120.15	120.03	120.30	117.43	

2.1. Consumer Price Index data

Item	Year	Base (=100)	1	2	3	4	5	6	7	8	9	10	11	12	Average	Source
Consumer Price Index Foods Group	2000	1999 Dec	101.9	104.6	105.7	110.0	110.2	111.0	111.9	113.8	117.9	115.0	110.1	109.1	110.10	LSB SYB 2007
	2001	1999 Dec	110.9	112.2	112.8	115.6	118.2	117.8	119.0	122.9	122.9	121.6	118.8	116.1	117.40	
	2002	1999 Dec	117.8	120.1	121.6	124.8	125.9	128.0	132.7	135.8	138.4	136.2	132.2	132.1	128.80	
	2003	1999 Dec	132.9	134.5	138.1	141.5	144.7	147.2	150.5	159.6	164.4	161.9	154.6	151.2	148.43	
	2004	1999 Dec	152.2	155.1	158.1	162.7	165.8	167.3	169.6	170.9	171.0	166.3	164.0	162.6	163.80	
	2005	1999 Dec	163.5	164.6	166.8	170.7	173.7	175.4	178.1	183.6	187.0	187.2	183.7	182.0	176.36	
	2006	1999 Dec	181.1	182.8	184.7	190.6	191.5	193.2	195.8	199.7	200.7	198.9	198.2	198.9	193.01	
	2007	1999 Dec	201.5	202.1	202.9	204.7	204.9	206.7	209.5	213.3	216.0	216.5	214.0	210.7	208.57	
	2005	2010 Dec	63.2	63.6	64.5	66.0	67.1	67.7	68.8	70.9	72.3	72.3	71.0	70.3	68.14	LSB SYB 2011
	2006	2010 Dec	70.0	70.6	71.4	73.6	74.0	74.6	75.7	77.1	77.6	76.8	76.6	76.8	74.57	
	2007	2010 Dec	77.8	78.1	78.4	79.1	79.2	79.9	80.9	82.4	83.5	83.6	82.7	81.4	80.58	
	2008	2010 Dec	82.5	83.7	85.6	88.3	90.4	91.2	91.7	94.2	94.2	92.5	91.2	90.0	89.63	
	2009	2010 Dec	90.0	89.4	90.3	91.4	91.9	91.7	92.6	92.3	92.7	93.1	92.3	92.6	91.69	
	2010	2010 Dec	92.7	93.1	94.1	95.1	96.0	97.4	101.9	104.0	104.7	104.3	101.5	100.0	98.73	
	2011	2010 Dec	101.0	101.5	103.1	107.3	108.6	110.0	111.0	111.2	112.0	112.6	112.1	110.7	108.43	
	2011	- -	100.97	101.49	103.07	107.30	108.63	110.04	110.99	111.17	111.95	112.63	112.11	110.66	108.42	LSB SYB 2021
	2012	- -	109.80	110.12	111.28	113.85	114.73	115.56	115.69	116.58	116.90	117.24	116.98	118.97	114.81	
	2013	- -	119.99	121.24	122.80	126.05	128.92	129.92	131.45	131.86	132.84	132.87	132.77	133.25	128.66	
	2014	- -	133.54	134.37	134.96	137.07	137.46	137.94	138.72	139.20	139.98	139.42	139.22	139.27	137.60	
	2015	- -	139.43	139.68	140.02	142.48	143.18	143.93	144.55	145.48	146.20	146.50	146.17	145.74	143.61	
	2011	2015 Dec	69.28	69.64	70.72	73.62	74.54	75.50	76.16	76.28	76.81	77.28	76.92	75.93	74.39	Corrected
	2012	2015 Dec	75.34	75.56	76.36	78.12	78.72	79.29	79.38	79.99	80.21	80.44	80.27	81.63	78.78	
	2013	2015 Dec	82.33	83.19	84.26	86.49	88.46	89.15	90.19	90.48	91.15	91.17	91.10	91.43	88.28	
	2014	2015 Dec	91.63	92.20	92.60	94.05	94.32	94.65	95.18	95.51	96.05	95.66	95.53	95.56	94.41	
	2015	2015 Dec	95.67	95.84	96.08	97.76	98.24	98.76	99.18	99.82	100.32	100.52	100.30	100.00	98.54	
	2016	2015 Dec	99.66	100.30	100.33	101.25	101.93	102.71	103.40	103.76	103.73	103.84	103.82	103.88	102.38	LSB SYB 2021
	2017	2015 Dec	102.77	101.82	101.67	102.04	102.22	102.42	102.50	102.88	103.12	103.27	102.60	102.35	102.47	
	2018	2015 Dec	102.67	103.02	103.25	103.40	103.57	103.87	104.23	104.91	106.09	104.77	104.27	103.12	103.93	
	2019	2015 Dec	103.67	104.37	104.61	105.61	106.46	107.04	108.41	109.43	111.70	112.94	113.54	112.36	108.35	
	2020	2015 Dec	113.78	113.04	113.55	115.44	115.91	115.41	116.15	118.31	118.65	118.13	117.11	116.43	115.99	
	2021	2015 Dec	115.75	114.98	115.96	118.45	119.35	119.89	121.40	122.16	123.02	122.38	121.04	120.53	119.58	

Source：Statistical Yearbook

2.2. Modification of Consumer Price Index

Item	Year	Base Year Modification	1	2	3	4	5	6	7	8	9	10	11	12	Average
		From → To													
Consumer Price Index	2000	1995 Dec →	653.90	665.20	670.80	685.60	693.70	701.10	706.50	714.80	732.20	726.70	713.20	712.10	697.98
	2000	→ 1999 Dec	101.50	103.30	104.20	106.40	107.70	108.90	109.70	111.00	113.70	112.80	110.70	110.60	108.38
	Modification Coefficient	1995 Dec → 1999 Dec	0.15522	0.15529	0.15534	0.15519	0.15525	0.15533	0.15527	0.15529	0.15529	0.15522	0.15522	0.15532	
	1990	1995 Dec → 1999 Dec	7.73	8.06	8.06	8.35	8.60	8.81	9.05	9.02	9.05	9.17	9.06	9.09	8.67
	1991	1995 Dec → 1999 Dec	8.89	8.90	9.18	9.48	9.97	10.16	10.28	10.22	10.26	10.31	10.17	10.02	9.82
	1992	1995 Dec → 1999 Dec	10.01	10.03	10.14	10.29	10.67	10.87	11.41	11.57	11.54	11.38	10.91	10.62	10.79
	1993	1995 Dec → 1999 Dec	10.65	10.68	10.77	11.07	11.21	11.45	11.91	12.17	12.28	12.14	11.67	11.57	11.46
	1994	1995 Dec → 1999 Dec	11.46	11.46	11.76	11.95	12.03	12.24	12.51	12.78	13.01	12.79	12.51	12.36	12.24
	1995	1995 Dec → 1999 Dec	12.36	12.44	13.00	13.72	14.58	14.55	14.97	15.93	16.54	16.24	15.86	15.53	14.64
	1996	1995 Dec → 1999 Dec	15.74	16.04	16.40	16.68	17.00	17.09	17.27	17.28	17.69	17.46	17.35	17.52	16.96
	1997	1995 Dec → 1999 Dec	17.54	17.97	18.44	18.73	19.76	19.80	20.65	21.73	22.58	22.15	21.72	22.18	20.27
	1998	1995 Dec → 1999 Dec	23.02	25.98	26.86	30.43	32.18	39.92	42.09	43.34	46.60	47.08	51.30	53.65	38.54
	1999	1995 Dec → 1999 Dec	57.74	65.07	71.72	78.90	82.19	89.70	99.22	104.11	103.73	104.11	99.70	100.04	88.02
	2007	1999 Dec →	191.70	192.20	192.60	194.10	195.00	196.30	197.70	200.00	201.40	202.20	202.60	201.30	197.26
	2007	→ 2010 Dec	83.90	84.10	84.30	84.90	85.30	85.90	86.50	87.50	88.10	88.50	88.60	88.20	86.32
	Modification Coefficient	1999 Dec → 2010 Dec	0.43766	0.43757	0.43769	0.43740	0.43744	0.43760	0.43753	0.43750	0.43744	0.43769	0.43731	0.43815	
	1990	1999 Dec → 2010 Dec	3.38	3.53	3.53	3.65	3.76	3.86	3.96	3.95	3.96	4.01	3.96	3.98	3.79
	1991	1999 Dec → 2010 Dec	3.89	3.89	4.02	4.15	4.36	4.45	4.50	4.47	4.49	4.51	4.45	4.39	4.30
	1992	1999 Dec → 2010 Dec	4.38	4.39	4.44	4.50	4.67	4.76	4.99	5.06	5.05	4.98	4.77	4.65	4.72
	1993	1999 Dec → 2010 Dec	4.66	4.67	4.71	4.84	4.90	5.01	5.21	5.32	5.37	5.31	5.10	5.07	5.01
	1994	1999 Dec → 2010 Dec	5.02	5.01	5.15	5.23	5.26	5.36	5.47	5.59	5.69	5.60	5.47	5.42	5.36
	1995	1999 Dec → 2010 Dec	5.41	5.44	5.69	6.00	6.38	6.37	6.55	6.97	7.24	7.11	6.94	6.80	6.41
	1996	1999 Dec → 2010 Dec	6.89	7.02	7.18	7.30	7.44	7.48	7.56	7.56	7.74	7.64	7.59	7.68	7.42
	1997	1999 Dec → 2010 Dec	7.68	7.86	8.07	8.19	8.64	8.66	9.03	9.51	9.88	9.69	9.50	9.72	8.87
	1998	1999 Dec → 2010 Dec	10.07	11.37	11.76	13.31	14.08	17.47	18.42	18.96	20.38	20.61	22.43	23.51	16.86
	1999	1999 Dec → 2010 Dec	25.27	28.47	31.39	34.51	35.95	39.25	43.41	45.55	45.38	45.57	43.60	43.83	38.52
	2000	1999 Dec → 2010 Dec	44.42	45.20	45.61	46.54	47.11	47.65	48.00	48.56	49.74	49.37	48.41	48.46	47.42
	2001	1999 Dec → 2010 Dec	48.93	49.27	49.46	50.17	50.83	50.81	51.32	52.50	52.84	52.87	52.39	52.10	51.12
	2002	1999 Dec → 2010 Dec	52.43	52.81	53.00	53.93	54.24	55.44	57.23	59.11	60.63	60.44	59.74	59.98	56.58
	2003	1999 Dec → 2010 Dec	60.48	61.08	62.46	63.55	64.13	64.68	65.63	67.90	69.33	69.16	67.91	67.56	65.32
	2004	1999 Dec → 2010 Dec	68.10	68.96	69.94	71.12	72.05	72.82	73.59	74.16	74.45	73.84	73.42	73.43	72.16

2.2. Modification of Consumer Price Index

Item	Year	Base Year Modification	1	2	3	4	5	6	7	8	9	10	11	12	Average
		From → To													
Consumer Price Index	2011	2010 Dec →	100.70	101.60	103.30	105.50	106.50	106.80	107.20	107.60	108.00	108.30	108.30	107.70	105.96
	2011	→ 2015 Dec	81.06	81.74	83.08	84.89	85.71	85.93	86.26	86.57	86.91	87.15	87.17	86.65	85.26
	Modification Coefficient	2010 Dec → 2015 Dec	0.80497	0.80453	0.80426	0.80464	0.80479	0.80459	0.80466	0.80455	0.80472	0.80471	0.80489	0.80455	
	1990	2010 Dec → 2015 Dec	2.72	2.84	2.84	2.94	3.03	3.11	3.19	3.18	3.19	3.23	3.19	3.20	3.06
	1991	2010 Dec → 2015 Dec	3.13	3.13	3.23	3.34	3.51	3.58	3.62	3.60	3.61	3.63	3.58	3.53	3.46
	1992	2010 Dec → 2015 Dec	3.53	3.53	3.57	3.62	3.76	3.83	4.02	4.07	4.06	4.01	3.84	3.74	3.80
	1993	2010 Dec → 2015 Dec	3.75	3.76	3.79	3.89	3.94	4.03	4.19	4.28	4.32	4.27	4.10	4.08	4.03
	1994	2010 Dec → 2015 Dec	4.04	4.03	4.14	4.21	4.23	4.31	4.40	4.50	4.58	4.51	4.40	4.36	4.31
	1995	2010 Dec → 2015 Dec	4.35	4.38	4.58	4.83	5.13	5.13	5.27	5.61	5.83	5.72	5.59	5.47	5.16
	1996	2010 Dec → 2015 Dec	5.55	5.65	5.77	5.87	5.99	6.02	6.08	6.08	6.23	6.15	6.11	6.18	5.97
	1997	2010 Dec → 2015 Dec	6.18	6.32	6.49	6.59	6.95	6.97	7.27	7.65	7.95	7.80	7.65	7.82	7.14
	1998	2010 Dec → 2015 Dec	8.11	9.15	9.46	10.71	11.33	14.06	14.82	15.25	16.40	16.59	18.05	18.91	13.57
	1999	2010 Dec → 2015 Dec	20.34	22.90	25.25	27.77	28.93	31.58	34.93	36.65	36.52	36.67	35.09	35.26	30.99
	2000	2010 Dec → 2015 Dec	35.76	36.36	36.68	37.45	37.91	38.34	38.62	39.07	40.03	39.73	38.96	38.99	38.16
	2001	2010 Dec → 2015 Dec	39.39	39.64	39.78	40.37	40.91	40.88	41.30	42.24	42.52	42.55	42.17	41.92	41.14
	2002	2010 Dec → 2015 Dec	42.20	42.49	42.63	43.39	43.65	44.61	46.05	47.56	48.79	48.64	48.08	48.26	45.53
	2003	2010 Dec → 2015 Dec	48.68	49.14	50.23	51.13	51.61	52.04	52.81	54.63	55.79	55.65	54.66	54.36	52.56
	2004	2010 Dec → 2015 Dec	54.82	55.48	56.25	57.23	57.99	58.59	59.21	59.67	59.91	59.42	59.10	59.08	58.06
	2005	2010 Dec → 2015 Dec	59.25	59.37	59.84	60.91	61.49	61.79	62.36	63.56	64.54	65.02	64.31	64.20	62.22
	2006	2010 Dec → 2015 Dec	64.00	64.44	64.74	65.98	66.40	66.78	67.19	67.98	68.00	67.43	67.21	67.18	66.44
	2007	2010 Dec → 2015 Dec	67.54	67.66	67.80	68.31	68.65	69.11	69.60	70.40	70.90	71.22	71.31	70.96	69.46
	2008	2010 Dec → 2015 Dec	71.64	72.01	73.03	74.27	75.73	76.19	76.52	77.16	76.93	75.80	74.61	73.21	74.76
	2009	2010 Dec → 2015 Dec	73.41	73.21	73.51	74.11	74.52	74.75	75.40	75.39	75.56	75.72	75.74	76.03	74.78
	2010	2010 Dec → 2015 Dec	76.47	76.59	77.13	77.73	78.15	78.45	80.55	81.42	81.76	81.68	80.81	80.46	79.27

2.2. Modification of Consumer Price Index

Item	Year	Base Year Modification	1	2	3	4	5	6	7	8	9	10	11	12	Average
		From → To													
Consumer Price Index	2018	2015 Dec →	102.92	103.30	103.47	103.66	103.88	104.20	104.50	104.96	105.73	105.06	104.86	104.16	104.23
	Modification Coefficient	2015 Dec → 2018 Dec	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	0.96006	
	1990	2015 Dec → 2018 Dec	2.61	2.73	2.73	2.82	2.91	2.99	3.06	3.05	3.06	3.10	3.06	3.07	2.93
	1991	2015 Dec → 2018 Dec	3.00	3.00	3.10	3.21	3.37	3.44	3.48	3.46	3.47	3.49	3.44	3.39	3.32
	1992	2015 Dec → 2018 Dec	3.39	3.39	3.43	3.48	3.61	3.68	3.86	3.91	3.90	3.85	3.69	3.59	3.65
	1993	2015 Dec → 2018 Dec	3.60	3.61	3.64	3.73	3.78	3.87	4.02	4.11	4.15	4.10	3.94	3.92	3.87
	1994	2015 Dec → 2018 Dec	3.88	3.87	3.97	4.04	4.06	4.14	4.22	4.32	4.40	4.33	4.22	4.19	4.14
	1995	2015 Dec → 2018 Dec	4.18	4.21	4.40	4.64	4.93	4.93	5.06	5.39	5.60	5.49	5.37	5.25	4.95
	1996	2015 Dec → 2018 Dec	5.33	5.42	5.54	5.64	5.75	5.78	5.84	5.84	5.98	5.90	5.87	5.93	5.74
	1997	2015 Dec → 2018 Dec	5.93	6.07	6.23	6.33	6.67	6.69	6.98	7.34	7.63	7.49	7.34	7.51	6.85
	1998	2015 Dec → 2018 Dec	7.79	8.78	9.08	10.28	10.88	13.50	14.23	14.64	15.74	15.93	17.33	18.15	13.03
	1999	2015 Dec → 2018 Dec	19.53	21.99	24.24	26.66	27.77	30.32	33.53	35.19	35.06	35.21	33.69	33.85	29.75
	2000	2015 Dec → 2018 Dec	34.33	34.91	35.22	35.95	36.40	36.81	37.08	37.51	38.43	38.14	37.40	37.43	36.63
	2001	2015 Dec → 2018 Dec	37.82	38.06	38.19	38.76	39.28	39.25	39.65	40.55	40.82	40.85	40.49	40.25	39.50
	2002	2015 Dec → 2018 Dec	40.51	40.79	40.93	41.66	41.91	42.83	44.21	45.66	46.84	46.70	46.16	46.33	43.71
	2003	2015 Dec → 2018 Dec	46.74	47.18	48.22	49.09	49.55	49.96	50.70	52.45	53.56	53.43	52.48	52.19	50.46
	2004	2015 Dec → 2018 Dec	52.63	53.26	54.00	54.94	55.67	56.25	56.85	57.29	57.52	57.05	56.74	56.72	55.74
	2005	2015 Dec → 2018 Dec	56.88	57.00	57.45	58.48	59.03	59.32	59.87	61.02	61.96	62.42	61.74	61.64	59.73
	2006	2015 Dec → 2018 Dec	61.44	61.87	62.15	63.34	63.75	64.11	64.51	65.26	65.28	64.74	64.53	64.50	63.79
	2007	2015 Dec → 2018 Dec	64.84	64.96	65.09	65.58	65.91	66.35	66.82	67.59	68.07	68.38	68.46	68.13	66.68
	2008	2015 Dec → 2018 Dec	68.78	69.13	70.11	71.30	72.71	73.15	73.46	74.08	73.86	72.77	71.63	70.29	71.77
	2009	2015 Dec → 2018 Dec	70.48	70.29	70.57	71.15	71.54	71.76	72.39	72.38	72.54	72.70	72.71	72.99	71.79
	2010	2015 Dec → 2018 Dec	73.42	73.53	74.05	74.63	75.03	75.32	77.33	78.17	78.49	78.42	77.58	77.25	76.10
	2011	2015 Dec → 2018 Dec	77.82	78.48	79.76	81.50	82.29	82.50	82.81	83.11	83.44	83.67	83.69	83.19	81.86
	2012	2015 Dec → 2018 Dec	83.03	83.27	84.01	85.06	85.39	85.44	85.22	85.90	86.50	86.61	86.50	87.13	85.34
	2013	2015 Dec → 2018 Dec	87.75	88.30	88.89	89.70	90.26	90.78	91.56	91.76	92.43	92.42	92.51	92.92	90.77
	2014	2015 Dec → 2018 Dec	93.01	93.29	93.63	94.41	94.53	94.64	94.95	95.08	95.25	95.23	95.11	95.15	94.52
	2015	2015 Dec → 2018 Dec	94.91	94.63	94.74	95.31	95.65	95.94	96.06	96.30	96.42	96.48	96.31	96.01	95.73
	2016	2015 Dec → 2018 Dec	95.71	95.87	95.80	96.23	96.76	97.49	97.96	98.09	98.19	98.27	98.33	98.40	97.26
	2017	2015 Dec → 2018 Dec	97.88	97.47	97.48	97.69	97.81	97.90	97.94	98.24	98.50	98.74	98.56	98.54	98.06
	2018	2015 Dec → 2018 Dec	98.81	99.17	99.34	99.52	99.73	100.04	100.33	100.77	101.51	100.86	100.67	100.00	100.06
	2019	2015 Dec → 2018 Dec	100.29	100.74	100.99	101.72	102.27	102.52	103.34	104.13	105.49	106.25	106.62	106.29	103.39
	2020	2015 Dec → 2018 Dec	107.25	107.02	107.19	107.65	107.85	107.94	108.63	110.21	110.38	110.11	109.66	109.68	108.63
	2021	2015 Dec → 2018 Dec	109.45	109.11	109.85	111.18	111.73	112.26	113.78	114.45	115.02	115.35	115.24	115.50	112.74

2.2. Modification of Consumer Price Index

Item	Year	Base Year Modification	1	2	3	4	5	6	7	8	9	10	11	12	Average
		From → To													
Consumer Price Index Foods Group	2007	1999 Dec →	201.50	202.10	202.90	204.70	204.90	206.70	209.50	213.30	216.00	216.50	214.00	210.70	208.57
	2007	→ 2010 Dec	77.80	78.10	78.40	79.10	79.20	79.90	80.90	82.40	83.50	83.60	82.70	81.40	80.58
	Modification Coefficient	1999 Dec → 2010 Dec	0.38610	0.38644	0.38640	0.38642	0.38653	0.38655	0.38616	0.38631	0.38657	0.38614	0.38645	0.38633	
	2000	1999 Dec → 2010 Dec	39.34	40.42	40.84	42.51	42.60	42.91	43.21	43.96	45.58	44.41	42.55	42.15	42.54
	2001	1999 Dec → 2010 Dec	42.82	43.36	43.59	44.67	45.69	45.54	45.95	47.48	47.51	46.95	45.91	44.85	45.36
	2002	1999 Dec → 2010 Dec	45.48	46.41	46.99	48.23	48.66	49.48	51.24	52.46	53.50	52.59	51.09	51.03	49.76
	2003	1999 Dec → 2010 Dec	51.31	51.98	53.36	54.68	55.93	56.90	58.12	61.66	63.55	62.52	59.75	58.41	57.35
	2004	1999 Dec → 2010 Dec	58.76	59.94	61.09	62.87	64.09	64.67	65.49	66.02	66.10	64.22	63.38	62.82	63.29
	2011	2010 Dec →	101.00	101.50	103.10	107.30	108.60	110.00	111.00	111.20	112.00	112.60	112.10	110.70	108.43
	2011	→ 2015 Dec	69.28	69.64	70.72	73.62	74.54	75.50	76.16	76.28	76.81	77.28	76.92	75.93	74.39
	Modification Coefficient	2010 Dec → 2015 Dec	0.68594	0.68611	0.68594	0.68611	0.68637	0.68636	0.68613	0.68597	0.68580	0.68632	0.68617	0.68591	
	2000	2010 Dec → 2015 Dec	26.98	27.73	28.01	29.17	29.24	29.45	29.65	30.16	31.26	30.48	29.20	28.91	29.19
	2001	2010 Dec → 2015 Dec	29.37	29.75	29.90	30.65	31.36	31.26	31.53	32.57	32.58	32.22	31.50	30.76	31.12
	2002	2010 Dec → 2015 Dec	31.20	31.84	32.23	33.09	33.40	33.96	35.16	35.99	36.69	36.09	35.06	35.00	34.14
	2003	2010 Dec → 2015 Dec	35.20	35.66	36.60	37.52	38.39	39.05	39.88	42.30	43.58	42.91	41.00	40.06	39.35
	2004	2010 Dec → 2015 Dec	40.31	41.13	41.90	43.14	43.99	44.39	44.93	45.29	45.33	44.08	43.49	43.09	43.42
	2005	2010 Dec → 2015 Dec	43.35	43.64	44.24	45.28	46.06	46.47	47.21	48.64	49.58	49.62	48.72	48.22	46.75
	2006	2010 Dec → 2015 Dec	48.02	48.44	48.98	50.50	50.79	51.20	51.94	52.89	53.22	52.71	52.56	52.68	51.16
	2007	2010 Dec → 2015 Dec	53.37	53.59	53.78	54.27	54.36	54.84	55.51	56.52	57.26	57.38	56.75	55.83	55.29
	2008	2010 Dec → 2015 Dec	56.59	57.43	58.72	60.58	62.05	62.60	62.92	64.62	64.60	63.48	62.58	61.73	61.49
	2009	2010 Dec → 2015 Dec	61.73	61.34	61.94	62.71	63.08	62.94	63.56	63.32	63.57	63.90	63.33	63.52	62.91
	2010	2010 Dec → 2015 Dec	63.59	63.88	64.55	65.25	65.89	66.85	69.92	71.34	71.80	71.58	69.65	68.59	67.74

2.2. Modification of Consumer Price Index

Item	Year	Base Year Modification	1	2	3	4	5	6	7	8	9	10	11	12	Average
		From → To													
Consumer Price Index Foods Group	2018	2015 Dec →	102.67	103.02	103.25	103.40	103.57	103.87	104.23	104.91	106.09	104.77	104.27	103.12	103.93
	Modification Coefficient	2015 Dec → 2018 Dec	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	0.96974	
	2000	2015 Dec → 2018 Dec	26.16	26.89	27.16	28.29	28.36	28.56	28.75	29.25	30.31	29.56	28.32	28.04	28.30
	2001	2015 Dec → 2018 Dec	28.48	28.85	29.00	29.72	30.41	30.31	30.58	31.58	31.59	31.25	30.55	29.83	30.18
	2002	2015 Dec → 2018 Dec	30.26	30.88	31.25	32.09	32.39	32.93	34.10	34.90	35.58	35.00	34.00	33.94	33.11
	2003	2015 Dec → 2018 Dec	34.13	34.58	35.49	36.38	37.23	37.87	38.67	41.02	42.26	41.61	39.76	38.85	38.15
	2004	2015 Dec → 2018 Dec	39.09	39.89	40.63	41.83	42.66	43.05	43.57	43.92	43.96	42.75	42.17	41.79	42.11
	2005	2015 Dec → 2018 Dec	42.04	42.32	42.90	43.91	44.67	45.06	45.78	47.17	48.08	48.12	47.25	46.76	45.34
	2006	2015 Dec → 2018 Dec	46.57	46.97	47.50	48.97	49.25	49.65	50.37	51.29	51.61	51.11	50.97	51.09	49.61
	2007	2015 Dec → 2018 Dec	51.76	51.97	52.15	52.63	52.72	53.18	53.83	54.81	55.53	55.64	55.03	54.14	53.62
	2008	2015 Dec → 2018 Dec	54.88	55.69	56.94	58.75	60.17	60.71	61.02	62.66	62.65	61.56	60.69	59.86	59.63
	2009	2015 Dec → 2018 Dec	59.86	59.48	60.07	60.81	61.17	61.04	61.64	61.40	61.65	61.97	61.41	61.60	61.01
	2010	2015 Dec → 2018 Dec	61.67	61.95	62.60	63.28	63.90	64.83	67.80	69.18	69.63	69.41	67.54	66.51	65.69
	2011	2015 Dec → 2018 Dec	67.18	67.53	68.58	71.39	72.28	73.22	73.86	73.97	74.49	74.94	74.59	73.63	72.14
	2012	2015 Dec → 2018 Dec	73.06	73.27	74.05	75.76	76.34	76.89	76.98	77.57	77.78	78.01	77.84	79.16	76.39
	2013	2015 Dec → 2018 Dec	79.84	80.67	81.71	83.87	85.78	86.45	87.46	87.74	88.39	88.41	88.34	88.66	85.61
	2014	2015 Dec → 2018 Dec	88.86	89.41	89.80	91.20	91.47	91.79	92.30	92.62	93.14	92.77	92.64	92.67	91.56
	2015	2015 Dec → 2018 Dec	92.78	92.94	93.17	94.80	95.27	95.77	96.18	96.80	97.28	97.48	97.26	96.97	95.56
	2016	2015 Dec → 2018 Dec	96.64	97.26	97.29	98.19	98.85	99.60	100.27	100.62	100.59	100.70	100.68	100.74	99.29
	2017	2015 Dec → 2018 Dec	99.66	98.74	98.59	98.95	99.13	99.32	99.40	99.77	100.00	100.15	99.50	99.25	99.37
	2018	2015 Dec → 2018 Dec	99.56	99.90	100.13	100.27	100.44	100.73	101.08	101.74	102.88	101.60	101.11	100.00	100.79
	2019	2015 Dec → 2018 Dec	100.53	101.21	101.44	102.41	103.24	103.80	105.13	106.12	108.32	109.52	110.10	108.96	105.07
	2020	2015 Dec → 2018 Dec	110.34	109.62	110.11	111.95	112.40	111.92	112.64	114.73	115.06	114.56	113.57	112.91	112.48
	2021	2015 Dec → 2018 Dec	112.25	111.50	112.45	114.87	115.74	116.26	117.73	118.46	119.30	118.68	117.38	116.88	115.96

2.3. Yearly average Consumer Price Index

LECS Number	Survey Period	Base Year	Consumer Price Index																
			3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	Average
LECS1	1992. 3 ~ 1993. 2	2018	3.43	3.48	3.61	3.68	3.86	3.91	3.90	3.85	3.69	3.59	3.60	3.61	-	-	-	-	3.68
LECS2	1997. 3 ~ 1998. 2	2018	6.23	6.33	6.67	6.69	6.98	7.34	7.63	7.49	7.34	7.51	7.79	8.78	-	-	-	-	7.23
LECS3	2002. 3 ~ 2003. 2	2018	40.93	41.66	41.91	42.83	44.21	45.66	46.84	46.70	46.16	46.33	46.74	47.18	-	-	-	-	44.76
LECS4	2007. 4 ~ 2008. 3	2018	-	65.58	65.91	66.35	66.82	67.59	68.07	68.38	68.46	68.13	68.78	69.13	70.11	-	-	-	67.78
LECS5	2012. 4 ~ 2013. 3	2018	-	85.06	85.39	85.44	85.22	85.90	86.50	86.61	86.50	87.13	87.75	88.30	88.89	-	-	-	86.56
LECS6	2018. 6 ~ 2019. 6	2018	-	-	-	100.04	100.33	100.77	101.51	100.86	100.67	100.00	100.29	100.74	100.99	101.72	102.27	102.52	100.98

3. Household Number and Size

Area	Number of households				Household size						Percent of household (%)			
	LECS3 2002	LECS4 2007	LECS5 2012	LECS6 2018	LECS1 1992	LECS2 1997	LECS3 2002	LECS4 2007	LECS5 2012	LECS6 2018	LECS3 2002	LECS4 2007	LECS5 2012	LECS6 2018
Lao PDR	867	985	1,118	1,274		6.5	6.1	5.7	5.2	4.7	100.0	100.0	100.0	100.0
Urban	240	302	338	443			5.8	5.4	4.9	4.5	27.7	30.7	30.2	34.8
Rural	627	683	780	831			6.2	5.8	5.3	4.9	72.3	69.3	69.8	65.2
North	266	305	334	387			6.2	5.9	5.3	4.9	30.7	31.0	29.9	30.4
Phongsaly	25	29	34	37			6.5	6.0	5.0	4.7	2.9	2.9	3.0	2.9
Luangnamtha	23	28	30	35			6.0	5.9	5.7	5.0	2.7	2.8	2.7	2.7
Oudomxay	38	44	44	59			6.5	6.4	5.7	5.5	4.4	4.5	3.9	4.6
Bokeo	25	27	31	39			5.4	5.0	5.1	4.7	2.9	2.7	2.8	3.1
Luangprabang	61	69	78	86			6.3	5.9	5.3	4.9	7.0	7.0	7.0	6.8
Huaphanh	37	44	43	52			7.3	7.0	6.2	5.0	4.3	4.5	3.8	4.1
Xayaboury	58	64	73	80			5.6	5.3	4.7	4.5	*6.8*	6.5	*6.6*	*6.2*
Center	423	478	*550*	*636*			6.0	5.5	5.1	4.7	48.8	48.5	49.2	49.9
Vientiane C.	111	125	145	181			5.7	5.2	4.8	4.3	12.8	12.7	13.0	14.2
Xiengkhuang	30	39	44	47			7.4	6.3	5.8	5.1	3.5	4.0	3.9	3.7
Vientiane P.	62	77	97	92			5.9	5.6	4.7	4.4	7.2	7.8	8.7	7.2
Borikhamxay	38	40	49	53			5.6	5.1	4.5	4.6	4.4	4.1	4.4	4.2
Khammuane	55	63	62	83			5.8	5.3	4.7	4.2	6.3	6.4	5.5	6.5
Savannakhet	122	134	153	163			6.3	5.8	5.4	5.0	*14.2*	13.6	13.7	12.8
Xaysomboun				17						5.0	-	-	-	1.3
South	178	201	234	252			5.9	5.7	5.4	4.9	20.5	*20.5*	20.9	*19.7*
Sravane	51	58	64	69			6.0	6.1	5.3	5.2	5.9	5.9	5.7	5.4
Sekong	12	14	19	22			6.4	6.7	7.0	5.6	1.4	1.4	1.7	1.7
Champasack	97	109	125	136			5.9	5.5	5.1	4.5	11.2	11.1	11.2	10.7
Attapeu	17	20	26	25			5.9	5.5	5.4	5.2	*2.1*	*2.1*	*2.4*	*1.9*

Source : LECS3,4,5,6 and JICA Survey Team's calculations.

Note1 : Xaysomboun was formally established as a province in December 2013. Indicators for earlier than 2012 are not applicable for Xaysomboun.

Note2 : *Italic* menas corrected number.

4. Actual PCE and PCC

Area	Total HH monthly expenditure						Household size					
	LECS1 1992	LECS2 1997	LECS3 2002	LECS4 2007	LECS5 2012	LECS6 2018	LECS1 1992	LECS2 1997	LECS3 2002	LECS4 2007	LECS5 2012	LECS6 2018
	a Unit: 1000Kip/HH						b Unit: persons/HH					
Lao PDR		189.319	1,091.3	2,170.7	2,047.5	2,634.3	-	6.5	6.1	5.7	5.2	4.7
Urban				2,950.2	2,687.4	3,484.3	-	-	5.8	5.4	4.9	4.5
Rural				1,826.1	1,782.2	2,180.5	-	-	6.2	5.8	5.3	4.9
North				1,975.7	1,873.0	2,571.7	-	-	6.2	5.9	5.3	4.9
Phongsaly				1,258.6	1,825.5	2,719.4	-	-	6.5	6.0	5.0	4.7
Luangnamtha				1,654.6	2,423.6	3,799.1	-	-	6.0	5.9	5.7	5.0
Oudomxay				1,734.9	1,881.8	3,353.3	-	-	6.5	6.4	5.7	5.5
Bokeo				1,279.0	1,560.0	2,571.1	-	-	5.4	5.0	5.1	4.7
Luangprabang				2,177.6	1,817.7	2,185.7	-	-	6.3	5.9	5.3	4.9
Huaphanh				1,471.5	1,734.6	2,374.5	-	-	7.3	7.0	6.2	5.0
Xayaboury				3,035.4	1,990.1	1,927.4	-	-	5.6	5.3	4.7	4.5
Center				2,389.1	1,939.1	2,835.3	-	-	6.0	5.5	5.1	4.7
Vientiane C.				3,183.1	3,417.4	4,103.3	-	-	5.7	5.2	4.8	4.3
Xiengkhuang				2,191.0	1,961.2	2,936.8	-	-	7.4	6.3	5.8	5.1
Vientiane P.				1,857.5	2,115.1	2,628.2	-	-	5.9	5.6	4.7	4.4
Borikhamxay				2,019.1	1,840.9	2,175.6	-	-	5.6	5.1	4.5	4.6
Khammuane				1,871.8	1,525.6	1,635.8	-	-	5.8	5.3	4.7	4.2
Savannakhet				2,365.0	2,053.9	2,396.1	-	-	6.3	5.8	5.4	5.0
Xaysomboun				-	-	2,312.2	-	-	-	-	-	5.0
South				1,948.0	1,873.8	2,223.8	-	-	5.9	5.7	5.4	4.9
Sravane				1,455.9	1,305.4	1,882.5	-	-	6.0	6.1	5.3	5.2
Sekong				1,518.7	2,085.1	2,248.4	-	-	6.4	6.7	7.0	5.6
Champasack				2,299.5	1,968.6	2,406.2	-	-	5.9	5.5	5.1	4.5
Attapeu				1,759.7	2,559.9	2,144.3	-	-	5.9	5.5	5.4	5.2

4. Actual PCE and PCC

Area	Total monthly expenditure per capita: PCE						Monthly HH expenditure for foods								
							Food expenditure			Own produced food			Sub total		
	LECS1 1992	LECS2 1997	LECS3 2002	LECS4 2007	LECS5 2012	LECS6 2018	LECS4 2007	LECS5 2012	LECS6 2018	LECS4 2007	LECS5 2012	LECS6 2018	LECS4 2007	LECS5 2012	LECS6 2018
	c=a/b Unit: 1000Kip/capita						d Unit: 1000Kip/HH								
Lao PDR	-	29.1	178.9	380.8	393.8	560.5	492.5			507.0			999.5	1,284.0	1,648.2
Urban	-	-	-	546.3	548.4	774.3	887.0			251.8			1,138.8	1,529.0	1,911.0
Rural	-	-	-	314.8	336.3	445.0	318.1			619.8			937.9	1,182.4	1,507.9
North	-	-	-	334.9	353.4	524.8	332.8			582.2			915.0	1,245.5	1,724.5
Phongsaly	-	-	-	209.8	365.1	578.6	179.3			635.0			814.3	1,346.2	1,873.8
Luangnamtha	-	-	-	280.4	425.2	759.8	280.2			564.6			844.8	1,492.6	2,341.3
Oudomxay	-	-	-	271.1	330.1	609.7	260.9			655.1			916.0	1,290.3	1,877.0
Bokeo	-	-	-	255.8	305.9	547.0	232.6			536.9			769.5	1,082.1	1,527.8
Luangprabang	-	-	-	369.1	343.0	446.1	487.3			471.3			958.6	1,214.3	1,632.7
Huaphanh	-	-	-	210.2	279.8	474.9	168.6			718.8			887.4	1,263.3	1,728.1
Xayaboury	-	-	-	572.7	423.4	428.3	463.3			561.3			1,024.6	1,188.1	1,463.4
Center	-	-	-	434.4	380.2	603.3	614.8			452.8			1,067.6	1,279.4	1,673.1
Vientiane C.	-	-	-	612.1	712.0	954.3	993.0			169.5			1,162.5	1,763.0	1,918.5
Xiengkhuang	-	-	-	347.8	338.1	575.8	377.6			657.1			1,034.7	1,288.9	1,575.2
Vientiane P.	-	-	-	331.7	450.0	597.3	438.1			497.6			935.7	1,301.3	1,819.7
Borikhamxay	-	-	-	395.9	409.1	473.0	501.2			528.4			1,029.6	1,172.6	1,480.0
Khammuane	-	-	-	353.2	324.6	389.5	391.2			614.8			1,006.0	1,147.1	1,341.6
Savannakhet	-	-	-	407.8	380.4	479.2	571.9			532.6			1,104.5	1,348.9	1,597.2
Xaysomboun	-	-	-	-	-	462.4	-			-			-	-	1,496.2
South	-	-	-	341.8	347.0	453.8	444.7			521.4			966.1	1,144.5	1,468.6
Sravane	-	-	-	238.7	246.3	362.0	255.9			618.7			874.6	943.6	1,468.7
Sekong	-	-	-	226.7	297.9	401.5	366.8			536.7			903.5	1,333.5	1,646.8
Champasack	-	-	-	418.1	386.0	534.7	561.9			465.2			1,027.1	1,148.4	1,447.4
Attapeu	-	-	-	319.9	474.1	412.4	408.3			534.6			942.9	1,493.2	1,426.0

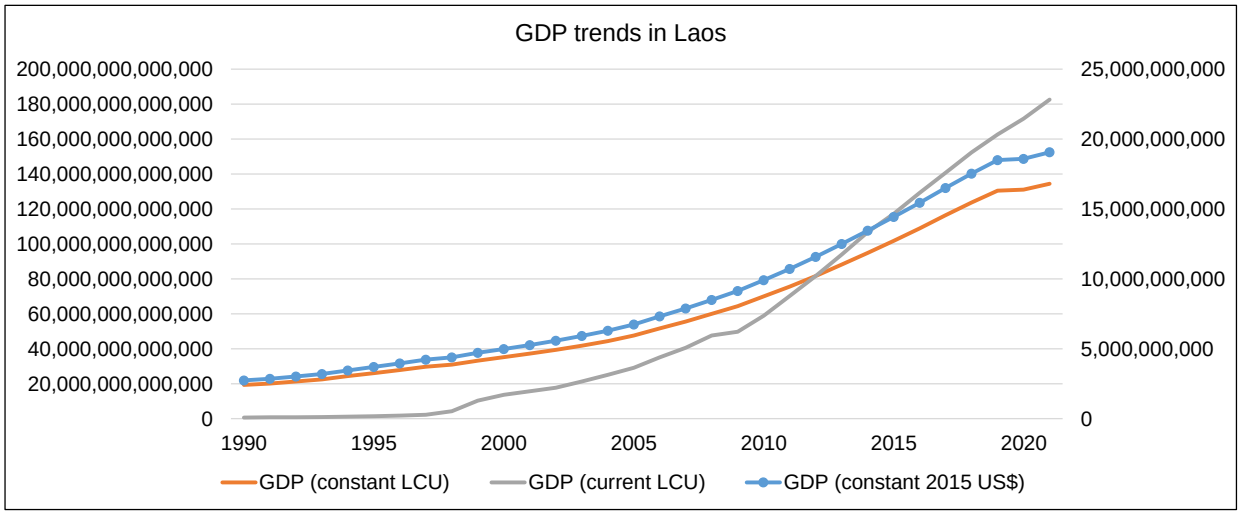
4. Actual PCE and PCC

Area	Rice consumption						Rice Price			Annual rice consumption : PCC		
	Percent among foods			Monthly HH expenditure								
	LECS4 2007	LECS5 2012	LECS6 2018	LECS4 2007	LECS5 2012	LECS6 2018	LECS4 2007	LECS5 2012	LECS6 2018	LECS4 2007	LECS5 2012	LECS6 2018
	e Unit : %			f=d*e Unit : 1000Kip/HH			g Unit : Kip/kg			h=f/g/b*12 Unit : kg/capita/yr		
Lao PDR	38.7	34.2	30.7	386.8	439.1	506.0	4,603.0	6,133.1	7,346.9	176.9	165.2	175.8
Urban	26.4	25.2	24.7	300.6	385.3	472.0	4,603.0	6,133.1	7,346.9	145.1	153.9	171.3
Rural	45.4	37.9	33.9	425.8	448.1	511.2	4,603.0	6,133.1	7,346.9	191.4	165.4	170.4
North	44.3	41.2	34.2	405.3	513.1	589.8	4,603.0	6,133.1	7,346.9	179.1	189.4	196.6
Phongsaly	46.1	43.0	31.2	375.4	578.9	584.6	4,603.0	6,133.1	7,346.9	163.1	226.5	203.2
Luangnamtha	46.9	41.6	33.7	396.2	621.6	789.0	4,603.0	6,133.1	7,346.9	175.1	213.4	257.7
Oudomxay	48.2	44.0	38.5	441.5	567.7	722.6	4,603.0	6,133.1	7,346.9	179.8	194.9	214.6
Bokeo	41.9	41.1	31.8	322.4	444.7	485.8	4,603.0	6,133.1	7,346.9	168.1	170.6	168.8
Luangprabang	40.1	37.3	31.2	384.4	452.9	509.4	4,603.0	6,133.1	7,346.9	169.9	167.2	169.8
Huaphanh	51.1	52.2	38.5	453.5	659.4	665.3	4,603.0	6,133.1	7,346.9	168.9	208.1	217.3
Xayaboury	41.1	35.3	34.1	421.1	419.4	499.0	4,603.0	6,133.1	7,346.9	207.1	174.6	181.1
Center	34.5	34.1	29.2	368.3	436.3	488.5	4,603.0	6,133.1	7,346.9	174.6	167.4	169.8
Vientiane C.	21.2	17.3	20.5	246.5	305.0	393.3	4,603.0	6,133.1	7,346.9	123.6	124.3	149.4
Xiengkhuang	46.5	40.2	35.3	481.1	518.1	556.0	4,603.0	6,133.1	7,346.9	199.1	174.8	178.1
Vientiane P.	37.9	32.3	27.9	354.6	420.3	507.7	4,603.0	6,133.1	7,346.9	165.1	175.0	188.5
Borikhamxay	36.9	36.8	34.4	379.9	431.5	509.1	4,603.0	6,133.1	7,346.9	194.2	187.6	180.8
Khammuane	44.9	34.6	33.3	451.7	396.9	446.8	4,603.0	6,133.1	7,346.9	222.2	165.2	173.8
Savannakhet	37.6	33.1	33.1	415.3	446.5	528.7	4,603.0	6,133.1	7,346.9	186.7	161.8	172.7
Xaysomboun	-	-	37.3	-	-	558.1	4,603.0	6,133.1	7,346.9	-	-	182.3
South	41.8	32.6	29.4	403.8	373.1	431.8	4,603.0	6,133.1	7,346.9	184.7	135.2	143.9
Sravane	52.3	37.3	33.8	457.4	352.0	496.4	4,603.0	6,133.1	7,346.9	195.5	129.9	155.9
Sekong	44.4	43.4	35.2	401.2	578.7	579.7	4,603.0	6,133.1	7,346.9	156.1	161.8	169.1
Champasack	36.7	29.3	25.7	376.9	336.5	372.0	4,603.0	6,133.1	7,346.9	178.7	129.1	135.0
Attapeu	41.7	33.8	32.4	393.2	504.7	462.0	4,603.0	6,133.1	7,346.9	186.4	182.9	145.1

5. GDP Projection and the Relationship with PCE

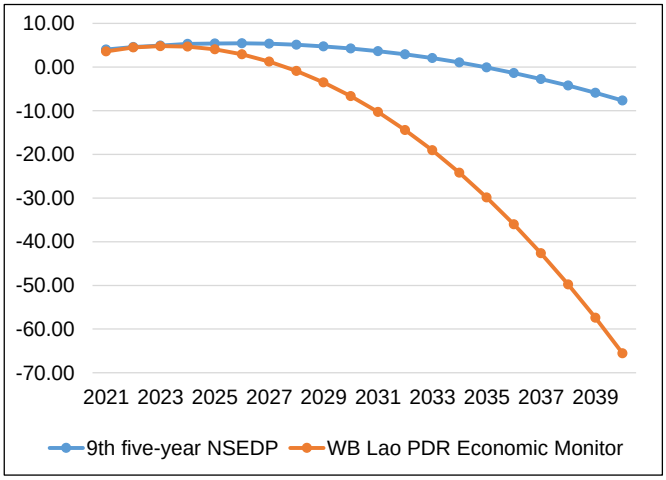
5.1. GDP growth rates in Laos

Year	Statistical Yearbook	World Development Indicators			
	GDP growth (annual %)	GDP growth (annual %)	GDP (constant 2015 US$)	GDP (constant LCU)	GDP (current LCU)
	%	%	US$	Kip	Kip
1990		6.7046	2,736,044,728	19,300,876,381,000	612,599,988,200
1991		4.2966	2,853,600,631	20,130,150,817,700	721,800,003,600
1992		5.5599	3,012,256,768	21,249,358,571,600	807,599,996,900
1993		5.9126	3,190,358,153	22,505,738,915,000	950,999,973,900
1994		8.1590	3,450,660,066	24,341,986,323,500	1,107,799,965,700
1995		7.0313	3,693,284,751	26,053,533,290,300	1,419,100,028,900
1996		6.9283	3,949,167,474	27,858,606,418,500	1,725,688,971,300
1997		6.8721	4,220,557,868	29,773,075,279,000	2,201,200,000,000
1998		3.9676	4,388,013,063	30,954,354,222,800	4,222,449,098,800
1999		7.3064	4,708,617,800	33,215,995,753,300	10,329,402,638,300
2000	5.80	5.7988	4,981,660,297	35,142,119,044,500	13,638,378,020,900
2001	5.80	5.7514	5,268,176,149	37,163,287,406,300	15,701,800,000,000
2002	5.90	5.9187	5,579,985,992	39,362,887,131,600	17,681,982,600,000
2003	5.80	6.0670	5,918,523,870	41,751,034,400,700	21,277,279,467,200
2004	6.90	6.3577	6,294,805,595	44,405,438,027,700	25,049,270,658,200
2005	7.30	7.1076	6,742,213,206	47,561,584,895,100	29,147,834,245,900
2006	8.30	8.6193	7,323,342,511	51,661,044,510,300	35,081,076,407,000
2007	7.80	7.5968	7,879,684,304	55,585,645,618,300	40,553,790,510,300
2008	7.80	7.8249	8,496,261,938	59,935,168,337,900	47,602,813,795,100
2009	7.50	7.5018	9,133,632,385	64,431,369,760,100	49,673,414,247,800
2010	8.10	8.5269	9,912,448,589	69,925,371,783,000	58,866,800,648,200
2011	8.00	8.0387	10,709,275,903	75,546,429,556,400	70,256,887,355,200
2012	7.93	8.0261	11,568,812,929	81,609,860,356,000	81,609,860,356,000
2013	8.02	8.0263	12,497,360,587	88,160,112,762,500	93,867,573,852,200
2014	7.60	7.6120	13,448,655,106	94,870,828,315,300	106,797,293,551,000
2015	7.27	7.2701	14,426,381,187	101,768,000,000,000	117,252,000,000,000
2016	7.02	7.0228	15,439,522,315	108,915,000,000,000	129,279,000,000,000
2017	6.89	6.8925	16,503,696,158	116,422,000,000,000	140,749,000,000,000
2018	6.29	6.2480	17,534,840,493	123,696,000,000,000	152,414,000,000,000
2019	5.46	5.4577	18,491,845,636	130,447,000,000,000	162,657,000,000,000
2020	3.28	0.5030	18,584,865,506	131,103,189,930,859	171,705,383,000,000
2021		2.5284	19,054,756,139	134,417,938,745,864	182,584,101,000,000

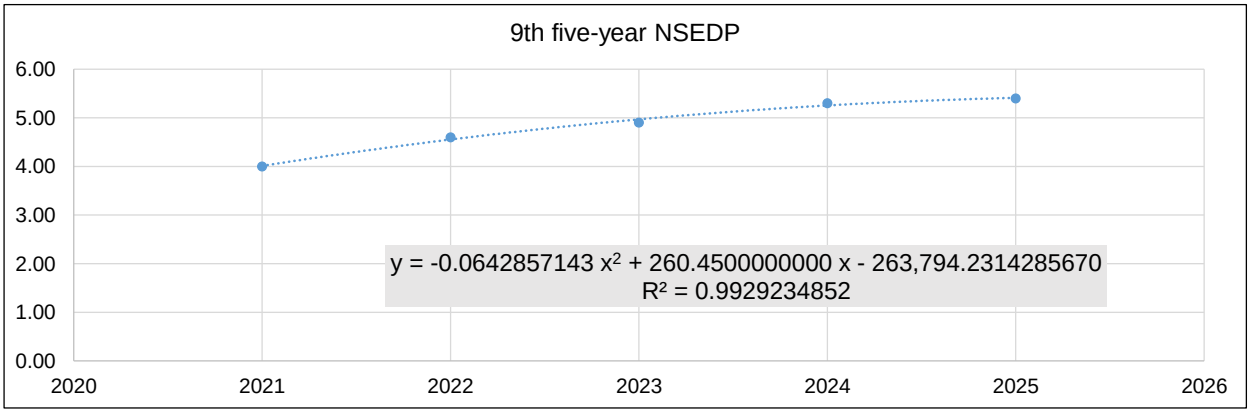


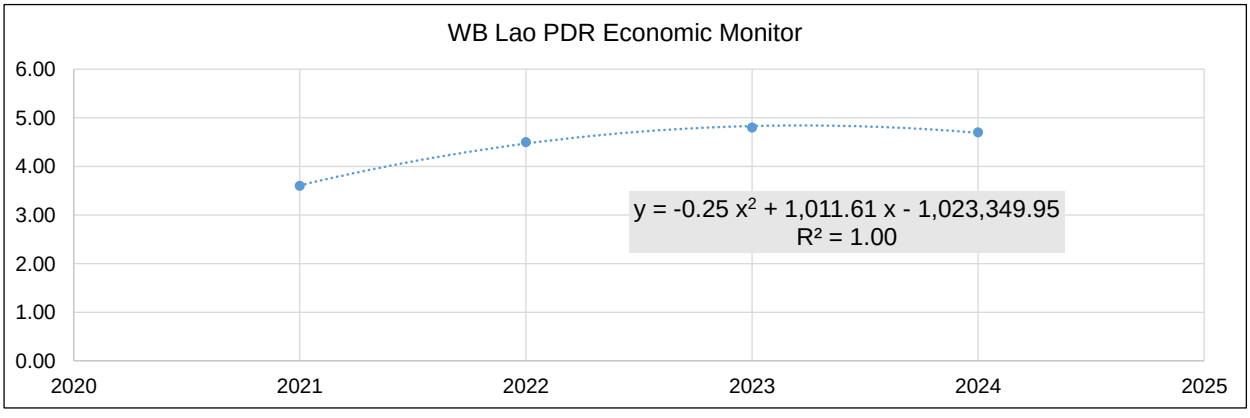
5.2. GDP growth rate's targets in Laos

Year	GDP growth rate's taegets in Laos	
	9th five-year NSEDP %	WB Lao PDR Economic Monitor %
2019		5.50
2020		0.50
2021	4.00	3.60
2022	4.60	4.50
2023	4.90	4.80
2024	5.30	4.70
2025	5.40	4.05
2026	5.44	2.91
2027	5.34	1.27
2028	5.11	-0.87
2029	4.75	-3.51
2030	4.27	-6.65
2031	3.65	-10.29
2032	2.91	-14.43
2033	2.04	-19.07
2034	1.04	-24.21
2035	-0.09	-29.85
2036	-1.35	-35.99
2037	-2.73	-42.63
2038	-4.25	-49.77
2039	-5.89	-57.41
2040	-7.66	-65.55



Considering the world trend and history of economic growth, it is not reasonable that GDP growth rates of Laos will go below 0.0% within this 20 years. So this model (Polynomial regression based on growth rate's targets) should be rejected.





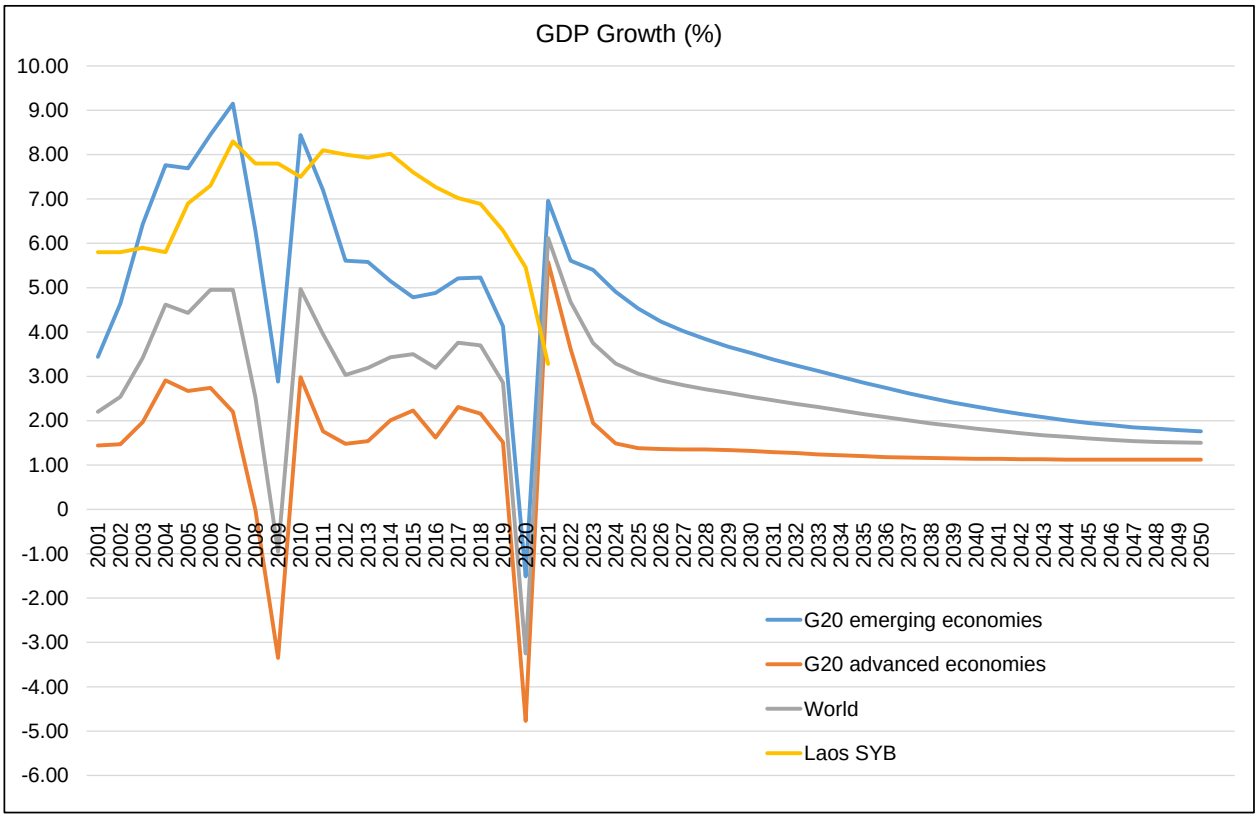
5.3. GDP growth forecast by OECD

Year	G20 emerging economies			G20 advanced economies			World		
	GDP	Growth Rate	Change	GDP	Growth Rate	Change	GDP	Growth Rate	Change
	US$	%	%	US$	%	%	US$	%	%
2000	16,711,262,350,670			31,324,644,222,484			55,675,111,471,329		
2001	17,286,069,048,227	3.44		31,775,641,879,654	1.44		56,902,065,422,937	2.20	
2002	18,087,840,431,802	4.64	1.20	32,243,896,378,287	1.47	0.03	58,346,368,052,425	2.54	0.34
2003	19,253,252,470,520	6.44	1.80	32,878,051,154,463	1.97	0.50	60,342,053,133,522	3.42	0.88
2004	20,747,569,823,231	7.76	1.32	33,834,748,036,499	2.91	0.94	63,128,665,357,360	4.62	1.20
2005	22,343,562,967,092	7.69	-0.07	34,739,822,382,699	2.67	-0.24	65,924,663,390,071	4.43	-0.19
2006	24,230,583,302,527	8.45	0.76	35,692,958,703,944	2.74	0.07	69,185,956,357,421	4.95	0.52
2007	26,448,475,084,594	9.15	0.70	36,479,391,252,598	2.20	-0.54	72,613,689,530,760	4.95	-
2008	28,111,623,685,019	6.29	-2.86	36,474,566,098,445	-0.01	-2.21	74,447,960,182,195	2.53	-2.42
2009	28,922,606,157,953	2.88	-3.41	35,250,924,422,352	-3.35	-3.34	73,739,749,291,218	-0.95	-3.48
2010	31,364,952,402,829	8.44	5.56	36,299,834,714,529	2.98	6.33	77,406,243,655,827	4.97	5.92
2011	33,622,726,736,462	7.20	-1.24	36,938,454,914,194	1.76	-1.22	80,466,919,402,105	3.95	-1.02
2012	35,507,662,036,955	5.61	-1.59	37,484,923,165,735	1.48	-0.28	82,902,946,680,564	3.03	-0.92
2013	37,487,730,678,914	5.58	-0.03	38,061,042,830,274	1.54	0.06	85,549,503,172,425	3.19	0.16
2014	39,419,561,410,733	5.15	-0.43	38,827,630,857,164	2.01	0.47	88,486,365,184,737	3.43	0.24
2015	41,304,429,415,905	4.78	-0.37	39,693,845,480,400	2.23	0.22	91,587,772,349,209	3.50	0.07
2016	43,319,802,213,360	4.88	0.10	40,338,842,626,051	1.62	-0.61	94,509,094,643,032	3.19	-0.31
2017	45,578,326,101,191	5.21	0.33	41,269,782,169,547	2.31	0.69	98,062,496,142,123	3.76	0.57
2018	47,960,476,113,388	5.23	0.02	42,160,665,938,927	2.16	-0.15	101,695,577,125,605	3.70	-0.06
2019	49,939,638,405,935	4.13	-1.10	42,797,447,304,359	1.51	-0.65	104,608,770,218,275	2.86	-0.84
2020	49,185,085,309,598	-1.51	-5.64	40,755,427,223,308	-4.77	-6.28	101,207,240,798,170	-3.25	-6.11
2021	52,610,797,803,626	6.96	8.47	43,028,156,838,123	5.58	10.35	107,400,073,967,992	6.12	9.37
2022	55,560,262,908,283	5.61	-1.35	44,584,896,422,586	3.62	-1.96	112,421,645,484,062	4.68	-1.44
2023	58,559,470,000,000	5.40	-0.21	45,453,660,000,000	1.95	-1.67	116,639,700,000,000	3.75	-0.93
2024	61,435,610,000,000	4.91	-0.49	46,130,250,000,000	1.49	-0.46	120,482,500,000,000	3.29	-0.46
2025	64,220,330,000,000	4.53	-0.38	46,764,860,000,000	1.38	-0.11	124,169,900,000,000	3.06	-0.23
2026	66,944,680,000,000	4.24	-0.29	47,398,910,000,000	1.36	-0.02	127,785,200,000,000	2.91	-0.15
2027	69,633,640,000,000	4.02	-0.22	48,041,000,000,000	1.35	-0.01	131,364,800,000,000	2.80	-0.11
2028	72,304,570,000,000	3.84	-0.18	48,690,560,000,000	1.35	-	134,927,800,000,000	2.71	-0.09
2029	74,961,570,000,000	3.67	-0.17	49,341,960,000,000	1.34	-0.01	138,472,900,000,000	2.63	-0.08
2030	77,604,620,000,000	3.53	-0.14	49,991,330,000,000	1.32	-0.02	141,996,300,000,000	2.54	-0.09
2031	80,231,530,000,000	3.38	-0.15	50,636,890,000,000	1.29	-0.03	145,494,000,000,000	2.46	-0.08
2032	82,839,510,000,000	3.25	-0.13	51,277,620,000,000	1.27	-0.02	148,962,000,000,000	2.38	-0.08
2033	85,424,100,000,000	3.12	-0.13	51,913,960,000,000	1.24	-0.03	152,396,000,000,000	2.31	-0.07
2034	87,979,460,000,000	2.99	-0.13	52,546,670,000,000	1.22	-0.02	155,791,000,000,000	2.23	-0.08
2035	90,499,810,000,000	2.86	-0.13	53,176,740,000,000	1.20	-0.02	159,141,900,000,000	2.15	-0.08
2036	92,981,000,000,000	2.74	-0.12	53,805,540,000,000	1.18	-0.02	162,446,100,000,000	2.08	-0.07
2037	95,421,150,000,000	2.62	-0.12	54,434,470,000,000	1.17	-0.01	165,703,500,000,000	2.01	-0.07
2038	97,820,510,000,000	2.51	-0.11	55,064,760,000,000	1.16	-0.01	168,915,800,000,000	1.94	-0.07
2039	100,179,900,000,000	2.41	-0.10	55,697,410,000,000	1.15	-0.01	172,085,400,000,000	1.88	-0.06
2040	102,500,600,000,000	2.32	-0.09	56,333,310,000,000	1.14	-0.01	175,215,500,000,000	1.82	-0.06
2041	104,785,100,000,000	2.23	-0.09	56,973,500,000,000	1.14	-	178,310,200,000,000	1.77	-0.05
2042	107,036,200,000,000	2.15	-0.08	57,618,660,000,000	1.13	-0.01	181,374,000,000,000	1.72	-0.05
2043	109,257,800,000,000	2.08	-0.07	58,269,090,000,000	1.13	-	184,412,000,000,000	1.67	-0.05
2044	111,453,700,000,000	2.01	-0.07	58,924,610,000,000	1.12	-0.01	187,428,600,000,000	1.64	-0.03
2045	113,627,500,000,000	1.95	-0.06	59,585,080,000,000	1.12	-	190,427,900,000,000	1.60	-0.04
2046	115,783,700,000,000	1.90	-0.05	60,251,010,000,000	1.12	-	193,416,000,000,000	1.57	-0.03
2047	117,928,700,000,000	1.85	-0.05	60,923,520,000,000	1.12	-	196,400,900,000,000	1.54	-0.03
2048	120,070,700,000,000	1.82	-0.03	61,603,590,000,000	1.12	-	199,392,200,000,000	1.52	-0.02
2049	122,216,600,000,000	1.79	-0.03	62,292,290,000,000	1.12	-	202,398,900,000,000	1.51	-0.01
2050	124,372,300,000,000	1.76	-0.03	62,990,860,000,000	1.12	-	205,428,600,000,000	1.50	-0.01

Source: OECD Long-term baseline projections, No. 109 (Edition 2021)

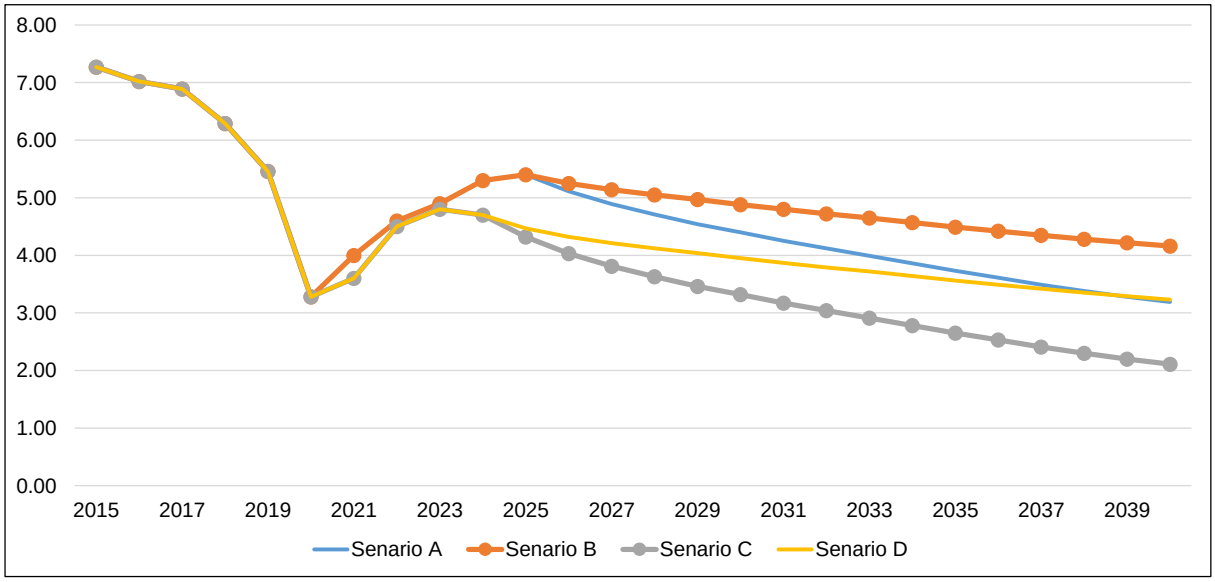
Note: Gross domestic product, volume in USD, at constant 2015 purchasing power parities

5.3. GDP growth forecast by OECD



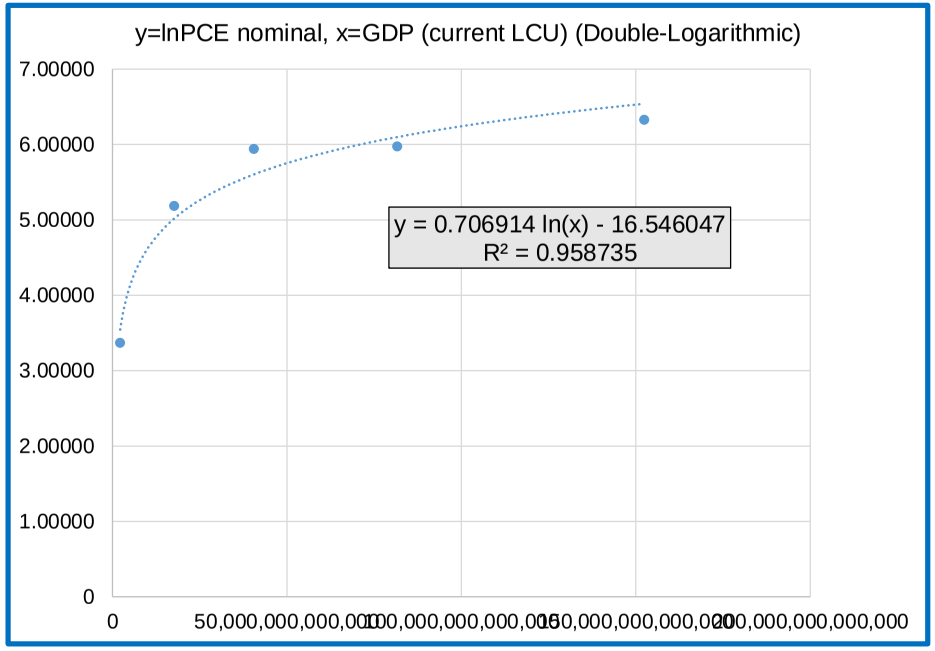
5.4. GDP growth rates in Laos

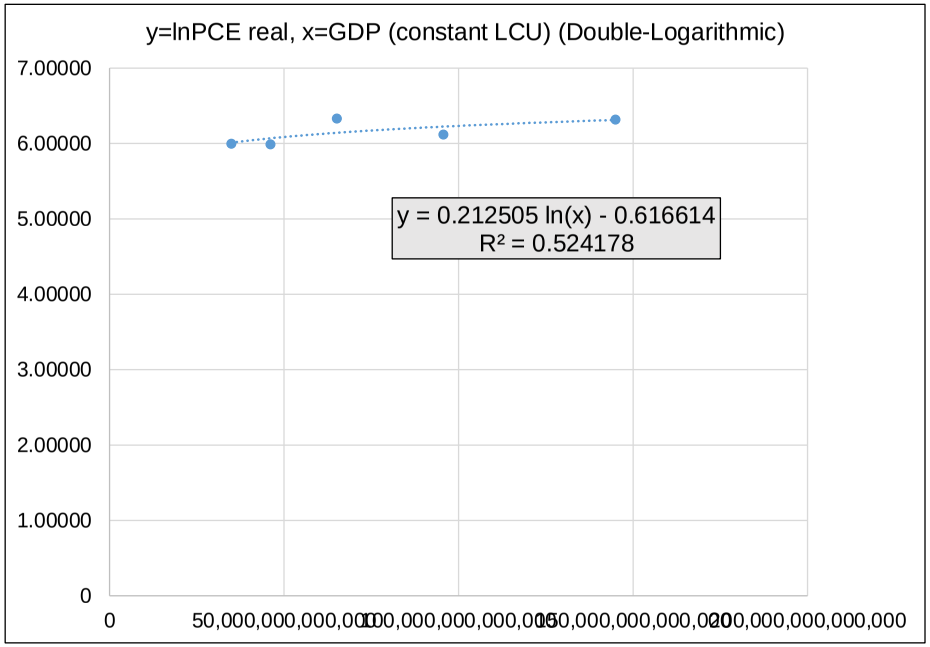
Year	GDP growth rate forecast in Laos				Change of growth rates		
	Senario A	Senario B	Senario C	Senario D			
	Statistical Yearbook	Statistical Yearbook	Statistical Yearbook	Statistical Yearbook			
	9th five-year NSEDP	9th five-year NSEDP	WB Lao PDR Economic Monitor	WB Lao PDR Economic Monitor			
	G20 emerging economies	World	G20 emerging economies	World	G20 emerging economies	G20 advanced economies	World
	%	%	%	%	%	%	%
2015	7.27	7.27	7.27	7.27	-0.37	0.22	0.07
2016	7.02	7.02	7.02	7.02	0.10	-0.61	-0.31
2017	6.89	6.89	6.89	6.89	0.33	0.69	0.57
2018	6.29	6.29	6.29	6.29	0.02	-0.15	-0.06
2019	5.46	5.46	5.46	5.46	-1.10	-0.65	-0.84
2020	3.28	3.28	3.28	3.28	-5.64	-6.28	-6.11
2021	4.00	4.00	3.60	3.60	8.47	10.35	9.37
2022	4.60	4.60	4.50	4.50	-1.35	-1.96	-1.44
2023	4.90	4.90	4.80	4.80	-0.21	-1.67	-0.93
2024	5.30	5.30	4.70	4.70	-0.49	-0.46	-0.46
2025	5.40	5.40	4.32	4.47	-0.38	-0.11	-0.23
2026	5.11	5.25	4.03	4.32	-0.29	-0.02	-0.15
2027	4.89	5.14	3.81	4.21	-0.22	-0.01	-0.11
2028	4.71	5.05	3.63	4.12	-0.18	-	-0.09
2029	4.54	4.97	3.46	4.04	-0.17	-0.01	-0.08
2030	4.40	4.88	3.32	3.95	-0.14	-0.02	-0.09
2031	4.25	4.80	3.17	3.87	-0.15	-0.03	-0.08
2032	4.12	4.72	3.04	3.79	-0.13	-0.02	-0.08
2033	3.99	4.65	2.91	3.72	-0.13	-0.03	-0.07
2034	3.86	4.57	2.78	3.64	-0.13	-0.02	-0.08
2035	3.73	4.49	2.65	3.56	-0.13	-0.02	-0.08
2036	3.61	4.42	2.53	3.49	-0.12	-0.02	-0.07
2037	3.49	4.35	2.41	3.42	-0.12	-0.01	-0.07
2038	3.38	4.28	2.30	3.35	-0.11	-0.01	-0.07
2039	3.28	4.22	2.20	3.29	-0.10	-0.01	-0.06
2040	3.19	4.16	2.11	3.23	-0.09	-0.01	-0.06



5.5. Estimation of elasticity between GDP and PCE

LECS Number	FY	CPI	GDP (current LCU)	GDP (constant LCU)			PCE nominal	lnPCE nominal	PCE real	lnPCE real
		Base Year 2018 Dec = 100	Kip	Base Year 2012 = 100 Kip	Modification 2012 → 2018 Dec Kip	Base Year 2018 Dec = 100 Kip	Kip/capita/mo	Kip/capita/mo	Kip/capita/mo	Kip/capita/mo
LECS1	1992	3.68	807,599,996,900	21,249,358,571,600	85.34	24,899,646,791,188	-	-	-	-
LECS2	1997	7.23	2,201,200,000,000	29,773,075,279,000	85.34	34,887,596,999,063	29.1	3.37074	402.5	5.99770
LECS3	2002	44.76	17,681,982,600,000	39,362,887,131,600	85.34	46,124,779,858,917	178.9	5.18683	399.7	5.99071
LECS4	2007	67.78	40,553,790,510,300	55,585,645,618,300	85.34	65,134,339,838,645	380.8	5.94227	561.8	6.33115
LECS5	2012	86.56	81,609,860,356,000	81,609,860,356,000	85.34	95,629,084,082,494	393.8	5.97584	454.9	6.12008
LECS6	2018	100.98	152,414,000,000,000	123,696,000,000,000	85.34	144,944,926,177,642	560.5	6.32883	555.1	6.31915



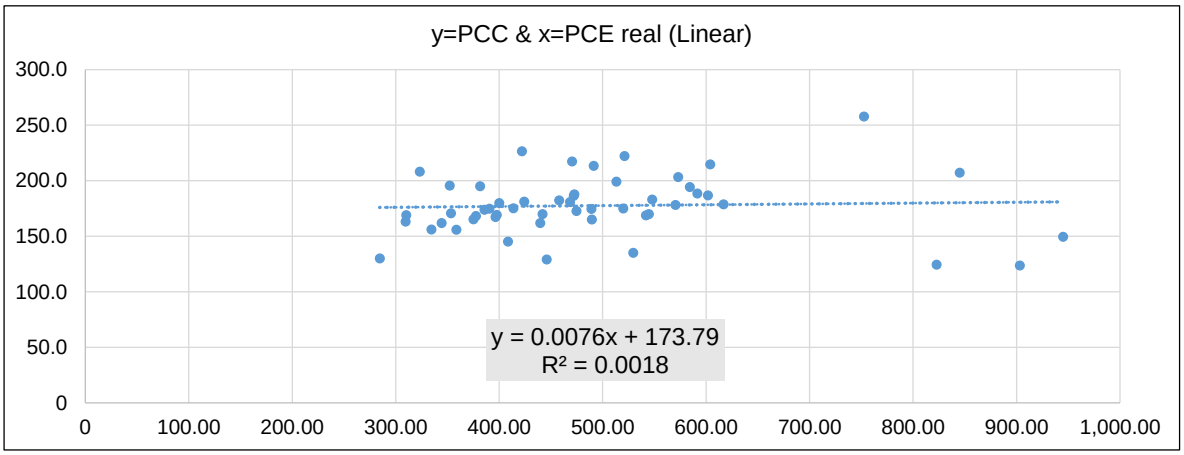


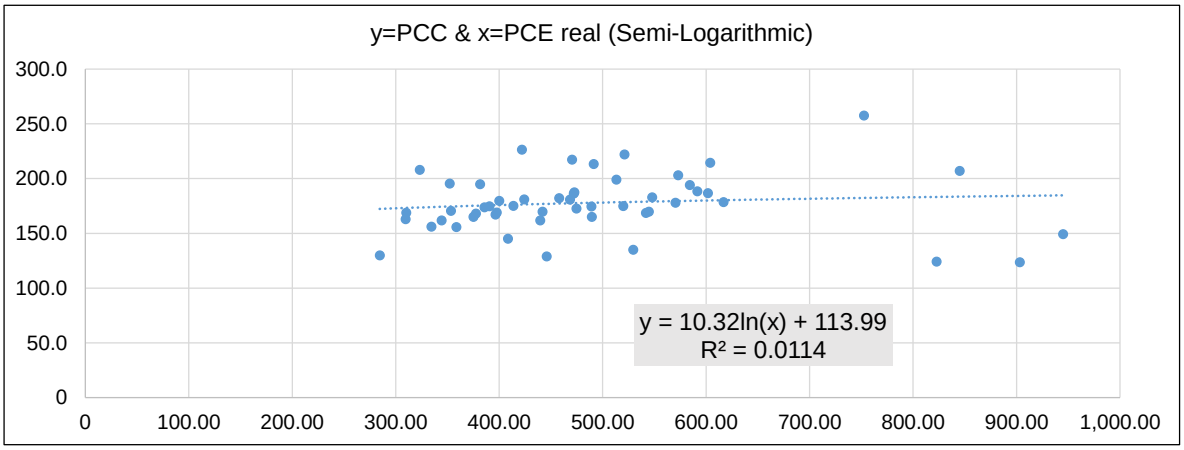
6. Projection of PCE and PCC

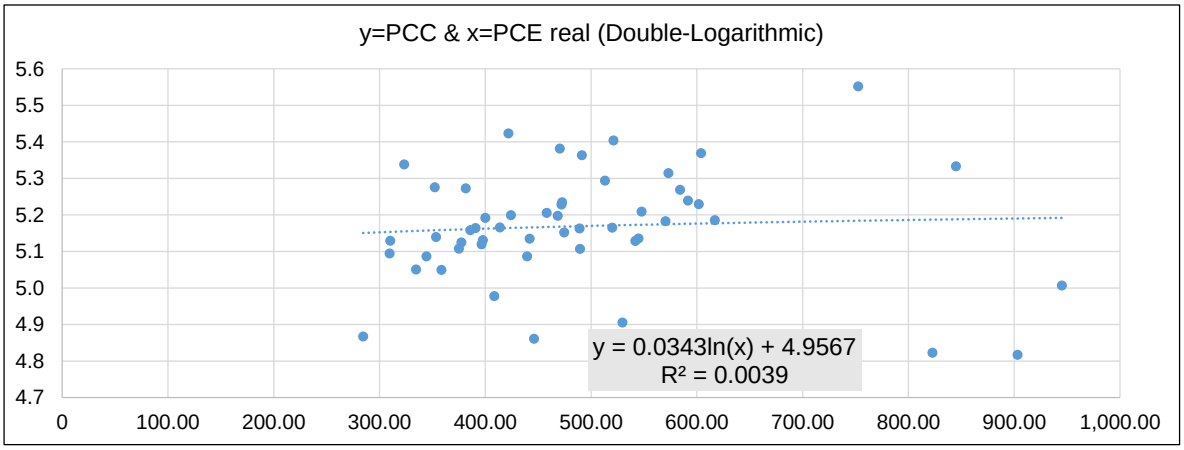
6.1. Relationship between PCE and PCC

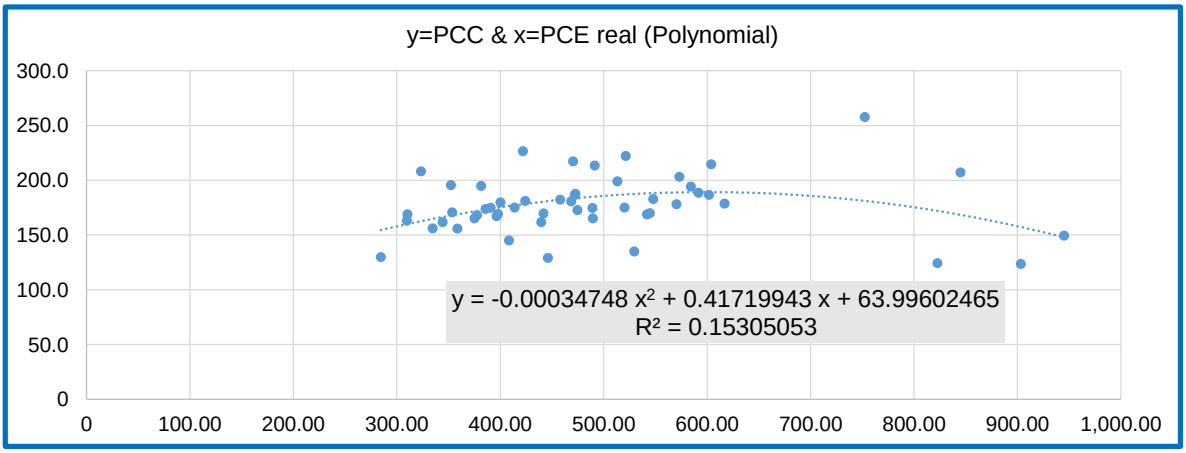
Area	Province	LECS Number	% of Rural areas %	CPI 2018 Dec =100	PCE nominal Kip	PCE real Kip	PCC kg/capita/yr	lnPCC kg/capita/yr
North	Phongsaly	LECS4	88.0	67.78	209.8	309.5	163.1	5.09436
	Luangnamtha	LECS4	82.0	67.78	280.4	413.7	175.1	5.16536
	Oudomxay	LECS4	78.0	67.78	271.1	400.0	179.8	5.19185
	Bokeo	LECS4	87.0	67.78	255.8	377.4	168.1	5.12456
	Luangprabang	LECS4	77.0	67.78	369.1	544.6	169.9	5.13521
	Huaphanh	LECS4	89.0	67.78	210.2	310.1	168.9	5.12931
	Xayaboury	LECS4	70.0	67.78	572.7	844.9	207.1	5.33320
Center	Vientiane C.	LECS4	35.0	67.78	612.1	903.1	123.6	4.81705
	Xiengkhuang	LECS4	77.0	67.78	347.8	513.1	199.1	5.29381
	Vientiane P.	LECS4	75.0	67.78	331.7	489.4	165.1	5.10655
	Borikhamxay	LECS4	79.0	67.78	395.9	584.1	194.2	5.26889
	Khammuane	LECS4	78.0	67.78	353.2	521.1	222.2	5.40358
	Savannakhet	LECS4	50.0	67.78	407.8	601.7	186.7	5.22950
South	Sravane	LECS4	91.0	67.78	238.7	352.2	195.5	5.27556
	Sekong	LECS4	77.0	67.78	226.7	334.5	156.1	5.05050
	Champasack	LECS4	74.0	67.78	418.1	616.8	178.7	5.18571
	Attapeu	LECS4	76.0	67.78	319.9	472.0	186.4	5.22789
North	Phongsaly	LECS5	80.8	86.56	365.1	421.8	226.5	5.42274
	Luangnamtha	LECS5	82.3	86.56	425.2	491.2	213.4	5.36317
	Oudomxay	LECS5	71.2	86.56	330.1	381.4	194.9	5.27249
	Bokeo	LECS5	89.4	86.56	305.9	353.4	170.6	5.13932
	Luangprabang	LECS5	77.8	86.56	343.0	396.3	167.2	5.11919
	Huaphanh	LECS5	85.8	86.56	279.8	323.2	208.1	5.33802
	Xayaboury	LECS5	72.0	86.56	423.4	489.1	174.6	5.16250
Center	Vientiane C.	LECS5	20.9	86.56	712.0	822.6	124.3	4.82270
	Xiengkhuang	LECS5	77.4	86.56	338.1	390.6	174.8	5.16364
	Vientiane P.	LECS5	66.2	86.56	450.0	519.9	175.0	5.16479
	Borikhamxay	LECS5	69.0	86.56	409.1	472.6	187.6	5.23431
	Khammuane	LECS5	72.3	86.56	324.6	375.0	165.2	5.10716
	Savannakhet	LECS5	78.4	86.56	380.4	439.5	161.8	5.08636
South	Sravane	LECS5	91.5	86.56	246.3	284.5	129.9	4.86676
	Sekong	LECS5	77.6	86.56	297.9	344.2	161.8	5.08636
	Champasack	LECS5	79.0	86.56	386.0	445.9	129.1	4.86059
	Attapeu	LECS5	71.7	86.56	474.1	547.7	182.9	5.20894
North	Phongsaly	LECS6	80.4	100.98	578.6	573.0	203.2	5.31419
	Luangnamtha	LECS6	70.8	100.98	759.8	752.4	257.7	5.55180
	Oudomxay	LECS6	73.3	100.98	609.7	603.8	214.6	5.36878
	Bokeo	LECS6	67.3	100.98	547.0	541.7	168.8	5.12871
	Luangprabang	LECS6	67.6	100.98	446.1	441.8	169.8	5.13462
	Huaphanh	LECS6	83.7	100.98	474.9	470.3	217.3	5.38128
	Xayaboury	LECS6	56.5	100.98	428.3	424.1	181.1	5.19905
Center	Vientiane C.	LECS6	22.1	100.98	954.3	945.0	149.4	5.00663
	Xiengkhuang	LECS6	67.7	100.98	575.8	570.2	178.1	5.18235
	Vientiane P.	LECS6	67.0	100.98	597.3	591.5	188.5	5.23910
	Borikhamxay	LECS6	60.7	100.98	473.0	468.4	180.8	5.19739
	Khammuane	LECS6	78.9	100.98	389.5	385.7	173.8	5.15791
	Savannakhet	LECS6	77.1	100.98	479.2	474.5	172.7	5.15156
	Xaysomboun	LECS6	68.4	100.98	462.4	457.9	182.3	5.20565
South	Sravane	LECS6	88.3	100.98	362.0	358.5	155.9	5.04921
	Sekong	LECS6	64.9	100.98	401.5	397.6	169.1	5.13049
	Champasack	LECS6	74.8	100.98	534.7	529.5	135.0	4.90527
	Attapeu	LECS6	62.4	100.98	412.4	408.4	145.1	4.97742

6.1. Relationship between PCE and PCC





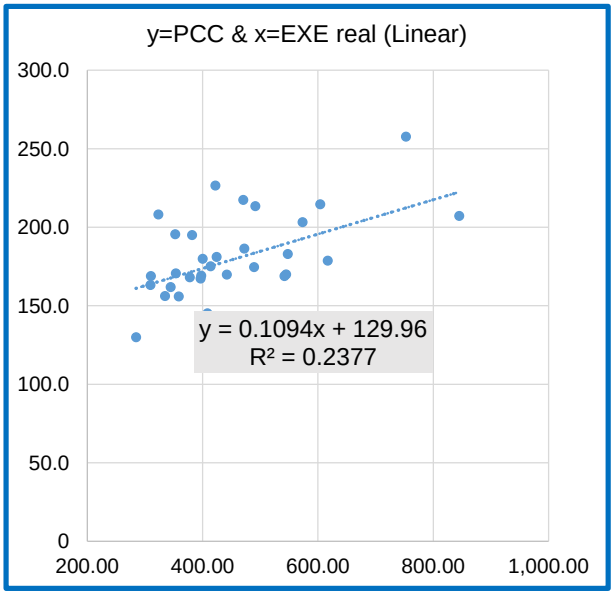


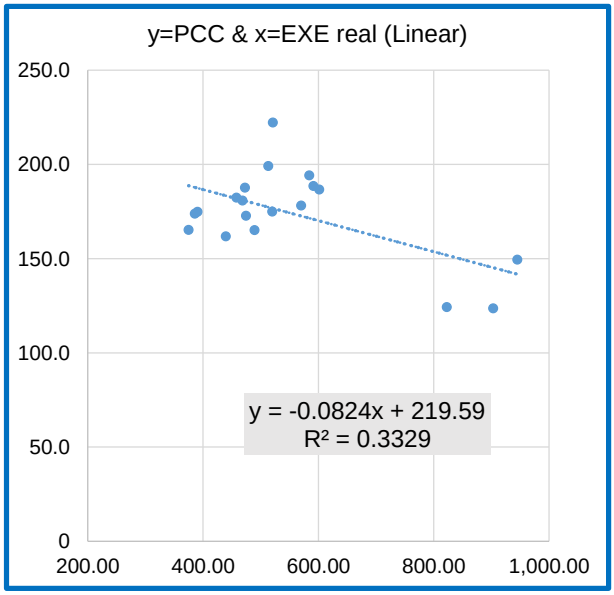


6.1. Relationship between PCE and PCC

North & South			
Province	LECS Number	PCE real	PCC
Phongsaly	LECS4	309.5	163.1
Luangnamtha	LECS4	413.7	175.1
Oudomxay	LECS4	400.0	179.8
Bokeo	LECS4	377.4	168.1
Luangprabang	LECS4	544.6	169.9
Huaphanh	LECS4	310.1	168.9
Xayaboury	LECS4	844.9	207.1
Sravane	LECS4	352.2	195.5
Sekong	LECS4	334.5	156.1
Champasack	LECS4	616.8	178.7
Attapeu	LECS4	472.0	186.4
Phongsaly	LECS5	421.8	226.5
Luangnamtha	LECS5	491.2	213.4
Oudomxay	LECS5	381.4	194.9
Bokeo	LECS5	353.4	170.6
Luangprabang	LECS5	396.3	167.2
Huaphanh	LECS5	323.2	208.1
Xayaboury	LECS5	489.1	174.6
Sravane	LECS5	284.5	129.9
Sekong	LECS5	344.2	161.8
Champasack	LECS5	445.9	129.1
Attapeu	LECS5	547.7	182.9
Phongsaly	LECS6	573.0	203.2
Luangnamtha	LECS6	752.4	257.7
Oudomxay	LECS6	603.8	214.6
Bokeo	LECS6	541.7	168.8
Luangprabang	LECS6	441.8	169.8
Huaphanh	LECS6	470.3	217.3
Xayaboury	LECS6	424.1	181.1
Sravane	LECS6	358.5	155.9
Sekong	LECS6	397.6	169.1
Champasack	LECS6	529.5	135.0
Attapeu	LECS6	408.4	145.1

Center			
Province	LECS Number	PCE real	PCC
Vientiane C.	LECS4	903.1	123.6
Xiengkhuang	LECS4	513.1	199.1
Vientiane P.	LECS4	489.4	165.1
Borikhamxay	LECS4	584.1	194.2
Khammuane	LECS4	521.1	222.2
Savannakhet	LECS4	601.7	186.7
Vientiane C.	LECS5	822.6	124.3
Xiengkhuang	LECS5	390.6	174.8
Vientiane P.	LECS5	519.9	175.0
Borikhamxay	LECS5	472.6	187.6
Khammuane	LECS5	375.0	165.2
Savannakhet	LECS5	439.5	161.8
Vientiane C.	LECS6	945.0	149.4
Xiengkhuang	LECS6	570.2	178.1
Vientiane P.	LECS6	591.5	188.5
Borikhamxay	LECS6	468.4	180.8
Khammuane	LECS6	385.7	173.8
Savannakhet	LECS6	474.5	172.7
Xaysomboun	LECS6	457.9	182.3

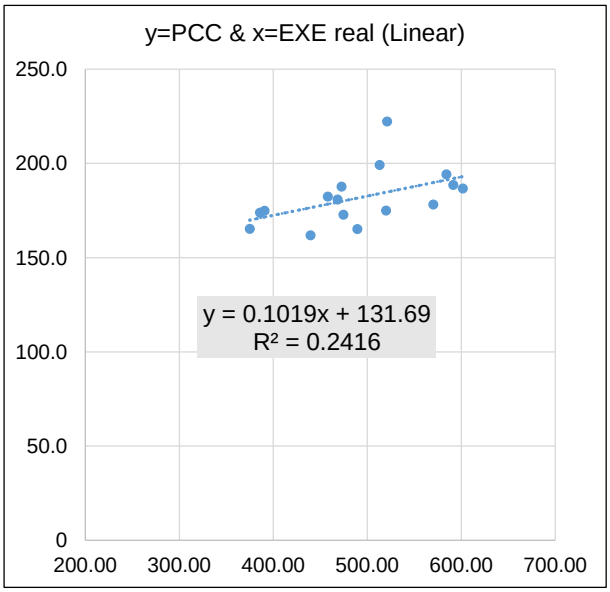


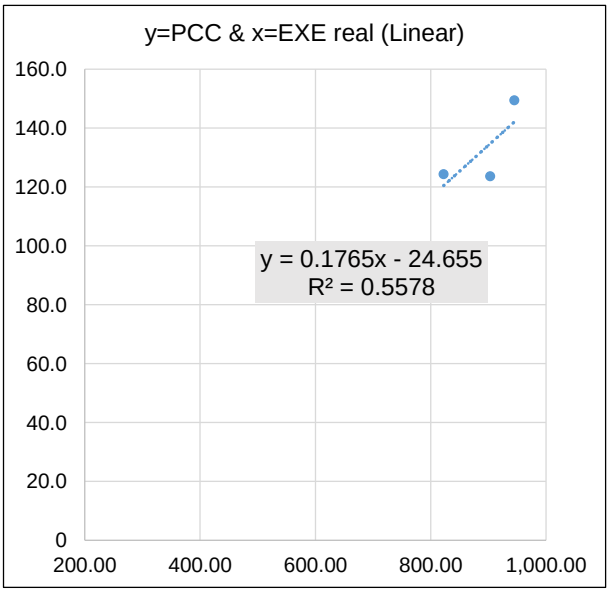


6.1. Relationship between PCE and PCC

Center without Vientiane C.			
Province	LECS Number	PCE real	PCC
Xiengkhuang	LECS4	513.1	199.1
Vientiane P.	LECS4	489.4	165.1
Borikhamxay	LECS4	584.1	194.2
Khammuane	LECS4	521.1	222.2
Savannakhet	LECS4	601.7	186.7
Xiengkhuang	LECS5	390.6	174.8
Vientiane P.	LECS5	519.9	175.0
Borikhamxay	LECS5	472.6	187.6
Khammuane	LECS5	375.0	165.2
Savannakhet	LECS5	439.5	161.8
Xiengkhuang	LECS6	570.2	178.1
Vientiane P.	LECS6	591.5	188.5
Borikhamxay	LECS6	468.4	180.8
Khammuane	LECS6	385.7	173.8
Savannakhet	LECS6	474.5	172.7
Xaysomboun	LECS6	457.9	182.3

Vientiane C. only			
Province	LECS Number	PCE real	PCC
Vientiane C.	LECS4	903.1	123.6
Vientiane C.	LECS5	822.6	124.3
Vientiane C.	LECS6	945.0	149.4



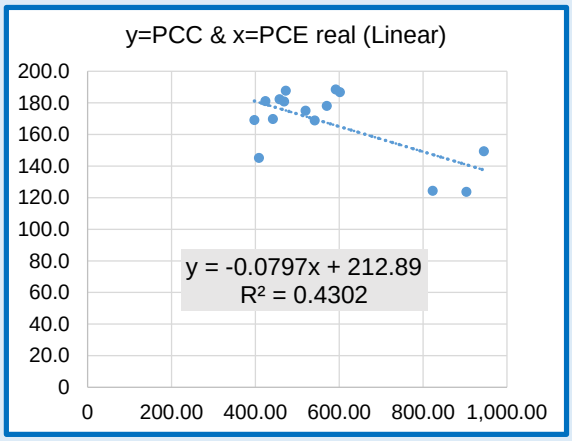


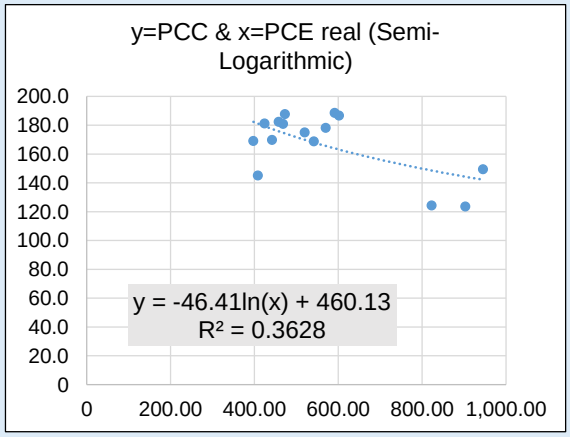
6.1. Relationship between PCE and PCC

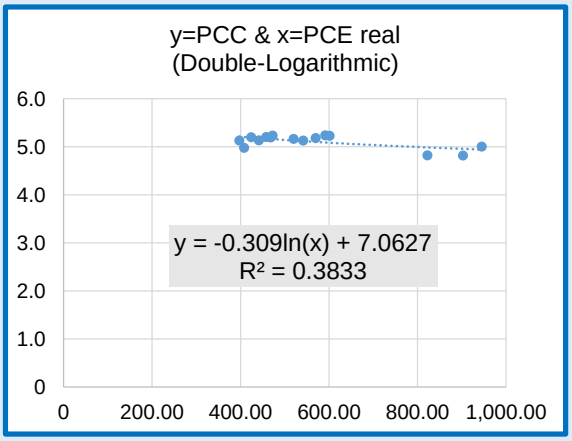
U/R Code	Province	% of Rural areas	LECS Number	PCE real	PCC	lnPCC
U-1	Vientiane C.	35.0	LECS4	903.1	123.6	4.817051
U-2	Savannakhet	50.0	LECS4	601.7	186.7	5.229503
U-3	Vientiane C.	20.9	LECS5	822.6	124.3	4.822698
U-4	Vientiane P.	66.2	LECS5	519.9	175.0	5.164786
U-5	Borikhamxay	69.0	LECS5	472.6	187.6	5.234312
U-6	Bokeo	67.3	LECS6	541.7	168.8	5.128715
U-7	Luangprabang	67.6	LECS6	441.8	169.8	5.134621
U-8	Xayaboury	56.5	LECS6	424.1	181.1	5.199049
U-9	Vientiane C.	22.1	LECS6	945.0	149.4	5.006627
U-10	Xiengkhuang	67.7	LECS6	570.2	178.1	5.182345
U-11	Vientiane P.	67.0	LECS6	591.5	188.5	5.239098
U-12	Borikhamxay	60.7	LECS6	468.4	180.8	5.197391
U-13	Xaysomboun	68.4	LECS6	457.9	182.3	5.205654
U-14	Sekong	64.9	LECS6	397.6	169.1	5.130490
U-15	Attapeu	62.4	LECS6	408.4	145.1	4.977423
R-1	Phongsaly	88.0	LECS4	309.5	163.1	5.094364
R-2	Luangnamtha	82.0	LECS4	413.7	175.1	5.165357
R-3	Oudomxay	78.0	LECS4	400.0	179.8	5.191845
R-4	Bokeo	87.0	LECS4	377.4	168.1	5.124559
R-5	Luangprabang	77.0	LECS4	544.6	169.9	5.135210
R-6	Huaphanh	89.0	LECS4	310.1	168.9	5.129307
R-7	Xayaboury	70.0	LECS4	844.9	207.1	5.333202
R-8	Xiengkhuang	77.0	LECS4	513.1	199.1	5.293807
R-9	Vientiane P.	75.0	LECS4	489.4	165.1	5.106551
R-10	Borikhamxay	79.0	LECS4	584.1	194.2	5.268889
R-11	Khammuane	78.0	LECS4	521.1	222.2	5.403578
R-12	Sravane	91.0	LECS4	352.2	195.5	5.275560
R-13	Sekong	77.0	LECS4	334.5	156.1	5.050497
R-14	Champasack	74.0	LECS4	616.8	178.7	5.185708
R-15	Attapeu	76.0	LECS4	472.0	186.4	5.227895
R-16	Phongsaly	80.8	LECS5	421.8	226.5	5.422745
R-17	Luangnamtha	82.3	LECS5	491.2	213.4	5.363168
R-18	Oudomxay	71.2	LECS5	381.4	194.9	5.272487
R-19	Bokeo	89.4	LECS5	353.4	170.6	5.139322
R-20	Luangprabang	77.8	LECS5	396.3	167.2	5.119191
R-21	Huaphanh	85.8	LECS5	323.2	208.1	5.338019
R-22	Xayaboury	72.0	LECS5	489.1	174.6	5.162498
R-23	Xiengkhuang	77.4	LECS5	390.6	174.8	5.163642
R-24	Khammuane	72.3	LECS5	375.0	165.2	5.107157
R-25	Savannakhet	78.4	LECS5	439.5	161.8	5.086361
R-26	Sravane	91.5	LECS5	284.5	129.9	4.866765
R-27	Sekong	77.6	LECS5	344.2	161.8	5.086361
R-28	Champasack	79.0	LECS5	445.9	129.1	4.860587
R-29	Attapeu	71.7	LECS5	547.7	182.9	5.208940
R-30	Phongsaly	80.4	LECS6	573.0	203.2	5.314191
R-31	Luangnamtha	70.8	LECS6	752.4	257.7	5.551796
R-32	Oudomxay	73.3	LECS6	603.8	214.6	5.368776
R-33	Huaphanh	83.7	LECS6	470.3	217.3	5.381279
R-34	Khammuane	78.9	LECS6	385.7	173.8	5.157905
R-35	Savannakhet	77.1	LECS6	474.5	172.7	5.151556
R-36	Sravane	88.3	LECS6	358.5	155.9	5.049215
R-37	Champasack	74.8	LECS6	529.5	135.0	4.905275

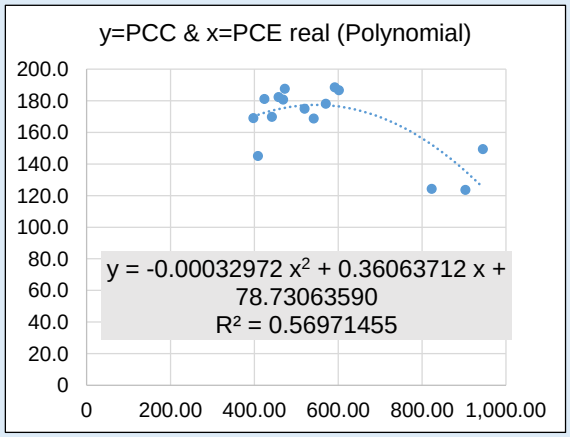
6.1. Relationship between PCE and PCC

Urban regression : Rural areas < 70.0%

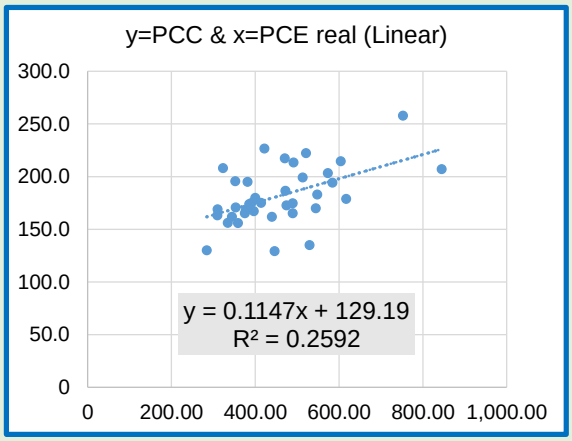


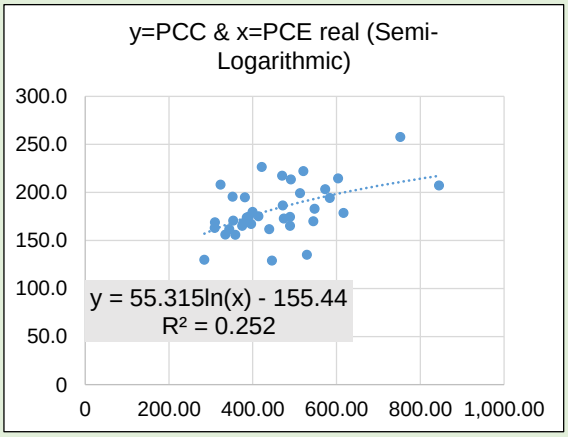


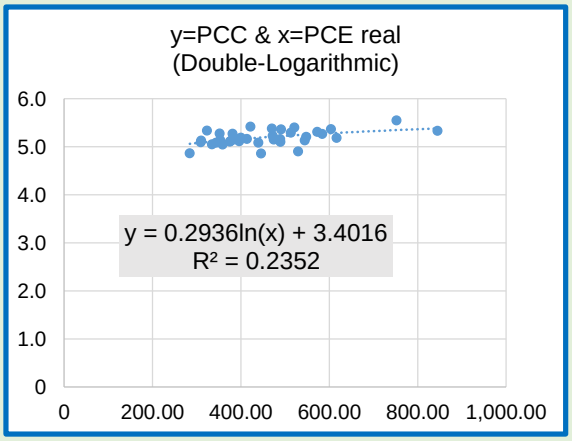


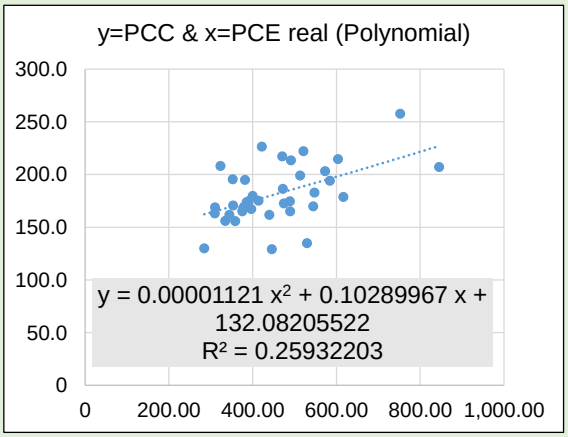


Rural regression : Rural areas >=70.0%









6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: Poly

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Equation		Intercept
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8		x^2	-0.0003475	51.2898765
Urban	2018	LECS6	100.98	774.3	766.8	171.3	0.706914	x	0.4171994	55.7153285
Rural	2018	LECS6	100.98	445.0	440.7	170.4		Intercept	~~63.9960247~~	54.0304547

modified based on 2018's value

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	175.8	171.3	170.4	175.8	171.3	170.4
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	176.3	167.6	172.2	176.3	167.6	172.2
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	176.5	164.9	173.2	176.5	164.9	173.2
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	176.5	161.3	174.4	176.5	161.7	174.2
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	176.3	156.5	175.6	176.3	157.1	175.4
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	175.7	150.7	176.7	175.8	151.5	176.6
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	174.7	143.5	177.7	175.0	145.2	177.5
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	173.2	134.9	178.5	173.9	138.7	178.2
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	171.2	125.4	179.0	172.6	131.9	178.7
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	168.7	114.9	179.2	171.1	124.7	179.0
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	165.7	103.2	179.2	169.3	117.3	179.2
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	162.0	90.3	178.7	167.4	109.6	179.2
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	157.9	76.2	178.0	165.2	101.6	179.1
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	153.0	60.8	176.9	163.0	93.3	178.9
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	147.6	44.0	175.4	160.5	84.9	178.5
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	141.4	25.8	173.5	157.9	76.2	178.0
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	134.5	6.2	171.2	155.2	67.4	177.4
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	127.0	-14.9	168.5	152.3	58.5	176.7
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	118.7	-37.4	165.3	149.4	49.5	175.9
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	109.5	-61.7	161.6	146.4	40.5	175.1
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	99.5	-87.6	157.5	143.3	31.5	174.1
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	88.8	-115.2	152.9	140.2	22.5	173.1
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	77.1	-144.7	147.7	137.1	13.4	172.1

6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: Center

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Equation		Intercept
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8		x^2		221.54024
Urban	2018	LECS6	100.98	774.3	766.8	171.3	0.706914	x	-0.0824	234.48432
Rural	2018	LECS6	100.98	445.0	440.7	170.4		Intercept	~~219.59~~	206.71368

modified based on 2018's value

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	~~175.8~~	~~171.3~~	~~170.4~~	~~175.8~~	~~171.3~~	~~170.4~~
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	~~174.0~~	~~168.9~~	~~169.0~~	~~174.0~~	~~168.9~~	~~169.0~~
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	~~172.9~~	~~167.3~~	~~168.1~~	~~172.9~~	~~167.3~~	~~168.1~~
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	~~171.6~~	~~165.4~~	~~167.0~~	~~171.7~~	~~165.6~~	~~167.1~~
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	~~169.9~~	~~163.2~~	~~165.7~~	~~170.1~~	~~163.4~~	~~165.9~~
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	~~168.1~~	~~160.7~~	~~164.3~~	~~168.4~~	~~161.0~~	~~164.5~~
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	~~166.1~~	~~158.0~~	~~162.7~~	~~166.6~~	~~158.6~~	~~163.1~~
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	~~164.0~~	~~155.0~~	~~161.0~~	~~164.9~~	~~156.3~~	~~161.8~~
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	~~161.9~~	~~152.1~~	~~159.4~~	~~163.3~~	~~154.1~~	~~160.5~~
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	~~159.7~~	~~149.1~~	~~157.6~~	~~161.8~~	~~151.9~~	~~159.3~~
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	~~157.5~~	~~146.0~~	~~155.9~~	~~160.2~~	~~149.8~~	~~158.0~~
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	~~155.3~~	~~142.9~~	~~154.1~~	~~158.7~~	~~147.7~~	~~156.8~~
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	~~153.0~~	~~139.8~~	~~152.3~~	~~157.2~~	~~145.6~~	~~155.7~~
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	~~150.7~~	~~136.6~~	~~150.4~~	~~155.8~~	~~143.6~~	~~154.5~~
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	~~148.3~~	~~133.3~~	~~148.5~~	~~154.4~~	~~141.7~~	~~153.4~~
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	~~145.9~~	~~130.0~~	~~146.6~~	~~153.0~~	~~139.8~~	~~152.3~~
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	~~143.4~~	~~126.6~~	~~144.7~~	~~151.6~~	~~137.9~~	~~151.2~~
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	~~141.0~~	~~123.2~~	~~142.7~~	~~150.3~~	~~136.1~~	~~150.2~~
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	~~138.5~~	~~119.7~~	~~140.7~~	~~149.1~~	~~134.4~~	~~149.2~~
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	~~135.9~~	~~116.2~~	~~138.7~~	~~147.8~~	~~132.6~~	~~148.2~~
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	~~133.3~~	~~112.6~~	~~136.6~~	~~146.6~~	~~131.0~~	~~147.2~~
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	~~130.7~~	~~108.9~~	~~134.6~~	~~145.5~~	~~129.4~~	~~146.3~~
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	~~128.0~~	~~105.3~~	~~132.4~~	~~144.3~~	~~127.8~~	~~145.4~~

6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: NS

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Equation		Intercept
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8		x^2		115.07206
Urban	2018	LECS6	100.98	774.3	766.8	171.3	0.706914	x	0.1094	87.41208
Rural	2018	LECS6	100.98	445.0	440.7	170.4		Intercept	~~129.96~~	122.18742

modified based on 2018's value

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	~~175.8~~	~~171.3~~	170.4	~~175.8~~	~~171.3~~	170.4
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	~~178.1~~	~~174.5~~	172.3	~~178.1~~	~~174.5~~	172.3
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	~~179.6~~	~~176.6~~	173.4	~~179.6~~	~~176.6~~	173.4
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	~~181.4~~	~~179.1~~	174.9	~~181.2~~	~~178.8~~	174.7
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	~~183.6~~	~~182.1~~	176.6	~~183.3~~	~~181.7~~	176.4
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	~~186.0~~	~~185.3~~	178.5	~~185.7~~	~~184.9~~	178.2
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	~~188.6~~	~~189.0~~	180.6	~~188.0~~	~~188.2~~	180.1
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	~~191.4~~	~~192.9~~	182.8	~~190.2~~	~~191.2~~	181.9
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	~~194.3~~	~~196.8~~	185.1	~~192.4~~	~~194.2~~	183.5
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	~~197.1~~	~~200.8~~	187.4	~~194.5~~	~~197.1~~	185.2
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	~~200.1~~	~~204.8~~	189.7	~~196.5~~	~~199.9~~	186.8
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	~~203.1~~	~~209.0~~	192.1	~~198.5~~	~~202.7~~	188.4
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	~~206.1~~	~~213.1~~	194.5	~~200.4~~	~~205.4~~	190.0
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	~~209.2~~	~~217.4~~	196.9	~~202.4~~	~~208.0~~	191.5
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	~~212.3~~	~~221.8~~	199.4	~~204.2~~	~~210.6~~	193.0
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	~~215.5~~	~~226.2~~	202.0	~~206.1~~	~~213.1~~	194.4
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	~~218.8~~	~~230.7~~	204.5	~~207.9~~	~~215.6~~	195.8
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	~~222.0~~	~~235.2~~	207.1	~~209.6~~	~~218.0~~	197.2
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	~~225.4~~	~~239.8~~	209.8	~~211.3~~	~~220.4~~	198.6
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	~~228.8~~	~~244.5~~	212.5	~~212.9~~	~~222.6~~	199.9
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	~~232.2~~	~~249.3~~	215.2	~~214.5~~	~~224.8~~	201.1
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	~~235.7~~	~~254.1~~	218.0	~~216.1~~	~~227.0~~	202.4
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	~~239.3~~	~~259.0~~	220.8	~~217.6~~	~~229.0~~	203.6

6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: Urban①

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Equation		Intercept
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8		x^2		220.04147
Urban	2018	LECS6	100.98	774.3	766.8	171.3	0.706914	x	-0.0797	232.41396
Rural	2018	LECS6	100.98	445.0	440.7	170.4		Intercept	~~212.89~~	205.52379

modified based on 2018's value

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	~~175.8~~	~~171.3~~	~~170.4~~	~~175.8~~	~~171.3~~	~~170.4~~
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	~~174.1~~	~~168.9~~	~~169.0~~	~~174.1~~	~~168.9~~	~~169.0~~
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	~~173.0~~	~~167.5~~	~~168.2~~	~~173.0~~	~~167.5~~	~~168.2~~
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	~~171.7~~	~~165.6~~	~~167.1~~	~~171.8~~	~~165.8~~	~~167.3~~
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	~~170.1~~	~~163.5~~	~~165.9~~	~~170.3~~	~~163.7~~	~~166.0~~
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	~~168.4~~	~~161.1~~	~~164.5~~	~~168.6~~	~~161.4~~	~~164.7~~
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	~~166.5~~	~~158.4~~	~~163.0~~	~~166.9~~	~~159.0~~	~~163.3~~
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	~~164.4~~	~~155.6~~	~~161.4~~	~~165.3~~	~~156.8~~	~~162.1~~
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	~~162.3~~	~~152.7~~	~~159.7~~	~~163.7~~	~~154.6~~	~~160.8~~
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	~~160.3~~	~~149.8~~	~~158.0~~	~~162.2~~	~~152.5~~	~~159.6~~
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	~~158.1~~	~~146.9~~	~~156.3~~	~~160.7~~	~~150.5~~	~~158.4~~
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	~~155.9~~	~~143.9~~	~~154.6~~	~~159.3~~	~~148.5~~	~~157.3~~
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	~~153.7~~	~~140.8~~	~~152.9~~	~~157.9~~	~~146.5~~	~~156.1~~
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	~~151.5~~	~~137.7~~	~~151.1~~	~~156.5~~	~~144.6~~	~~155.0~~
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	~~149.2~~	~~134.5~~	~~149.3~~	~~155.1~~	~~142.7~~	~~154.0~~
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	~~146.9~~	~~131.3~~	~~147.4~~	~~153.7~~	~~140.8~~	~~152.9~~
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	~~144.5~~	~~128.1~~	~~145.5~~	~~152.4~~	~~139.0~~	~~151.9~~
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	~~142.1~~	~~124.7~~	~~143.6~~	~~151.2~~	~~137.3~~	~~150.9~~
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	~~139.7~~	~~121.4~~	~~141.7~~	~~149.9~~	~~135.6~~	~~149.9~~
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	~~137.2~~	~~118.0~~	~~139.7~~	~~148.7~~	~~133.9~~	~~148.9~~
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	~~134.7~~	~~114.5~~	~~137.7~~	~~147.6~~	~~132.3~~	~~148.0~~
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	~~132.1~~	~~111.0~~	~~135.7~~	~~146.4~~	~~130.7~~	~~147.1~~
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	~~129.6~~	~~107.4~~	~~133.7~~	~~145.3~~	~~129.2~~	~~146.2~~

6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: Rural①

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Equation		Intercept
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8		x^2		112.13003
Urban	2018	LECS6	100.98	774.3	766.8	171.3	0.706914	x	0.1147	83.34804
Rural	2018	LECS6	100.98	445.0	440.7	170.4		Intercept	~~129.19~~	119.85171

modified based on 2018's value

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	~~175.8~~	~~171.3~~	170.4	~~175.8~~	~~171.3~~	170.4
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	~~178.3~~	~~174.7~~	172.3	~~178.3~~	~~174.7~~	172.3
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	~~179.8~~	~~176.8~~	173.6	~~179.8~~	~~176.8~~	173.6
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	~~181.7~~	~~179.5~~	175.1	~~181.5~~	~~179.2~~	174.9
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	~~184.0~~	~~182.6~~	176.9	~~183.7~~	~~182.2~~	176.7
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	~~186.5~~	~~186.0~~	178.9	~~186.1~~	~~185.6~~	178.6
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	~~189.2~~	~~189.9~~	181.1	~~188.6~~	~~189.0~~	180.6
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	~~192.2~~	~~193.9~~	183.4	~~190.9~~	~~192.2~~	182.4
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	~~195.2~~	~~198.0~~	185.8	~~193.2~~	~~195.3~~	184.2
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	~~198.2~~	~~202.2~~	188.2	~~195.4~~	~~198.3~~	185.9
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	~~201.3~~	~~206.5~~	190.6	~~197.5~~	~~201.3~~	187.6
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	~~204.4~~	~~210.8~~	193.1	~~199.6~~	~~204.2~~	189.3
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	~~207.6~~	~~215.2~~	195.6	~~201.6~~	~~207.0~~	190.9
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	~~210.8~~	~~219.6~~	198.2	~~203.6~~	~~209.8~~	192.5
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	~~214.1~~	~~224.2~~	200.8	~~205.6~~	~~212.5~~	194.1
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	~~217.4~~	~~228.8~~	203.5	~~207.5~~	~~215.2~~	195.6
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	~~220.8~~	~~233.5~~	206.2	~~209.4~~	~~217.8~~	197.1
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	~~224.3~~	~~238.3~~	208.9	~~211.2~~	~~220.3~~	198.5
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	~~227.8~~	~~243.1~~	211.7	~~213.0~~	~~222.7~~	199.9
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	~~231.3~~	~~248.0~~	214.5	~~214.7~~	~~225.1~~	201.3
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	~~235.0~~	~~253.0~~	217.4	~~216.4~~	~~227.4~~	202.6
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	~~238.6~~	~~258.1~~	220.3	~~218.0~~	~~229.7~~	203.9
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	~~242.3~~	~~263.2~~	223.2	~~219.6~~	~~231.8~~	205.2

6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: Urban②

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Elasticity
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8	0.706914	-0.309
Urban	2018	LECS6	100.98	774.3	766.8	171.3		
Rural	2018	LECS6	100.98	445.0	440.7	170.4		

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	175.8	171.3	170.4	175.8	171.3	170.4
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	173.7	169.3	168.4	173.7	169.3	168.4
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	172.5	168.1	167.2	172.5	168.1	167.2
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	171.0	166.6	165.7	171.1	166.8	165.9
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	169.3	164.9	164.0	169.4	165.2	164.3
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	167.5	163.1	162.2	167.6	163.5	162.6
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	165.6	161.2	160.3	165.9	161.8	160.9
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	163.6	159.3	158.4	164.3	160.3	159.4
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	161.7	157.5	156.6	162.9	158.9	158.0
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	159.9	155.7	154.8	161.5	157.6	156.7
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	158.1	154.0	153.1	160.2	156.3	155.5
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	156.4	152.3	151.4	159.0	155.1	154.3
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	154.7	150.7	149.8	157.8	154.0	153.2
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	153.1	149.1	148.2	156.7	152.9	152.1
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	151.5	147.6	146.7	155.7	151.9	151.1
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	150.0	146.1	145.2	154.7	150.9	150.1
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	148.5	144.6	143.8	153.8	150.0	149.2
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	147.0	143.2	142.4	152.9	149.1	148.3
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	145.6	141.8	141.0	152.1	148.3	147.5
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	144.2	140.5	139.7	151.3	147.5	146.7
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	142.8	139.2	138.4	150.5	146.8	146.0
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	141.5	137.9	137.1	149.8	146.1	145.3
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	140.2	136.6	135.9	149.1	145.4	144.6

6.2. Future Projection of PCE and PCC

PCE･PCC Relationship: Rural②

Baseline	Basae Year	LECS Number	CPI	PCE nominal	PCE real	PCC	GDP･PCE Elasticity	PCE･PCC Elasticity
Lao PDR	2018	LECS6	100.98	560.5	555.1	175.8	0.706914	0.2936
Urban	2018	LECS6	100.98	774.3	766.8	171.3		
Rural	2018	LECS6	100.98	445.0	440.7	170.4		

Item	GDP growth		PCE growth		PCE real						PCC					
Senario	B	C	B	C	B			C			B			C		
Year					Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural	Lao PDR	Urban	Rural
	%	%	%	%	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip	Kip
2018	6.29	6.29	4.45	4.45	555.1	766.8	440.7	555.1	766.8	440.7	175.8	171.3	170.4	175.8	171.3	170.4
2019	5.46	5.46	3.86	3.86	576.5	796.4	457.7	576.5	796.4	457.7	177.8	173.2	172.3	177.8	173.2	172.3
2020	3.28	3.28	2.32	2.32	589.9	814.9	468.3	589.9	814.9	468.3	179.0	174.4	173.5	179.0	174.4	173.5
2021	4.00	3.60	2.83	2.54	606.6	838.0	481.6	604.9	835.6	480.2	180.5	175.9	174.9	180.3	175.7	174.8
2022	4.60	4.50	3.25	3.18	626.3	865.2	497.3	624.1	862.2	495.5	182.2	177.6	176.6	182.0	177.3	176.4
2023	4.90	4.80	3.46	3.39	648.0	895.1	514.5	645.3	891.4	512.3	184.1	179.4	178.4	183.8	179.1	178.2
2024	5.30	4.70	3.75	3.32	672.3	928.7	533.8	666.7	921.0	529.3	186.1	181.4	180.4	185.6	180.8	179.9
2025	5.40	4.32	3.82	3.05	698.0	964.2	554.2	687.0	949.1	545.4	188.2	183.4	182.4	187.3	182.4	181.5
2026	5.25	4.03	3.71	2.85	723.9	1,000.0	574.8	706.6	976.1	560.9	190.3	185.4	184.4	188.9	183.9	183.0
2027	5.14	3.81	3.63	2.69	750.2	1,036.3	595.7	725.6	1,002.4	576.0	192.3	187.4	186.4	190.4	185.4	184.4
2028	5.05	3.63	3.57	2.57	777.0	1,073.3	617.0	744.2	1,028.2	590.8	194.3	189.4	188.4	191.8	186.8	185.8
2029	4.97	3.46	3.51	2.45	804.3	1,111.0	638.7	762.4	1,053.4	605.3	196.3	191.4	190.3	193.2	188.1	187.1
2030	4.88	3.32	3.45	2.35	832.0	1,149.3	660.7	780.3	1,078.2	619.5	198.3	193.3	192.2	194.5	189.4	188.4
2031	4.80	3.17	3.39	2.24	860.2	1,188.3	683.1	797.8	1,102.4	633.4	200.3	195.2	194.1	195.8	190.6	189.6
2032	4.72	3.04	3.34	2.15	888.9	1,228.0	705.9	815.0	1,126.1	647.0	202.3	197.1	196.0	197.0	191.8	190.8
2033	4.65	2.91	3.29	2.06	918.1	1,268.4	729.1	831.8	1,149.3	660.3	204.3	199.0	197.9	198.2	193.0	192.0
2034	4.57	2.78	3.23	1.97	947.8	1,309.4	752.6	848.2	1,171.9	673.3	206.2	200.9	199.8	199.3	194.1	193.1
2035	4.49	2.65	3.17	1.87	977.8	1,350.9	776.5	864.1	1,193.8	685.9	208.1	202.8	201.7	200.4	195.2	194.2
2036	4.42	2.53	3.12	1.79	1,008.3	1,393.0	800.7	879.6	1,215.2	698.2	210.0	204.7	203.5	201.5	196.2	195.2
2037	4.35	2.41	3.08	1.70	1,039.4	1,435.9	825.4	894.6	1,235.9	710.1	211.9	206.6	205.3	202.5	197.2	196.2
2038	4.28	2.30	3.03	1.63	1,070.9	1,479.4	850.4	909.2	1,256.0	721.7	213.8	208.4	207.1	203.5	198.1	197.1
2039	4.22	2.20	2.98	1.56	1,102.8	1,523.5	875.7	923.4	1,275.6	733.0	215.7	210.2	208.9	204.4	199.0	198.0
2040	4.16	2.11	2.94	1.49	1,135.2	1,568.3	901.4	937.2	1,294.6	743.9	217.6	212.0	210.7	205.3	199.9	198.9

6.3. Summary of PCC

Unit : kg/capita/yr

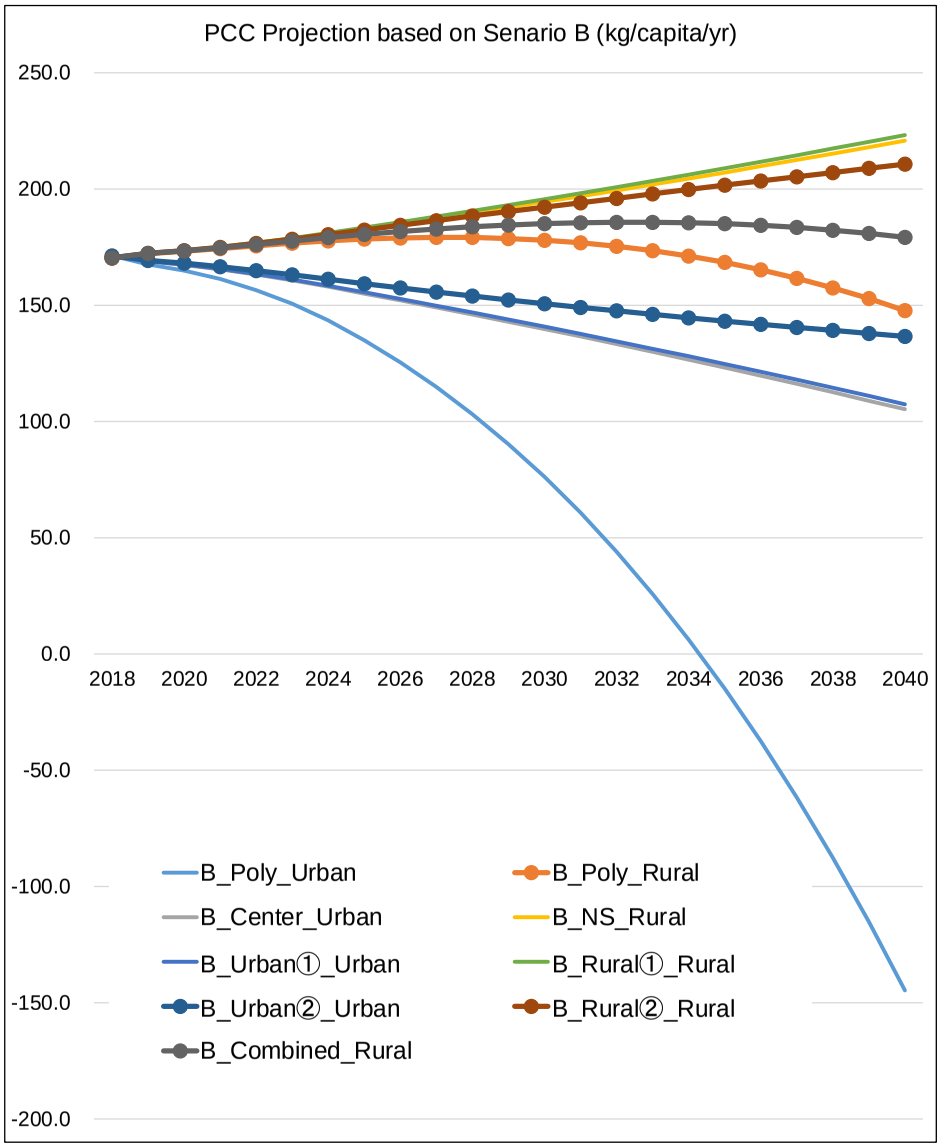
GDP Senario	B	B	B	B	B	B	B	B	B
Analysis Code	Poly	Poly	Center	NS	Urban①	Rural①	Urban②	Rural②	Combined
Urban / Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Rural
2018	171.3	170.4	171.3	170.4	171.3	170.4	171.3	170.4	170.4
2019	167.6	172.2	168.9	172.3	168.9	172.3	169.3	172.3	172.3
2020	164.9	173.2	167.3	173.4	167.5	173.6	168.1	173.5	173.4
2021	161.3	174.4	165.4	174.9	165.6	175.1	166.6	174.9	174.7
2022	156.5	175.6	163.2	176.6	163.5	176.9	164.9	176.6	176.1
2023	150.7	176.7	160.7	178.5	161.1	178.9	163.1	178.4	177.6
2024	143.5	177.7	158.0	180.6	158.4	181.1	161.2	180.4	179.1
2025	134.9	178.5	155.0	182.8	155.6	183.4	159.3	182.4	180.5
2026	125.4	179.0	152.1	185.1	152.7	185.8	157.5	184.4	181.7
2027	114.9	179.2	149.1	187.4	149.8	188.2	155.7	186.4	182.8
2028	103.2	179.2	146.0	189.7	146.9	190.6	154.0	188.4	183.8
2029	90.3	178.7	142.9	192.1	143.9	193.1	152.3	190.3	184.5
2030	76.2	178.0	139.8	194.5	140.8	195.6	150.7	192.2	185.1
2031	60.8	176.9	136.6	196.9	137.7	198.2	149.1	194.1	185.5
2032	44.0	175.4	133.3	199.4	134.5	200.8	147.6	196.0	185.7
2033	25.8	173.5	130.0	202.0	131.3	203.5	146.1	197.9	185.7
2034	6.2	171.2	126.6	204.5	128.1	206.2	144.6	199.8	185.5
2035	-14.9	168.5	123.2	207.1	124.7	208.9	143.2	201.7	185.1
2036	-37.4	165.3	119.7	209.8	121.4	211.7	141.8	203.5	184.4
2037	-61.7	161.6	116.2	212.5	118.0	214.5	140.5	205.3	183.5
2038	-87.6	157.5	112.6	215.2	114.5	217.4	139.2	207.1	182.3
2039	-115.2	152.9	108.9	218.0	111.0	220.3	137.9	208.9	180.9
2040	-144.7	147.7	105.3	220.8	107.4	223.2	136.6	210.7	179.2

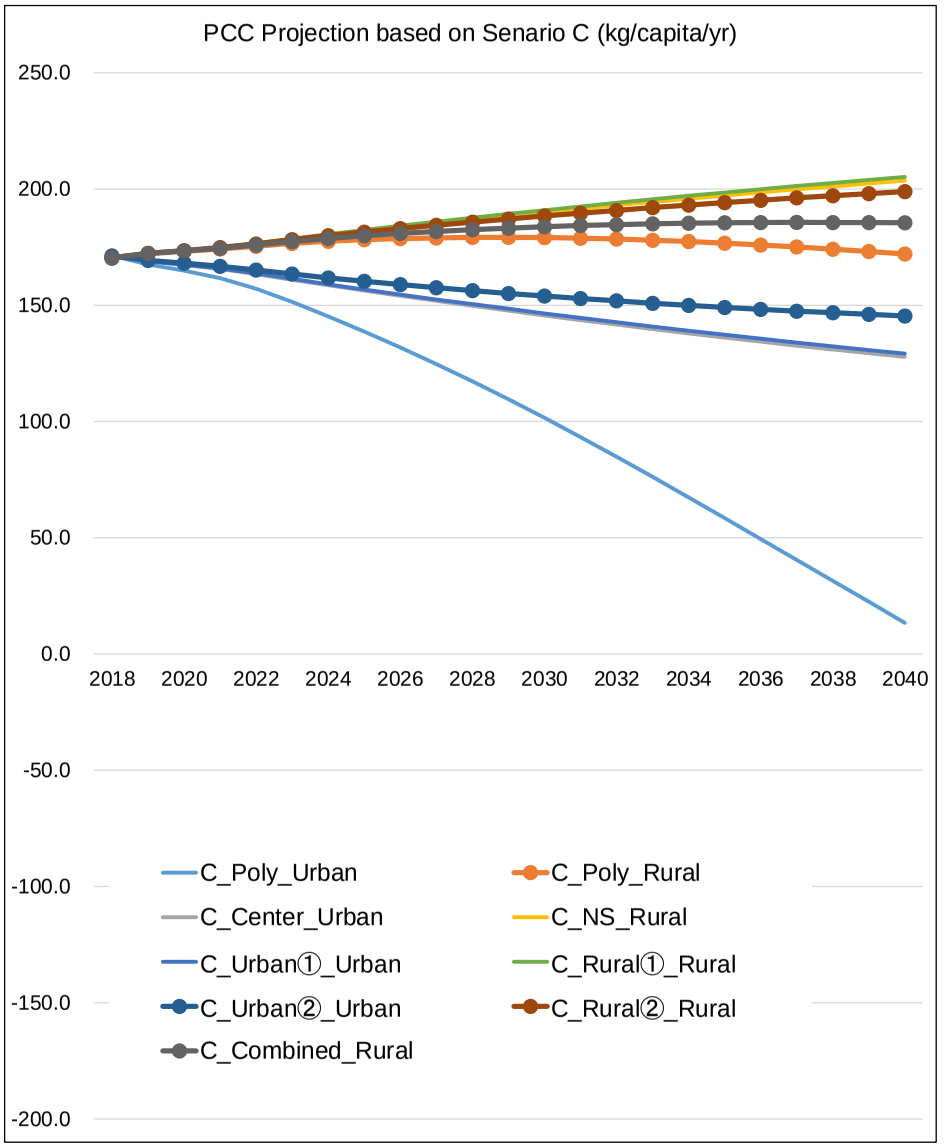
6.3. Summary of PCC

Unit : kg/capita/yr

GDP Senario	C	C	C	C	C	C	C	C	C
Analysis Code	Poly	Poly	Center	NS	Urban①	Rural①	Urban②	Rural②	Combined
Urban / Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Rural
2018	171.3	170.4	171.3	170.4	171.3	170.4	171.3	170.4	170.4
2019	167.6	172.2	168.9	172.3	168.9	172.3	169.3	172.3	172.3
2020	164.9	173.2	167.3	173.4	167.5	173.6	168.1	173.5	173.4
2021	161.7	174.2	165.6	174.7	165.8	174.9	166.8	174.8	174.5
2022	157.1	175.4	163.4	176.4	163.7	176.7	165.2	176.4	175.9
2023	151.5	176.6	161.0	178.2	161.4	178.6	163.5	178.2	177.4
2024	145.2	177.5	158.6	180.1	159.0	180.6	161.8	179.9	178.7
2025	138.7	178.2	156.3	181.9	156.8	182.4	160.3	181.5	179.9
2026	131.9	178.7	154.1	183.5	154.6	184.2	158.9	183.0	180.9
2027	124.7	179.0	151.9	185.2	152.5	185.9	157.6	184.4	181.7
2028	117.3	179.2	149.8	186.8	150.5	187.6	156.3	185.8	182.5
2029	109.6	179.2	147.7	188.4	148.5	189.3	155.1	187.1	183.2
2030	101.6	179.1	145.6	190.0	146.5	190.9	154.0	188.4	183.8
2031	93.3	178.9	143.6	191.5	144.6	192.5	152.9	189.6	184.3
2032	84.9	178.5	141.7	193.0	142.7	194.1	151.9	190.8	184.7
2033	76.2	178.0	139.8	194.4	140.8	195.6	150.9	192.0	185.0
2034	67.4	177.4	137.9	195.8	139.0	197.1	150.0	193.1	185.3
2035	58.5	176.7	136.1	197.2	137.3	198.5	149.1	194.2	185.5
2036	49.5	175.9	134.4	198.6	135.6	199.9	148.3	195.2	185.6
2037	40.5	175.1	132.6	199.9	133.9	201.3	147.5	196.2	185.7
2038	31.5	174.1	131.0	201.1	132.3	202.6	146.8	197.1	185.6
2039	22.5	173.1	129.4	202.4	130.7	203.9	146.1	198.0	185.6
2040	13.4	172.1	127.8	203.6	129.2	205.2	145.4	198.9	185.5

6.3. Summary of PCC

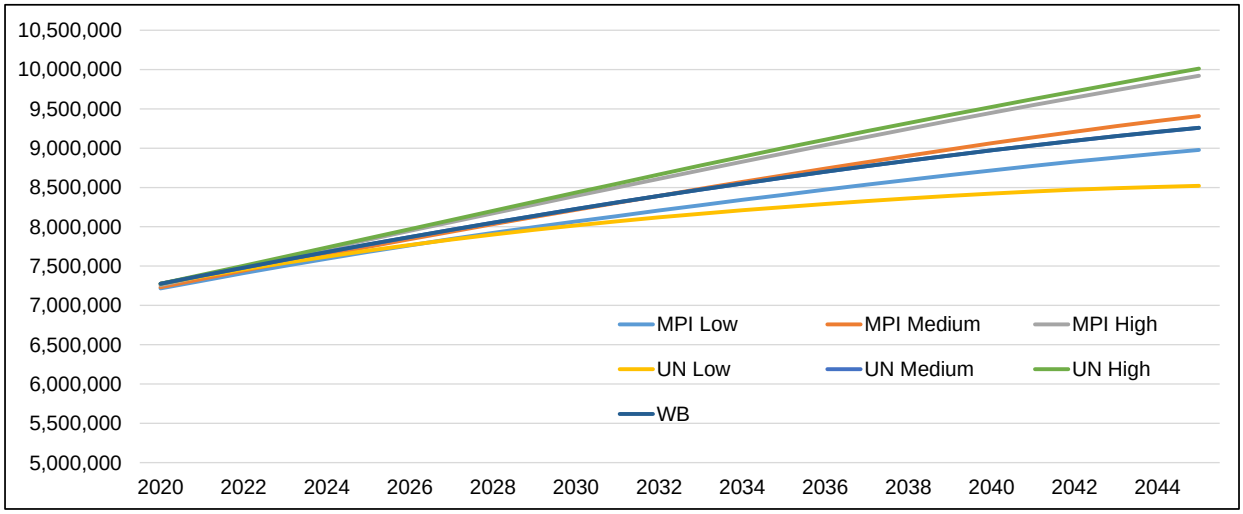




7. Population and Urbanization

7.1. Population Projection

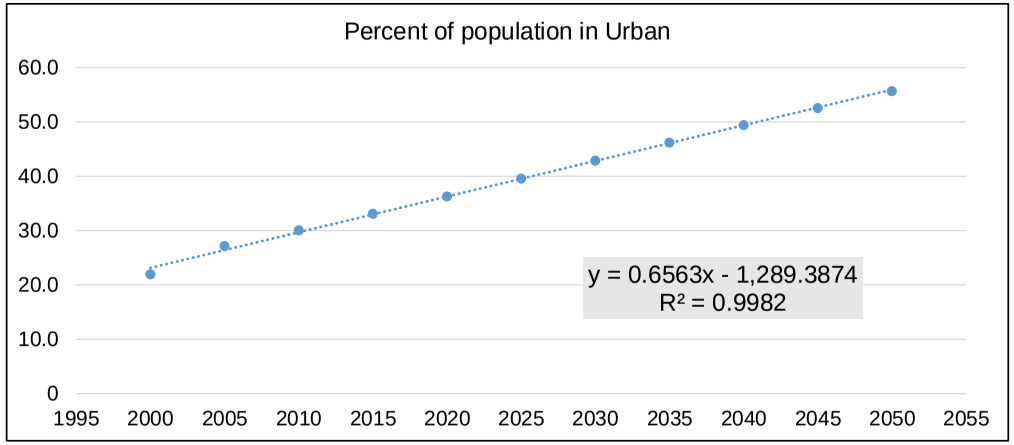
Year	Ministry of Planning and Investment Lao Statistic Bureau			UN Population Division			World Bank
	Low	Medium	High	Low	Medium	High	
2015	6,671,680	6,671,680	6,671,680	-	-	-	6,741,160
2016	6,785,911	6,787,007	6,788,651	-	-	-	6,845,848
2017	6,897,534	6,900,846	6,905,813	-	-	-	6,953,031
2018	7,006,313	7,012,995	7,023,016	-	-	-	7,061,498
2019	7,111,968	7,123,205	7,140,062	-	-	-	7,169,456
2020	7,216,196	7,231,210	7,256,731	7,275,556	7,275,556	7,275,556	7,275,556
2021	7,313,744	7,337,783	7,373,246	7,369,081	7,379,358	7,388,770	7,379,000
2022	7,410,450	7,442,794	7,489,515	7,457,383	7,481,026	7,503,659	7,481,000
2023	7,503,835	7,545,792	7,605,114	7,541,029	7,580,608	7,619,644	7,581,000
2024	7,593,826	7,646,723	7,720,009	7,620,442	7,678,397	7,736,251	7,678,000
2025	7,680,057	7,745,249	7,833,888	7,695,966	7,774,527	7,853,085	7,775,000
2026	7,763,667	7,842,539	7,947,321	7,767,790	7,868,912	7,969,903	7,869,000
2027	7,844,314	7,938,274	8,059,997	7,835,957	7,961,311	8,086,521	7,961,000
2028	7,921,895	8,032,365	8,171,837	7,900,431	8,051,684	8,202,866	8,052,000
2029	7,996,183	8,124,617	8,282,658	7,961,098	8,140,008	8,318,935	8,140,000
2030	8,067,139	8,215,004	8,392,443	8,017,853	8,226,277	8,434,699	8,226,000
2031	8,137,298	8,304,784	8,501,825	8,070,712	8,310,416	8,550,072	8,310,000
2032	8,206,555	8,393,877	8,610,763	8,119,906	8,392,395	8,664,811	8,392,000
2033	8,274,598	8,481,970	8,718,955	8,165,898	8,472,242	8,778,505	8,472,000
2034	8,341,453	8,569,102	8,826,463	8,209,309	8,550,006	8,890,647	8,550,000
2035	8,406,984	8,655,138	8,933,170	8,250,547	8,625,713	9,000,877	8,626,000
2036	8,471,540	8,739,742	9,038,773	8,289,790	8,699,342	9,108,989	8,699,000
2037	8,535,092	8,822,910	9,143,324	8,326,928	8,770,832	9,215,064	8,771,000
2038	8,597,285	8,904,298	9,246,531	8,361,739	8,840,139	9,319,288	8,840,000
2039	8,657,953	8,983,763	9,348,305	8,393,832	8,907,193	9,421,979	8,907,000
2040	8,716,860	9,061,797	9,448,490	8,422,919	8,971,941	9,523,401	8,972,000
2041	8,773,714	9,136,811	9,546,960	8,448,953	9,034,337	9,623,571	9,034,000
2042	8,828,616	9,209,355	9,643,586	8,471,923	9,094,331	9,722,432	9,094,000
2043	8,880,930	9,279,129	9,738,120	8,491,686	9,151,849	9,820,088	9,152,000
2044	8,930,776	9,345,485	9,830,657	8,508,077	9,206,826	9,916,636	9,207,000
2045	8,977,787	9,408,810	9,920,913	8,520,941	9,259,159	10,012,144	9,259,000



7.2. Urbanisation Projection

Year	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Percent of population in Urban	21.977	27.186	30.064	33.108	36.290	39.566	42.891	46.207	49.439	52.566	55.677
Defference	-	5.2	2.9	3.0	3.2	3.3	3.3	3.3	3.2	3.1	3.1

Source: United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision.



7.3. Annual percent of population in urban

Regression equation by linear approximation :

y(% of population in urban)=a+b*x(year)

a	-1,289.3874
b	0.6563

Year	Percent of population in urban (%)	
	UN Projection	Based on regression equation
2015	33.108	33.057
2016	-	33.713
2017	-	34.370
2018	-	35.026
2019	-	35.682
2020	36.290	36.339
2021	-	36.995
2022	-	37.651
2023	-	38.307
2024	-	38.964
2025	39.566	39.620
2026	-	40.276
2027	-	40.933
2028	-	41.589
2029	-	42.245
2030	42.891	42.902
2031	-	43.558
2032	-	44.214
2033	-	44.871
2034	-	45.527
2035	46.207	46.183
2036	-	46.839
2037	-	47.496
2038	-	48.152
2039	-	48.808
2040	49.439	49.465

7.4. Future population

Calculation of population by urban and rural

Besed on the projection by Ministry of Planning and Investment or UN Population Division

Year	Population in UN High Scenario			Population in MPI High Scenario			Population in MPI Medium Scenario		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2015	-	-	-	2,205,457	4,466,223	6,671,680	2,205,457	4,466,223	6,671,680
2016	-	-	-	2,288,658	4,499,993	6,788,651	2,288,104	4,498,903	6,787,007
2017	-	-	-	2,373,528	4,532,285	6,905,813	2,371,821	4,529,025	6,900,846
2018	-	-	-	2,459,882	4,563,134	7,023,016	2,456,372	4,556,623	7,012,995
2019	-	-	-	2,547,717	4,592,345	7,140,062	2,541,702	4,581,503	7,123,205
2020	2,643,864	4,631,692	7,275,556	2,637,023	4,619,708	7,256,731	2,627,749	4,603,461	7,231,210
2021	2,733,475	4,655,295	7,388,770	2,727,732	4,645,514	7,373,246	2,714,613	4,623,170	7,337,783
2022	2,825,203	4,678,456	7,503,659	2,819,877	4,669,638	7,489,515	2,802,286	4,640,508	7,442,794
2023	2,918,857	4,700,787	7,619,644	2,913,291	4,691,823	7,605,114	2,890,567	4,655,225	7,545,792
2024	3,014,353	4,721,898	7,736,251	3,008,024	4,711,985	7,720,009	2,979,469	4,667,254	7,646,723
2025	3,111,392	4,741,693	7,853,085	3,103,786	4,730,102	7,833,888	3,068,668	4,676,581	7,745,249
2026	3,209,958	4,759,945	7,969,903	3,200,863	4,746,458	7,947,321	3,158,661	4,683,878	7,842,539
2027	3,310,056	4,776,465	8,086,521	3,299,199	4,760,798	8,059,997	3,249,374	4,688,900	7,938,274
2028	3,411,490	4,791,376	8,202,866	3,398,585	4,773,252	8,171,837	3,340,580	4,691,785	8,032,365
2029	3,514,334	4,804,601	8,318,935	3,499,009	4,783,649	8,282,658	3,432,244	4,692,373	8,124,617
2030	3,618,655	4,816,044	8,434,699	3,600,526	4,791,917	8,392,443	3,524,401	4,690,603	8,215,004
2031	3,724,240	4,825,832	8,550,072	3,703,225	4,798,600	8,501,825	3,617,398	4,687,386	8,304,784
2032	3,831,060	4,833,751	8,664,811	3,807,163	4,803,600	8,610,763	3,711,269	4,682,608	8,393,877
2033	3,939,003	4,839,502	8,778,505	3,912,282	4,806,673	8,718,955	3,805,945	4,676,025	8,481,970
2034	4,047,645	4,843,002	8,890,647	4,018,424	4,808,039	8,826,463	3,901,255	4,667,847	8,569,102
2035	4,156,875	4,844,002	9,000,877	4,125,606	4,807,564	8,933,170	3,997,202	4,657,936	8,655,138
2036	4,266,559	4,842,430	9,108,989	4,233,671	4,805,102	9,038,773	4,093,608	4,646,134	8,739,742
2037	4,376,787	4,838,277	9,215,064	4,342,713	4,800,611	9,143,324	4,190,529	4,632,381	8,822,910
2038	4,487,424	4,831,864	9,319,288	4,452,390	4,794,141	9,246,531	4,287,598	4,616,700	8,904,298
2039	4,598,680	4,823,299	9,421,979	4,562,721	4,785,584	9,348,305	4,384,795	4,598,968	8,983,763
2040	4,710,750	4,812,651	9,523,401	4,673,696	4,774,794	9,448,490	4,482,418	4,579,379	9,061,797
Growth rate 2020 → 2040	178.2%	103.9%	130.9%	177.2%	103.4%	130.2%	170.6%	99.5%	125.3%

7.4. Future population

Calculation of population by urban and rural

Besed on the projection by Ministry of Planning and Investment or UN Population Division

Year	Population in UN Medium Scenario			Population in MPI Low Scenario			Population in UN Low Scenario		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2015	-	-	-	2,205,457	4,466,223	6,671,680	-	-	-
2016	-	-	-	2,287,734	4,498,177	6,785,911	-	-	-
2017	-	-	-	2,370,682	4,526,852	6,897,534	-	-	-
2018	-	-	-	2,454,031	4,552,282	7,006,313	-	-	-
2019	-	-	-	2,537,692	4,574,276	7,111,968	-	-	-
2020	2,643,864	4,631,692	7,275,556	2,622,293	4,593,903	7,216,196	2,643,864	4,631,692	7,275,556
2021	2,729,993	4,649,365	7,379,358	2,705,720	4,608,024	7,313,744	2,726,192	4,642,889	7,369,081
2022	2,816,681	4,664,345	7,481,026	2,790,109	4,620,341	7,410,450	2,807,779	4,649,604	7,457,383
2023	2,903,904	4,676,704	7,580,608	2,874,494	4,629,341	7,503,835	2,888,742	4,652,287	7,541,029
2024	2,991,811	4,686,586	7,678,397	2,958,858	4,634,968	7,593,826	2,969,229	4,651,213	7,620,442
2025	3,080,268	4,694,259	7,774,527	3,042,839	4,637,218	7,680,057	3,049,142	4,646,824	7,695,966
2026	3,169,283	4,699,629	7,868,912	3,126,895	4,636,772	7,763,667	3,128,555	4,639,235	7,767,790
2027	3,258,803	4,702,508	7,961,311	3,210,913	4,633,401	7,844,314	3,207,492	4,628,465	7,835,957
2028	3,348,615	4,703,069	8,051,684	3,294,637	4,627,258	7,921,895	3,285,710	4,614,721	7,900,431
2029	3,438,746	4,701,262	8,140,008	3,377,988	4,618,195	7,996,183	3,363,166	4,597,932	7,961,098
2030	3,529,237	4,697,040	8,226,277	3,460,964	4,606,175	8,067,139	3,439,819	4,578,034	8,017,853
2031	3,619,851	4,690,565	8,310,416	3,544,444	4,592,854	8,137,298	3,515,441	4,555,271	8,070,712
2032	3,710,614	4,681,781	8,392,395	3,628,446	4,578,109	8,206,555	3,590,135	4,529,771	8,119,906
2033	3,801,580	4,670,662	8,472,242	3,712,895	4,561,703	8,274,598	3,664,120	4,501,778	8,165,898
2034	3,892,561	4,657,445	8,550,006	3,797,613	4,543,840	8,341,453	3,737,452	4,471,857	8,209,309
2035	3,983,613	4,642,100	8,625,713	3,882,597	4,524,387	8,406,984	3,810,350	4,440,197	8,250,547
2036	4,074,685	4,624,657	8,699,342	3,967,985	4,503,555	8,471,540	3,882,855	4,406,935	8,289,790
2037	4,165,794	4,605,038	8,770,832	4,053,827	4,481,265	8,535,092	3,954,958	4,371,970	8,326,928
2038	4,256,704	4,583,435	8,840,139	4,139,765	4,457,520	8,597,285	4,026,345	4,335,394	8,361,739
2039	4,347,423	4,559,770	8,907,193	4,225,774	4,432,179	8,657,953	4,096,862	4,296,970	8,393,832
2040	4,437,971	4,533,970	8,971,941	4,311,795	4,405,065	8,716,860	4,166,397	4,256,522	8,422,919
Growth rate 2020 → 2040	167.9%	97.9%	123.3%	164.4%	95.9%	120.8%	157.6%	91.9%	115.8%

8. Scenario List

Scenario CODE	G1-P1	G1-P2	G1-P3	G1-P4	G1-P5	G1-P6	G2-P1	G2-P2	G2-P3	G2-P4	G2-P5	G2-P6
GDP Growth	High	High	High	High	High	High	Low	Low	Low	Low	Low	Low
Population Growth	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low

GDP Growth	G1	(High)	Scenario B ： Statistical Yearbook × 9th five-year NSEDP Targets× OECD Word Forecast
Scenario Description	G2	(Low)	Scenario C ： Statistical Yearbook × WB Lao PDR Economic Monitor Targets × OECD G20 emerging economies Forecast

Population Growth	P1	P2	P3	P4	P5	P6
Scenario Description	UN High	MPI High	MPI Medium	UN Medium	MPI Low	UN Low
	(Very High)	(High)	(Upper-Medium)	(Lower-Medium)	(Low)	(Very Low)

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②
(milled rice base)

Projection	PCC Projection (kg/capita/yr)				Population Projection (person)											
GDP Growth	High		Low													
Population Growth					Very High		High		Upper-Medium		Lower-Medium		Low		Very Low	
Area	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
2018	171.3	170.4	171.3	170.4	-	-	2,459,882	4,563,134	2,456,372	4,556,623	-	-	2,454,031	4,552,282	-	-
2019	169.3	172.3	169.3	172.3	-	-	2,547,717	4,592,345	2,541,702	4,581,503	-	-	2,537,692	4,574,276	-	-
2020	168.1	173.5	168.1	173.5	2,643,864	4,631,692	2,637,023	4,619,708	2,627,749	4,603,461	2,643,864	4,631,692	2,622,293	4,593,903	2,643,864	4,631,692
2021	166.6	174.9	166.8	174.8	2,733,475	4,655,295	2,727,732	4,645,514	2,714,613	4,623,170	2,729,993	4,649,365	2,705,720	4,608,024	2,726,192	4,642,889
2022	164.9	176.6	165.2	176.4	2,825,203	4,678,456	2,819,877	4,669,638	2,802,286	4,640,508	2,816,681	4,664,345	2,790,109	4,620,341	2,807,779	4,649,604
2023	163.1	178.4	163.5	178.2	2,918,857	4,700,787	2,913,291	4,691,823	2,890,567	4,655,225	2,903,904	4,676,704	2,874,494	4,629,341	2,888,742	4,652,287
2024	161.2	180.4	161.8	179.9	3,014,353	4,721,898	3,008,024	4,711,985	2,979,469	4,667,254	2,991,811	4,686,586	2,958,858	4,634,968	2,969,229	4,651,213
2025	159.3	182.4	160.3	181.5	3,111,392	4,741,693	3,103,786	4,730,102	3,068,668	4,676,581	3,080,268	4,694,259	3,042,839	4,637,218	3,049,142	4,646,824
2026	157.5	184.4	158.9	183.0	3,209,958	4,759,945	3,200,863	4,746,458	3,158,661	4,683,878	3,169,283	4,699,629	3,126,895	4,636,772	3,128,555	4,639,235
2027	155.7	186.4	157.6	184.4	3,310,056	4,776,465	3,299,199	4,760,798	3,249,374	4,688,900	3,258,803	4,702,508	3,210,913	4,633,401	3,207,492	4,628,465
2028	154.0	188.4	156.3	185.8	3,411,490	4,791,376	3,398,585	4,773,252	3,340,580	4,691,785	3,348,615	4,703,069	3,294,637	4,627,258	3,285,710	4,614,721
2029	152.3	190.3	155.1	187.1	3,514,334	4,804,601	3,499,009	4,783,649	3,432,244	4,692,373	3,438,746	4,701,262	3,377,988	4,618,195	3,363,166	4,597,932
2030	150.7	192.2	154.0	188.4	3,618,655	4,816,044	3,600,526	4,791,917	3,524,401	4,690,603	3,529,237	4,697,040	3,460,964	4,606,175	3,439,819	4,578,034
2031	149.1	194.1	152.9	189.6	3,724,240	4,825,832	3,703,225	4,798,600	3,617,398	4,687,386	3,619,851	4,690,565	3,544,444	4,592,854	3,515,441	4,555,271
2032	147.6	196.0	151.9	190.8	3,831,060	4,833,751	3,807,163	4,803,600	3,711,269	4,682,608	3,710,614	4,681,781	3,628,446	4,578,109	3,590,135	4,529,771
2033	146.1	197.9	150.9	192.0	3,939,003	4,839,502	3,912,282	4,806,673	3,805,945	4,676,025	3,801,580	4,670,662	3,712,895	4,561,703	3,664,120	4,501,778
2034	144.6	199.8	150.0	193.1	4,047,645	4,843,002	4,018,424	4,808,039	3,901,255	4,667,847	3,892,561	4,657,445	3,797,613	4,543,840	3,737,452	4,471,857
2035	143.2	201.7	149.1	194.2	4,156,875	4,844,002	4,125,606	4,807,564	3,997,202	4,657,936	3,983,613	4,642,100	3,882,597	4,524,387	3,810,350	4,440,197
2036	141.8	203.5	148.3	195.2	4,266,559	4,842,430	4,233,671	4,805,102	4,093,608	4,646,134	4,074,685	4,624,657	3,967,985	4,503,555	3,882,855	4,406,935
2037	140.5	205.3	147.5	196.2	4,376,787	4,838,277	4,342,713	4,800,611	4,190,529	4,632,381	4,165,794	4,605,038	4,053,827	4,481,265	3,954,958	4,371,970
2038	139.2	207.1	146.8	197.1	4,487,424	4,831,864	4,452,390	4,794,141	4,287,598	4,616,700	4,256,704	4,583,435	4,139,765	4,457,520	4,026,345	4,335,394
2039	137.9	208.9	146.1	198.0	4,598,680	4,823,299	4,562,721	4,785,584	4,384,795	4,598,968	4,347,423	4,559,770	4,225,774	4,432,179	4,096,862	4,296,970
2040	136.6	210.7	145.4	198.9	4,710,750	4,812,651	4,673,696	4,774,794	4,482,418	4,579,379	4,437,971	4,533,970	4,311,795	4,405,065	4,166,397	4,256,522

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Rural②
(milled rice base, Unit: tonnes)

Scenario CODE	G1-P1			G1-P2			G1-P3		
GDP Growth	High			High			High		
Population Growth	Very High			High			Upper-Medium		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	421,377.8	777,558.0	1,198,935.8	420,776.5	776,448.6	1,197,225.1
2019	-	-	-	431,328.5	791,261.0	1,222,589.5	430,310.1	789,393.0	1,219,703.1
2020	444,433.5	803,598.6	1,248,032.1	443,283.6	801,519.3	1,244,802.9	441,724.6	798,700.5	1,240,425.1
2021	455,396.9	814,211.1	1,269,608.0	454,440.2	812,500.4	1,266,940.6	452,254.5	808,592.4	1,260,846.9
2022	465,876.0	826,215.3	1,292,091.3	464,997.7	824,658.1	1,289,655.8	462,097.0	819,513.7	1,281,610.7
2023	476,065.6	838,620.4	1,314,686.0	475,157.8	837,021.2	1,312,179.0	471,451.5	830,492.1	1,301,943.6
2024	485,913.7	851,830.4	1,337,744.1	484,893.5	850,042.1	1,334,935.6	480,290.4	841,972.6	1,322,263.0
2025	495,644.7	864,884.8	1,360,529.5	494,433.1	862,770.6	1,357,203.7	488,838.8	853,008.4	1,341,847.2
2026	505,568.4	877,733.9	1,383,302.3	504,135.9	875,246.9	1,379,382.8	497,489.1	863,707.1	1,361,196.2
2027	515,375.7	890,333.1	1,405,708.8	513,685.3	887,412.7	1,401,098.0	505,927.5	874,011.0	1,379,938.5
2028	525,369.5	902,695.2	1,428,064.7	523,382.1	899,280.7	1,422,662.8	514,449.3	883,932.3	1,398,381.6
2029	535,233.1	914,315.6	1,449,548.7	532,899.1	910,328.4	1,443,227.5	522,730.8	892,958.6	1,415,689.4
2030	545,331.3	925,643.7	1,470,975.0	542,599.3	921,006.4	1,463,605.7	531,127.2	901,533.9	1,432,661.1
2031	555,284.2	936,694.0	1,491,978.2	552,150.8	931,408.3	1,483,559.1	539,354.0	909,821.6	1,449,175.6
2032	565,464.5	947,415.2	1,512,879.7	561,937.3	941,505.6	1,503,442.9	547,783.3	917,791.2	1,465,574.5
2033	575,488.3	957,737.4	1,533,225.7	571,584.4	951,240.6	1,522,825.0	556,048.6	925,385.3	1,481,433.9
2034	585,289.5	967,631.8	1,552,921.3	581,064.1	960,646.2	1,541,710.3	564,121.5	932,635.8	1,496,757.3
2035	595,264.5	977,035.2	1,572,299.7	590,786.8	969,685.7	1,560,472.5	572,399.3	939,505.7	1,511,905.0
2036	604,998.1	985,434.5	1,590,432.6	600,334.5	977,838.3	1,578,172.8	580,473.6	945,488.3	1,525,961.9
2037	614,938.6	993,298.3	1,608,236.9	610,151.2	985,565.4	1,595,716.6	588,769.3	951,027.8	1,539,797.1
2038	624,649.4	1,000,679.0	1,625,328.4	619,772.7	992,866.6	1,612,639.3	596,833.6	956,118.6	1,552,952.2
2039	634,158.0	1,007,587.2	1,641,745.2	629,199.2	999,708.5	1,628,907.7	604,663.2	960,724.4	1,565,387.6
2040	643,488.5	1,014,025.6	1,657,514.1	638,426.9	1,006,049.1	1,644,476.0	612,298.3	964,875.2	1,577,173.5

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Rural②
(milled rice base, Unit: tonnes)

Scenario CODE	G1-P4			G1-P5			G1-P6		
GDP Growth	High			High			High		
Population Growth	Lower-Medium			Low			Very Low		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	420,375.5	775,708.9	1,196,084.4	-	-	-
2019	-	-	-	429,631.3	788,147.8	1,217,779.1	-	-	-
2020	444,433.5	803,598.6	1,248,032.1	440,807.5	797,042.2	1,237,849.7	444,433.5	803,598.6	1,248,032.1
2021	454,816.8	813,173.9	1,267,990.7	450,773.0	805,943.4	1,256,716.4	454,183.6	812,041.3	1,266,224.9
2022	464,470.7	823,723.3	1,288,194.0	460,089.0	815,952.2	1,276,041.2	463,002.8	821,120.1	1,284,122.9
2023	473,626.7	834,324.0	1,307,950.7	468,830.0	825,874.4	1,294,704.4	471,153.8	829,968.0	1,301,121.8
2024	482,279.9	845,460.1	1,327,740.0	476,967.9	836,148.2	1,313,116.1	478,639.7	839,078.8	1,317,718.5
2025	490,686.7	856,232.8	1,346,919.5	484,724.3	845,828.6	1,330,552.9	485,728.3	847,580.7	1,333,309.0
2026	499,162.1	866,611.6	1,365,773.7	492,486.0	855,020.8	1,347,506.8	492,747.4	855,474.9	1,348,222.3
2027	507,395.6	876,547.5	1,383,943.1	499,939.2	863,665.9	1,363,605.1	499,406.5	862,745.9	1,362,152.4
2028	515,686.7	886,058.2	1,401,744.9	507,374.1	871,775.4	1,379,149.5	505,999.3	869,413.4	1,375,412.7
2029	523,721.0	894,650.2	1,418,371.2	514,467.6	878,842.5	1,393,310.1	512,210.2	874,986.5	1,387,196.7
2030	531,856.0	902,771.1	1,434,627.1	521,567.3	885,306.8	1,406,874.1	518,380.7	879,898.1	1,398,278.8
2031	539,719.8	910,438.7	1,450,158.5	528,476.6	891,473.0	1,419,949.6	524,152.3	884,178.1	1,408,330.4
2032	547,686.6	917,629.1	1,465,315.7	535,558.6	897,309.4	1,432,868.0	529,903.9	887,835.1	1,417,739.0
2033	555,410.8	924,324.0	1,479,734.8	542,454.0	902,761.0	1,445,215.0	535,327.9	890,901.9	1,426,229.8
2034	562,864.3	930,557.5	1,493,421.8	549,134.8	907,859.2	1,456,994.0	540,435.6	893,477.0	1,433,912.6
2035	570,453.4	936,311.6	1,506,765.0	555,987.9	912,568.9	1,468,556.8	545,642.1	895,587.7	1,441,229.8
2036	577,790.3	941,117.7	1,518,908.0	562,660.3	916,473.4	1,479,133.7	550,588.8	896,811.3	1,447,400.1
2037	585,294.1	945,414.3	1,530,708.4	569,562.7	920,003.7	1,489,566.4	555,671.6	897,565.4	1,453,237.0
2038	592,533.2	949,229.4	1,541,762.6	576,255.3	923,152.4	1,499,407.7	560,467.2	897,860.1	1,458,327.3
2039	599,509.6	952,536.0	1,552,045.6	582,734.2	925,882.2	1,508,616.4	564,957.3	897,637.0	1,462,594.3
2040	606,226.8	955,307.5	1,561,534.3	588,991.2	928,147.2	1,517,138.4	569,129.8	896,849.2	1,465,979.0

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Rural②
(milled rice base, Unit: tonnes)

Scenario CODE	G2-P1			G2-P2			G2-P3		
GDP Growth	Low			Low			Low		
Population Growth	Very High			High			Upper-Medium		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	421,377.8	777,558.0	1,198,935.8	420,776.5	776,448.6	1,197,225.1
2019	-	-	-	431,328.5	791,261.0	1,222,589.5	430,310.1	789,393.0	1,219,703.1
2020	444,433.5	803,598.6	1,248,032.1	443,283.6	801,519.3	1,244,802.9	441,724.6	798,700.5	1,240,425.1
2021	455,943.6	813,745.6	1,269,689.2	454,985.7	812,035.8	1,267,021.5	452,797.4	808,130.1	1,260,927.5
2022	466,723.5	825,279.6	1,292,003.1	465,843.7	823,724.1	1,289,567.8	462,937.6	818,585.6	1,281,523.2
2023	477,233.1	837,680.2	1,314,913.3	476,323.1	836,082.9	1,312,406.0	472,607.7	829,561.1	1,302,168.8
2024	487,722.3	849,469.5	1,337,191.8	486,698.3	847,686.1	1,334,384.4	482,078.1	839,639.0	1,321,717.1
2025	498,756.1	860,617.3	1,359,373.4	497,536.9	858,513.5	1,356,050.4	491,907.5	848,799.5	1,340,707.0
2026	510,062.3	871,069.9	1,381,132.2	508,617.1	868,601.8	1,377,218.9	501,911.2	857,149.7	1,359,060.9
2027	521,664.8	880,780.1	1,402,444.9	519,953.8	877,891.2	1,397,845.0	512,101.3	864,633.2	1,376,734.5
2028	533,215.9	890,237.7	1,423,453.6	531,198.8	886,870.2	1,418,069.0	522,132.7	871,733.7	1,393,866.4
2029	545,073.2	898,940.8	1,444,014.0	542,696.3	895,020.7	1,437,717.0	532,341.0	877,943.0	1,410,284.0
2030	557,272.9	907,342.7	1,464,615.6	554,481.0	902,797.2	1,457,278.2	542,757.8	883,709.6	1,426,467.4
2031	569,436.3	914,977.7	1,484,414.0	566,223.1	909,814.6	1,476,037.7	553,100.2	888,728.4	1,441,828.6
2032	581,938.0	922,279.7	1,504,217.7	578,308.1	916,526.9	1,494,835.0	563,741.8	893,441.6	1,457,183.4
2033	594,395.6	929,184.4	1,523,580.0	590,363.4	922,881.2	1,513,244.6	574,317.1	897,796.8	1,472,113.9
2034	607,146.8	935,183.7	1,542,330.5	602,763.6	928,432.3	1,531,195.9	585,188.3	901,361.3	1,486,549.6
2035	619,790.1	940,705.2	1,560,495.3	615,127.9	933,628.9	1,548,756.8	595,982.8	904,571.2	1,500,554.0
2036	632,730.7	945,242.3	1,577,973.0	627,853.4	937,955.9	1,565,809.3	607,082.1	906,925.4	1,514,007.5
2037	645,576.1	949,269.9	1,594,846.0	640,550.2	941,879.9	1,582,430.1	618,103.0	908,873.2	1,526,976.2
2038	658,753.8	952,360.4	1,611,114.2	653,610.9	944,925.2	1,598,536.1	629,419.4	909,951.6	1,539,371.0
2039	671,867.1	955,013.2	1,626,880.3	666,613.5	947,545.6	1,614,159.1	640,618.5	910,595.7	1,551,214.2
2040	684,943.1	957,236.3	1,642,179.4	679,555.4	949,706.5	1,629,261.9	651,743.6	910,838.5	1,562,582.1

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②
(milled rice base, Unit: tonnes)

Scenario CODE	G2-P4			G2-P5			G2-P6		
GDP Growth	Low			Low			Low		
Population Growth	Lower-Medium			Low			Very Low		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	420,375.5	775,708.9	1,196,084.4	-	-	-
2019	-	-	-	429,631.3	788,147.8	1,217,779.1	-	-	-
2020	444,433.5	803,598.6	1,248,032.1	440,807.5	797,042.2	1,237,849.7	444,433.5	803,598.6	1,248,032.1
2021	455,362.8	812,709.0	1,268,071.8	451,314.1	805,482.6	1,256,796.7	454,728.8	811,577.0	1,266,305.8
2022	465,315.7	822,790.5	1,288,106.2	460,926.0	815,028.2	1,275,954.2	463,845.1	820,190.1	1,284,035.2
2023	474,788.3	833,388.7	1,308,177.0	469,979.8	824,948.6	1,294,928.4	472,309.3	829,037.5	1,301,346.8
2024	484,075.0	843,116.8	1,327,191.8	478,743.2	833,830.7	1,312,573.9	480,421.3	836,753.2	1,317,174.5
2025	493,767.0	852,008.0	1,345,775.0	487,767.1	841,655.1	1,329,422.2	488,777.5	843,398.6	1,332,176.1
2026	503,599.1	860,032.1	1,363,631.2	496,863.6	848,529.3	1,345,392.9	497,127.4	848,980.0	1,346,107.4
2027	513,587.4	867,142.5	1,380,729.9	506,039.9	854,399.1	1,360,439.0	505,500.7	853,488.9	1,358,989.6
2028	523,388.5	873,830.2	1,397,218.7	514,951.8	859,744.5	1,374,696.3	513,556.5	857,415.2	1,370,971.7
2029	533,349.5	879,606.1	1,412,955.6	523,925.9	864,064.3	1,387,990.2	521,627.0	860,273.1	1,381,900.1
2030	543,502.5	884,922.3	1,428,424.8	532,988.5	867,803.4	1,400,791.9	529,732.1	862,501.6	1,392,233.7
2031	553,475.2	889,331.1	1,442,806.3	541,945.5	870,805.1	1,412,750.6	537,510.9	863,679.4	1,401,190.3
2032	563,642.3	893,283.8	1,456,926.1	551,160.9	873,503.2	1,424,664.1	545,341.5	864,280.3	1,409,621.8
2033	573,658.4	896,767.1	1,470,425.5	560,275.9	875,847.0	1,436,122.9	552,915.7	864,341.4	1,417,257.1
2034	583,884.2	899,352.6	1,483,236.8	569,642.0	877,415.5	1,447,057.5	560,617.8	863,515.6	1,424,133.4
2035	593,956.7	901,495.8	1,495,452.5	578,895.2	878,636.0	1,457,531.2	568,123.2	862,286.3	1,430,409.5
2036	604,275.8	902,733.0	1,507,008.8	588,452.2	879,093.9	1,467,546.1	575,827.4	860,233.7	1,436,061.1
2037	614,454.6	903,508.5	1,517,963.1	597,939.5	879,224.2	1,477,163.7	583,356.3	857,780.5	1,441,136.8
2038	624,884.1	903,395.0	1,528,279.1	607,717.5	878,577.2	1,486,294.7	591,067.4	854,506.2	1,445,573.6
2039	635,158.5	902,834.5	1,537,993.0	617,385.6	877,571.4	1,494,957.0	598,551.5	850,800.1	1,449,351.6
2040	645,281.0	901,806.6	1,547,087.6	626,935.0	876,167.4	1,503,102.4	605,794.1	846,622.2	1,452,416.3

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Conversion from milled rice base to paddy rice base (Unit: tonnes)

60.0% ：Conversion Coefficient

Projection Average in 2018 (1,000 tonnes)： 1,995.7

Scenario CODE	G1-P1	G1-P2	G1-P3	G1-P4	G1-P5	G1-P6	G2-P1	G2-P2	G2-P3	G2-P4	G2-P5	G2-P6
GDP Growth	High	High	High	High	High	High	Low	Low	Low	Low	Low	Low
Population Growth	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low
Area	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
2018	-	1,998,226.3	1,995,375.2	-	1,993,474.0	-	-	1,998,226.3	1,995,375.2	-	1,993,474.0	-
2019	-	2,037,649.2	2,032,838.5	-	2,029,631.8	-	-	2,037,649.2	2,032,838.5	-	2,029,631.8	-
2020	2,080,053.5	2,074,671.5	2,067,375.2	2,080,053.5	2,063,082.8	2,080,053.5	2,080,053.5	2,074,671.5	2,067,375.2	2,080,053.5	2,063,082.8	2,080,053.5
2021	2,116,013.3	2,111,567.7	2,101,411.5	2,113,317.8	2,094,527.3	2,110,374.8	2,116,148.7	2,111,702.5	2,101,545.8	2,113,453.0	2,094,661.2	2,110,509.7
2022	2,153,485.5	2,149,426.3	2,136,017.8	2,146,990.0	2,126,735.3	2,140,204.8	2,153,338.5	2,149,279.7	2,135,872.0	2,146,843.7	2,126,590.3	2,140,058.7
2023	2,191,143.3	2,186,965.0	2,169,906.0	2,179,917.8	2,157,840.7	2,168,536.3	2,191,522.2	2,187,343.3	2,170,281.3	2,180,295.0	2,158,214.0	2,168,911.3
2024	2,229,573.5	2,224,892.7	2,203,771.7	2,212,900.0	2,188,526.8	2,196,197.5	2,228,653.0	2,223,974.0	2,202,861.8	2,211,986.3	2,187,623.2	2,195,290.8
2025	2,267,549.2	2,262,006.2	2,236,412.0	2,244,865.8	2,217,588.2	2,222,181.7	2,265,622.3	2,260,084.0	2,234,511.7	2,242,958.3	2,215,703.7	2,220,293.5
2026	2,305,503.8	2,298,971.3	2,268,660.3	2,276,289.5	2,245,844.7	2,247,037.2	2,301,887.0	2,295,364.8	2,265,101.5	2,272,718.7	2,242,321.5	2,243,512.3
2027	2,342,848.0	2,335,163.3	2,299,897.5	2,306,571.8	2,272,675.2	2,270,254.0	2,337,408.2	2,329,741.7	2,294,557.5	2,301,216.5	2,267,398.3	2,264,982.7
2028	2,380,107.8	2,371,104.7	2,330,636.0	2,336,241.5	2,298,582.5	2,292,354.5	2,372,422.7	2,363,448.3	2,323,110.7	2,328,697.8	2,291,160.5	2,284,952.8
2029	2,415,914.5	2,405,379.2	2,359,482.3	2,363,952.0	2,322,183.5	2,311,994.5	2,406,690.0	2,396,195.0	2,350,473.3	2,354,926.0	2,313,317.0	2,303,166.8
2030	2,451,625.0	2,439,342.8	2,387,768.5	2,391,045.2	2,344,790.2	2,330,464.7	2,441,026.0	2,428,797.0	2,377,445.7	2,380,708.0	2,334,653.2	2,320,389.5
2031	2,486,630.3	2,472,598.5	2,415,292.7	2,416,930.8	2,366,582.7	2,347,217.3	2,474,023.3	2,460,062.8	2,403,047.7	2,404,677.2	2,354,584.3	2,335,317.2
2032	2,521,466.2	2,505,738.2	2,442,624.2	2,442,192.8	2,388,113.3	2,362,898.3	2,507,029.5	2,491,391.7	2,428,639.0	2,428,210.2	2,374,440.2	2,349,369.7
2033	2,555,376.2	2,538,041.7	2,469,056.5	2,466,224.7	2,408,691.7	2,377,049.7	2,539,300.0	2,522,074.3	2,453,523.2	2,450,709.2	2,393,538.2	2,362,095.2
2034	2,588,202.2	2,569,517.2	2,494,595.5	2,489,036.3	2,428,323.3	2,389,854.3	2,570,550.8	2,551,993.2	2,477,582.7	2,472,061.3	2,411,762.5	2,373,555.7
2035	2,620,499.5	2,600,787.5	2,519,841.7	2,511,275.0	2,447,594.7	2,402,049.7	2,600,825.5	2,581,261.3	2,500,923.3	2,492,420.8	2,429,218.7	2,384,015.8
2036	2,650,721.0	2,630,288.0	2,543,269.8	2,531,513.3	2,465,222.8	2,412,333.5	2,629,955.0	2,609,682.2	2,523,345.8	2,511,681.3	2,445,910.2	2,393,435.2
2037	2,680,394.8	2,659,527.7	2,566,328.5	2,551,180.7	2,482,610.7	2,422,061.7	2,658,076.7	2,637,383.5	2,544,960.3	2,529,938.5	2,461,939.5	2,401,894.7
2038	2,708,880.7	2,687,732.2	2,588,253.7	2,569,604.3	2,499,012.8	2,430,545.5	2,685,190.3	2,664,226.8	2,565,618.3	2,547,131.8	2,477,157.8	2,409,289.3
2039	2,736,242.0	2,714,846.2	2,608,979.3	2,586,742.7	2,514,360.7	2,437,657.2	2,711,467.2	2,690,265.2	2,585,357.0	2,563,321.7	2,491,595.0	2,415,586.0
2040	2,762,523.5	2,740,793.3	2,628,622.5	2,602,557.2	2,528,564.0	2,443,298.3	2,736,965.7	2,715,436.5	2,604,303.5	2,578,479.3	2,505,170.7	2,420,693.8

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly
(milled rice base)

Projection	PCC Projection (kg/capita/yr)				Population Projection (person)											
GDP Growth	High		Low													
Population Growth					Very High		High		Upper-Medium		Lower-Medium		Low		Very Low	
Area	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
2018	171.3	170.4	171.3	170.4	-	-	2,459,882	4,563,134	2,456,372	4,556,623	-	-	2,454,031	4,552,282	-	-
2019	169.3	172.2	169.3	172.2	-	-	2,547,717	4,592,345	2,541,702	4,581,503	-	-	2,537,692	4,574,276	-	-
2020	168.1	173.2	168.1	173.2	2,643,864	4,631,692	2,637,023	4,619,708	2,627,749	4,603,461	2,643,864	4,631,692	2,622,293	4,593,903	2,643,864	4,631,692
2021	166.6	174.4	166.8	174.2	2,733,475	4,655,295	2,727,732	4,645,514	2,714,613	4,623,170	2,729,993	4,649,365	2,705,720	4,608,024	2,726,192	4,642,889
2022	164.9	175.6	165.2	175.4	2,825,203	4,678,456	2,819,877	4,669,638	2,802,286	4,640,508	2,816,681	4,664,345	2,790,109	4,620,341	2,807,779	4,649,604
2023	163.1	176.7	163.5	176.6	2,918,857	4,700,787	2,913,291	4,691,823	2,890,567	4,655,225	2,903,904	4,676,704	2,874,494	4,629,341	2,888,742	4,652,287
2024	161.2	177.7	161.8	177.5	3,014,353	4,721,898	3,008,024	4,711,985	2,979,469	4,667,254	2,991,811	4,686,586	2,958,858	4,634,968	2,969,229	4,651,213
2025	159.3	178.5	160.3	178.2	3,111,392	4,741,693	3,103,786	4,730,102	3,068,668	4,676,581	3,080,268	4,694,259	3,042,839	4,637,218	3,049,142	4,646,824
2026	157.5	179.0	158.9	178.7	3,209,958	4,759,945	3,200,863	4,746,458	3,158,661	4,683,878	3,169,283	4,699,629	3,126,895	4,636,772	3,128,555	4,639,235
2027	155.7	179.2	157.6	179.0	3,310,056	4,776,465	3,299,199	4,760,798	3,249,374	4,688,900	3,258,803	4,702,508	3,210,913	4,633,401	3,207,492	4,628,465
2028	154.0	179.2	156.3	179.2	3,411,490	4,791,376	3,398,585	4,773,252	3,340,580	4,691,785	3,348,615	4,703,069	3,294,637	4,627,258	3,285,710	4,614,721
2029	152.3	178.7	155.1	179.2	3,514,334	4,804,601	3,499,009	4,783,649	3,432,244	4,692,373	3,438,746	4,701,262	3,377,988	4,618,195	3,363,166	4,597,932
2030	150.7	178.0	154.0	179.1	3,618,655	4,816,044	3,600,526	4,791,917	3,524,401	4,690,603	3,529,237	4,697,040	3,460,964	4,606,175	3,439,819	4,578,034
2031	149.1	176.9	152.9	178.9	3,724,240	4,825,832	3,703,225	4,798,600	3,617,398	4,687,386	3,619,851	4,690,565	3,544,444	4,592,854	3,515,441	4,555,271
2032	147.6	175.4	151.9	178.5	3,831,060	4,833,751	3,807,163	4,803,600	3,711,269	4,682,608	3,710,614	4,681,781	3,628,446	4,578,109	3,590,135	4,529,771
2033	146.1	173.5	150.9	178.0	3,939,003	4,839,502	3,912,282	4,806,673	3,805,945	4,676,025	3,801,580	4,670,662	3,712,895	4,561,703	3,664,120	4,501,778
2034	144.6	171.2	150.0	177.4	4,047,645	4,843,002	4,018,424	4,808,039	3,901,255	4,667,847	3,892,561	4,657,445	3,797,613	4,543,840	3,737,452	4,471,857
2035	143.2	168.5	149.1	176.7	4,156,875	4,844,002	4,125,606	4,807,564	3,997,202	4,657,936	3,983,613	4,642,100	3,882,597	4,524,387	3,810,350	4,440,197
2036	141.8	165.3	148.3	175.9	4,266,559	4,842,430	4,233,671	4,805,102	4,093,608	4,646,134	4,074,685	4,624,657	3,967,985	4,503,555	3,882,855	4,406,935
2037	140.5	161.6	147.5	175.1	4,376,787	4,838,277	4,342,713	4,800,611	4,190,529	4,632,381	4,165,794	4,605,038	4,053,827	4,481,265	3,954,958	4,371,970
2038	139.2	157.5	146.8	174.1	4,487,424	4,831,864	4,452,390	4,794,141	4,287,598	4,616,700	4,256,704	4,583,435	4,139,765	4,457,520	4,026,345	4,335,394
2039	137.9	152.9	146.1	173.1	4,598,680	4,823,299	4,562,721	4,785,584	4,384,795	4,598,968	4,347,423	4,559,770	4,225,774	4,432,179	4,096,862	4,296,970
2040	136.6	147.7	145.4	172.1	4,710,750	4,812,651	4,673,696	4,774,794	4,482,418	4,579,379	4,437,971	4,533,970	4,311,795	4,405,065	4,166,397	4,256,522

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Poly
(milled rice base, Unit: tonnes)

Scenario CODE	G1-P1			G1-P2			G1-P3		
GDP Growth	High			High			High		
Population Growth	Very High			High			Upper-Medium		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	421,377.8	777,558.0	1,198,935.8	420,776.5	776,448.6	1,197,225.1
2019	-	-	-	431,328.5	790,801.8	1,222,130.3	430,310.1	788,934.8	1,219,244.9
2020	444,433.5	802,209.1	1,246,642.6	443,283.6	800,133.4	1,243,417.0	441,724.6	797,319.4	1,239,044.0
2021	455,396.9	811,883.4	1,267,280.3	454,440.2	810,177.6	1,264,617.8	452,254.5	806,280.8	1,258,535.3
2022	465,876.0	821,536.9	1,287,412.9	464,997.7	819,988.4	1,284,986.1	462,097.0	814,873.2	1,276,970.2
2023	476,065.6	830,629.1	1,306,694.7	475,157.8	829,045.1	1,304,202.9	471,451.5	822,578.3	1,294,029.8
2024	485,913.7	839,081.3	1,324,995.0	484,893.5	837,319.7	1,322,213.2	480,290.4	829,371.0	1,309,661.4
2025	495,644.7	846,392.2	1,342,036.9	494,433.1	844,323.2	1,338,756.3	488,838.8	834,769.7	1,323,608.5
2026	505,568.4	852,030.2	1,357,598.6	504,135.9	849,616.0	1,353,751.9	497,489.1	838,414.2	1,335,903.3
2027	515,375.7	855,942.5	1,371,318.2	513,685.3	853,135.0	1,366,820.3	505,927.5	840,250.9	1,346,178.4
2028	525,369.5	858,614.6	1,383,984.1	523,382.1	855,366.8	1,378,748.9	514,449.3	840,767.9	1,355,217.2
2029	535,233.1	858,582.2	1,393,815.3	532,899.1	854,838.1	1,387,737.2	522,730.8	838,527.1	1,361,257.9
2030	545,331.3	857,255.8	1,402,587.1	542,599.3	852,961.2	1,395,560.5	531,127.2	834,927.3	1,366,054.5
2031	555,284.2	853,689.7	1,408,973.9	552,150.8	848,872.3	1,401,023.1	539,354.0	829,198.6	1,368,552.6
2032	565,464.5	847,839.9	1,413,304.4	561,937.3	842,551.4	1,404,488.7	547,783.3	821,329.4	1,369,112.7
2033	575,488.3	839,653.6	1,415,141.9	571,584.4	833,957.8	1,405,542.2	556,048.6	811,290.3	1,367,338.9
2034	585,289.5	829,121.9	1,414,411.4	581,064.1	823,136.3	1,404,200.4	564,121.5	799,135.4	1,363,256.9
2035	595,264.5	816,214.3	1,411,478.8	590,786.8	810,074.5	1,400,861.3	572,399.3	784,862.2	1,357,261.5
2036	604,998.1	800,453.7	1,405,451.8	600,334.5	794,283.4	1,394,617.9	580,473.6	768,006.0	1,348,479.6
2037	614,938.6	781,865.6	1,396,804.2	610,151.2	775,778.7	1,385,929.9	588,769.3	748,592.8	1,337,362.1
2038	624,649.4	761,018.6	1,385,668.0	619,772.7	755,077.2	1,374,849.9	596,833.6	727,130.3	1,323,963.9
2039	634,158.0	737,482.4	1,371,640.4	629,199.2	731,715.8	1,360,915.0	604,663.2	703,182.2	1,307,845.4
2040	643,488.5	710,828.6	1,354,317.1	638,426.9	705,237.1	1,343,664.0	612,298.3	676,374.3	1,288,672.6

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Poly
(milled rice base, Unit: tonnes)

Scenario CODE	G1-P4			G1-P5			G1-P6		
GDP Growth	High			High			High		
Population Growth	Lower-Medium			Low			Very Low		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	420,375.5	775,708.9	1,196,084.4	-	-	-
2019	-	-	-	429,631.3	787,690.3	1,217,321.6	-	-	-
2020	444,433.5	802,209.1	1,246,642.6	440,807.5	795,664.0	1,236,471.5	444,433.5	802,209.1	1,246,642.6
2021	454,816.8	810,849.3	1,265,666.1	450,773.0	803,639.4	1,254,412.4	454,183.6	809,719.8	1,263,903.4
2022	464,470.7	819,059.0	1,283,529.7	460,089.0	811,331.9	1,271,420.9	463,002.8	816,470.5	1,279,473.3
2023	473,626.7	826,373.6	1,300,000.3	468,830.0	818,004.6	1,286,834.6	471,153.8	822,059.1	1,293,212.9
2024	482,279.9	832,806.3	1,315,086.2	476,967.9	823,633.8	1,300,601.7	478,639.7	826,520.6	1,305,160.3
2025	490,686.7	837,925.2	1,328,611.9	484,724.3	827,743.4	1,312,467.7	485,728.3	829,458.1	1,315,186.4
2026	499,162.1	841,233.6	1,340,395.7	492,486.0	829,982.2	1,322,468.2	492,747.4	830,423.1	1,323,170.5
2027	507,395.6	842,689.4	1,350,085.0	499,939.2	830,305.5	1,330,244.7	499,406.5	829,420.9	1,328,827.4
2028	515,686.7	842,790.0	1,358,476.7	507,374.1	829,204.6	1,336,578.7	505,999.3	826,958.0	1,332,957.3
2029	523,721.0	840,115.5	1,363,836.5	514,467.6	825,271.4	1,339,739.0	512,210.2	821,650.4	1,333,860.6
2030	531,856.0	836,073.1	1,367,929.1	521,567.3	819,899.2	1,341,466.5	518,380.7	814,890.1	1,333,270.8
2031	539,719.8	829,760.9	1,369,480.7	528,476.6	812,475.9	1,340,952.5	524,152.3	805,827.4	1,329,979.7
2032	547,686.6	821,184.4	1,368,871.0	535,558.6	803,000.3	1,338,558.9	529,903.9	794,521.8	1,324,425.7
2033	555,410.8	810,359.9	1,365,770.7	542,454.0	791,455.5	1,333,909.5	535,327.9	781,058.5	1,316,386.4
2034	562,864.3	797,354.6	1,360,218.9	549,134.8	777,905.4	1,327,040.2	540,435.6	765,581.9	1,306,017.5
2035	570,453.4	782,193.9	1,352,647.3	555,987.9	762,359.2	1,318,347.1	545,642.1	748,173.2	1,293,815.3
2036	577,790.3	764,455.8	1,342,246.1	562,660.3	744,437.6	1,307,097.9	550,588.8	728,466.4	1,279,055.2
2037	585,294.1	744,174.1	1,329,468.2	569,562.7	724,172.4	1,293,735.1	555,671.6	706,510.4	1,262,182.0
2038	592,533.2	721,891.0	1,314,424.2	576,255.3	702,059.4	1,278,314.7	560,467.2	682,824.6	1,243,291.8
2039	599,509.6	697,188.8	1,296,698.4	582,734.2	677,680.2	1,260,414.4	564,957.3	657,006.7	1,221,964.0
2040	606,226.8	669,667.4	1,275,894.2	588,991.2	650,628.1	1,239,619.3	569,129.8	628,688.3	1,197,818.1

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Poly
(milled rice base, Unit: tonnes)

Scenario CODE	G2-P1			G2-P2			G2-P3		
GDP Growth	Low			Low			Low		
Population Growth	Very High			High			Upper-Medium		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	421,377.8	777,558.0	1,198,935.8	420,776.5	776,448.6	1,197,225.1
2019	-	-	-	431,328.5	790,801.8	1,222,130.3	430,310.1	788,934.8	1,219,244.9
2020	444,433.5	802,209.1	1,246,642.6	443,283.6	800,133.4	1,243,417.0	441,724.6	797,319.4	1,239,044.0
2021	455,943.6	810,952.4	1,266,896.0	454,985.7	809,248.5	1,264,234.2	452,797.4	805,356.2	1,258,153.6
2022	466,723.5	820,601.2	1,287,324.7	465,843.7	819,054.5	1,284,898.2	462,937.6	813,945.1	1,276,882.7
2023	477,233.1	830,159.0	1,307,392.1	476,323.1	828,575.9	1,304,899.0	472,607.7	822,112.7	1,294,720.4
2024	487,722.3	838,136.9	1,325,859.2	486,698.3	836,377.3	1,323,075.6	482,078.1	828,437.6	1,310,515.7
2025	498,756.1	844,969.7	1,343,725.8	497,536.9	842,904.2	1,340,441.1	491,907.5	833,366.7	1,325,274.2
2026	510,062.3	850,602.2	1,360,664.5	508,617.1	848,192.0	1,356,809.1	501,911.2	837,009.0	1,338,920.2
2027	521,664.8	854,987.2	1,376,652.0	519,953.8	852,182.8	1,372,136.6	512,101.3	839,313.1	1,351,414.4
2028	533,215.9	858,614.6	1,391,830.5	531,198.8	855,366.8	1,386,565.6	522,132.7	840,767.9	1,362,900.6
2029	545,073.2	860,984.5	1,406,057.7	542,696.3	857,229.9	1,399,926.2	532,341.0	840,873.2	1,373,214.2
2030	557,272.9	862,553.5	1,419,826.4	554,481.0	858,232.3	1,412,713.3	542,757.8	840,087.0	1,382,844.8
2031	569,436.3	863,341.3	1,432,777.6	566,223.1	858,469.5	1,424,692.6	553,100.2	838,573.4	1,391,673.6
2032	581,938.0	862,824.6	1,444,762.6	578,308.1	857,442.6	1,435,750.7	563,741.8	835,845.5	1,399,587.3
2033	594,395.6	861,431.4	1,455,827.0	590,363.4	855,587.8	1,445,951.2	574,317.1	832,332.5	1,406,649.6
2034	607,146.8	859,148.6	1,466,295.4	602,763.6	852,946.1	1,455,709.7	585,188.3	828,076.1	1,413,264.4
2035	619,790.1	855,935.2	1,475,725.3	615,127.9	849,496.6	1,464,624.5	595,982.8	823,057.3	1,419,040.1
2036	632,730.7	851,783.4	1,484,514.1	627,853.4	845,217.4	1,473,070.8	607,082.1	817,255.0	1,424,337.1
2037	645,576.1	847,182.3	1,492,758.4	640,550.2	840,587.0	1,481,137.2	618,103.0	811,129.9	1,429,232.9
2038	658,753.8	841,227.5	1,499,981.3	653,610.9	834,659.9	1,488,270.8	629,419.4	803,767.5	1,433,186.9
2039	671,867.1	834,913.1	1,506,780.2	666,613.5	828,384.6	1,494,998.1	640,618.5	796,081.4	1,436,699.9
2040	684,943.1	828,257.2	1,513,200.3	679,555.4	821,742.0	1,501,297.4	651,743.6	788,111.1	1,439,854.7

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Poly
(milled rice base, Unit: tonnes)

Scenario CODE	G2-P4			G2-P5			G2-P6		
GDP Growth	Low			Low			Low		
Population Growth	Lower-Medium			Low			Very Low		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	420,375.5	775,708.9	1,196,084.4	-	-	-
2019	-	-	-	429,631.3	787,690.3	1,217,321.6	-	-	-
2020	444,433.5	802,209.1	1,246,642.6	440,807.5	795,664.0	1,236,471.5	444,433.5	802,209.1	1,246,642.6
2021	455,362.8	809,919.4	1,265,282.2	451,314.1	802,717.8	1,254,031.9	454,728.8	808,791.3	1,263,520.1
2022	465,315.7	818,126.1	1,283,441.8	460,926.0	810,407.8	1,271,333.8	463,845.1	815,540.5	1,279,385.6
2023	474,788.3	825,905.9	1,300,694.2	469,979.8	817,541.6	1,287,521.4	472,309.3	821,593.9	1,293,903.2
2024	484,075.0	831,869.0	1,315,944.0	478,743.2	822,706.8	1,301,450.0	480,421.3	825,590.3	1,306,011.6
2025	493,767.0	836,517.0	1,330,284.0	487,767.1	826,352.2	1,314,119.3	488,777.5	828,064.0	1,316,841.5
2026	503,599.1	839,823.7	1,343,422.8	496,863.6	828,591.2	1,325,454.8	497,127.4	829,031.3	1,326,158.7
2027	513,587.4	841,748.9	1,355,336.3	506,039.9	829,378.8	1,335,418.7	505,500.7	828,495.2	1,333,995.9
2028	523,388.5	842,790.0	1,366,178.5	514,951.8	829,204.6	1,344,156.4	513,556.5	826,958.0	1,340,514.5
2029	533,349.5	842,466.2	1,375,815.7	523,925.9	827,580.5	1,351,506.4	521,627.0	823,949.4	1,345,576.4
2030	543,502.5	841,239.9	1,384,742.4	532,988.5	824,965.9	1,357,954.4	529,732.1	819,925.9	1,349,658.0
2031	553,475.2	839,142.1	1,392,617.3	541,945.5	821,661.6	1,363,607.1	537,510.9	814,938.0	1,352,448.9
2032	563,642.3	835,697.9	1,399,340.2	551,160.9	817,192.5	1,368,353.4	545,341.5	808,564.1	1,353,905.6
2033	573,658.4	831,377.8	1,405,036.2	560,275.9	811,983.1	1,372,259.0	552,915.7	801,316.5	1,354,232.2
2034	583,884.2	826,230.7	1,410,114.9	569,642.0	806,077.2	1,375,719.2	560,617.8	793,307.4	1,353,925.2
2035	593,956.7	820,259.1	1,414,215.8	578,895.2	799,459.2	1,378,354.4	568,123.2	784,582.8	1,352,706.0
2036	604,275.8	813,477.2	1,417,753.0	588,452.2	792,175.3	1,380,627.5	575,827.4	775,179.9	1,351,007.3
2037	614,454.6	806,342.2	1,420,796.8	597,939.5	784,669.5	1,382,609.0	583,356.3	765,531.9	1,348,888.2
2038	624,884.1	797,976.0	1,422,860.1	607,717.5	776,054.2	1,383,771.7	591,067.4	754,792.1	1,345,859.5
2039	635,158.5	789,296.2	1,424,454.7	617,385.6	767,210.2	1,384,595.8	598,551.5	743,805.5	1,342,357.0
2040	645,281.0	780,296.2	1,425,577.2	626,935.0	758,111.7	1,385,046.7	605,794.1	732,547.4	1,338,341.5

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Conversion from milled rice base to paddy rice base (Unit: tonnes)

60.0% ：Conversion Coefficient

Projection Average in 2018 (1,000 tonnes)： 1,995.7

Scenario CODE	G1-P1	G1-P2	G1-P3	G1-P4	G1-P5	G1-P6	G2-P1	G2-P2	G2-P3	G2-P4	G2-P5	G2-P6
GDP Growth	High	High	High	High	High	High	Low	Low	Low	Low	Low	Low
Population Growth	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low
Area	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
2018	-	1,998,226.3	1,995,375.2	-	1,993,474.0	-	-	1,998,226.3	1,995,375.2	-	1,993,474.0	-
2019	-	2,036,883.8	2,032,074.8	-	2,028,869.3	-	-	2,036,883.8	2,032,074.8	-	2,028,869.3	-
2020	2,077,737.7	2,072,361.7	2,065,073.3	2,077,737.7	2,060,785.8	2,077,737.7	2,077,737.7	2,072,361.7	2,065,073.3	2,077,737.7	2,060,785.8	2,077,737.7
2021	2,112,133.8	2,107,696.3	2,097,558.8	2,109,443.5	2,090,687.3	2,106,505.7	2,111,493.3	2,107,057.0	2,096,922.7	2,108,803.7	2,090,053.2	2,105,866.8
2022	2,145,688.2	2,141,643.5	2,128,283.7	2,139,216.2	2,119,034.8	2,132,455.5	2,145,541.2	2,141,497.0	2,128,137.8	2,139,069.7	2,118,889.7	2,132,309.3
2023	2,177,824.5	2,173,671.5	2,156,716.3	2,166,667.2	2,144,724.3	2,155,354.8	2,178,986.8	2,174,831.7	2,157,867.3	2,167,823.7	2,145,869.0	2,156,505.3
2024	2,208,325.0	2,203,688.7	2,182,769.0	2,191,810.3	2,167,669.5	2,175,267.2	2,209,765.3	2,205,126.0	2,184,192.8	2,193,240.0	2,169,083.3	2,176,686.0
2025	2,236,728.2	2,231,260.5	2,206,014.2	2,214,353.2	2,187,446.2	2,191,977.3	2,239,543.0	2,234,068.5	2,208,790.3	2,217,140.0	2,190,198.8	2,194,735.8
2026	2,262,664.3	2,256,253.2	2,226,505.5	2,233,992.8	2,204,113.7	2,205,284.2	2,267,774.2	2,261,348.5	2,231,533.7	2,239,038.0	2,209,091.3	2,210,264.5
2027	2,285,530.3	2,278,033.8	2,243,630.7	2,250,141.7	2,217,074.5	2,214,712.3	2,294,420.0	2,286,894.3	2,252,357.3	2,258,893.8	2,225,697.8	2,223,326.5
2028	2,306,640.2	2,297,914.8	2,258,695.3	2,264,127.8	2,227,631.2	2,221,595.5	2,319,717.5	2,310,942.7	2,271,501.0	2,276,964.2	2,240,260.7	2,234,190.8
2029	2,323,025.5	2,312,895.3	2,268,763.2	2,273,060.8	2,232,898.3	2,223,101.0	2,343,429.5	2,333,210.3	2,288,690.3	2,293,026.2	2,252,510.7	2,242,627.3
2030	2,337,645.2	2,325,934.2	2,276,757.5	2,279,881.8	2,235,777.5	2,222,118.0	2,366,377.3	2,354,522.2	2,304,741.3	2,307,904.0	2,263,257.3	2,249,430.0
2031	2,348,289.8	2,335,038.5	2,280,921.0	2,282,467.8	2,234,920.8	2,216,632.8	2,387,962.7	2,374,487.7	2,319,456.0	2,321,028.8	2,272,678.5	2,254,081.5
2032	2,355,507.3	2,340,814.5	2,281,854.5	2,281,451.7	2,230,931.5	2,207,376.2	2,407,937.7	2,392,917.8	2,332,645.5	2,332,233.7	2,280,589.0	2,256,509.3
2033	2,358,569.8	2,342,570.3	2,278,898.2	2,276,284.5	2,223,182.5	2,193,977.3	2,426,378.3	2,409,918.7	2,344,416.0	2,341,727.0	2,287,098.3	2,257,053.7
2034	2,357,352.3	2,340,334.0	2,272,094.8	2,267,031.5	2,211,733.7	2,176,695.8	2,443,825.7	2,426,182.8	2,355,440.7	2,350,191.5	2,292,865.3	2,256,542.0
2035	2,352,464.7	2,334,768.8	2,262,102.5	2,254,412.2	2,197,245.2	2,156,358.8	2,459,542.2	2,441,040.8	2,365,066.8	2,357,026.3	2,297,257.3	2,254,510.0
2036	2,342,419.7	2,324,363.2	2,247,466.0	2,237,076.8	2,178,496.5	2,131,758.7	2,474,190.2	2,455,118.0	2,373,895.2	2,362,921.7	2,301,045.8	2,251,678.8
2037	2,328,007.0	2,309,883.2	2,228,936.8	2,215,780.3	2,156,225.2	2,103,636.7	2,487,930.7	2,468,562.0	2,382,054.8	2,367,994.7	2,304,348.3	2,248,147.0
2038	2,309,446.7	2,291,416.5	2,206,606.5	2,190,707.0	2,130,524.5	2,072,153.0	2,499,968.8	2,480,451.3	2,388,644.8	2,371,433.5	2,306,286.2	2,243,099.2
2039	2,286,067.3	2,268,191.7	2,179,742.3	2,161,164.0	2,100,690.7	2,036,606.7	2,511,300.3	2,491,663.5	2,394,499.8	2,374,091.2	2,307,659.7	2,237,261.7
2040	2,257,195.2	2,239,440.0	2,147,787.7	2,126,490.3	2,066,032.2	1,996,363.5	2,522,000.5	2,502,162.3	2,399,757.8	2,375,962.0	2,308,411.2	2,230,569.2

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined
(milled rice base)

Projection	PCC Projection (kg/capita/yr)				Population Projection (person)											
GDP Growth	High		Low													
Population Growth					Very High		High		Upper-Medium		Lower-Medium		Low		Very Low	
Area	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
2018	171.3	170.4	171.3	170.4	-	-	2,459,882	4,563,134	2,456,372	4,556,623	-	-	2,454,031	4,552,282	-	-
2019	169.3	172.3	169.3	172.3	-	-	2,547,717	4,592,345	2,541,702	4,581,503	-	-	2,537,692	4,574,276	-	-
2020	168.1	173.4	168.1	173.4	2,643,864	4,631,692	2,637,023	4,619,708	2,627,749	4,603,461	2,643,864	4,631,692	2,622,293	4,593,903	2,643,864	4,631,692
2021	166.6	174.7	166.8	174.5	2,733,475	4,655,295	2,727,732	4,645,514	2,714,613	4,623,170	2,729,993	4,649,365	2,705,720	4,608,024	2,726,192	4,642,889
2022	164.9	176.1	165.2	175.9	2,825,203	4,678,456	2,819,877	4,669,638	2,802,286	4,640,508	2,816,681	4,664,345	2,790,109	4,620,341	2,807,779	4,649,604
2023	163.1	177.6	163.5	177.4	2,918,857	4,700,787	2,913,291	4,691,823	2,890,567	4,655,225	2,903,904	4,676,704	2,874,494	4,629,341	2,888,742	4,652,287
2024	161.2	179.1	161.8	178.7	3,014,353	4,721,898	3,008,024	4,711,985	2,979,469	4,667,254	2,991,811	4,686,586	2,958,858	4,634,968	2,969,229	4,651,213
2025	159.3	180.5	160.3	179.9	3,111,392	4,741,693	3,103,786	4,730,102	3,068,668	4,676,581	3,080,268	4,694,259	3,042,839	4,637,218	3,049,142	4,646,824
2026	157.5	181.7	158.9	180.9	3,209,958	4,759,945	3,200,863	4,746,458	3,158,661	4,683,878	3,169,283	4,699,629	3,126,895	4,636,772	3,128,555	4,639,235
2027	155.7	182.8	157.6	181.7	3,310,056	4,776,465	3,299,199	4,760,798	3,249,374	4,688,900	3,258,803	4,702,508	3,210,913	4,633,401	3,207,492	4,628,465
2028	154.0	183.8	156.3	182.5	3,411,490	4,791,376	3,398,585	4,773,252	3,340,580	4,691,785	3,348,615	4,703,069	3,294,637	4,627,258	3,285,710	4,614,721
2029	152.3	184.5	155.1	183.2	3,514,334	4,804,601	3,499,009	4,783,649	3,432,244	4,692,373	3,438,746	4,701,262	3,377,988	4,618,195	3,363,166	4,597,932
2030	150.7	185.1	154.0	183.8	3,618,655	4,816,044	3,600,526	4,791,917	3,524,401	4,690,603	3,529,237	4,697,040	3,460,964	4,606,175	3,439,819	4,578,034
2031	149.1	185.5	152.9	184.3	3,724,240	4,825,832	3,703,225	4,798,600	3,617,398	4,687,386	3,619,851	4,690,565	3,544,444	4,592,854	3,515,441	4,555,271
2032	147.6	185.7	151.9	184.7	3,831,060	4,833,751	3,807,163	4,803,600	3,711,269	4,682,608	3,710,614	4,681,781	3,628,446	4,578,109	3,590,135	4,529,771
2033	146.1	185.7	150.9	185.0	3,939,003	4,839,502	3,912,282	4,806,673	3,805,945	4,676,025	3,801,580	4,670,662	3,712,895	4,561,703	3,664,120	4,501,778
2034	144.6	185.5	150.0	185.3	4,047,645	4,843,002	4,018,424	4,808,039	3,901,255	4,667,847	3,892,561	4,657,445	3,797,613	4,543,840	3,737,452	4,471,857
2035	143.2	185.1	149.1	185.5	4,156,875	4,844,002	4,125,606	4,807,564	3,997,202	4,657,936	3,983,613	4,642,100	3,882,597	4,524,387	3,810,350	4,440,197
2036	141.8	184.4	148.3	185.6	4,266,559	4,842,430	4,233,671	4,805,102	4,093,608	4,646,134	4,074,685	4,624,657	3,967,985	4,503,555	3,882,855	4,406,935
2037	140.5	183.5	147.5	185.7	4,376,787	4,838,277	4,342,713	4,800,611	4,190,529	4,632,381	4,165,794	4,605,038	4,053,827	4,481,265	3,954,958	4,371,970
2038	139.2	182.3	146.8	185.6	4,487,424	4,831,864	4,452,390	4,794,141	4,287,598	4,616,700	4,256,704	4,583,435	4,139,765	4,457,520	4,026,345	4,335,394
2039	137.9	180.9	146.1	185.6	4,598,680	4,823,299	4,562,721	4,785,584	4,384,795	4,598,968	4,347,423	4,559,770	4,225,774	4,432,179	4,096,862	4,296,970
2040	136.6	179.2	145.4	185.5	4,710,750	4,812,651	4,673,696	4,774,794	4,482,418	4,579,379	4,437,971	4,533,970	4,311,795	4,405,065	4,166,397	4,256,522

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Combined
(milled rice base, Unit: tonnes)

Scenario CODE	G1-P1			G1-P2			G1-P3		
GDP Growth	High			High			High		
Population Growth	Very High			High			Upper-Medium		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	421,377.8	777,558.0	1,198,935.8	420,776.5	776,448.6	1,197,225.1
2019	-	-	-	431,328.5	791,261.0	1,222,589.5	430,310.1	789,393.0	1,219,703.1
2020	444,433.5	803,135.4	1,247,568.9	443,283.6	801,057.4	1,244,341.0	441,724.6	798,240.1	1,239,964.7
2021	455,396.9	813,280.0	1,268,676.9	454,440.2	811,571.3	1,266,011.5	452,254.5	807,667.8	1,259,922.3
2022	465,876.0	823,876.1	1,289,752.1	464,997.7	822,323.3	1,287,321.0	462,097.0	817,193.5	1,279,290.5
2023	476,065.6	834,859.8	1,310,925.4	475,157.8	833,267.8	1,308,425.6	471,451.5	826,768.0	1,298,219.5
2024	485,913.7	845,691.9	1,331,605.6	484,893.5	843,916.5	1,328,810.0	480,290.4	835,905.2	1,316,195.6
2025	495,644.7	855,875.6	1,351,520.3	494,433.1	853,783.4	1,348,216.5	488,838.8	844,122.9	1,332,961.7
2026	505,568.4	864,882.0	1,370,450.4	504,135.9	862,431.4	1,366,567.3	497,489.1	851,060.6	1,348,549.7
2027	515,375.7	873,137.8	1,388,513.5	513,685.3	870,273.9	1,383,959.2	505,927.5	857,130.9	1,363,058.4
2028	525,369.5	880,654.9	1,406,024.4	523,382.1	877,323.7	1,400,705.8	514,449.3	862,350.1	1,376,799.4
2029	535,233.1	886,448.9	1,421,682.0	532,899.1	882,583.2	1,415,482.3	522,730.8	865,742.8	1,388,473.6
2030	545,331.3	891,449.7	1,436,781.0	542,599.3	886,983.8	1,429,583.1	531,127.2	868,230.6	1,399,357.8
2031	555,284.2	895,191.8	1,450,476.0	552,150.8	890,140.3	1,442,291.1	539,354.0	869,510.1	1,408,864.1
2032	565,464.5	897,627.6	1,463,092.1	561,937.3	892,028.5	1,453,965.8	547,783.3	869,560.3	1,417,343.6
2033	575,488.3	898,695.5	1,474,183.8	571,584.4	892,599.2	1,464,183.6	556,048.6	868,337.8	1,424,386.4
2034	585,289.5	898,376.9	1,483,666.4	581,064.1	891,891.2	1,472,955.3	564,121.5	865,885.6	1,430,007.1
2035	595,264.5	896,624.8	1,491,889.3	590,786.8	889,880.1	1,480,666.9	572,399.3	862,184.0	1,434,583.3
2036	604,998.1	892,944.1	1,497,942.2	600,334.5	886,060.8	1,486,395.3	580,473.6	856,747.1	1,437,220.7
2037	614,938.6	887,823.8	1,502,762.4	610,151.2	880,912.1	1,491,063.3	588,769.3	850,041.9	1,438,811.2
2038	624,649.4	880,848.8	1,505,498.2	619,772.7	873,971.9	1,493,744.6	596,833.6	841,624.4	1,438,458.0
2039	634,158.0	872,534.8	1,506,692.8	629,199.2	865,712.1	1,494,911.3	604,663.2	831,953.3	1,436,616.5
2040	643,488.5	862,427.1	1,505,915.6	638,426.9	855,643.1	1,494,070.0	612,298.3	820,624.7	1,432,923.0

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Combined
(milled rice base, Unit: tonnes)

Scenario CODE	G1-P4			G1-P5			G1-P6		
GDP Growth	High			High			High		
Population Growth	Lower-Medium			Low			Very Low		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	420,375.5	775,708.9	1,196,084.4	-	-	-
2019	-	-	-	429,631.3	788,147.8	1,217,779.1	-	-	-
2020	444,433.5	803,135.4	1,247,568.9	440,807.5	796,582.8	1,237,390.3	444,433.5	803,135.4	1,247,568.9
2021	454,816.8	812,244.1	1,267,060.9	450,773.0	805,021.8	1,255,794.8	454,183.6	811,112.7	1,265,296.3
2022	464,470.7	821,391.2	1,285,861.9	460,089.0	813,642.1	1,273,731.1	463,002.8	818,795.3	1,281,798.1
2023	473,626.7	830,582.6	1,304,209.3	468,830.0	822,171.0	1,291,001.0	471,153.8	826,246.2	1,297,400.0
2024	482,279.9	839,367.6	1,321,647.5	476,967.9	830,122.8	1,307,090.7	478,639.7	833,032.2	1,311,671.9
2025	490,686.7	847,313.7	1,338,000.4	484,724.3	837,017.8	1,321,742.1	485,728.3	838,751.7	1,324,480.0
2026	499,162.1	853,922.6	1,353,084.7	492,486.0	842,501.5	1,334,987.5	492,747.4	842,949.0	1,335,696.4
2027	507,395.6	859,618.5	1,367,014.1	499,939.2	846,985.7	1,346,924.9	499,406.5	846,083.4	1,345,489.9
2028	515,686.7	864,424.1	1,380,110.8	507,374.1	850,490.0	1,357,864.1	505,999.3	848,185.7	1,354,185.0
2029	523,721.0	867,382.8	1,391,103.8	514,467.6	852,057.0	1,366,524.6	512,210.2	848,318.5	1,360,528.7
2030	531,856.0	869,422.1	1,401,278.1	521,567.3	852,603.0	1,374,170.3	518,380.7	847,394.1	1,365,774.8
2031	539,719.8	870,099.8	1,409,819.6	528,476.6	851,974.4	1,380,451.0	524,152.3	845,002.8	1,369,155.1
2032	547,686.6	869,406.7	1,417,093.3	535,558.6	850,154.8	1,385,713.4	529,903.9	841,178.5	1,371,082.4
2033	555,410.8	867,341.9	1,422,752.7	542,454.0	847,108.2	1,389,562.2	535,327.9	835,980.2	1,371,308.1
2034	562,864.3	863,956.0	1,426,820.3	549,134.8	842,882.3	1,392,017.1	540,435.6	829,529.5	1,369,965.1
2035	570,453.4	859,252.7	1,429,706.1	555,987.9	837,464.0	1,393,451.9	545,642.1	821,880.5	1,367,522.6
2036	577,790.3	852,786.8	1,430,577.1	562,660.3	830,455.5	1,393,115.8	550,588.8	812,638.8	1,363,227.6
2037	585,294.1	845,024.5	1,430,318.6	569,562.7	822,312.1	1,391,874.8	555,671.6	802,256.5	1,357,928.1
2038	592,533.2	835,560.2	1,428,093.4	576,255.3	812,605.9	1,388,861.2	560,467.2	790,342.3	1,350,809.5
2039	599,509.6	824,862.4	1,424,372.0	582,734.2	801,781.2	1,384,515.4	564,957.3	777,321.9	1,342,279.2
2040	606,226.8	812,487.4	1,418,714.2	588,991.2	789,387.6	1,378,378.8	569,129.8	762,768.7	1,331,898.5

9. Food Demand

PCE・PCC Relation : [Urban] Urban② & [Rural] Combined
(milled rice base, Unit: tonnes)

Scenario CODE	G2-P1			G2-P2			G2-P3		
GDP Growth	Low			Low			Low		
Population Growth	Very High			High			Upper-Medium		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	421,377.8	777,558.0	1,198,935.8	420,776.5	776,448.6	1,197,225.1
2019	-	-	-	431,328.5	791,261.0	1,222,589.5	430,310.1	789,393.0	1,219,703.1
2020	444,433.5	803,135.4	1,247,568.9	443,283.6	801,057.4	1,244,341.0	441,724.6	798,240.1	1,239,964.7
2021	455,943.6	812,349.0	1,268,292.6	454,985.7	810,642.2	1,265,627.9	452,797.4	806,743.2	1,259,540.6
2022	466,723.5	822,940.4	1,289,663.9	465,843.7	821,389.3	1,287,233.0	462,937.6	816,265.4	1,279,203.0
2023	477,233.1	833,919.6	1,311,152.7	476,323.1	832,329.4	1,308,652.5	472,607.7	825,836.9	1,298,444.6
2024	487,722.3	843,803.2	1,331,525.5	486,698.3	842,031.7	1,328,730.0	482,078.1	834,038.3	1,316,116.4
2025	498,756.1	853,030.6	1,351,786.7	497,536.9	850,945.3	1,348,482.2	491,907.5	841,316.9	1,333,224.4
2026	510,062.3	861,074.1	1,371,136.4	508,617.1	858,634.3	1,367,251.4	501,911.2	847,313.5	1,349,224.7
2027	521,664.8	867,883.7	1,389,548.5	519,953.8	865,037.0	1,384,990.8	512,101.3	851,973.1	1,364,074.4
2028	533,215.9	874,426.1	1,407,642.0	531,198.8	871,118.5	1,402,317.3	522,132.7	856,250.8	1,378,383.5
2029	545,073.2	880,202.9	1,425,276.1	542,696.3	876,364.5	1,419,060.8	532,341.0	859,642.7	1,391,983.7
2030	557,272.9	885,188.9	1,442,461.8	554,481.0	880,754.3	1,435,235.3	542,757.8	862,132.8	1,404,890.6
2031	569,436.3	889,400.8	1,458,837.1	566,223.1	884,382.0	1,450,605.1	553,100.2	863,885.2	1,416,985.4
2032	581,938.0	892,793.8	1,474,731.8	578,308.1	887,224.9	1,465,533.0	563,741.8	864,877.7	1,428,619.5
2033	594,395.6	895,307.9	1,489,703.5	590,363.4	889,234.5	1,479,597.9	574,317.1	865,064.6	1,439,381.7
2034	607,146.8	897,408.3	1,504,555.1	602,763.6	890,929.6	1,493,693.2	585,188.3	864,952.0	1,450,140.3
2035	619,790.1	898,562.4	1,518,352.5	615,127.9	891,803.1	1,506,931.0	595,982.8	864,047.1	1,460,029.9
2036	632,730.7	898,755.0	1,531,485.7	627,853.4	891,826.9	1,519,680.3	607,082.1	862,322.5	1,469,404.6
2037	645,576.1	898,468.0	1,544,044.1	640,550.2	891,473.5	1,532,023.7	618,103.0	860,233.2	1,478,336.2
2038	658,753.8	896,794.0	1,555,547.8	653,610.9	889,792.6	1,543,403.5	629,419.4	856,859.5	1,486,278.9
2039	671,867.1	895,204.3	1,567,071.4	666,613.5	888,204.4	1,554,817.9	640,618.5	853,568.5	1,494,187.0
2040	684,943.1	892,746.8	1,577,689.9	679,555.4	885,724.3	1,565,279.7	651,743.6	849,474.8	1,501,218.4

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined
(milled rice base, Unit: tonnes)

Scenario CODE	G2-P4			G2-P5			G2-P6		
GDP Growth	Low			Low			Low		
Population Growth	Lower-Medium			Low			Very Low		
Area	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2018	-	-	-	420,375.5	775,708.9	1,196,084.4	-	-	-
2019	-	-	-	429,631.3	788,147.8	1,217,779.1	-	-	-
2020	444,433.5	803,135.4	1,247,568.9	440,807.5	796,582.8	1,237,390.3	444,433.5	803,135.4	1,247,568.9
2021	455,362.8	811,314.2	1,266,677.0	451,314.1	804,100.2	1,255,414.3	454,728.8	810,184.1	1,264,912.9
2022	465,315.7	820,458.3	1,285,774.0	460,926.0	812,718.0	1,273,644.0	463,845.1	817,865.3	1,281,710.4
2023	474,788.3	829,647.3	1,304,435.6	469,979.8	821,245.1	1,291,224.9	472,309.3	825,315.7	1,297,625.0
2024	484,075.0	837,492.9	1,321,567.9	478,743.2	828,268.8	1,307,012.0	480,421.3	831,171.8	1,311,593.1
2025	493,767.0	844,497.2	1,338,264.2	487,767.1	834,235.5	1,322,002.6	488,777.5	835,963.6	1,324,741.1
2026	503,599.1	850,162.9	1,353,762.0	496,863.6	838,792.1	1,335,655.7	497,127.4	839,237.6	1,336,365.0
2027	513,587.4	854,445.7	1,368,033.1	506,039.9	841,889.0	1,347,928.9	505,500.7	840,992.1	1,346,492.8
2028	523,388.5	858,310.1	1,381,698.6	514,951.8	844,474.6	1,359,426.4	513,556.5	842,186.6	1,355,743.1
2029	533,349.5	861,271.2	1,394,620.7	523,925.9	846,053.3	1,369,979.2	521,627.0	842,341.1	1,363,968.1
2030	543,502.5	863,316.0	1,406,818.5	532,988.5	846,615.0	1,379,603.5	529,732.1	841,442.6	1,371,174.7
2031	553,475.2	864,471.1	1,417,946.3	541,945.5	846,463.0	1,388,408.5	537,510.9	839,536.4	1,377,047.3
2032	563,642.3	864,725.0	1,428,367.3	551,160.9	845,576.7	1,396,737.6	545,341.5	836,648.7	1,381,990.2
2033	573,658.4	864,072.5	1,437,730.9	560,275.9	843,915.1	1,404,191.0	552,915.7	832,828.9	1,385,744.6
2034	583,884.2	863,024.6	1,446,908.8	569,642.0	841,973.6	1,411,615.6	560,617.8	828,635.1	1,389,252.9
2035	593,956.7	861,109.6	1,455,066.3	578,895.2	839,273.8	1,418,169.0	568,123.2	823,656.5	1,391,779.7
2036	604,275.8	858,336.3	1,462,612.1	588,452.2	835,859.8	1,424,312.0	575,827.4	817,927.1	1,393,754.5
2037	614,454.6	855,155.6	1,469,610.2	597,939.5	832,170.9	1,430,110.4	583,356.3	811,874.8	1,395,231.1
2038	624,884.1	850,685.5	1,475,569.6	607,717.5	827,315.7	1,435,033.2	591,067.4	804,649.1	1,395,716.5
2039	635,158.5	846,293.3	1,481,451.8	617,385.6	822,612.4	1,439,998.0	598,551.5	797,517.6	1,396,069.1
2040	645,281.0	841,051.4	1,486,332.4	626,935.0	817,139.6	1,444,074.6	605,794.1	789,584.8	1,395,378.9

9. Food Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Conversion from milled rice base to paddy rice base (Unit: tonnes)

60.0% ：Conversion Coefficient

Projection Average in 2018 (1,000 tonnes)： 1,995.7

Scenario CODE	G1-P1	G1-P2	G1-P3	G1-P4	G1-P5	G1-P6	G2-P1	G2-P2	G2-P3	G2-P4	G2-P5	G2-P6
GDP Growth	High	High	High	High	High	High	Low	Low	Low	Low	Low	Low
Population Growth	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low	Very High	High	Upper-Medium	Lower-Medium	Low	Very Low
Area	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
2018	-	1,998,226.3	1,995,375.2	-	1,993,474.0	-	-	1,998,226.3	1,995,375.2	-	1,993,474.0	-
2019	-	2,037,649.2	2,032,838.5	-	2,029,631.8	-	-	2,037,649.2	2,032,838.5	-	2,029,631.8	-
2020	2,079,281.5	2,073,901.7	2,066,607.8	2,079,281.5	2,062,317.2	2,079,281.5	2,079,281.5	2,073,901.7	2,066,607.8	2,079,281.5	2,062,317.2	2,079,281.5
2021	2,114,461.5	2,110,019.2	2,099,870.5	2,111,768.2	2,092,991.3	2,108,827.2	2,113,821.0	2,109,379.8	2,099,234.3	2,111,128.3	2,092,357.2	2,108,188.2
2022	2,149,586.8	2,145,535.0	2,132,150.8	2,143,103.2	2,122,885.2	2,136,330.2	2,149,439.8	2,145,388.3	2,132,005.0	2,142,956.7	2,122,740.0	2,136,184.0
2023	2,184,875.7	2,180,709.3	2,163,699.2	2,173,682.2	2,151,668.3	2,162,333.3	2,185,254.5	2,181,087.5	2,164,074.3	2,174,059.3	2,152,041.5	2,162,708.3
2024	2,219,342.7	2,214,683.3	2,193,659.3	2,202,745.8	2,178,484.5	2,186,119.8	2,219,209.2	2,214,550.0	2,193,527.3	2,202,613.2	2,178,353.3	2,185,988.5
2025	2,252,533.8	2,247,027.5	2,221,602.8	2,230,000.7	2,202,903.5	2,207,466.7	2,252,977.8	2,247,470.3	2,222,040.7	2,230,440.3	2,203,337.7	2,207,901.8
2026	2,284,084.0	2,277,612.2	2,247,582.8	2,255,141.2	2,224,979.2	2,226,160.7	2,285,227.3	2,278,752.3	2,248,707.8	2,256,270.0	2,226,092.8	2,227,275.0
2027	2,314,189.2	2,306,598.7	2,271,764.0	2,278,356.8	2,244,874.8	2,242,483.2	2,315,914.2	2,308,318.0	2,273,457.3	2,280,055.2	2,246,548.2	2,244,154.7
2028	2,343,374.0	2,334,509.7	2,294,665.7	2,300,184.7	2,263,106.8	2,256,975.0	2,346,070.0	2,337,195.5	2,297,305.8	2,302,831.0	2,265,710.7	2,259,571.8
2029	2,369,470.0	2,359,137.2	2,314,122.7	2,318,506.3	2,277,541.0	2,267,547.8	2,375,460.2	2,365,101.3	2,319,972.8	2,324,367.8	2,283,298.7	2,273,280.2
2030	2,394,635.0	2,382,638.5	2,332,263.0	2,335,463.5	2,290,283.8	2,276,291.3	2,404,103.0	2,392,058.8	2,341,484.3	2,344,697.5	2,299,339.2	2,285,291.2
2031	2,417,460.0	2,403,818.5	2,348,106.8	2,349,699.3	2,300,751.7	2,281,925.2	2,431,395.2	2,417,675.2	2,361,642.3	2,363,243.8	2,314,014.2	2,295,078.8
2032	2,438,486.8	2,423,276.3	2,362,239.3	2,361,822.2	2,309,522.3	2,285,137.3	2,457,886.3	2,442,555.0	2,381,032.5	2,380,612.2	2,327,896.0	2,303,317.0
2033	2,456,973.0	2,440,306.0	2,373,977.3	2,371,254.5	2,315,937.0	2,285,513.5	2,482,839.2	2,465,996.5	2,398,969.5	2,396,218.2	2,340,318.3	2,309,574.3
2034	2,472,777.3	2,454,925.5	2,383,345.2	2,378,033.8	2,320,028.5	2,283,275.2	2,507,591.8	2,489,488.7	2,416,900.5	2,411,514.7	2,352,692.7	2,315,421.5
2035	2,486,482.2	2,467,778.2	2,390,972.2	2,382,843.5	2,322,419.8	2,279,204.3	2,530,587.5	2,511,551.7	2,433,383.2	2,425,110.5	2,363,615.0	2,319,632.8
2036	2,496,570.3	2,477,325.5	2,395,367.8	2,384,295.2	2,321,859.7	2,272,046.0	2,552,476.2	2,532,800.5	2,449,007.7	2,437,686.8	2,373,853.3	2,322,924.2
2037	2,504,604.0	2,485,105.5	2,398,018.7	2,383,864.3	2,319,791.3	2,263,213.5	2,573,406.8	2,553,372.8	2,463,893.7	2,449,350.3	2,383,517.3	2,325,385.2
2038	2,509,163.7	2,489,574.3	2,397,430.0	2,380,155.7	2,314,768.7	2,251,349.2	2,592,579.7	2,572,339.2	2,477,131.5	2,459,282.7	2,391,722.0	2,326,194.2
2039	2,511,154.7	2,491,518.8	2,394,360.8	2,373,953.3	2,307,525.7	2,237,132.0	2,611,785.7	2,591,363.2	2,490,311.7	2,469,086.3	2,399,996.7	2,326,781.8
2040	2,509,859.3	2,490,116.7	2,388,205.0	2,364,523.7	2,297,298.0	2,219,830.8	2,629,483.2	2,608,799.5	2,502,030.7	2,477,220.7	2,406,791.0	2,325,631.5

10. Demand and Supply of Rice based on FBS

Item	Element	Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Remarks
Population	Total Population - Both sexes	1000 persons	6,249	6,348	6,445	6,541	6,640	6,741	6,846	6,953	7,062	7,169	a
Rice and products	Domestic supply quantity	1000 tonnes	3,109	3,138	3,238	3,349	3,703	4,000	4,429	4,275	3,775	3,630	b=c+d-e-f =sum(g:n)
Rice and products	Production	1000 tonnes	3,071	3,066	3,489	3,415	4,002	4,102	4,149	4,040	3,585	3,535	c=r
Rice and products	Import Quantity	1000 tonnes	71	28	22	18	7	11	153	95	48	141	d
Rice and products	Stock Variation	1000 tonnes	33	△43	273	83	282	65	△198	△220	△210	△8	e
Rice and products	Export Quantity	1000 tonnes	0	0	0	0	25	48	71	80	68	53	f
Rice and products	Feed	1000 tonnes	358	357	407	397	465	480	481	293	418	88	g
Rice and products	Seed	1000 tonnes	184	184	209	205	240	246	249	242	215	212	h
Rice and products	Losses	1000 tonnes	125	124	142	138	162	165	165	159	140	134	i
Rice and products	Processing	1000 tonnes	155	157	158	166	181	196	222	203	181	230	j
Rice and products	Other uses (non-food)	1000 tonnes	801	796	769	854	1,036	1,270	1,646	1,685	1,102	1,289	k
Rice and products	Tourist consumption	1000 tonnes	3	2	3	5	4	5	2	2	2	2	l
Rice and products	Residuals	1000 tonnes	0	0	0	0	0	0	0	0	0	0	m
Rice and products	Food	1000 tonnes	1,483	1,517	1,550	1,583	1,613	1,638	1,664	1,690	1,717	1,674	n
Rice and products	Food supply quantity (kg/capita/yr)	kg	237.37	238.92	240.50	242.06	243.00	243.04	243.04	243.06	243.12	233.52	o=n/a
Rice, paddy	Area harvested	ha	855,114	817,250	933,767	891,190	957,836	965,152	973,327	956,134	848,174	807,239	p
Rice, paddy	Yield	hg/ha	35,909	37,513	37,367	38,315	41,786	42,501	42,625	42,251	42,264	43,785	q=r/p
Rice, paddy	Production	tonnes	3,070,640	3,065,760	3,489,210	3,414,560	4,002,425	4,102,000	4,148,800	4,039,779	3,584,700	3,534,500	r=c
Rice, paddy (rice milled equivalent)	Production	tonnes	2,048,117	2,044,862	2,327,303	2,277,512	2,669,617	2,736,034	2,767,250	2,694,533	2,390,995	2,357,512	s=r*0.667

※Given the value of "c" and "r", values from "b" to "o" should be paddy rice base. Source:FAOSTAT

[Modification of the value of Food] FBS value in 2018 : 1,717.0 Projection average in 2018 : 1,995.7 Modification Coefficient : 1.1623

Food	Corrected value of Food	1000 tonnes	1,723.7	1,763.2	1,801.6	1,839.9	1,874.8	1,903.8	1,934.1	1,964.3	1,995.7	1,945.7	t=n*1.1623
Food	Difference of quantity	1000 tonnes	△240.7	△246.2	△251.6	△256.9	△261.8	△265.8	△270.1	△274.3	△278.7	△271.7	u=n-t

[Modification of the value of Seed] Seed rate of 60kg per Area harvested ha should be applied.

Seed	Corrected value of Seed	1000 tonnes	51.3	49.0	56.0	53.5	57.5	57.9	58.4	57.4	50.9	48.4	v=p*60kg/ha
Seed	Difference of quantity	1000 tonnes	132.7	135.0	153.0	151.5	182.5	188.1	190.6	184.6	164.1	163.6	w=h-v

[Modification of the value of Other uses]

Other uses	Corrected value of Other uses	1000 tonnes	693.0	684.8	670.4	748.6	956.7	1,192.3	1,566.5	1,595.3	987.4	1,180.9	x=k+u+w

[Conversion from paddy rice base to milled rice base]

Yearly consumption	60.0%	kg/capita/yr	142.42	143.35	144.30	145.24	145.80	145.82	145.82	145.84	145.87	140.11	y=o*0.6
Daily consumption	60.0%	g/capita/day	390.20	392.70	395.30	397.90	399.50	399.50	399.50	399.60	399.60	383.90	z=y/365

10. Demand and Supply of Rice based on FBS

Item	Element	Ratio	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
Population	Total Population - Both sexes												
Rice and products	Domestic supply quantity	% to Food corrected	180.4	178.0	179.7	182.0	197.5	210.1	229.0	217.6	189.2	186.6	195.0
Rice and products	Production	% to Food corrected	178.2	173.9	193.7	185.6	213.5	215.5	214.5	205.7	179.6	181.7	194.2
Rice and products	Import Quantity	% to Food corrected	4.1	1.6	1.2	1.0	0.4	0.6	7.9	4.8	2.4	7.2	3.1
Rice and products	Stock Variation	% to Food corrected	1.9	△2.4	15.2	4.5	15.0	3.4	△10.2	△11.2	△10.5	△0.4	0.5
Rice and products	Export Quantity	% to Food corrected	0.0	0.0	0.0	0.0	1.3	2.5	3.7	4.1	3.4	2.7	1.8
Rice and products	Feed	% to Food corrected	20.8	20.2	22.6	21.6	24.8	25.2	24.9	14.9	20.9	4.5	**20.0**
Rice and products	Seed												
Rice and products	Losses	% to Food corrected	7.3	7.0	7.9	7.5	8.6	8.7	8.5	8.1	7.0	6.9	**7.8**
Rice and products	Processing	% to Food corrected	9.0	8.9	8.8	9.0	9.7	10.3	11.5	10.3	9.1	11.8	**9.8**
Rice and products	Other uses (non-food)												
Rice and products	Tourist consumption	% to Food corrected	0.2	0.1	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.1	**0.2**
Rice and products	Residuals	% to Food corrected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Rice and products	Food												
Rice and products	Food supply quantity (kg/capita/yr)												
Rice, paddy	Area harvested												
Rice, paddy	Yield												
Rice, paddy	Production												
Rice, paddy (rice milled equivalent)	Production												

[Modification of the value of Food]

Food	Corrected value of Food	% to Food corrected	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**
Food	Difference of quantity												

[Modification of the value of Seed]

Seed	Corrected value of Seed	% to Food corrected	3.0	2.8	3.1	2.9	3.1	3.0	3.0	2.9	2.6	2.5	**2.9**
Seed	Difference of quantity												

[Modification of the value of Other uses]

Other uses	Corrected value of Other uses	% to Food corrected	40.2	38.8	37.20	40.70	51.00	62.60	81.00	81.20	49.50	60.70	**54.3**

[Conversion from paddy rice base to milled rice bas

Yearly consumption	60.0%												
Daily consumption	60.0%												

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
1	Food	100.0	-	-	2,080,053.5	2,116,013.3	2,153,485.5	2,191,143.3	2,229,573.5	2,267,549.2
Scenario CODE	Feed	20.0	-	-	416,010.7	423,202.7	430,697.1	438,228.7	445,914.7	453,509.8
G1-P1	Seed	2.9	-	-	60,321.6	61,364.4	62,451.1	63,543.2	64,657.6	65,758.9
GDP Growth	Losses	7.8	-	-	162,244.2	165,049.0	167,971.9	170,909.2	173,906.7	176,868.8
High	Processing	9.8	-	-	203,845.2	207,369.3	211,041.6	214,732.0	218,498.2	222,219.8
Population Growth	Other uses (non-food)	54.3	-	-	1,129,469.1	1,148,995.2	1,169,342.6	1,189,790.8	1,210,658.4	1,231,279.2
Very High	Tourist consumption	0.2	-	-	4,160.1	4,232.0	4,307.0	4,382.3	4,459.1	4,535.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,056,104.4	4,126,225.9	4,199,296.8	4,272,729.5	4,347,668.2	4,421,720.8
2	Food	100.0	1,998,226.3	2,037,649.2	2,074,671.5	2,111,567.7	2,149,426.3	2,186,965.0	2,224,892.7	2,262,006.2
Scenario CODE	Feed	20.0	399,645.3	407,529.8	414,934.3	422,313.5	429,885.3	437,393.0	444,978.5	452,401.2
G1-P2	Seed	2.9	57,948.6	59,091.8	60,165.5	61,235.5	62,333.4	63,422.0	64,521.9	65,598.2
GDP Growth	Losses	7.8	155,861.7	158,936.6	161,824.4	164,702.3	167,655.3	170,583.3	173,541.6	176,436.5
High	Processing	9.8	195,826.2	199,689.6	203,317.8	206,933.6	210,643.8	214,322.6	218,039.5	221,676.6
Population Growth	Other uses (non-food)	54.3	1,085,036.9	1,106,443.5	1,126,546.6	1,146,581.3	1,167,138.5	1,187,522.0	1,208,116.7	1,228,269.4
High	Tourist consumption	0.2	3,996.5	4,075.3	4,149.3	4,223.1	4,298.9	4,373.9	4,449.8	4,524.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,896,541.5	3,973,415.8	4,045,609.4	4,117,557.0	4,191,381.5	4,264,581.8	4,338,540.7	4,410,912.1
3	Food	100.0	1,995,375.2	2,032,838.5	2,067,375.2	2,101,411.5	2,136,017.8	2,169,906.0	2,203,771.7	2,236,412.0
Scenario CODE	Feed	20.0	399,075.0	406,567.7	413,475.0	420,282.3	427,203.6	433,981.2	440,754.3	447,282.4
G1-P3	Seed	2.9	57,865.9	58,952.3	59,953.9	60,940.9	61,944.5	62,927.3	63,909.4	64,855.9
GDP Growth	Losses	7.8	155,639.3	158,561.4	161,255.3	163,910.1	166,609.4	169,252.7	171,894.2	174,440.1
High	Processing	9.8	195,546.8	199,218.2	202,602.8	205,938.3	209,329.7	212,650.8	215,969.6	219,168.4
Population Growth	Other uses (non-food)	54.3	1,083,488.7	1,103,831.3	1,122,584.7	1,141,066.4	1,159,857.7	1,178,259.0	1,196,648.0	1,214,371.7
Upper-Medium	Tourist consumption	0.2	3,990.8	4,065.7	4,134.8	4,202.8	4,272.0	4,339.8	4,407.5	4,472.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,890,981.7	3,964,035.1	4,031,381.7	4,097,752.3	4,165,234.7	4,231,316.8	4,297,354.7	4,361,003.3

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
1	Food	100.0	2,305,503.8	2,342,848.0	2,380,107.8	2,415,914.5	2,451,625.0	2,486,630.3	2,521,466.2	2,555,376.2
Scenario CODE	Feed	20.0	461,100.8	468,569.6	476,021.6	483,182.9	490,325.0	497,326.1	504,293.2	511,075.2
G1-P1	Seed	2.9	66,859.6	67,942.6	69,023.1	70,061.5	71,097.1	72,112.3	73,122.5	74,105.9
GDP Growth	Losses	7.8	179,829.3	182,742.1	185,648.4	188,441.3	191,226.8	193,957.2	196,674.4	199,319.3
High	Processing	9.8	225,939.4	229,599.1	233,250.6	236,759.6	240,259.3	243,689.8	247,103.7	250,426.9
Population Growth	Other uses (non-food)	54.3	1,251,888.6	1,272,166.5	1,292,398.5	1,311,841.6	1,331,232.4	1,350,240.3	1,369,156.1	1,387,569.3
Very High	Tourist consumption	0.2	4,611.0	4,685.7	4,760.2	4,831.8	4,903.3	4,973.3	5,042.9	5,110.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,495,732.5	4,568,553.6	4,641,210.2	4,711,033.2	4,780,668.9	4,848,929.3	4,916,859.0	4,982,983.6
2	Food	100.0	2,298,971.3	2,335,163.3	2,371,104.7	2,405,379.2	2,439,342.8	2,472,598.5	2,505,738.2	2,538,041.7
Scenario CODE	Feed	20.0	459,794.3	467,032.7	474,220.9	481,075.8	487,868.6	494,519.7	501,147.6	507,608.3
G1-P2	Seed	2.9	66,670.2	67,719.7	68,762.0	69,756.0	70,740.9	71,705.4	72,666.4	73,603.2
GDP Growth	Losses	7.8	179,319.8	182,142.7	184,946.2	187,619.6	190,268.7	192,862.7	195,447.6	197,967.3
High	Processing	9.8	225,299.2	228,846.0	232,368.3	235,727.2	239,055.6	242,314.7	245,562.3	248,728.1
Population Growth	Other uses (non-food)	54.3	1,248,341.4	1,267,993.7	1,287,509.9	1,306,120.9	1,324,563.1	1,342,621.0	1,360,615.8	1,378,156.6
High	Tourist consumption	0.2	4,597.9	4,670.3	4,742.2	4,810.8	4,878.7	4,945.2	5,011.5	5,076.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,482,994.1	4,553,568.4	4,623,654.2	4,690,489.5	4,756,718.4	4,821,567.2	4,886,189.4	4,949,181.3
3	Food	100.0	2,268,660.3	2,299,897.5	2,330,636.0	2,359,482.3	2,387,768.5	2,415,292.7	2,442,624.2	2,469,056.5
Scenario CODE	Feed	20.0	453,732.1	459,979.5	466,127.2	471,896.5	477,553.7	483,058.5	488,524.8	493,811.3
G1-P3	Seed	2.9	65,791.1	66,697.0	67,588.4	68,425.0	69,245.3	70,043.5	70,836.1	71,602.6
GDP Growth	Losses	7.8	176,955.5	179,392.0	181,789.6	184,039.6	186,245.9	188,392.8	190,524.7	192,586.4
High	Processing	9.8	222,328.7	225,390.0	228,402.3	231,229.3	234,001.3	236,698.7	239,377.2	241,967.5
Population Growth	Other uses (non-food)	54.3	1,231,882.5	1,248,844.3	1,265,535.3	1,281,198.9	1,296,558.3	1,311,503.9	1,326,344.9	1,340,697.7
Upper-Medium	Tourist consumption	0.2	4,537.3	4,599.8	4,661.3	4,719.0	4,775.5	4,830.6	4,885.2	4,938.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,423,887.5	4,484,800.1	4,544,740.1	4,600,990.6	4,656,148.5	4,709,820.7	4,763,117.1	4,814,660.1

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
1	Food	100.0	2,588,202.2	2,620,499.5	2,650,721.0	2,680,394.8	2,708,880.7	2,736,242.0	2,762,523.5
Scenario CODE	Feed	20.0	517,640.4	524,099.9	530,144.2	536,079.0	541,776.1	547,248.4	552,504.7
G1-P1	Seed	2.9	75,057.9	75,994.5	76,870.9	77,731.4	78,557.5	79,351.0	80,113.2
GDP Growth	Losses	7.8	201,879.8	204,399.0	206,756.2	209,070.8	211,292.7	213,426.9	215,476.8
High	Processing	9.8	253,643.8	256,809.0	259,770.7	262,678.7	265,470.3	268,151.7	270,727.3
Population Growth	Other uses (non-food)	54.3	1,405,393.8	1,422,931.2	1,439,341.5	1,455,454.4	1,470,922.2	1,485,779.4	1,500,050.3
Very High	Tourist consumption	0.2	5,176.4	5,241.0	5,301.4	5,360.8	5,417.8	5,472.5	5,525.0
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		5,046,994.3	5,109,974.1	5,168,905.9	5,226,769.9	5,282,317.3	5,335,671.9	5,386,920.8
2	Food	100.0	2,569,517.2	2,600,787.5	2,630,288.0	2,659,527.7	2,687,732.2	2,714,846.2	2,740,793.3
Scenario CODE	Feed	20.0	513,903.4	520,157.5	526,057.6	531,905.5	537,546.4	542,969.2	548,158.7
G1-P2	Seed	2.9	74,516.0	75,422.8	76,278.4	77,126.3	77,944.2	78,730.5	79,483.0
GDP Growth	Losses	7.8	200,422.3	202,861.4	205,162.5	207,443.2	209,643.1	211,758.0	213,781.9
High	Processing	9.8	251,812.7	254,877.2	257,768.2	260,633.7	263,397.8	266,054.9	268,597.7
Population Growth	Other uses (non-food)	54.3	1,395,247.8	1,412,227.6	1,428,246.4	1,444,123.5	1,459,438.6	1,474,161.5	1,488,250.8
High	Tourist consumption	0.2	5,139.0	5,201.6	5,260.6	5,319.1	5,375.5	5,429.7	5,481.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		5,010,558.4	5,071,535.6	5,129,061.7	5,186,079.0	5,241,077.8	5,293,950.0	5,344,547.0
3	Food	100.0	2,494,595.5	2,519,841.7	2,543,269.8	2,566,328.5	2,588,253.7	2,608,979.3	2,628,622.5
Scenario CODE	Feed	20.0	498,919.1	503,968.3	508,654.0	513,265.7	517,650.7	521,795.9	525,724.5
G1-P3	Seed	2.9	72,343.3	73,075.4	73,754.8	74,423.5	75,059.4	75,660.4	76,230.1
GDP Growth	Losses	7.8	194,578.4	196,547.7	198,375.0	200,173.6	201,883.8	203,500.4	205,032.6
High	Processing	9.8	244,470.4	246,944.5	249,240.4	251,500.2	253,648.9	255,680.0	257,605.0
Population Growth	Other uses (non-food)	54.3	1,354,565.4	1,368,274.0	1,380,995.5	1,393,516.4	1,405,421.8	1,416,675.8	1,427,342.0
Upper-Medium	Tourist consumption	0.2	4,989.2	5,039.7	5,086.5	5,132.7	5,176.5	5,218.0	5,257.2
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,864,461.3	4,913,691.3	4,959,376.0	5,004,340.6	5,047,094.8	5,087,509.8	5,125,813.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
4	Food	100.0	-	-	2,080,053.5	2,113,317.8	2,146,990.0	2,179,917.8	2,212,900.0	2,244,865.8
Scenario CODE	Feed	20.0	-	-	416,010.7	422,663.6	429,398.0	435,983.6	442,580.0	448,973.2
G1-P4	Seed	2.9	-	-	60,321.6	61,286.2	62,262.7	63,217.6	64,174.1	65,101.1
GDP Growth	Losses	7.8	-	-	162,244.2	164,838.8	167,465.2	170,033.6	172,606.2	175,099.5
High	Processing	9.8	-	-	203,845.2	207,105.1	210,405.0	213,631.9	216,864.2	219,996.8
Population Growth	Other uses (non-food)	54.3	-	-	1,129,469.1	1,147,531.6	1,165,815.6	1,183,695.4	1,201,604.7	1,218,962.1
Lower-Medium	Tourist consumption	0.2	-	-	4,160.1	4,226.6	4,294.0	4,359.8	4,425.8	4,489.7
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,056,104.4	4,120,969.7	4,186,630.5	4,250,839.7	4,315,155.0	4,377,488.2
5	Food	100.0	1,993,474.0	2,029,631.8	2,063,082.8	2,094,527.3	2,126,735.3	2,157,840.7	2,188,526.8	2,217,588.2
Scenario CODE	Feed	20.0	398,694.8	405,926.4	412,616.6	418,905.5	425,347.1	431,568.1	437,705.4	443,517.6
G1-P5	Seed	2.9	57,810.7	58,859.3	59,829.4	60,741.3	61,675.3	62,577.4	63,467.3	64,310.1
GDP Growth	Losses	7.8	155,491.0	158,311.3	160,920.5	163,373.1	165,885.4	168,311.6	170,705.1	172,971.9
High	Processing	9.8	195,360.5	198,903.9	202,182.1	205,263.7	208,420.1	211,468.4	214,475.6	217,323.6
Population Growth	Other uses (non-food)	54.3	1,082,456.4	1,102,090.1	1,120,254.0	1,137,328.3	1,154,817.3	1,171,707.5	1,188,370.1	1,204,150.4
Low	Tourist consumption	0.2	3,986.9	4,059.3	4,126.2	4,189.1	4,253.5	4,315.7	4,377.1	4,435.2
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,887,274.3	3,957,782.1	4,023,011.6	4,084,328.3	4,147,134.0	4,207,789.4	4,267,627.4	4,324,297.0
6	Food	100.0	-	-	2,080,053.5	2,110,374.8	2,140,204.8	2,168,536.3	2,196,197.5	2,222,181.7
Scenario CODE	Feed	20.0	-	-	416,010.7	422,075.0	428,041.0	433,707.3	439,239.5	444,436.3
G1-P6	Seed	2.9	-	-	60,321.6	61,200.9	62,065.9	62,887.6	63,689.7	64,443.3
GDP Growth	Losses	7.8	-	-	162,244.2	164,609.2	166,936.0	169,145.8	171,303.4	173,330.2
High	Processing	9.8	-	-	203,845.2	206,816.7	209,740.1	212,516.6	215,227.4	217,773.8
Population Growth	Other uses (non-food)	54.3	-	-	1,129,469.1	1,145,933.5	1,162,131.2	1,177,515.2	1,192,535.2	1,206,644.7
Very Low	Tourist consumption	0.2	-	-	4,160.1	4,220.7	4,280.4	4,337.1	4,392.4	4,444.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,056,104.4	4,115,230.8	4,173,399.4	4,228,645.9	4,282,585.1	4,333,254.4

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
4	Food	100.0	2,276,289.5	2,306,571.8	2,336,241.5	2,363,952.0	2,391,045.2	2,416,930.8	2,442,192.8	2,466,224.7
Scenario CODE	Feed	20.0	455,257.9	461,314.4	467,248.3	472,790.4	478,209.0	483,386.2	488,438.6	493,244.9
G1-P4	Seed	2.9	66,012.4	66,890.6	67,751.0	68,554.6	69,340.3	70,091.0	70,823.6	71,520.5
GDP Growth	Losses	7.8	177,550.6	179,912.6	182,226.8	184,388.3	186,501.5	188,520.6	190,491.0	192,365.5
High	Processing	9.8	223,076.4	226,044.0	228,951.7	231,667.3	234,322.4	236,859.2	239,334.9	241,690.0
Population Growth	Other uses (non-food)	54.3	1,236,025.2	1,252,468.5	1,268,579.1	1,283,625.9	1,298,337.5	1,312,393.4	1,326,110.7	1,339,160.0
Lower-Medium	Tourist consumption	0.2	4,552.6	4,613.1	4,672.5	4,727.9	4,782.1	4,833.9	4,884.4	4,932.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,438,764.6	4,497,815.0	4,555,670.9	4,609,706.4	4,662,538.0	4,713,015.1	4,762,276.0	4,809,138.0
5	Food	100.0	2,245,844.7	2,272,675.2	2,298,582.5	2,322,183.5	2,344,790.2	2,366,582.7	2,388,113.3	2,408,691.7
Scenario CODE	Feed	20.0	449,168.9	454,535.0	459,716.5	464,436.7	468,958.0	473,316.5	477,622.7	481,738.3
G1-P5	Seed	2.9	65,129.5	65,907.6	66,658.9	67,343.3	67,998.9	68,630.9	69,255.3	69,852.1
GDP Growth	Losses	7.8	175,175.9	177,268.7	179,289.4	181,130.3	182,893.6	184,593.5	186,272.8	187,878.0
High	Processing	9.8	220,092.8	222,722.2	225,261.1	227,574.0	229,789.4	231,925.1	234,035.1	236,051.8
Population Growth	Other uses (non-food)	54.3	1,219,493.7	1,234,062.6	1,248,130.3	1,260,945.6	1,273,221.1	1,285,054.4	1,296,745.5	1,307,919.6
Low	Tourist consumption	0.2	4,491.7	4,545.4	4,597.2	4,644.4	4,689.6	4,733.2	4,776.2	4,817.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,379,397.2	4,431,716.7	4,482,235.9	4,528,257.8	4,572,340.8	4,614,836.3	4,656,820.9	4,696,948.9
6	Food	100.0	2,247,037.2	2,270,254.0	2,292,354.5	2,311,994.5	2,330,464.7	2,347,217.3	2,362,898.3	2,377,049.7
Scenario CODE	Feed	20.0	449,407.4	454,050.8	458,470.9	462,398.9	466,092.9	469,443.5	472,579.7	475,409.9
G1-P6	Seed	2.9	65,164.1	65,837.4	66,478.3	67,047.8	67,583.5	68,069.3	68,524.1	68,934.4
GDP Growth	Losses	7.8	175,268.9	177,079.8	178,803.7	180,335.6	181,776.2	183,082.9	184,306.1	185,409.9
High	Processing	9.8	220,209.6	222,484.9	224,650.7	226,575.5	228,385.5	230,027.3	231,564.0	232,950.9
Population Growth	Other uses (non-food)	54.3	1,220,141.2	1,232,747.9	1,244,748.5	1,255,413.0	1,265,442.3	1,274,539.0	1,283,053.8	1,290,738.0
Very Low	Tourist consumption	0.2	4,494.1	4,540.5	4,584.7	4,624.0	4,660.9	4,694.4	4,725.8	4,754.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,381,722.5	4,426,995.3	4,470,091.3	4,508,389.3	4,544,406.0	4,577,073.7	4,607,651.8	4,635,246.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
4	Food	100.0	2,489,036.3	2,511,275.0	2,531,513.3	2,551,180.7	2,569,604.3	2,586,742.7	2,602,557.2
Scenario CODE	Feed	20.0	497,807.3	502,255.0	506,302.7	510,236.1	513,920.9	517,348.5	520,511.4
G1-P4	Seed	2.9	72,182.1	72,827.0	73,413.9	73,984.2	74,518.5	75,015.5	75,474.2
GDP Growth	Losses	7.8	194,144.8	195,879.5	197,458.0	198,992.1	200,429.1	201,765.9	202,999.5
High	Processing	9.8	243,925.6	246,105.0	248,088.3	250,015.7	251,821.2	253,500.8	255,050.6
Population Growth	Other uses (non-food)	54.3	1,351,546.7	1,363,622.3	1,374,611.7	1,385,291.1	1,395,295.1	1,404,601.3	1,413,188.6
Lower-Medium	Tourist consumption	0.2	4,978.1	5,022.6	5,063.0	5,102.4	5,139.2	5,173.5	5,205.1
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,853,620.9	4,896,986.4	4,936,450.9	4,974,802.3	5,010,728.3	5,044,148.2	5,074,986.6
5	Food	100.0	2,428,323.3	2,447,594.7	2,465,222.8	2,482,610.7	2,499,012.8	2,514,360.7	2,528,564.0
Scenario CODE	Feed	20.0	485,664.7	489,518.9	493,044.6	496,522.1	499,802.6	502,872.1	505,712.8
G1-P5	Seed	2.9	70,421.4	70,980.2	71,491.5	71,995.7	72,471.4	72,916.5	73,328.4
GDP Growth	Losses	7.8	189,409.2	190,912.4	192,287.4	193,643.6	194,923.0	196,120.1	197,228.0
High	Processing	9.8	237,975.7	239,864.3	241,591.8	243,295.8	244,903.3	246,407.3	247,799.3
Population Growth	Other uses (non-food)	54.3	1,318,579.6	1,329,043.9	1,338,616.0	1,348,057.6	1,356,964.0	1,365,297.9	1,373,010.3
Low	Tourist consumption	0.2	4,856.6	4,895.2	4,930.4	4,965.2	4,998.0	5,028.7	5,057.1
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,735,230.5	4,772,809.6	4,807,184.5	4,841,090.7	4,873,075.1	4,903,003.3	4,930,699.9
6	Food	100.0	2,389,854.3	2,402,049.7	2,412,333.5	2,422,061.7	2,430,545.5	2,437,657.2	2,443,298.3
Scenario CODE	Feed	20.0	477,970.9	480,409.9	482,466.7	484,412.3	486,109.1	487,531.4	488,659.7
G1-P6	Seed	2.9	69,305.8	69,659.4	69,957.7	70,239.8	70,485.8	70,692.1	70,855.7
GDP Growth	Losses	7.8	186,408.6	187,359.9	188,162.0	188,920.8	189,582.5	190,137.3	190,577.3
High	Processing	9.8	234,205.7	235,400.9	236,408.7	237,362.0	238,193.5	238,890.4	239,443.2
Population Growth	Other uses (non-food)	54.3	1,297,690.9	1,304,313.0	1,309,897.1	1,315,179.5	1,319,786.2	1,323,647.9	1,326,711.0
Very Low	Tourist consumption	0.2	4,779.7	4,804.1	4,824.7	4,844.1	4,861.1	4,875.3	4,886.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,660,215.9	4,683,996.9	4,704,050.4	4,723,020.2	4,739,563.7	4,753,431.6	4,764,431.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
7	Food	100.0	-	-	2,080,053.5	2,116,148.7	2,153,338.5	2,191,522.2	2,228,653.0	2,265,622.3
Scenario CODE	Feed	20.0	-	-	416,010.7	423,229.7	430,667.7	438,304.4	445,730.6	453,124.5
G2-P1	Seed	2.9	-	-	60,321.6	61,368.3	62,446.8	63,554.1	64,630.9	65,703.0
GDP Growth	Losses	7.8	-	-	162,244.2	165,059.6	167,960.4	170,938.7	173,834.9	176,718.5
Low	Processing	9.8	-	-	203,845.2	207,382.6	211,027.2	214,769.2	218,408.0	222,031.0
Population Growth	Other uses (non-food)	54.3	-	-	1,129,469.1	1,149,068.7	1,169,262.8	1,189,996.6	1,210,158.6	1,230,232.9
Very High	Tourist consumption	0.2	-	-	4,160.1	4,232.3	4,306.7	4,383.0	4,457.3	4,531.2
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,056,104.4	4,126,489.9	4,199,010.1	4,273,468.2	4,345,873.3	4,417,963.4
8	Food	100.0	1,998,226.3	2,037,649.2	2,074,671.5	2,111,702.5	2,149,279.7	2,187,343.3	2,223,974.0	2,260,084.0
Scenario CODE	Feed	20.0	399,645.3	407,529.8	414,934.3	422,340.5	429,855.9	437,468.7	444,794.8	452,016.8
G2-P2	Seed	2.9	57,948.6	59,091.8	60,165.5	61,239.4	62,329.1	63,433.0	64,495.2	65,542.4
GDP Growth	Losses	7.8	155,861.7	158,936.6	161,824.4	164,712.8	167,643.8	170,612.8	173,470.0	176,286.6
Low	Processing	9.8	195,826.2	199,689.6	203,317.8	206,946.8	210,629.4	214,359.6	217,949.5	221,488.2
Population Growth	Other uses (non-food)	54.3	1,085,036.9	1,106,443.5	1,126,546.6	1,146,654.5	1,167,058.9	1,187,727.4	1,207,617.9	1,227,225.6
High	Tourist consumption	0.2	3,996.5	4,075.3	4,149.3	4,223.4	4,298.6	4,374.7	4,447.9	4,520.2
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,896,541.5	3,973,415.8	4,045,609.4	4,117,819.9	4,191,095.4	4,265,319.5	4,336,749.3	4,407,163.8
9	Food	100.0	1,995,375.2	2,032,838.5	2,067,375.2	2,101,545.8	2,135,872.0	2,170,281.3	2,202,861.8	2,234,511.7
Scenario CODE	Feed	20.0	399,075.0	406,567.7	413,475.0	420,309.2	427,174.4	434,056.3	440,572.4	446,902.3
G2-P3	Seed	2.9	57,865.9	58,952.3	59,953.9	60,944.8	61,940.3	62,938.2	63,883.0	64,800.8
GDP Growth	Losses	7.8	155,639.3	158,561.4	161,255.3	163,920.6	166,598.0	169,281.9	171,823.2	174,291.9
Low	Processing	9.8	195,546.8	199,218.2	202,602.8	205,951.5	209,315.5	212,687.6	215,880.5	218,982.1
Population Growth	Other uses (non-food)	54.3	1,083,488.7	1,103,831.3	1,122,584.7	1,141,139.4	1,159,778.5	1,178,462.7	1,196,154.0	1,213,339.9
Upper-Medium	Tourist consumption	0.2	3,990.8	4,065.7	4,134.8	4,203.1	4,271.7	4,340.6	4,405.7	4,469.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,890,981.7	3,964,035.1	4,031,381.7	4,098,014.4	4,164,950.4	4,232,048.6	4,295,580.6	4,357,297.7

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
7	Food	100.0	2,301,887.0	2,337,408.2	2,372,422.7	2,406,690.0	2,441,026.0	2,474,023.3	2,507,029.5	2,539,300.0
Scenario CODE	Feed	20.0	460,377.4	467,481.6	474,484.5	481,338.0	488,205.2	494,804.7	501,405.9	507,860.0
G2-P1	Seed	2.9	66,754.7	67,784.8	68,800.3	69,794.0	70,789.8	71,746.7	72,703.9	73,639.7
GDP Growth	Losses	7.8	179,547.2	182,317.8	185,049.0	187,721.8	190,400.0	192,973.8	195,548.3	198,065.4
Low	Processing	9.8	225,584.9	229,066.0	232,497.4	235,855.6	239,220.5	242,454.3	245,688.9	248,851.4
Population Growth	Other uses (non-food)	54.3	1,249,924.6	1,269,212.7	1,288,225.5	1,306,832.7	1,325,477.1	1,343,394.7	1,361,317.0	1,378,839.9
Very High	Tourist consumption	0.2	4,603.8	4,674.8	4,744.8	4,813.4	4,882.1	4,948.0	5,014.1	5,078.6
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,488,679.6	4,557,945.9	4,626,224.2	4,693,045.5	4,760,000.7	4,824,345.5	4,888,707.6	4,951,635.0
8	Food	100.0	2,295,364.8	2,329,741.7	2,363,448.3	2,396,195.0	2,428,797.0	2,460,062.8	2,491,391.7	2,522,074.3
Scenario CODE	Feed	20.0	459,073.0	465,948.3	472,689.7	479,239.0	485,759.4	492,012.6	498,278.3	504,414.9
G2-P2	Seed	2.9	66,565.6	67,562.5	68,540.0	69,489.7	70,435.1	71,341.8	72,250.4	73,140.2
GDP Growth	Losses	7.8	179,038.5	181,719.9	184,349.0	186,903.2	189,446.2	191,884.9	194,328.6	196,721.8
Low	Processing	9.8	224,945.8	228,314.7	231,617.9	234,827.1	238,022.1	241,086.2	244,156.4	247,163.3
Population Growth	Other uses (non-food)	54.3	1,246,383.1	1,265,049.7	1,283,352.4	1,301,133.9	1,318,836.8	1,335,814.1	1,352,825.7	1,369,486.3
High	Tourist consumption	0.2	4,590.7	4,659.5	4,726.9	4,792.4	4,857.6	4,920.1	4,982.8	5,044.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,475,961.5	4,542,996.3	4,608,724.2	4,672,580.3	4,736,154.2	4,797,122.5	4,858,213.9	4,918,044.9
9	Food	100.0	2,265,101.5	2,294,557.5	2,323,110.7	2,350,473.3	2,377,445.7	2,403,047.7	2,428,639.0	2,453,523.2
Scenario CODE	Feed	20.0	453,020.3	458,911.5	464,622.1	470,094.7	475,489.1	480,609.5	485,727.8	490,704.6
G2-P3	Seed	2.9	65,687.9	66,542.2	67,370.2	68,163.7	68,945.9	69,688.4	70,430.5	71,152.2
GDP Growth	Losses	7.8	176,677.9	178,975.5	181,202.6	183,336.9	185,440.8	187,437.7	189,433.8	191,374.8
Low	Processing	9.8	221,979.9	224,866.6	227,664.8	230,346.4	232,989.7	235,498.7	238,006.6	240,445.3
Population Growth	Other uses (non-food)	54.3	1,229,950.1	1,245,944.7	1,261,449.1	1,276,307.0	1,290,953.0	1,304,854.9	1,318,751.0	1,332,263.1
Upper-Medium	Tourist consumption	0.2	4,530.2	4,589.1	4,646.2	4,700.9	4,754.9	4,806.1	4,857.3	4,907.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,416,947.8	4,474,387.1	4,530,065.7	4,583,422.9	4,636,019.1	4,685,943.0	4,735,846.0	4,784,370.2

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
7	Food	100.0	2,570,550.8	2,600,825.5	2,629,955.0	2,658,076.7	2,685,190.3	2,711,467.2	2,736,965.7
Scenario CODE	Feed	20.0	514,110.2	520,165.1	525,991.0	531,615.3	537,038.1	542,293.4	547,393.1
G2-P1	Seed	2.9	74,546.0	75,423.9	76,268.7	77,084.2	77,870.5	78,632.5	79,372.0
GDP Growth	Losses	7.8	200,503.0	202,864.4	205,136.5	207,330.0	209,444.8	211,494.4	213,483.3
Low	Processing	9.8	251,914.0	254,880.9	257,735.6	260,491.5	263,148.6	265,723.8	268,222.6
Population Growth	Other uses (non-food)	54.3	1,395,809.1	1,412,248.2	1,428,065.6	1,443,335.6	1,458,058.3	1,472,326.7	1,486,172.4
Very High	Tourist consumption	0.2	5,141.1	5,201.7	5,259.9	5,316.2	5,370.4	5,422.9	5,473.9
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		5,012,574.2	5,071,609.7	5,128,412.3	5,183,249.5	5,236,121.0	5,287,360.9	5,337,083.0
8	Food	100.0	2,551,993.2	2,581,261.3	2,609,682.2	2,637,383.5	2,664,226.8	2,690,265.2	2,715,436.5
Scenario CODE	Feed	20.0	510,398.6	516,252.3	521,936.4	527,476.7	532,845.4	538,053.0	543,087.3
G2-P2	Seed	2.9	74,007.8	74,856.6	75,680.8	76,484.1	77,262.6	78,017.7	78,747.7
GDP Growth	Losses	7.8	199,055.5	201,338.4	203,555.2	205,715.9	207,809.7	209,840.7	211,804.0
Low	Processing	9.8	250,095.3	252,963.6	255,748.9	258,463.6	261,094.2	263,646.0	266,112.8
Population Growth	Other uses (non-food)	54.3	1,385,732.3	1,401,624.9	1,417,057.4	1,432,099.2	1,446,675.2	1,460,814.0	1,474,482.0
High	Tourist consumption	0.2	5,104.0	5,162.5	5,219.4	5,274.8	5,328.5	5,380.5	5,430.9
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,976,386.7	5,033,459.6	5,088,880.3	5,142,897.8	5,195,242.4	5,246,017.1	5,295,101.2
9	Food	100.0	2,477,582.7	2,500,923.3	2,523,345.8	2,544,960.3	2,565,618.3	2,585,357.0	2,604,303.5
Scenario CODE	Feed	20.0	495,516.5	500,184.7	504,669.2	508,992.1	513,123.7	517,071.4	520,860.7
G2-P3	Seed	2.9	71,849.9	72,526.8	73,177.0	73,803.8	74,402.9	74,975.4	75,524.8
GDP Growth	Losses	7.8	193,251.5	195,072.0	196,821.0	198,506.9	200,118.2	201,657.8	203,135.7
Low	Processing	9.8	242,803.1	245,090.5	247,287.9	249,406.1	251,430.6	253,365.0	255,221.7
Population Growth	Other uses (non-food)	54.3	1,345,327.4	1,358,001.4	1,370,176.8	1,381,913.4	1,393,130.7	1,403,848.9	1,414,136.8
Upper-Medium	Tourist consumption	0.2	4,955.2	5,001.8	5,046.7	5,089.9	5,131.2	5,170.7	5,208.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,831,286.3	4,876,800.5	4,920,524.4	4,962,672.5	5,002,955.6	5,041,446.2	5,078,391.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
10	Food	100.0	-	-	2,080,053.5	2,113,453.0	2,146,843.7	2,180,295.0	2,211,986.3	2,242,958.3
Scenario CODE	Feed	20.0	-	-	416,010.7	422,690.6	429,368.7	436,059.0	442,397.3	448,591.7
G2-P4	Seed	2.9	-	-	60,321.6	61,290.1	62,258.5	63,228.6	64,147.6	65,045.8
GDP Growth	Losses	7.8	-	-	162,244.2	164,849.3	167,453.8	170,063.0	172,534.9	174,950.7
Low	Processing	9.8	-	-	203,845.2	207,118.4	210,390.7	213,668.9	216,774.7	219,809.9
Population Growth	Other uses (non-food)	54.3	-	-	1,129,469.1	1,147,605.0	1,165,736.1	1,183,900.2	1,201,108.6	1,217,926.4
Lower-Medium	Tourist consumption	0.2	-	-	4,160.1	4,226.9	4,293.7	4,360.6	4,424.0	4,485.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,056,104.4	4,121,233.3	4,186,345.2	4,251,575.3	4,313,373.4	4,373,768.7
11	Food	100.0	1,993,474.0	2,029,631.8	2,063,082.8	2,094,661.2	2,126,590.3	2,158,214.0	2,187,623.2	2,215,703.7
Scenario CODE	Feed	20.0	398,694.8	405,926.4	412,616.6	418,932.2	425,318.1	431,642.8	437,524.6	443,140.7
G2-P5	Seed	2.9	57,810.7	58,859.3	59,829.4	60,745.2	61,671.1	62,588.2	63,441.1	64,255.4
GDP Growth	Losses	7.8	155,491.0	158,311.3	160,920.5	163,383.6	165,874.0	168,340.7	170,634.6	172,824.9
Low	Processing	9.8	195,360.5	198,903.9	202,182.1	205,276.8	208,405.8	211,505.0	214,387.1	217,139.0
Population Growth	Other uses (non-food)	54.3	1,082,456.4	1,102,090.1	1,120,254.0	1,137,401.0	1,154,738.5	1,171,910.2	1,187,879.4	1,203,127.1
Low	Tourist consumption	0.2	3,986.9	4,059.3	4,126.2	4,189.3	4,253.2	4,316.4	4,375.2	4,431.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,887,274.3	3,957,782.1	4,023,011.6	4,084,589.3	4,146,851.0	4,208,517.3	4,265,865.2	4,320,622.2
12	Food	100.0	-	-	2,080,053.5	2,110,509.7	2,140,058.7	2,168,911.3	2,195,290.8	2,220,293.5
Scenario CODE	Feed	20.0	-	-	416,010.7	422,101.9	428,011.7	433,782.3	439,058.2	444,058.7
G2-P6	Seed	2.9	-	-	60,321.6	61,204.8	62,061.7	62,898.4	63,663.4	64,388.5
GDP Growth	Losses	7.8	-	-	162,244.2	164,619.8	166,924.6	169,175.1	171,232.7	173,182.9
Low	Processing	9.8	-	-	203,845.2	206,830.0	209,725.8	212,553.3	215,138.5	217,588.8
Population Growth	Other uses (non-food)	54.3	-	-	1,129,469.1	1,146,006.8	1,162,051.9	1,177,718.8	1,192,042.9	1,205,619.4
Very Low	Tourist consumption	0.2	-	-	4,160.1	4,221.0	4,280.1	4,337.8	4,390.6	4,440.6
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,056,104.4	4,115,494.0	4,173,114.5	4,229,377.0	4,280,817.1	4,329,572.4

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
10	Food	100.0	2,272,718.7	2,301,216.5	2,328,697.8	2,354,926.0	2,380,708.0	2,404,677.2	2,428,210.2	2,450,709.2
Scenario CODE	Feed	20.0	454,543.7	460,243.3	465,739.6	470,985.2	476,141.6	480,935.4	485,642.0	490,141.8
G2-P4	Seed	2.9	65,908.8	66,735.3	67,532.2	68,292.9	69,040.5	69,735.6	70,418.1	71,070.6
GDP Growth	Losses	7.8	177,272.1	179,494.9	181,638.4	183,684.2	185,695.2	187,564.8	189,400.4	191,155.3
Low	Processing	9.8	222,726.4	225,519.2	228,212.4	230,782.7	233,309.4	235,658.4	237,964.6	240,169.5
Population Growth	Other uses (non-food)	54.3	1,234,086.3	1,249,560.6	1,264,482.9	1,278,724.8	1,292,724.4	1,305,739.7	1,318,518.1	1,330,735.1
Lower-Medium	Tourist consumption	0.2	4,545.4	4,602.4	4,657.4	4,709.9	4,761.4	4,809.4	4,856.4	4,901.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,431,801.4	4,487,372.2	4,540,960.7	4,592,105.7	4,642,380.5	4,689,120.5	4,735,009.8	4,778,882.9
11	Food	100.0	2,242,321.5	2,267,398.3	2,291,160.5	2,313,317.0	2,334,653.2	2,354,584.3	2,374,440.2	2,393,538.2
Scenario CODE	Feed	20.0	448,464.3	453,479.7	458,232.1	462,663.4	466,930.6	470,916.9	474,888.0	478,707.6
G2-P5	Seed	2.9	65,027.3	65,754.6	66,443.7	67,086.2	67,704.9	68,282.9	68,858.8	69,412.6
GDP Growth	Losses	7.8	174,901.1	176,857.1	178,710.5	180,438.7	182,102.9	183,657.6	185,206.3	186,696.0
Low	Processing	9.8	219,747.5	222,205.0	224,533.7	226,705.1	228,796.0	230,749.3	232,695.1	234,566.7
Population Growth	Other uses (non-food)	54.3	1,217,580.6	1,231,197.3	1,244,100.2	1,256,131.1	1,267,716.7	1,278,539.3	1,289,321.0	1,299,691.2
Low	Tourist consumption	0.2	4,484.6	4,534.8	4,582.3	4,626.6	4,669.3	4,709.2	4,748.9	4,787.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,372,526.9	4,421,426.8	4,467,763.0	4,510,968.1	4,552,573.6	4,591,439.5	4,630,158.3	4,667,399.4
12	Food	100.0	2,243,512.3	2,264,982.7	2,284,952.8	2,303,166.8	2,320,389.5	2,335,317.2	2,349,369.7	2,362,095.2
Scenario CODE	Feed	20.0	448,702.5	452,996.5	456,990.6	460,633.4	464,077.9	467,063.4	469,873.9	472,419.0
G2-P6	Seed	2.9	65,061.9	65,684.5	66,263.6	66,791.8	67,291.3	67,724.2	68,131.7	68,500.8
GDP Growth	Losses	7.8	174,994.0	176,668.7	178,226.3	179,647.0	180,990.4	182,154.7	183,250.8	184,243.4
Low	Processing	9.8	219,864.2	221,968.3	223,925.4	225,710.3	227,398.2	228,861.1	230,238.2	231,485.3
Population Growth	Other uses (non-food)	54.3	1,218,227.2	1,229,885.6	1,240,729.4	1,250,619.6	1,259,971.5	1,268,077.2	1,275,707.7	1,282,617.7
Very Low	Tourist consumption	0.2	4,487.0	4,530.0	4,569.9	4,606.3	4,640.8	4,670.6	4,698.7	4,724.2
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,374,849.1	4,416,716.3	4,455,658.0	4,491,175.2	4,524,759.6	4,553,868.4	4,581,270.7	4,606,085.6

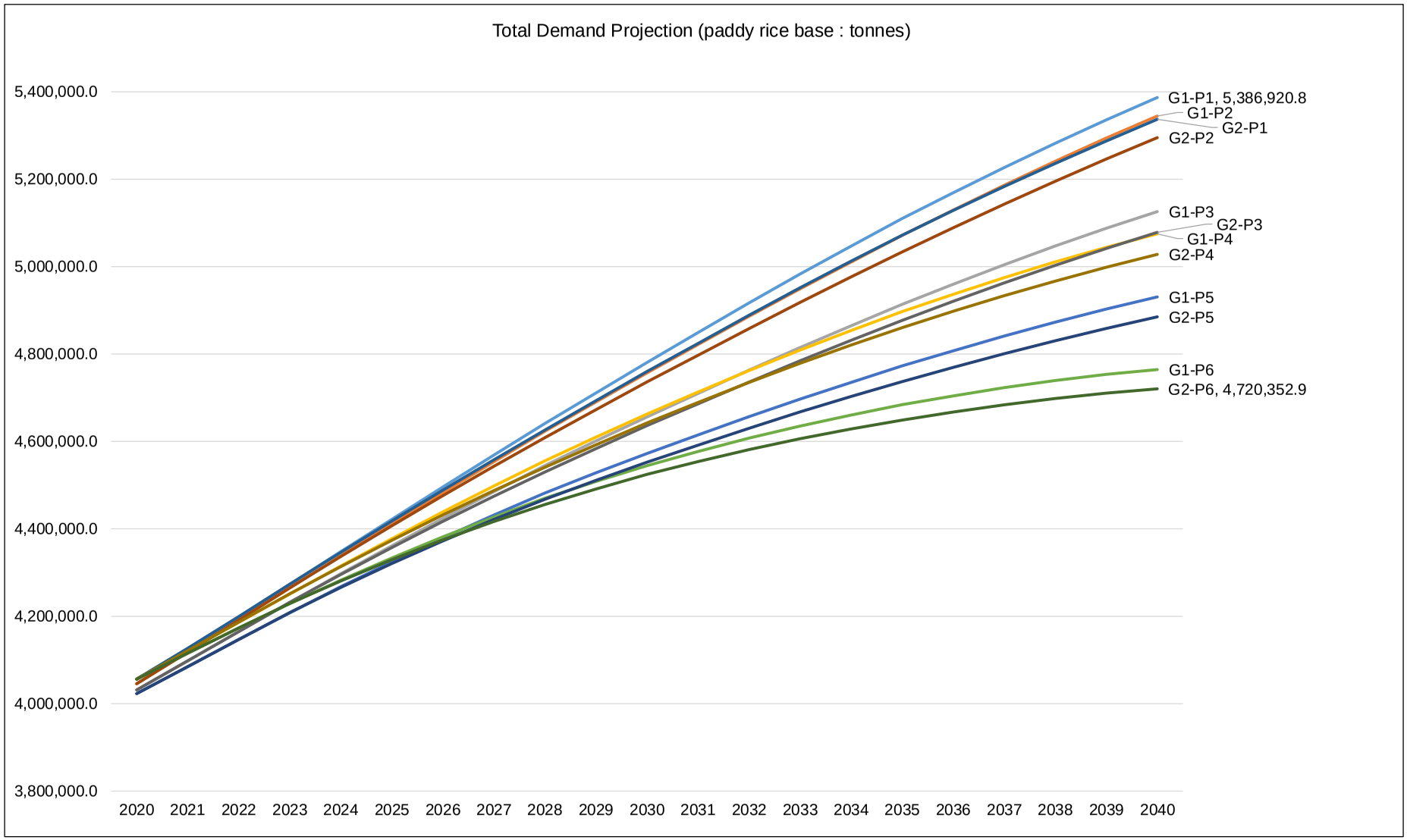
11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
10	Food	100.0	2,472,061.3	2,492,420.8	2,511,681.3	2,529,938.5	2,547,131.8	2,563,321.7	2,578,479.3
Scenario CODE	Feed	20.0	494,412.3	498,484.2	502,336.3	505,987.7	509,426.4	512,664.3	515,695.9
G2-P4	Seed	2.9	71,689.8	72,280.2	72,838.8	73,368.2	73,866.8	74,336.3	74,775.9
GDP Growth	Losses	7.8	192,820.8	194,408.8	195,911.1	197,335.2	198,676.3	199,939.1	201,121.4
Low	Processing	9.8	242,262.0	244,257.2	246,144.8	247,934.0	249,618.9	251,205.5	252,691.0
Population Growth	Other uses (non-food)	54.3	1,342,329.3	1,353,384.5	1,363,842.9	1,373,756.6	1,383,092.6	1,391,883.7	1,400,114.3
Lower-Medium	Tourist consumption	0.2	4,944.1	4,984.8	5,023.4	5,059.9	5,094.3	5,126.6	5,157.0
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,820,519.6	4,860,220.5	4,897,778.6	4,933,380.1	4,966,907.1	4,998,477.2	5,028,034.8
11	Food	100.0	2,411,762.5	2,429,218.7	2,445,910.2	2,461,939.5	2,477,157.8	2,491,595.0	2,505,170.7
Scenario CODE	Feed	20.0	482,352.5	485,843.7	489,182.0	492,387.9	495,431.6	498,319.0	501,034.1
G2-P5	Seed	2.9	69,941.1	70,447.3	70,931.4	71,396.2	71,837.6	72,256.3	72,650.0
GDP Growth	Losses	7.8	188,117.5	189,479.1	190,781.0	192,031.3	193,218.3	194,344.4	195,403.3
Low	Processing	9.8	236,352.7	238,063.4	239,699.2	241,270.1	242,761.5	244,176.3	245,506.7
Population Growth	Other uses (non-food)	54.3	1,309,587.0	1,319,065.8	1,328,129.2	1,336,833.1	1,345,096.7	1,352,936.1	1,360,307.7
Low	Tourist consumption	0.2	4,823.5	4,858.4	4,891.8	4,923.9	4,954.3	4,983.2	5,010.3
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,702,936.8	4,736,976.4	4,769,524.8	4,800,782.0	4,830,457.8	4,858,610.3	4,885,082.8
12	Food	100.0	2,373,555.7	2,384,015.8	2,393,435.2	2,401,894.7	2,409,289.3	2,415,586.0	2,420,693.8
Scenario CODE	Feed	20.0	474,711.1	476,803.2	478,687.0	480,378.9	481,857.9	483,117.2	484,138.8
G2-P6	Seed	2.9	68,833.1	69,136.5	69,409.6	69,654.9	69,869.4	70,052.0	70,200.1
GDP Growth	Losses	7.8	185,137.3	185,953.2	186,687.9	187,347.8	187,924.6	188,415.7	188,814.1
Low	Processing	9.8	232,608.5	233,633.5	234,556.6	235,385.7	236,110.4	236,727.4	237,228.0
Population Growth	Other uses (non-food)	54.3	1,288,840.7	1,294,520.6	1,299,635.3	1,304,228.8	1,308,244.1	1,311,663.2	1,314,436.7
Very Low	Tourist consumption	0.2	4,747.1	4,768.0	4,786.9	4,803.8	4,818.6	4,831.2	4,841.4
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,628,433.5	4,648,830.8	4,667,198.5	4,683,694.6	4,698,114.3	4,710,392.7	4,720,352.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Rural②



11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
1	Food	100.0	-	-	2,077,737.7	2,112,133.8	2,145,688.2	2,177,824.5	2,208,325.0	2,236,728.2
Scenario CODE	Feed	20.0	-	-	415,547.5	422,426.8	429,137.6	435,564.9	441,665.0	447,345.6
G1-P1	Seed	2.9	-	-	60,254.4	61,251.9	62,225.0	63,156.9	64,041.4	64,865.1
GDP Growth	Losses	7.8	-	-	162,063.5	164,746.4	167,363.7	169,870.3	172,249.4	174,464.8
High	Processing	9.8	-	-	203,618.3	206,989.1	210,277.4	213,426.8	216,415.9	219,199.4
Population Growth	Other uses (non-food)	54.3	-	-	1,128,211.6	1,146,888.7	1,165,108.7	1,182,558.7	1,199,120.5	1,214,543.4
Very High	Tourist consumption	0.2	-	-	4,155.5	4,224.3	4,291.4	4,355.6	4,416.7	4,473.5
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,051,588.5	4,118,661.0	4,184,092.0	4,246,757.7	4,306,233.9	4,361,620.0
2	Food	100.0	1,998,226.3	2,036,883.8	2,072,361.7	2,107,696.3	2,141,643.5	2,173,671.5	2,203,688.7	2,231,260.5
Scenario CODE	Feed	20.0	399,645.3	407,376.8	414,472.3	421,539.3	428,328.7	434,734.3	440,737.7	446,252.1
G1-P2	Seed	2.9	57,948.6	59,069.6	60,098.5	61,123.2	62,107.7	63,036.5	63,907.0	64,706.6
GDP Growth	Losses	7.8	155,861.7	158,876.9	161,644.2	164,400.3	167,048.2	169,546.4	171,887.7	174,038.3
High	Processing	9.8	195,826.2	199,614.6	203,091.4	206,554.2	209,881.1	213,019.8	215,961.5	218,663.5
Population Growth	Other uses (non-food)	54.3	1,085,036.9	1,106,027.9	1,125,292.4	1,144,479.1	1,162,912.4	1,180,303.6	1,196,603.0	1,211,574.5
High	Tourist consumption	0.2	3,996.5	4,073.8	4,144.7	4,215.4	4,283.3	4,347.3	4,407.4	4,462.5
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,896,541.5	3,971,923.4	4,041,105.2	4,110,007.8	4,176,204.9	4,238,659.4	4,297,193.0	4,350,958.0
3	Food	100.0	1,995,375.2	2,032,074.8	2,065,073.3	2,097,558.8	2,128,283.7	2,156,716.3	2,182,769.0	2,206,014.2
Scenario CODE	Feed	20.0	399,075.0	406,415.0	413,014.7	419,511.8	425,656.7	431,343.3	436,553.8	441,202.8
G1-P3	Seed	2.9	57,865.9	58,930.2	59,887.1	60,829.2	61,720.2	62,544.8	63,300.3	63,974.4
GDP Growth	Losses	7.8	155,639.3	158,501.8	161,075.7	163,609.6	166,006.1	168,223.9	170,256.0	172,069.1
High	Processing	9.8	195,546.8	199,143.3	202,377.2	205,560.8	208,571.8	211,358.2	213,911.4	216,189.4
Population Growth	Other uses (non-food)	54.3	1,083,488.7	1,103,416.6	1,121,334.8	1,138,974.4	1,155,658.0	1,171,097.0	1,185,243.6	1,197,865.7
Upper-Medium	Tourist consumption	0.2	3,990.8	4,064.1	4,130.1	4,195.1	4,256.6	4,313.4	4,365.5	4,412.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,890,981.7	3,962,545.8	4,026,892.9	4,090,239.7	4,150,153.1	4,205,596.9	4,256,399.6	4,301,727.6

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
1	Food	100.0	2,262,664.3	2,285,530.3	2,306,640.2	2,323,025.5	2,337,645.2	2,348,289.8	2,355,507.3	2,358,569.8
Scenario CODE	Feed	20.0	452,532.9	457,106.1	461,328.0	464,605.1	467,529.0	469,658.0	471,101.5	471,714.0
G1-P1	Seed	2.9	65,617.3	66,280.4	66,892.6	67,367.7	67,791.7	68,100.4	68,309.7	68,398.5
GDP Growth	Losses	7.8	176,487.8	178,271.4	179,917.9	181,196.0	182,336.3	183,166.6	183,729.6	183,968.4
High	Processing	9.8	221,741.1	223,982.0	226,050.7	227,656.5	229,089.2	230,132.4	230,839.7	231,139.8
Population Growth	Other uses (non-food)	54.3	1,228,626.7	1,241,043.0	1,252,505.6	1,261,402.8	1,269,341.3	1,275,121.4	1,279,040.5	1,280,703.4
Very High	Tourist consumption	0.2	4,525.3	4,571.1	4,613.3	4,646.1	4,675.3	4,696.6	4,711.0	4,717.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,412,195.4	4,456,784.3	4,497,948.3	4,529,899.7	4,558,408.0	4,579,165.2	4,593,239.3	4,599,211.0
2	Food	100.0	2,256,253.2	2,278,033.8	2,297,914.8	2,312,895.3	2,325,934.2	2,335,038.5	2,340,814.5	2,342,570.3
Scenario CODE	Feed	20.0	451,250.6	455,606.8	459,583.0	462,579.1	465,186.8	467,007.7	468,162.9	468,514.1
G1-P2	Seed	2.9	65,431.3	66,063.0	66,639.5	67,074.0	67,452.1	67,716.1	67,883.6	67,934.5
GDP Growth	Losses	7.8	175,987.7	177,686.6	179,237.4	180,405.8	181,422.9	182,133.0	182,583.5	182,720.5
High	Processing	9.8	221,112.8	223,247.3	225,195.7	226,663.7	227,941.6	228,833.8	229,399.8	229,571.9
Population Growth	Other uses (non-food)	54.3	1,225,145.5	1,236,972.4	1,247,767.7	1,255,902.1	1,262,982.3	1,267,925.9	1,271,062.3	1,272,015.7
High	Tourist consumption	0.2	4,512.5	4,556.1	4,595.8	4,625.8	4,651.9	4,670.1	4,681.6	4,685.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,399,693.6	4,442,166.0	4,480,933.9	4,510,145.8	4,535,571.8	4,553,325.1	4,564,588.2	4,568,012.1
3	Food	100.0	2,226,505.5	2,243,630.7	2,258,695.3	2,268,763.2	2,276,757.5	2,280,921.0	2,281,854.5	2,278,898.2
Scenario CODE	Feed	20.0	445,301.1	448,726.1	451,739.1	453,752.6	455,351.5	456,184.2	456,370.9	455,779.6
G1-P3	Seed	2.9	64,568.7	65,065.3	65,502.2	65,794.1	66,026.0	66,146.7	66,173.8	66,088.0
GDP Growth	Losses	7.8	173,667.4	175,003.2	176,178.2	176,963.5	177,587.1	177,911.8	177,984.7	177,754.1
High	Processing	9.8	218,197.5	219,875.8	221,352.1	222,338.8	223,122.2	223,530.3	223,621.7	223,332.0
Population Growth	Other uses (non-food)	54.3	1,208,992.5	1,218,291.5	1,226,471.5	1,231,938.4	1,236,279.3	1,238,540.1	1,239,047.0	1,237,441.7
Upper-Medium	Tourist consumption	0.2	4,453.0	4,487.3	4,517.4	4,537.5	4,553.5	4,561.8	4,563.7	4,557.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,341,685.7	4,375,079.9	4,404,455.8	4,424,088.1	4,439,677.1	4,447,795.9	4,449,616.3	4,443,851.4

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
1	Food	100.0	2,357,352.3	2,352,464.7	2,342,419.7	2,328,007.0	2,309,446.7	2,286,067.3	2,257,195.2
Scenario CODE	Feed	20.0	471,470.5	470,492.9	468,483.9	465,601.4	461,889.3	457,213.5	451,439.0
G1-P1	Seed	2.9	68,363.2	68,221.5	67,930.2	67,512.2	66,974.0	66,296.0	65,458.7
GDP Growth	Losses	7.8	183,873.5	183,492.2	182,708.7	181,584.5	180,136.8	178,313.2	176,061.2
High	Processing	9.8	231,020.5	230,541.5	229,557.1	228,144.7	226,325.8	224,034.6	221,205.1
Population Growth	Other uses (non-food)	54.3	1,280,042.3	1,277,388.3	1,271,933.9	1,264,107.8	1,254,029.6	1,241,334.5	1,225,657.0
Very High	Tourist consumption	0.2	4,714.7	4,704.9	4,684.8	4,656.0	4,618.9	4,572.1	4,514.4
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,596,837.0	4,587,306.0	4,567,718.3	4,539,613.6	4,503,421.1	4,457,831.2	4,401,530.6
2	Food	100.0	2,340,334.0	2,334,768.8	2,324,363.2	2,309,883.2	2,291,416.5	2,268,191.7	2,239,440.0
Scenario CODE	Feed	20.0	468,066.8	466,953.8	464,872.6	461,976.6	458,283.3	453,638.3	447,888.0
G1-P2	Seed	2.9	67,869.7	67,708.3	67,406.5	66,986.6	66,451.1	65,777.6	64,943.8
GDP Growth	Losses	7.8	182,546.1	182,112.0	181,300.3	180,170.9	178,730.5	176,919.0	174,676.3
High	Processing	9.8	229,352.7	228,807.3	227,787.6	226,368.6	224,558.8	222,282.8	219,465.1
Population Growth	Other uses (non-food)	54.3	1,270,801.4	1,267,779.5	1,262,129.2	1,254,266.6	1,244,239.2	1,231,628.1	1,216,015.9
High	Tourist consumption	0.2	4,680.7	4,669.5	4,648.7	4,619.8	4,582.8	4,536.4	4,478.9
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,563,651.4	4,552,799.2	4,532,508.1	4,504,272.3	4,468,262.2	4,422,973.9	4,366,908.0
3	Food	100.0	2,272,094.8	2,262,102.5	2,247,466.0	2,228,936.8	2,206,606.5	2,179,742.3	2,147,787.7
Scenario CODE	Feed	20.0	454,419.0	452,420.5	449,493.2	445,787.4	441,321.3	435,948.5	429,557.5
G1-P3	Seed	2.9	65,890.7	65,601.0	65,176.5	64,639.2	63,991.6	63,212.5	62,285.8
GDP Growth	Losses	7.8	177,223.4	176,444.0	175,302.3	173,857.1	172,115.3	170,019.9	167,527.4
High	Processing	9.8	222,665.3	221,686.0	220,251.7	218,435.8	216,247.4	213,614.7	210,483.2
Population Growth	Other uses (non-food)	54.3	1,233,747.5	1,228,321.7	1,220,374.0	1,210,312.7	1,198,187.3	1,183,600.1	1,166,248.7
Upper-Medium	Tourist consumption	0.2	4,544.2	4,524.2	4,494.9	4,457.9	4,413.2	4,359.5	4,295.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,430,584.9	4,411,099.9	4,382,558.6	4,346,426.9	4,302,882.6	4,250,497.5	4,188,185.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
4	Food	100.0	-	-	2,077,737.7	2,109,443.5	2,139,216.2	2,166,667.2	2,191,810.3	2,214,353.2
Scenario CODE	Feed	20.0	-	-	415,547.5	421,888.7	427,843.2	433,333.4	438,362.1	442,870.6
G1-P4	Seed	2.9	-	-	60,254.4	61,173.9	62,037.3	62,833.3	63,562.5	64,216.2
GDP Growth	Losses	7.8	-	-	162,063.5	164,536.6	166,858.9	169,000.0	170,961.2	172,719.5
High	Processing	9.8	-	-	203,618.3	206,725.5	209,643.2	212,333.4	214,797.4	217,006.6
Population Growth	Other uses (non-food)	54.3	-	-	1,128,211.6	1,145,427.8	1,161,594.4	1,176,500.3	1,190,153.0	1,202,393.8
Lower-Medium	Tourist consumption	0.2	-	-	4,155.5	4,218.9	4,278.4	4,333.3	4,383.6	4,428.7
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,051,588.5	4,113,414.9	4,171,471.6	4,225,000.9	4,274,030.1	4,317,988.6
5	Food	100.0	1,993,474.0	2,028,869.3	2,060,785.8	2,090,687.3	2,119,034.8	2,144,724.3	2,167,669.5	2,187,446.2
Scenario CODE	Feed	20.0	398,694.8	405,773.9	412,157.2	418,137.5	423,807.0	428,944.9	433,533.9	437,489.2
G1-P5	Seed	2.9	57,810.7	58,837.2	59,762.8	60,629.9	61,452.0	62,197.0	62,862.4	63,435.9
GDP Growth	Losses	7.8	155,491.0	158,251.8	160,741.3	163,073.6	165,284.7	167,288.5	169,078.2	170,620.8
High	Processing	9.8	195,360.5	198,829.2	201,957.0	204,887.4	207,665.4	210,183.0	212,431.6	214,369.7
Population Growth	Other uses (non-food)	54.3	1,082,456.4	1,101,676.0	1,119,006.7	1,135,243.2	1,150,635.9	1,164,585.3	1,177,044.5	1,187,783.3
Low	Tourist consumption	0.2	3,986.9	4,057.7	4,121.6	4,181.4	4,238.1	4,289.4	4,335.3	4,374.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,887,274.3	3,956,295.1	4,018,532.4	4,076,840.3	4,132,117.9	4,182,212.4	4,226,955.4	4,265,520.0
6	Food	100.0	-	-	2,077,737.7	2,106,505.7	2,132,455.5	2,155,354.8	2,175,267.2	2,191,977.3
Scenario CODE	Feed	20.0	-	-	415,547.5	421,301.1	426,491.1	431,071.0	435,053.4	438,395.5
G1-P6	Seed	2.9	-	-	60,254.4	61,088.7	61,841.2	62,505.3	63,082.7	63,567.3
GDP Growth	Losses	7.8	-	-	162,063.5	164,307.4	166,331.5	168,117.7	169,670.8	170,974.2
High	Processing	9.8	-	-	203,618.3	206,437.6	208,980.6	211,224.8	213,176.2	214,813.8
Population Growth	Other uses (non-food)	54.3	-	-	1,128,211.6	1,143,832.6	1,157,923.3	1,170,357.7	1,181,170.1	1,190,243.7
Very Low	Tourist consumption	0.2	-	-	4,155.5	4,213.0	4,264.9	4,310.7	4,350.5	4,384.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,051,588.5	4,107,686.1	4,158,288.1	4,202,942.0	4,241,770.9	4,274,355.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
4	Food	100.0	2,233,992.8	2,250,141.7	2,264,127.8	2,273,060.8	2,279,881.8	2,282,467.8	2,281,451.7	2,276,284.5
Scenario CODE	Feed	20.0	446,798.6	450,028.3	452,825.6	454,612.2	455,976.4	456,493.6	456,290.3	455,256.9
G1-P4	Seed	2.9	64,785.8	65,254.1	65,659.7	65,918.8	66,116.6	66,191.6	66,162.1	66,012.3
GDP Growth	Losses	7.8	174,251.4	175,511.1	176,602.0	177,298.7	177,830.8	178,032.5	177,953.2	177,550.2
High	Processing	9.8	218,931.3	220,513.9	221,884.5	222,760.0	223,428.4	223,681.8	223,582.3	223,075.9
Population Growth	Other uses (non-food)	54.3	1,213,058.1	1,221,826.9	1,229,421.4	1,234,272.0	1,237,975.8	1,239,380.0	1,238,828.3	1,236,022.5
Lower-Medium	Tourist consumption	0.2	4,468.0	4,500.3	4,528.3	4,546.1	4,559.8	4,564.9	4,562.9	4,552.6
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,356,286.0	4,387,776.3	4,415,049.3	4,432,468.6	4,445,769.6	4,450,812.2	4,448,830.8	4,438,754.9
5	Food	100.0	2,204,113.7	2,217,074.5	2,227,631.2	2,232,898.3	2,235,777.5	2,234,920.8	2,230,931.5	2,223,182.5
Scenario CODE	Feed	20.0	440,822.7	443,414.9	445,526.2	446,579.7	447,155.5	446,984.2	446,186.3	444,636.5
G1-P5	Seed	2.9	63,919.3	64,295.2	64,601.3	64,754.1	64,837.5	64,812.7	64,697.0	64,472.3
GDP Growth	Losses	7.8	171,920.9	172,931.8	173,755.2	174,166.1	174,390.6	174,323.8	174,012.7	173,408.2
High	Processing	9.8	216,003.1	217,273.3	218,307.9	218,824.0	219,106.2	219,022.2	218,631.3	217,871.9
Population Growth	Other uses (non-food)	54.3	1,196,833.7	1,203,871.5	1,209,603.7	1,212,463.8	1,214,027.2	1,213,562.0	1,211,395.8	1,207,188.1
Low	Tourist consumption	0.2	4,408.2	4,434.1	4,455.3	4,465.8	4,471.6	4,469.8	4,461.9	4,446.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,298,021.6	4,323,295.3	4,343,880.8	4,354,151.8	4,359,766.1	4,358,095.5	4,350,316.5	4,335,205.9
6	Food	100.0	2,205,284.2	2,214,712.3	2,221,595.5	2,223,101.0	2,222,118.0	2,216,632.8	2,207,376.2	2,193,977.3
Scenario CODE	Feed	20.0	441,056.8	442,942.5	444,319.1	444,620.2	444,423.6	443,326.6	441,475.2	438,795.5
G1-P6	Seed	2.9	63,953.2	64,226.7	64,426.3	64,469.9	64,441.4	64,282.4	64,013.9	63,625.3
GDP Growth	Losses	7.8	172,012.2	172,747.6	173,284.4	173,401.9	173,325.2	172,897.4	172,175.3	171,130.2
High	Processing	9.8	216,117.9	217,041.8	217,716.4	217,863.9	217,767.6	217,230.0	216,322.9	215,009.8
Population Growth	Other uses (non-food)	54.3	1,197,469.3	1,202,588.8	1,206,326.4	1,207,143.8	1,206,610.1	1,203,631.6	1,198,605.3	1,191,329.7
Very Low	Tourist consumption	0.2	4,410.6	4,429.4	4,443.2	4,446.2	4,444.2	4,433.3	4,414.8	4,388.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,300,304.2	4,318,689.1	4,332,111.3	4,335,046.9	4,333,130.1	4,322,434.1	4,304,383.6	4,278,255.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
4	Food	100.0	2,267,031.5	2,254,412.2	2,237,076.8	2,215,780.3	2,190,707.0	2,161,164.0	2,126,490.3
Scenario CODE	Feed	20.0	453,406.3	450,882.4	447,415.4	443,156.1	438,141.4	432,232.8	425,298.1
G1-P4	Seed	2.9	65,743.9	65,378.0	64,875.2	64,257.6	63,530.5	62,673.8	61,668.2
GDP Growth	Losses	7.8	176,828.5	175,844.2	174,492.0	172,830.9	170,875.1	168,570.8	165,866.2
High	Processing	9.8	222,169.1	220,932.4	219,233.5	217,146.5	214,689.3	211,794.1	208,396.0
Population Growth	Other uses (non-food)	54.3	1,230,998.1	1,224,145.8	1,214,732.7	1,203,168.7	1,189,553.9	1,173,512.1	1,154,684.2
Lower-Medium	Tourist consumption	0.2	4,534.1	4,508.8	4,474.2	4,431.6	4,381.4	4,322.3	4,253.0
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,420,711.5	4,396,103.8	4,362,299.8	4,320,771.7	4,271,878.6	4,214,269.9	4,146,656.0
5	Food	100.0	2,211,733.7	2,197,245.2	2,178,496.5	2,156,225.2	2,130,524.5	2,100,690.7	2,066,032.2
Scenario CODE	Feed	20.0	442,346.7	439,449.0	435,699.3	431,245.0	426,104.9	420,138.1	413,206.4
G1-P5	Seed	2.9	64,140.3	63,720.1	63,176.4	62,530.5	61,785.2	60,920.0	59,914.9
GDP Growth	Losses	7.8	172,515.2	171,385.1	169,922.7	168,185.6	166,180.9	163,853.9	161,150.5
High	Processing	9.8	216,749.9	215,330.0	213,492.7	211,310.1	208,791.4	205,867.7	202,471.2
Population Growth	Other uses (non-food)	54.3	1,200,971.4	1,193,104.1	1,182,923.6	1,170,830.3	1,156,874.8	1,140,675.1	1,121,855.5
Low	Tourist consumption	0.2	4,423.5	4,394.5	4,357.0	4,312.5	4,261.0	4,201.4	4,132.1
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,312,880.7	4,284,628.0	4,248,068.2	4,204,639.2	4,154,522.7	4,096,346.9	4,028,762.8
6	Food	100.0	2,176,695.8	2,156,358.8	2,131,758.7	2,103,636.7	2,072,153.0	2,036,606.7	1,996,363.5
Scenario CODE	Feed	20.0	435,339.2	431,271.8	426,351.7	420,727.3	414,430.6	407,321.3	399,272.7
G1-P6	Seed	2.9	63,124.2	62,534.4	61,821.0	61,005.5	60,092.4	59,061.6	57,894.5
GDP Growth	Losses	7.8	169,782.3	168,196.0	166,277.2	164,083.7	161,627.9	158,855.3	155,716.4
High	Processing	9.8	213,316.2	211,323.2	208,912.4	206,156.4	203,071.0	199,587.5	195,643.6
Population Growth	Other uses (non-food)	54.3	1,181,945.8	1,170,902.8	1,157,545.0	1,142,274.7	1,125,179.1	1,105,877.4	1,084,025.4
Very Low	Tourist consumption	0.2	4,353.4	4,312.7	4,263.5	4,207.3	4,144.3	4,073.2	3,992.7
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,244,556.9	4,204,899.7	4,156,929.5	4,102,091.6	4,040,698.3	3,971,383.0	3,892,908.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
7	Food	100.0	-	-	2,077,737.7	2,111,493.3	2,145,541.2	2,178,986.8	2,209,765.3	2,239,543.0
Scenario CODE	Feed	20.0	-	-	415,547.5	422,298.7	429,108.2	435,797.4	441,953.1	447,908.6
G2-P1	Seed	2.9	-	-	60,254.4	61,233.3	62,220.7	63,190.6	64,083.2	64,946.7
GDP Growth	Losses	7.8	-	-	162,063.5	164,696.5	167,352.2	169,961.0	172,361.7	174,684.4
Low	Processing	9.8	-	-	203,618.3	206,926.3	210,263.0	213,540.7	216,557.0	219,475.2
Population Growth	Other uses (non-food)	54.3	-	-	1,128,211.6	1,146,540.9	1,165,028.9	1,183,189.8	1,199,902.6	1,216,071.8
Very High	Tourist consumption	0.2	-	-	4,155.5	4,223.0	4,291.1	4,358.0	4,419.5	4,479.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,051,588.5	4,117,412.0	4,183,805.3	4,249,024.3	4,309,042.4	4,367,108.8
8	Food	100.0	1,998,226.3	2,036,883.8	2,072,361.7	2,107,057.0	2,141,497.0	2,174,831.7	2,205,126.0	2,234,068.5
Scenario CODE	Feed	20.0	399,645.3	407,376.8	414,472.3	421,411.4	428,299.4	434,966.3	441,025.2	446,813.7
G2-P2	Seed	2.9	57,948.6	59,069.6	60,098.5	61,104.7	62,103.4	63,070.1	63,948.7	64,788.0
GDP Growth	Losses	7.8	155,861.7	158,876.9	161,644.2	164,350.4	167,036.8	169,636.9	171,999.8	174,257.3
Low	Processing	9.8	195,826.2	199,614.6	203,091.4	206,491.6	209,866.7	213,133.5	216,102.3	218,938.7
Population Growth	Other uses (non-food)	54.3	1,085,036.9	1,106,027.9	1,125,292.4	1,144,132.0	1,162,832.9	1,180,933.6	1,197,383.4	1,213,099.2
High	Tourist consumption	0.2	3,996.5	4,073.8	4,144.7	4,214.1	4,283.0	4,349.7	4,410.3	4,468.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,896,541.5	3,971,923.4	4,041,105.2	4,108,761.2	4,175,919.2	4,240,921.8	4,299,995.7	4,356,433.5
9	Food	100.0	1,995,375.2	2,032,074.8	2,065,073.3	2,096,922.7	2,128,137.8	2,157,867.3	2,184,192.8	2,208,790.3
Scenario CODE	Feed	20.0	399,075.0	406,415.0	413,014.7	419,384.5	425,627.6	431,573.5	436,838.6	441,758.1
G2-P3	Seed	2.9	57,865.9	58,930.2	59,887.1	60,810.8	61,716.0	62,578.2	63,341.6	64,054.9
GDP Growth	Losses	7.8	155,639.3	158,501.8	161,075.7	163,560.0	165,994.7	168,313.6	170,367.0	172,285.6
Low	Processing	9.8	195,546.8	199,143.3	202,377.2	205,498.4	208,557.5	211,471.0	214,050.9	216,461.4
Population Growth	Other uses (non-food)	54.3	1,083,488.7	1,103,416.6	1,121,334.8	1,138,629.0	1,155,578.8	1,171,721.9	1,186,016.7	1,199,373.1
Upper-Medium	Tourist consumption	0.2	3,990.8	4,064.1	4,130.1	4,193.8	4,256.3	4,315.7	4,368.4	4,417.6
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,890,981.7	3,962,545.8	4,026,892.9	4,088,999.2	4,149,868.7	4,207,841.2	4,259,176.0	4,307,141.0

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
7	Food	100.0	2,267,774.2	2,294,420.0	2,319,717.5	2,343,429.5	2,366,377.3	2,387,962.7	2,407,937.7	2,426,378.3
Scenario CODE	Feed	20.0	453,554.8	458,884.0	463,943.5	468,685.9	473,275.5	477,592.5	481,587.5	485,275.7
G2-P1	Seed	2.9	65,765.5	66,538.2	67,271.8	67,959.5	68,624.9	69,250.9	69,830.2	70,365.0
GDP Growth	Losses	7.8	176,886.4	178,964.8	180,938.0	182,787.5	184,577.4	186,261.1	187,819.1	189,257.5
Low	Processing	9.8	222,241.9	224,853.2	227,332.3	229,656.1	231,905.0	234,020.3	235,977.9	237,785.1
Population Growth	Other uses (non-food)	54.3	1,231,401.4	1,245,870.1	1,259,606.6	1,272,482.2	1,284,942.9	1,296,663.7	1,307,510.2	1,317,523.4
Very High	Tourist consumption	0.2	4,535.5	4,588.8	4,639.4	4,686.9	4,732.8	4,775.9	4,815.9	4,852.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,422,159.7	4,474,119.1	4,523,449.1	4,569,687.6	4,614,435.8	4,656,527.1	4,695,478.5	4,731,437.8
8	Food	100.0	2,261,348.5	2,286,894.3	2,310,942.7	2,333,210.3	2,354,522.2	2,374,487.7	2,392,917.8	2,409,918.7
Scenario CODE	Feed	20.0	452,269.7	457,378.9	462,188.5	466,642.1	470,904.4	474,897.5	478,583.6	481,983.7
G2-P2	Seed	2.9	65,579.1	66,319.9	67,017.3	67,663.1	68,281.1	68,860.1	69,394.6	69,887.6
GDP Growth	Losses	7.8	176,385.2	178,377.8	180,253.5	181,990.4	183,652.7	185,210.0	186,647.6	187,973.7
Low	Processing	9.8	221,612.2	224,115.6	226,472.4	228,654.6	230,743.2	232,699.8	234,505.9	236,172.0
Population Growth	Other uses (non-food)	54.3	1,227,912.2	1,241,783.6	1,254,841.9	1,266,933.2	1,278,505.6	1,289,346.8	1,299,354.4	1,308,585.9
High	Tourist consumption	0.2	4,522.7	4,573.8	4,621.9	4,666.4	4,709.0	4,749.0	4,785.8	4,819.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,409,629.6	4,459,443.9	4,506,338.2	4,549,760.1	4,591,318.2	4,630,250.9	4,666,189.7	4,699,341.4
9	Food	100.0	2,231,533.7	2,252,357.3	2,271,501.0	2,288,690.3	2,304,741.3	2,319,456.0	2,332,645.5	2,344,416.0
Scenario CODE	Feed	20.0	446,306.7	450,471.5	454,300.2	457,738.1	460,948.3	463,891.2	466,529.1	468,883.2
G2-P3	Seed	2.9	64,714.5	65,318.4	65,873.5	66,372.0	66,837.5	67,264.2	67,646.7	67,988.1
GDP Growth	Losses	7.8	174,059.6	175,683.9	177,177.1	178,517.8	179,769.8	180,917.6	181,946.3	182,864.4
Low	Processing	9.8	218,690.3	220,731.0	222,607.1	224,291.6	225,864.6	227,306.7	228,599.3	229,752.8
Population Growth	Other uses (non-food)	54.3	1,211,722.8	1,223,030.0	1,233,425.0	1,242,758.8	1,251,474.5	1,259,464.6	1,266,626.5	1,273,017.9
Upper-Medium	Tourist consumption	0.2	4,463.1	4,504.7	4,543.0	4,577.4	4,609.5	4,638.9	4,665.3	4,688.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,351,490.7	4,392,096.8	4,429,426.9	4,462,946.0	4,494,245.5	4,522,939.2	4,548,658.7	4,571,611.2

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
7	Food	100.0	2,443,825.7	2,459,542.2	2,474,190.2	2,487,930.7	2,499,968.8	2,511,300.3	2,522,000.5
Scenario CODE	Feed	20.0	488,765.1	491,908.4	494,838.0	497,586.1	499,993.8	502,260.1	504,400.1
G2-P1	Seed	2.9	70,870.9	71,326.7	71,751.5	72,150.0	72,499.1	72,827.7	73,138.0
GDP Growth	Losses	7.8	190,618.4	191,844.3	192,986.8	194,058.6	194,997.6	195,881.4	196,716.0
Low	Processing	9.8	239,494.9	241,035.1	242,470.6	243,817.2	244,996.9	246,107.4	247,156.0
Population Growth	Other uses (non-food)	54.3	1,326,997.4	1,335,531.4	1,343,485.3	1,350,946.4	1,357,483.1	1,363,636.1	1,369,446.3
Very High	Tourist consumption	0.2	4,887.7	4,919.1	4,948.4	4,975.9	4,999.9	5,022.6	5,044.0
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,765,460.1	4,796,107.2	4,824,670.8	4,851,464.9	4,874,939.2	4,897,035.6	4,917,900.9
8	Food	100.0	2,426,182.8	2,441,040.8	2,455,118.0	2,468,562.0	2,480,451.3	2,491,663.5	2,502,162.3
Scenario CODE	Feed	20.0	485,236.6	488,208.2	491,023.6	493,712.4	496,090.3	498,332.7	500,432.5
G2-P2	Seed	2.9	70,359.3	70,790.2	71,198.4	71,588.3	71,933.1	72,258.2	72,562.7
GDP Growth	Losses	7.8	189,242.3	190,401.2	191,499.2	192,547.8	193,475.2	194,349.8	195,168.7
Low	Processing	9.8	237,765.9	239,222.0	240,601.6	241,919.1	243,084.2	244,183.0	245,211.9
Population Growth	Other uses (non-food)	54.3	1,317,417.3	1,325,485.2	1,333,129.1	1,340,429.2	1,346,885.1	1,352,973.3	1,358,674.1
High	Tourist consumption	0.2	4,852.4	4,882.1	4,910.2	4,937.1	4,960.9	4,983.3	5,004.3
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,731,056.6	4,760,029.7	4,787,480.1	4,813,695.9	4,836,880.1	4,858,743.8	4,879,216.5
9	Food	100.0	2,355,440.7	2,365,066.8	2,373,895.2	2,382,054.8	2,388,644.8	2,394,499.8	2,399,757.8
Scenario CODE	Feed	20.0	471,088.1	473,013.4	474,779.0	476,411.0	477,729.0	478,900.0	479,951.6
G2-P3	Seed	2.9	68,307.8	68,586.9	68,843.0	69,079.6	69,270.7	69,440.5	69,593.0
GDP Growth	Losses	7.8	183,724.4	184,475.2	185,163.8	185,800.3	186,314.3	186,771.0	187,181.1
Low	Processing	9.8	230,833.2	231,776.5	232,641.7	233,441.4	234,087.2	234,661.0	235,176.3
Population Growth	Other uses (non-food)	54.3	1,279,004.3	1,284,231.3	1,289,025.1	1,293,455.8	1,297,034.1	1,300,213.4	1,303,068.5
Upper-Medium	Tourist consumption	0.2	4,710.9	4,730.1	4,747.8	4,764.1	4,777.3	4,789.0	4,799.5
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,593,109.4	4,611,880.2	4,629,095.6	4,645,007.0	4,657,857.4	4,669,274.7	4,679,527.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
10	Food	100.0	-	-	2,077,737.7	2,108,803.7	2,139,069.7	2,167,823.7	2,193,240.0	2,217,140.0
Scenario CODE	Feed	20.0	-	-	415,547.5	421,760.7	427,813.9	433,564.7	438,648.0	443,428.0
G2-P4	Seed	2.9	-	-	60,254.4	61,155.3	62,033.0	62,866.9	63,604.0	64,297.1
GDP Growth	Losses	7.8	-	-	162,063.5	164,486.7	166,847.4	169,090.2	171,072.7	172,936.9
Low	Processing	9.8	-	-	203,618.3	206,662.8	209,628.8	212,446.7	214,937.5	217,279.7
Population Growth	Other uses (non-food)	54.3	-	-	1,128,211.6	1,145,080.4	1,161,514.8	1,177,128.3	1,190,929.3	1,203,907.0
Lower-Medium	Tourist consumption	0.2	-	-	4,155.5	4,217.6	4,278.1	4,335.6	4,386.5	4,434.3
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,051,588.5	4,112,167.2	4,171,185.7	4,227,256.1	4,276,818.0	4,323,423.0
11	Food	100.0	1,993,474.0	2,028,869.3	2,060,785.8	2,090,053.2	2,118,889.7	2,145,869.0	2,169,083.3	2,190,198.8
Scenario CODE	Feed	20.0	398,694.8	405,773.9	412,157.2	418,010.6	423,777.9	429,173.8	433,816.7	438,039.8
G2-P5	Seed	2.9	57,810.7	58,837.2	59,762.8	60,611.5	61,447.8	62,230.2	62,903.4	63,515.8
GDP Growth	Losses	7.8	155,491.0	158,251.8	160,741.3	163,024.1	165,273.4	167,377.8	169,188.5	170,835.5
Low	Processing	9.8	195,360.5	198,829.2	201,957.0	204,825.2	207,651.2	210,295.2	212,570.2	214,639.5
Population Growth	Other uses (non-food)	54.3	1,082,456.4	1,101,676.0	1,119,006.7	1,134,898.9	1,150,557.1	1,165,206.9	1,177,812.2	1,189,277.9
Low	Tourist consumption	0.2	3,986.9	4,057.7	4,121.6	4,180.1	4,237.8	4,291.7	4,338.2	4,380.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,887,274.3	3,956,295.1	4,018,532.4	4,075,603.6	4,131,834.9	4,184,444.6	4,229,712.5	4,270,887.7
12	Food	100.0	-	-	2,077,737.7	2,105,866.8	2,132,309.3	2,156,505.3	2,176,686.0	2,194,735.8
Scenario CODE	Feed	20.0	-	-	415,547.5	421,173.4	426,461.9	431,301.1	435,337.2	438,947.2
G2-P6	Seed	2.9	-	-	60,254.4	61,070.1	61,837.0	62,538.7	63,123.9	63,647.3
GDP Growth	Losses	7.8	-	-	162,063.5	164,257.6	166,320.1	168,207.4	169,781.5	171,189.4
Low	Processing	9.8	-	-	203,618.3	206,374.9	208,966.3	211,337.5	213,315.2	215,084.1
Population Growth	Other uses (non-food)	54.3	-	-	1,128,211.6	1,143,485.7	1,157,843.9	1,170,982.4	1,181,940.5	1,191,741.5
Very Low	Tourist consumption	0.2	-	-	4,155.5	4,211.7	4,264.6	4,313.0	4,353.4	4,389.5
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,051,588.5	4,106,440.2	4,158,003.1	4,205,185.4	4,244,537.7	4,279,734.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
10	Food	100.0	2,239,038.0	2,258,893.8	2,276,964.2	2,293,026.2	2,307,904.0	2,321,028.8	2,332,233.7	2,341,727.0
Scenario CODE	Feed	20.0	447,807.6	451,778.8	455,392.8	458,605.2	461,580.8	464,205.8	466,446.7	468,345.4
G2-P4	Seed	2.9	64,932.1	65,507.9	66,032.0	66,497.8	66,929.2	67,309.8	67,634.8	67,910.1
GDP Growth	Losses	7.8	174,645.0	176,193.7	177,603.2	178,856.0	180,016.5	181,040.2	181,914.2	182,654.7
Low	Processing	9.8	219,425.7	221,371.6	223,142.5	224,716.6	226,174.6	227,460.8	228,558.9	229,489.2
Population Growth	Other uses (non-food)	54.3	1,215,797.6	1,226,579.3	1,236,391.6	1,245,113.2	1,253,191.9	1,260,318.6	1,266,402.9	1,271,557.8
Lower-Medium	Tourist consumption	0.2	4,478.1	4,517.8	4,553.9	4,586.1	4,615.8	4,642.1	4,664.5	4,683.5
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,366,124.1	4,404,842.9	4,440,080.2	4,471,401.1	4,500,412.8	4,526,006.1	4,547,855.7	4,566,367.7
11	Food	100.0	2,209,091.3	2,225,697.8	2,240,260.7	2,252,510.7	2,263,257.3	2,272,678.5	2,280,589.0	2,287,098.3
Scenario CODE	Feed	20.0	441,818.3	445,139.6	448,052.1	450,502.1	452,651.5	454,535.7	456,117.8	457,419.7
G2-P5	Seed	2.9	64,063.6	64,545.2	64,967.6	65,322.8	65,634.5	65,907.7	66,137.1	66,325.9
GDP Growth	Losses	7.8	172,309.1	173,604.4	174,740.3	175,695.8	176,534.1	177,268.9	177,885.9	178,393.7
Low	Processing	9.8	216,490.9	218,118.4	219,545.5	220,746.0	221,799.2	222,722.5	223,497.7	224,135.6
Population Growth	Other uses (non-food)	54.3	1,199,536.6	1,208,553.9	1,216,461.6	1,223,113.3	1,228,948.7	1,234,064.4	1,238,359.8	1,241,894.4
Low	Tourist consumption	0.2	4,418.2	4,451.4	4,480.5	4,505.0	4,526.5	4,545.4	4,561.2	4,574.2
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,307,728.0	4,340,110.7	4,368,508.3	4,392,395.7	4,413,351.8	4,431,723.1	4,447,148.5	4,459,841.8
12	Food	100.0	2,210,264.5	2,223,326.5	2,234,190.8	2,242,627.3	2,249,430.0	2,254,081.5	2,256,509.3	2,257,053.7
Scenario CODE	Feed	20.0	442,052.9	444,665.3	446,838.2	448,525.5	449,886.0	450,816.3	451,301.9	451,410.7
G2-P6	Seed	2.9	64,097.7	64,476.5	64,791.5	65,036.2	65,233.5	65,368.4	65,438.8	65,454.6
GDP Growth	Losses	7.8	172,400.6	173,419.5	174,266.9	174,924.9	175,455.5	175,818.4	176,007.7	176,050.2
Low	Processing	9.8	216,605.9	217,886.0	218,950.7	219,777.5	220,444.1	220,900.0	221,137.9	221,191.3
Population Growth	Other uses (non-food)	54.3	1,200,173.6	1,207,266.3	1,213,165.6	1,217,746.6	1,221,440.5	1,223,966.3	1,225,284.5	1,225,580.2
Very Low	Tourist consumption	0.2	4,420.5	4,446.7	4,468.4	4,485.3	4,498.9	4,508.2	4,513.0	4,514.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,310,015.7	4,335,486.8	4,356,672.1	4,373,123.3	4,386,388.5	4,395,459.1	4,400,193.1	4,401,254.8

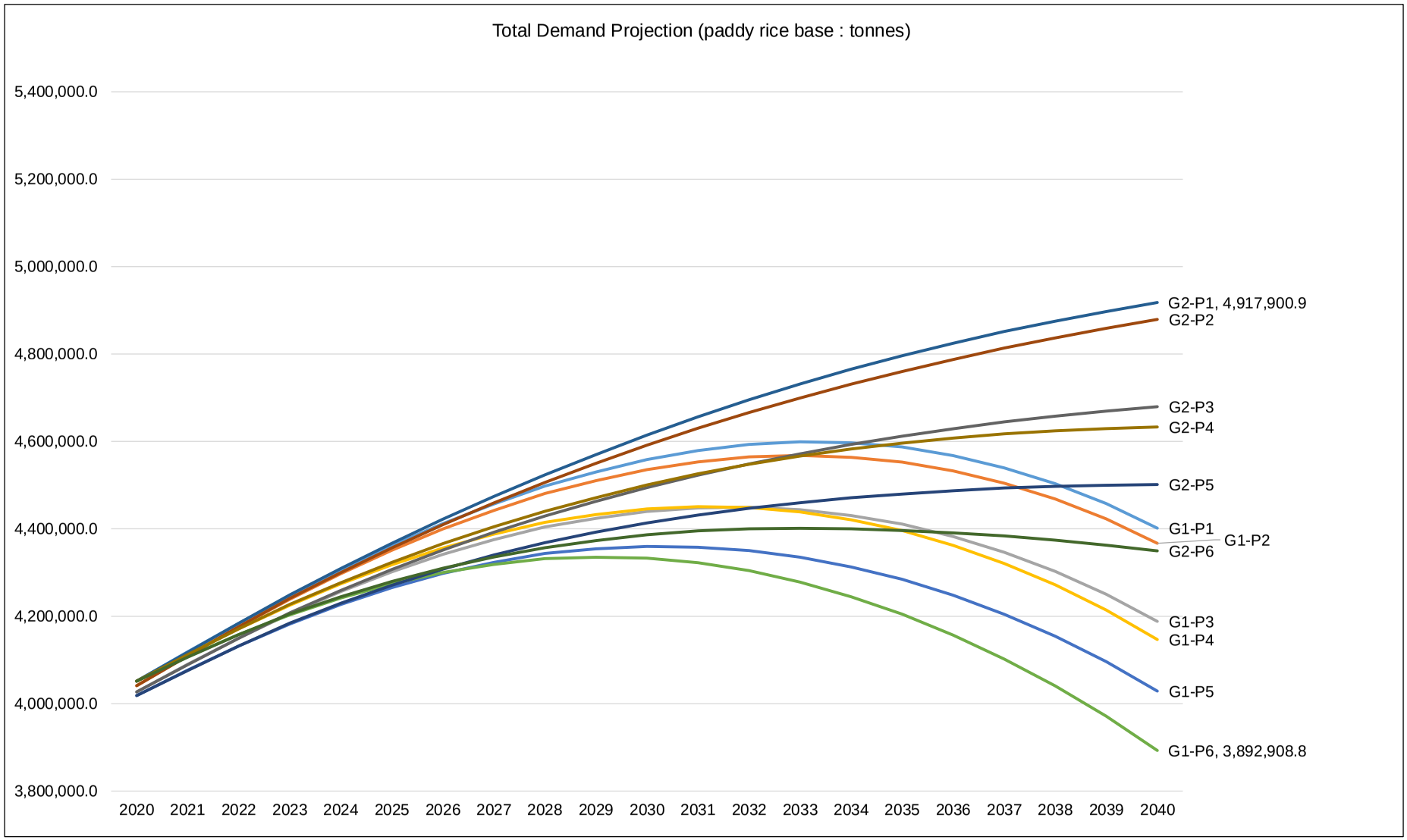
11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
10	Food	100.0	2,350,191.5	2,357,026.3	2,362,921.7	2,367,994.7	2,371,433.5	2,374,091.2	2,375,962.0
Scenario CODE	Feed	20.0	470,038.3	471,405.3	472,584.3	473,598.9	474,286.7	474,818.2	475,192.4
G2-P4	Seed	2.9	68,155.6	68,353.8	68,524.7	68,671.8	68,771.6	68,848.6	68,902.9
GDP Growth	Losses	7.8	183,314.9	183,848.1	184,307.9	184,703.6	184,971.8	185,179.1	185,325.0
Low	Processing	9.8	230,318.8	230,988.6	231,566.3	232,063.5	232,400.5	232,660.9	232,844.3
Population Growth	Other uses (non-food)	54.3	1,276,154.0	1,279,865.3	1,283,066.5	1,285,821.1	1,287,688.4	1,289,131.5	1,290,147.4
Lower-Medium	Tourist consumption	0.2	4,700.4	4,714.1	4,725.8	4,736.0	4,742.9	4,748.2	4,751.9
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,582,873.5	4,596,201.5	4,607,697.2	4,617,589.6	4,624,295.4	4,629,477.7	4,633,125.9
11	Food	100.0	2,292,865.3	2,297,257.3	2,301,045.8	2,304,348.3	2,306,286.2	2,307,659.7	2,308,411.2
Scenario CODE	Feed	20.0	458,573.1	459,451.5	460,209.2	460,869.7	461,257.2	461,531.9	461,682.2
G2-P5	Seed	2.9	66,493.1	66,620.5	66,730.3	66,826.1	66,882.3	66,922.1	66,943.9
GDP Growth	Losses	7.8	178,843.5	179,186.1	179,481.6	179,739.2	179,890.3	179,997.5	180,056.1
Low	Processing	9.8	224,700.8	225,131.2	225,502.5	225,826.1	226,016.0	226,150.7	226,224.3
Population Growth	Other uses (non-food)	54.3	1,245,025.9	1,247,410.7	1,249,467.9	1,251,261.1	1,252,313.4	1,253,059.2	1,253,467.3
Low	Tourist consumption	0.2	4,585.7	4,594.5	4,602.1	4,608.7	4,612.6	4,615.3	4,616.8
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,471,087.4	4,479,651.8	4,487,039.4	4,493,479.2	4,497,258.0	4,499,936.4	4,501,401.8
12	Food	100.0	2,256,542.0	2,254,510.0	2,251,678.8	2,248,147.0	2,243,099.2	2,237,261.7	2,230,569.2
Scenario CODE	Feed	20.0	451,308.4	450,902.0	450,335.8	449,629.4	448,619.8	447,452.3	446,113.8
G2-P6	Seed	2.9	65,439.7	65,380.8	65,298.7	65,196.3	65,049.9	64,880.6	64,686.5
GDP Growth	Losses	7.8	176,010.3	175,851.8	175,630.9	175,355.5	174,961.7	174,506.4	173,984.4
Low	Processing	9.8	221,141.1	220,942.0	220,664.5	220,318.4	219,823.7	219,251.6	218,595.8
Population Growth	Other uses (non-food)	54.3	1,225,302.3	1,224,198.9	1,222,661.6	1,220,743.8	1,218,002.9	1,214,833.1	1,211,199.1
Very Low	Tourist consumption	0.2	4,513.1	4,509.0	4,503.4	4,496.3	4,486.2	4,474.5	4,461.1
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,400,256.9	4,396,294.5	4,390,773.7	4,383,886.7	4,374,043.4	4,362,660.2	4,349,609.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Poly



11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
1	Food	100.0	-	-	2,079,281.5	2,114,461.5	2,149,586.8	2,184,875.7	2,219,342.7	2,252,533.8
Scenario CODE	Feed	20.0	-	-	415,856.3	422,892.3	429,917.4	436,975.1	443,868.5	450,506.8
G1-P1	Seed	2.9	-	-	60,299.2	61,319.4	62,338.0	63,361.4	64,360.9	65,323.5
GDP Growth	Losses	7.8	-	-	162,184.0	164,928.0	167,667.8	170,420.3	173,108.7	175,697.6
High	Processing	9.8	-	-	203,769.6	207,217.2	210,659.5	214,117.8	217,495.6	220,748.3
Population Growth	Other uses (non-food)	54.3	-	-	1,129,049.9	1,148,152.6	1,167,225.6	1,186,387.5	1,205,103.1	1,223,125.9
Very High	Tourist consumption	0.2	-	-	4,158.6	4,228.9	4,299.2	4,369.8	4,438.7	4,505.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,054,599.1	4,123,199.9	4,191,694.3	4,260,507.6	4,327,718.2	4,392,441.0
2	Food	100.0	1,998,226.3	2,037,649.2	2,073,901.7	2,110,019.2	2,145,535.0	2,180,709.3	2,214,683.3	2,247,027.5
Scenario CODE	Feed	20.0	399,645.3	407,529.8	414,780.3	422,003.8	429,107.0	436,141.9	442,936.7	449,405.5
G1-P2	Seed	2.9	57,948.6	59,091.8	60,143.1	61,190.6	62,220.5	63,240.6	64,225.8	65,163.8
GDP Growth	Losses	7.8	155,861.7	158,936.6	161,764.3	164,581.5	167,351.7	170,095.3	172,745.3	175,268.1
High	Processing	9.8	195,826.2	199,689.6	203,242.4	206,781.9	210,262.4	213,709.5	217,039.0	220,208.7
Population Growth	Other uses (non-food)	54.3	1,085,036.9	1,106,443.5	1,126,128.6	1,145,740.4	1,165,025.5	1,184,125.1	1,202,573.0	1,220,135.9
High	Tourist consumption	0.2	3,996.5	4,075.3	4,147.8	4,220.0	4,291.1	4,361.4	4,429.4	4,494.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,896,541.5	3,973,415.8	4,044,108.2	4,114,537.4	4,183,793.2	4,252,383.1	4,318,632.5	4,381,703.6
3	Food	100.0	1,995,375.2	2,032,838.5	2,066,607.8	2,099,870.5	2,132,150.8	2,163,699.2	2,193,659.3	2,221,602.8
Scenario CODE	Feed	20.0	399,075.0	406,567.7	413,321.6	419,974.1	426,430.2	432,739.8	438,731.9	444,320.6
G1-P3	Seed	2.9	57,865.9	58,952.3	59,931.6	60,896.2	61,832.4	62,747.3	63,616.1	64,426.5
GDP Growth	Losses	7.8	155,639.3	158,561.4	161,195.4	163,789.9	166,307.8	168,768.5	171,105.4	173,285.0
High	Processing	9.8	195,546.8	199,218.2	202,527.6	205,787.3	208,950.8	212,042.5	214,978.6	217,717.1
Population Growth	Other uses (non-food)	54.3	1,083,488.7	1,103,831.3	1,122,168.0	1,140,229.7	1,157,757.9	1,174,888.7	1,191,157.0	1,206,330.3
Upper-Medium	Tourist consumption	0.2	3,990.8	4,065.7	4,133.2	4,199.7	4,264.3	4,327.4	4,387.3	4,443.2
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,890,981.7	3,964,035.1	4,029,885.2	4,094,747.4	4,157,694.2	4,219,213.4	4,277,635.6	4,332,125.5

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
1	Food	100.0	2,284,084.0	2,314,189.2	2,343,374.0	2,369,470.0	2,394,635.0	2,417,460.0	2,438,486.8	2,456,973.0
Scenario CODE	Feed	20.0	456,816.8	462,837.8	468,674.8	473,894.0	478,927.0	483,492.0	487,697.4	491,394.6
G1-P1	Seed	2.9	66,238.4	67,111.5	67,957.8	68,714.6	69,444.4	70,106.3	70,716.1	71,252.2
GDP Growth	Losses	7.8	178,158.6	180,506.8	182,783.2	184,818.7	186,781.5	188,561.9	190,202.0	191,643.9
High	Processing	9.8	223,840.2	226,790.5	229,650.7	232,208.1	234,674.2	236,911.1	238,971.7	240,783.4
Population Growth	Other uses (non-food)	54.3	1,240,257.6	1,256,604.7	1,272,452.1	1,286,622.2	1,300,286.8	1,312,680.8	1,324,098.3	1,334,136.3
Very High	Tourist consumption	0.2	4,568.2	4,628.4	4,686.7	4,738.9	4,789.3	4,834.9	4,877.0	4,913.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,453,963.8	4,512,668.9	4,569,579.3	4,620,466.5	4,669,538.2	4,714,047.0	4,755,049.3	4,791,097.3
2	Food	100.0	2,277,612.2	2,306,598.7	2,334,509.7	2,359,137.2	2,382,638.5	2,403,818.5	2,423,276.3	2,440,306.0
Scenario CODE	Feed	20.0	455,522.4	461,319.7	466,901.9	471,827.4	476,527.7	480,763.7	484,655.3	488,061.2
G1-P2	Seed	2.9	66,050.8	66,891.4	67,700.8	68,415.0	69,096.5	69,710.7	70,275.0	70,768.9
GDP Growth	Losses	7.8	177,653.8	179,914.7	182,091.8	184,012.7	185,845.8	187,497.8	189,015.6	190,343.9
High	Processing	9.8	223,206.0	226,046.7	228,782.0	231,195.4	233,498.6	235,574.2	237,481.1	239,150.0
Population Growth	Other uses (non-food)	54.3	1,236,743.4	1,252,483.1	1,267,638.8	1,281,011.5	1,293,772.7	1,305,273.4	1,315,839.0	1,325,086.2
High	Tourist consumption	0.2	4,555.2	4,613.2	4,669.0	4,718.3	4,765.3	4,807.6	4,846.6	4,880.6
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,441,343.8	4,497,867.5	4,552,294.0	4,600,317.5	4,646,145.1	4,687,445.9	4,725,388.9	4,758,596.8
3	Food	100.0	2,247,582.8	2,271,764.0	2,294,665.7	2,314,122.7	2,332,263.0	2,348,106.8	2,362,239.3	2,373,977.3
Scenario CODE	Feed	20.0	449,516.6	454,352.8	458,933.1	462,824.5	466,452.6	469,621.4	472,447.9	474,795.5
G1-P3	Seed	2.9	65,179.9	65,881.2	66,545.3	67,109.6	67,635.6	68,095.1	68,504.9	68,845.3
GDP Growth	Losses	7.8	175,311.5	177,197.6	178,983.9	180,501.6	181,916.5	183,152.3	184,254.7	185,170.2
High	Processing	9.8	220,263.1	222,632.9	224,877.2	226,784.0	228,561.8	230,114.5	231,499.5	232,649.8
Population Growth	Other uses (non-food)	54.3	1,220,437.5	1,233,567.9	1,246,003.5	1,256,568.6	1,266,418.8	1,275,022.0	1,282,695.9	1,289,069.7
Upper-Medium	Tourist consumption	0.2	4,495.2	4,543.5	4,589.3	4,628.2	4,664.5	4,696.2	4,724.5	4,748.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,382,786.6	4,429,939.9	4,474,598.0	4,512,539.2	4,547,912.8	4,578,808.3	4,606,366.7	4,629,255.8

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
1	Food	100.0	2,472,777.3	2,486,482.2	2,496,570.3	2,504,604.0	2,509,163.7	2,511,154.7	2,509,859.3
Scenario CODE	Feed	20.0	494,555.5	497,296.4	499,314.1	500,920.8	501,832.7	502,230.9	501,971.9
G1-P1	Seed	2.9	71,710.5	72,108.0	72,400.5	72,633.5	72,765.7	72,823.5	72,785.9
GDP Growth	Losses	7.8	192,876.6	193,945.6	194,732.5	195,359.1	195,714.8	195,870.1	195,769.0
High	Processing	9.8	242,332.2	243,675.3	244,663.9	245,451.2	245,898.0	246,093.2	245,966.2
Population Growth	Other uses (non-food)	54.3	1,342,718.1	1,350,159.8	1,355,637.7	1,360,000.0	1,362,475.9	1,363,557.0	1,362,853.6
Very High	Tourist consumption	0.2	4,945.6	4,973.0	4,993.1	5,009.2	5,018.3	5,022.3	5,019.7
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,821,915.8	4,848,640.3	4,868,312.1	4,883,977.8	4,892,869.1	4,896,751.7	4,894,225.6
2	Food	100.0	2,454,925.5	2,467,778.2	2,477,325.5	2,485,105.5	2,489,574.3	2,491,518.8	2,490,116.7
Scenario CODE	Feed	20.0	490,985.1	493,555.6	495,465.1	497,021.1	497,914.9	498,303.8	498,023.3
G1-P2	Seed	2.9	71,192.8	71,565.6	71,842.4	72,068.1	72,197.7	72,254.0	72,213.4
GDP Growth	Losses	7.8	191,484.2	192,486.7	193,231.4	193,838.2	194,186.8	194,338.5	194,229.1
High	Processing	9.8	240,582.7	241,842.3	242,777.9	243,540.3	243,978.3	244,168.8	244,031.4
Population Growth	Other uses (non-food)	54.3	1,333,024.5	1,340,003.6	1,345,187.7	1,349,412.3	1,351,838.8	1,352,894.7	1,352,133.4
High	Tourist consumption	0.2	4,909.9	4,935.6	4,954.7	4,970.2	4,979.1	4,983.0	4,980.2
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,787,104.7	4,812,167.6	4,830,784.7	4,845,955.7	4,854,669.9	4,858,461.6	4,855,727.5
3	Food	100.0	2,383,345.2	2,390,972.2	2,395,367.8	2,398,018.7	2,397,430.0	2,394,360.8	2,388,205.0
Scenario CODE	Feed	20.0	476,669.0	478,194.4	479,073.6	479,603.7	479,486.0	478,872.2	477,641.0
G1-P3	Seed	2.9	69,117.0	69,338.2	69,465.7	69,542.5	69,525.5	69,436.5	69,257.9
GDP Growth	Losses	7.8	185,900.9	186,495.8	186,838.7	187,045.5	186,999.5	186,760.1	186,280.0
High	Processing	9.8	233,567.8	234,315.3	234,746.0	235,005.8	234,948.1	234,647.4	234,044.1
Population Growth	Other uses (non-food)	54.3	1,294,156.4	1,298,297.9	1,300,684.7	1,302,124.2	1,301,804.5	1,300,137.9	1,296,795.3
Upper-Medium	Tourist consumption	0.2	4,766.7	4,781.9	4,790.7	4,796.0	4,794.9	4,788.7	4,776.4
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,647,523.0	4,662,395.7	4,670,967.2	4,676,136.4	4,674,988.5	4,669,003.6	4,656,999.7

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
4	Food	100.0	-	-	2,079,281.5	2,111,768.2	2,143,103.2	2,173,682.2	2,202,745.8	2,230,000.7
Scenario CODE	Feed	20.0	-	-	415,856.3	422,353.6	428,620.6	434,736.4	440,549.2	446,000.1
G1-P4	Seed	2.9	-	-	60,299.2	61,241.3	62,150.0	63,036.8	63,879.6	64,670.0
GDP Growth	Losses	7.8	-	-	162,184.0	164,717.9	167,162.0	169,547.2	171,814.2	173,940.1
High	Processing	9.8	-	-	203,769.6	206,953.3	210,024.1	213,020.9	215,869.1	218,540.1
Population Growth	Other uses (non-food)	54.3	-	-	1,129,049.9	1,146,690.1	1,163,705.0	1,180,309.4	1,196,091.0	1,210,890.4
Lower-Medium	Tourist consumption	0.2	-	-	4,158.6	4,223.5	4,286.2	4,347.4	4,405.5	4,460.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,054,599.1	4,117,947.9	4,179,051.1	4,238,680.3	4,295,354.4	4,348,501.4
5	Food	100.0	1,993,474.0	2,029,631.8	2,062,317.2	2,092,991.3	2,122,885.2	2,151,668.3	2,178,484.5	2,202,903.5
Scenario CODE	Feed	20.0	398,694.8	405,926.4	412,463.4	418,598.3	424,577.0	430,333.7	435,696.9	440,580.7
G1-P5	Seed	2.9	57,810.7	58,859.3	59,807.2	60,696.7	61,563.7	62,398.4	63,176.1	63,884.2
GDP Growth	Losses	7.8	155,491.0	158,311.3	160,860.7	163,253.3	165,585.0	167,830.1	169,921.8	171,826.5
High	Processing	9.8	195,360.5	198,903.9	202,107.1	205,113.1	208,042.7	210,863.5	213,491.5	215,884.5
Population Growth	Other uses (non-food)	54.3	1,082,456.4	1,102,090.1	1,119,838.2	1,136,494.3	1,152,726.7	1,168,355.9	1,182,917.1	1,196,176.6
Low	Tourist consumption	0.2	3,986.9	4,059.3	4,124.6	4,186.0	4,245.8	4,303.3	4,357.0	4,405.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,887,274.3	3,957,782.1	4,021,518.4	4,081,333.0	4,139,626.1	4,195,753.2	4,248,044.9	4,295,661.8
6	Food	100.0	-	-	2,079,281.5	2,108,827.2	2,136,330.2	2,162,333.3	2,186,119.8	2,207,466.7
Scenario CODE	Feed	20.0	-	-	415,856.3	421,765.4	427,266.0	432,466.7	437,224.0	441,493.3
G1-P6	Seed	2.9	-	-	60,299.2	61,156.0	61,953.6	62,707.7	63,397.5	64,016.5
GDP Growth	Losses	7.8	-	-	162,184.0	164,488.5	166,633.8	168,662.0	170,517.3	172,182.4
High	Processing	9.8	-	-	203,769.6	206,665.1	209,360.4	211,908.7	214,239.7	216,331.7
Population Growth	Other uses (non-food)	54.3	-	-	1,129,049.9	1,145,093.2	1,160,027.3	1,174,147.0	1,187,063.1	1,198,654.4
Very Low	Tourist consumption	0.2	-	-	4,158.6	4,217.7	4,272.7	4,324.7	4,372.2	4,414.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,054,599.1	4,112,213.1	4,165,844.0	4,216,550.1	4,262,933.6	4,304,559.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
4	Food	100.0	2,255,141.2	2,278,356.8	2,300,184.7	2,318,506.3	2,335,463.5	2,349,699.3	2,361,822.2	2,371,254.5
Scenario CODE	Feed	20.0	451,028.2	455,671.4	460,036.9	463,701.3	467,092.7	469,939.9	472,364.4	474,250.9
G1-P4	Seed	2.9	65,399.1	66,072.3	66,705.4	67,236.7	67,728.4	68,141.3	68,492.8	68,766.4
GDP Growth	Losses	7.8	175,901.0	177,711.8	179,414.4	180,843.5	182,166.2	183,276.5	184,222.1	184,957.9
High	Processing	9.8	221,003.8	223,279.0	225,418.1	227,213.6	228,875.4	230,270.5	231,458.6	232,382.9
Population Growth	Other uses (non-food)	54.3	1,224,541.7	1,237,147.7	1,249,000.3	1,258,948.9	1,268,156.7	1,275,886.7	1,282,469.5	1,287,591.2
Lower-Medium	Tourist consumption	0.2	4,510.3	4,556.7	4,600.4	4,637.0	4,670.9	4,699.4	4,723.6	4,742.5
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,397,525.3	4,442,795.7	4,485,360.2	4,521,087.3	4,554,153.8	4,581,913.6	4,605,553.2	4,623,946.3
5	Food	100.0	2,224,979.2	2,244,874.8	2,263,106.8	2,277,541.0	2,290,283.8	2,300,751.7	2,309,522.3	2,315,937.0
Scenario CODE	Feed	20.0	444,995.8	448,975.0	452,621.4	455,508.2	458,056.8	460,150.3	461,904.5	463,187.4
G1-P5	Seed	2.9	64,524.4	65,101.4	65,630.1	66,048.7	66,418.2	66,721.8	66,976.1	67,162.2
GDP Growth	Losses	7.8	173,548.4	175,100.2	176,522.3	177,648.2	178,642.1	179,458.6	180,142.7	180,643.1
High	Processing	9.8	218,048.0	219,997.7	221,784.5	223,199.0	224,447.8	225,473.7	226,333.2	226,961.8
Population Growth	Other uses (non-food)	54.3	1,208,163.7	1,218,967.0	1,228,867.0	1,236,704.8	1,243,624.1	1,249,308.2	1,254,070.6	1,257,553.8
Low	Tourist consumption	0.2	4,450.0	4,489.7	4,526.2	4,555.1	4,580.6	4,601.5	4,619.0	4,631.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,338,709.5	4,377,505.8	4,413,058.3	4,441,205.0	4,466,053.4	4,486,465.8	4,503,568.4	4,516,077.2
6	Food	100.0	2,226,160.7	2,242,483.2	2,256,975.0	2,267,547.8	2,276,291.3	2,281,925.2	2,285,137.3	2,285,513.5
Scenario CODE	Feed	20.0	445,232.1	448,496.6	451,395.0	453,509.6	455,258.3	456,385.0	457,027.5	457,102.7
G1-P6	Seed	2.9	64,558.7	65,032.0	65,452.3	65,758.9	66,012.4	66,175.8	66,269.0	66,279.9
GDP Growth	Losses	7.8	173,640.5	174,913.7	176,044.1	176,868.7	177,550.7	177,990.2	178,240.7	178,270.1
High	Processing	9.8	218,163.7	219,763.4	221,183.6	222,219.7	223,076.5	223,628.7	223,943.5	223,980.3
Population Growth	Other uses (non-food)	54.3	1,208,805.3	1,217,668.4	1,225,537.4	1,231,278.5	1,236,026.2	1,239,085.4	1,240,829.6	1,241,033.8
Very Low	Tourist consumption	0.2	4,452.3	4,485.0	4,514.0	4,535.1	4,552.6	4,563.9	4,570.3	4,571.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,341,013.3	4,372,842.3	4,401,101.4	4,421,718.3	4,438,768.0	4,449,754.2	4,456,017.9	4,456,751.3

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
4	Food	100.0	2,378,033.8	2,382,843.5	2,384,295.2	2,383,864.3	2,380,155.7	2,373,953.3	2,364,523.7
Scenario CODE	Feed	20.0	475,606.8	476,568.7	476,859.0	476,772.9	476,031.1	474,790.7	472,904.7
G1-P4	Seed	2.9	68,963.0	69,102.5	69,144.6	69,132.1	69,024.5	68,844.6	68,571.2
GDP Growth	Losses	7.8	185,486.6	185,861.8	185,975.0	185,941.4	185,652.1	185,168.4	184,432.8
High	Processing	9.8	233,047.3	233,518.7	233,660.9	233,618.7	233,255.3	232,647.4	231,723.3
Population Growth	Other uses (non-food)	54.3	1,291,272.4	1,293,884.0	1,294,672.3	1,294,438.3	1,292,424.5	1,289,056.6	1,283,936.4
Lower-Medium	Tourist consumption	0.2	4,756.1	4,765.7	4,768.6	4,767.7	4,760.3	4,747.9	4,729.0
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,637,166.0	4,646,544.9	4,649,375.6	4,648,535.4	4,641,303.5	4,629,208.9	4,610,821.1
5	Food	100.0	2,320,028.5	2,322,419.8	2,321,859.7	2,319,791.3	2,314,768.7	2,307,525.7	2,297,298.0
Scenario CODE	Feed	20.0	464,005.7	464,484.0	464,371.9	463,958.3	462,953.7	461,505.1	459,459.6
G1-P5	Seed	2.9	67,280.8	67,350.2	67,333.9	67,273.9	67,128.3	66,918.2	66,621.6
GDP Growth	Losses	7.8	180,962.2	181,148.7	181,105.1	180,943.7	180,552.0	179,987.0	179,189.2
High	Processing	9.8	227,362.8	227,597.1	227,542.3	227,339.5	226,847.3	226,137.5	225,135.2
Population Growth	Other uses (non-food)	54.3	1,259,775.5	1,261,074.0	1,260,769.8	1,259,646.7	1,256,919.4	1,252,986.5	1,247,432.8
Low	Tourist consumption	0.2	4,640.1	4,644.8	4,643.7	4,639.6	4,629.5	4,615.1	4,594.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,524,055.6	4,528,718.6	4,527,626.4	4,523,593.0	4,513,798.9	4,499,675.1	4,479,731.0
6	Food	100.0	2,283,275.2	2,279,204.3	2,272,046.0	2,263,213.5	2,251,349.2	2,237,132.0	2,219,830.8
Scenario CODE	Feed	20.0	456,655.0	455,840.9	454,409.2	452,642.7	450,269.8	447,426.4	443,966.2
G1-P6	Seed	2.9	66,215.0	66,096.9	65,889.3	65,633.2	65,289.1	64,876.8	64,375.1
GDP Growth	Losses	7.8	178,095.5	177,777.9	177,219.6	176,530.7	175,605.2	174,496.3	173,146.8
High	Processing	9.8	223,761.0	223,362.0	222,660.5	221,794.9	220,632.2	219,238.9	217,543.4
Population Growth	Other uses (non-food)	54.3	1,239,818.4	1,237,607.9	1,233,721.0	1,228,924.9	1,222,482.6	1,214,762.7	1,205,368.1
Very Low	Tourist consumption	0.2	4,566.6	4,558.4	4,544.1	4,526.4	4,502.7	4,474.3	4,439.7
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,452,386.7	4,444,448.3	4,430,489.7	4,413,266.3	4,390,130.8	4,362,407.4	4,328,670.1

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
7	Food	100.0	-	-	2,079,281.5	2,113,821.0	2,149,439.8	2,185,254.5	2,219,209.2	2,252,977.8
Scenario CODE	Feed	20.0	-	-	415,856.3	422,764.2	429,888.0	437,050.9	443,841.8	450,595.6
G2-P1	Seed	2.9	-	-	60,299.2	61,300.8	62,333.8	63,372.4	64,357.1	65,336.4
GDP Growth	Losses	7.8	-	-	162,184.0	164,878.0	167,656.3	170,449.9	173,098.3	175,732.3
Low	Processing	9.8	-	-	203,769.6	207,154.5	210,645.1	214,154.9	217,482.5	220,791.8
Population Growth	Other uses (non-food)	54.3	-	-	1,129,049.9	1,147,804.8	1,167,145.8	1,186,593.2	1,205,030.6	1,223,366.9
Very High	Tourist consumption	0.2	-	-	4,158.6	4,227.6	4,298.9	4,370.5	4,438.4	4,506.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,054,599.1	4,121,950.9	4,191,407.7	4,261,246.3	4,327,457.9	4,393,306.8
8	Food	100.0	1,998,226.3	2,037,649.2	2,073,901.7	2,109,379.8	2,145,388.3	2,181,087.5	2,214,550.0	2,247,470.3
Scenario CODE	Feed	20.0	399,645.3	407,529.8	414,780.3	421,876.0	429,077.7	436,217.5	442,910.0	449,494.1
G2-P2	Seed	2.9	57,948.6	59,091.8	60,143.1	61,172.0	62,216.3	63,251.5	64,222.0	65,176.6
GDP Growth	Losses	7.8	155,861.7	158,936.6	161,764.3	164,531.6	167,340.3	170,124.8	172,734.9	175,302.7
Low	Processing	9.8	195,826.2	199,689.6	203,242.4	206,719.2	210,248.1	213,746.6	217,025.9	220,252.1
Population Growth	Other uses (non-food)	54.3	1,085,036.9	1,106,443.5	1,126,128.6	1,145,393.2	1,164,945.8	1,184,330.5	1,202,500.7	1,220,376.4
High	Tourist consumption	0.2	3,996.5	4,075.3	4,147.8	4,218.8	4,290.8	4,362.2	4,429.1	4,494.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,896,541.5	3,973,415.8	4,044,108.2	4,113,290.6	4,183,507.3	4,253,120.6	4,318,372.6	4,382,567.1
9	Food	100.0	1,995,375.2	2,032,838.5	2,066,607.8	2,099,234.3	2,132,005.0	2,164,074.3	2,193,527.3	2,222,040.7
Scenario CODE	Feed	20.0	399,075.0	406,567.7	413,321.6	419,846.9	426,401.0	432,814.9	438,705.5	444,408.1
G2-P3	Seed	2.9	57,865.9	58,952.3	59,931.6	60,877.8	61,828.1	62,758.2	63,612.3	64,439.2
GDP Growth	Losses	7.8	155,639.3	158,561.4	161,195.4	163,740.3	166,296.4	168,797.8	171,095.1	173,319.2
Low	Processing	9.8	195,546.8	199,218.2	202,527.6	205,725.0	208,936.5	212,079.3	214,965.7	217,760.0
Population Growth	Other uses (non-food)	54.3	1,083,488.7	1,103,831.3	1,122,168.0	1,139,884.2	1,157,678.7	1,175,092.3	1,191,085.3	1,206,568.1
Upper-Medium	Tourist consumption	0.2	3,990.8	4,065.7	4,133.2	4,198.5	4,264.0	4,328.1	4,387.1	4,444.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,890,981.7	3,964,035.1	4,029,885.2	4,093,507.0	4,157,409.7	4,219,944.9	4,277,378.3	4,332,979.4

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
7	Food	100.0	2,285,227.3	2,315,914.2	2,346,070.0	2,375,460.2	2,404,103.0	2,431,395.2	2,457,886.3	2,482,839.2
Scenario CODE	Feed	20.0	457,045.5	463,182.8	469,214.0	475,092.0	480,820.6	486,279.0	491,577.3	496,567.8
G2-P1	Seed	2.9	66,271.6	67,161.5	68,036.0	68,888.3	69,719.0	70,510.5	71,278.7	72,002.3
GDP Growth	Losses	7.8	178,247.7	180,641.3	182,993.5	185,285.9	187,520.0	189,648.8	191,715.1	193,661.5
Low	Processing	9.8	223,952.3	226,959.6	229,914.9	232,795.1	235,602.1	238,276.7	240,872.9	243,318.2
Population Growth	Other uses (non-food)	54.3	1,240,878.4	1,257,541.4	1,273,916.0	1,289,874.9	1,305,427.9	1,320,247.6	1,334,632.3	1,348,181.7
Very High	Tourist consumption	0.2	4,570.5	4,631.8	4,692.1	4,750.9	4,808.2	4,862.8	4,915.8	4,965.7
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,456,193.3	4,516,032.6	4,574,836.5	4,632,147.3	4,688,000.8	4,741,220.6	4,792,878.4	4,841,536.4
8	Food	100.0	2,278,752.3	2,308,318.0	2,337,195.5	2,365,101.3	2,392,058.8	2,417,675.2	2,442,555.0	2,465,996.5
Scenario CODE	Feed	20.0	455,750.5	461,663.6	467,439.1	473,020.3	478,411.8	483,535.0	488,511.0	493,199.3
G2-P2	Seed	2.9	66,083.8	66,941.2	67,778.7	68,587.9	69,369.7	70,112.6	70,834.1	71,513.9
GDP Growth	Losses	7.8	177,742.7	180,048.8	182,301.2	184,477.9	186,580.6	188,578.7	190,519.3	192,347.7
Low	Processing	9.8	223,317.7	226,215.2	229,045.2	231,779.9	234,421.8	236,932.2	239,370.4	241,667.7
Population Growth	Other uses (non-food)	54.3	1,237,362.5	1,253,416.7	1,269,097.2	1,284,250.0	1,298,887.9	1,312,797.6	1,326,307.4	1,339,036.1
High	Tourist consumption	0.2	4,557.5	4,616.6	4,674.4	4,730.2	4,784.1	4,835.4	4,885.1	4,932.0
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,443,567.0	4,501,220.1	4,557,531.3	4,611,947.5	4,664,514.7	4,714,466.7	4,762,982.3	4,808,693.2
9	Food	100.0	2,248,707.8	2,273,457.3	2,297,305.8	2,319,972.8	2,341,484.3	2,361,642.3	2,381,032.5	2,398,969.5
Scenario CODE	Feed	20.0	449,741.6	454,691.5	459,461.2	463,994.6	468,296.9	472,328.5	476,206.5	479,793.9
G2-P3	Seed	2.9	65,212.5	65,930.3	66,621.9	67,279.2	67,903.0	68,487.6	69,049.9	69,570.1
GDP Growth	Losses	7.8	175,399.2	177,329.7	179,189.9	180,957.9	182,635.8	184,208.1	185,720.5	187,119.6
Low	Processing	9.8	220,373.4	222,798.8	225,136.0	227,357.3	229,465.5	231,440.9	233,341.2	235,099.0
Population Growth	Other uses (non-food)	54.3	1,221,048.3	1,234,487.3	1,247,437.0	1,259,745.2	1,271,426.0	1,282,371.8	1,292,900.6	1,302,640.4
Upper-Medium	Tourist consumption	0.2	4,497.4	4,546.9	4,594.6	4,639.9	4,683.0	4,723.3	4,762.1	4,797.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,384,980.2	4,433,241.8	4,479,746.4	4,523,946.9	4,565,894.5	4,605,202.5	4,643,013.3	4,677,990.4

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
7	Food	100.0	2,507,591.8	2,530,587.5	2,552,476.2	2,573,406.8	2,592,579.7	2,611,785.7	2,629,483.2
Scenario CODE	Feed	20.0	501,518.4	506,117.5	510,495.2	514,681.4	518,515.9	522,357.1	525,896.6
G2-P1	Seed	2.9	72,720.2	73,387.0	74,021.8	74,628.8	75,184.8	75,741.8	76,255.0
GDP Growth	Losses	7.8	195,592.2	197,385.8	199,093.1	200,725.7	202,221.2	203,719.3	205,099.7
Low	Processing	9.8	245,744.0	247,997.6	250,142.7	252,193.9	254,072.8	255,955.0	257,689.4
Population Growth	Other uses (non-food)	54.3	1,361,622.3	1,374,109.0	1,385,994.6	1,397,359.9	1,407,770.8	1,418,199.6	1,427,809.4
Very High	Tourist consumption	0.2	5,015.2	5,061.2	5,105.0	5,146.8	5,185.2	5,223.6	5,259.0
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,889,804.1	4,934,645.6	4,977,328.6	5,018,143.3	5,055,530.4	5,092,982.1	5,127,492.3
8	Food	100.0	2,489,488.7	2,511,551.7	2,532,800.5	2,553,372.8	2,572,339.2	2,591,363.2	2,608,799.5
Scenario CODE	Feed	20.0	497,897.7	502,310.3	506,560.1	510,674.6	514,467.8	518,272.6	521,759.9
G2-P2	Seed	2.9	72,195.2	72,835.0	73,451.2	74,047.8	74,597.8	75,149.5	75,655.2
GDP Growth	Losses	7.8	194,180.1	195,901.0	197,558.4	199,163.1	200,642.5	202,126.3	203,486.4
Low	Processing	9.8	243,969.9	246,132.1	248,214.4	250,230.5	252,089.2	253,953.6	255,662.4
Population Growth	Other uses (non-food)	54.3	1,351,792.4	1,363,772.6	1,375,310.7	1,386,481.4	1,396,780.2	1,407,110.2	1,416,578.1
High	Tourist consumption	0.2	4,979.0	5,023.1	5,065.6	5,106.7	5,144.7	5,182.7	5,217.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,854,503.0	4,897,525.8	4,938,960.9	4,979,076.9	5,016,061.4	5,053,158.1	5,087,159.1
9	Food	100.0	2,416,900.5	2,433,383.2	2,449,007.7	2,463,893.7	2,477,131.5	2,490,311.7	2,502,030.7
Scenario CODE	Feed	20.0	483,380.1	486,676.6	489,801.5	492,778.7	495,426.3	498,062.3	500,406.1
G2-P3	Seed	2.9	70,090.1	70,568.1	71,021.2	71,452.9	71,836.8	72,219.0	72,558.9
GDP Growth	Losses	7.8	188,518.2	189,803.9	191,022.6	192,183.7	193,216.3	194,244.3	195,158.4
Low	Processing	9.8	236,856.2	238,471.6	240,002.8	241,461.6	242,758.9	244,050.5	245,199.0
Population Growth	Other uses (non-food)	54.3	1,312,377.0	1,321,327.1	1,329,811.2	1,337,894.3	1,345,082.4	1,352,239.3	1,358,602.7
Upper-Medium	Tourist consumption	0.2	4,833.8	4,866.8	4,898.0	4,927.8	4,954.3	4,980.6	5,004.1
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,712,955.9	4,745,097.3	4,775,565.0	4,804,592.7	4,830,406.5	4,856,107.7	4,878,959.9

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2018	2019	2020	2021	2022	2023	2024	2025
10	Food	100.0	-	-	2,079,281.5	2,111,128.3	2,142,956.7	2,174,059.3	2,202,613.2	2,230,440.3
Scenario CODE	Feed	20.0	-	-	415,856.3	422,225.7	428,591.3	434,811.9	440,522.6	446,088.1
G2-P4	Seed	2.9	-	-	60,299.2	61,222.7	62,145.7	63,047.7	63,875.8	64,682.8
GDP Growth	Losses	7.8	-	-	162,184.0	164,668.0	167,150.6	169,576.6	171,803.8	173,974.3
Low	Processing	9.8	-	-	203,769.6	206,890.6	210,009.8	213,057.8	215,856.1	218,583.1
Population Growth	Other uses (non-food)	54.3	-	-	1,129,049.9	1,146,342.7	1,163,625.5	1,180,514.2	1,196,019.0	1,211,129.1
Lower-Medium	Tourist consumption	0.2	-	-	4,158.6	4,222.3	4,285.9	4,348.1	4,405.2	4,460.9
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,054,599.1	4,116,700.3	4,178,765.5	4,239,415.6	4,295,095.7	4,349,358.6
11	Food	100.0	1,993,474.0	2,029,631.8	2,062,317.2	2,092,357.2	2,122,740.0	2,152,041.5	2,178,353.3	2,203,337.7
Scenario CODE	Feed	20.0	398,694.8	405,926.4	412,463.4	418,471.4	424,548.0	430,408.3	435,670.7	440,667.5
G2-P5	Seed	2.9	57,810.7	58,859.3	59,807.2	60,678.4	61,559.5	62,409.2	63,172.2	63,896.8
GDP Growth	Losses	7.8	155,491.0	158,311.3	160,860.7	163,203.9	165,573.7	167,859.2	169,911.6	171,860.3
Low	Processing	9.8	195,360.5	198,903.9	202,107.1	205,051.0	208,028.5	210,900.1	213,478.6	215,927.1
Population Growth	Other uses (non-food)	54.3	1,082,456.4	1,102,090.1	1,119,838.2	1,136,150.0	1,152,647.8	1,168,558.5	1,182,845.8	1,196,412.4
Low	Tourist consumption	0.2	3,986.9	4,059.3	4,124.6	4,184.7	4,245.5	4,304.1	4,356.7	4,406.7
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		3,887,274.3	3,957,782.1	4,021,518.4	4,080,096.6	4,139,343.0	4,196,480.9	4,247,788.9	4,296,508.5
12	Food	100.0	-	-	2,079,281.5	2,108,188.2	2,136,184.0	2,162,708.3	2,185,988.5	2,207,901.8
Scenario CODE	Feed	20.0	-	-	415,856.3	421,637.6	427,236.8	432,541.7	437,197.7	441,580.4
G2-P6	Seed	2.9	-	-	60,299.2	61,137.5	61,949.3	62,718.5	63,393.7	64,029.2
GDP Growth	Losses	7.8	-	-	162,184.0	164,438.7	166,622.4	168,691.2	170,507.1	172,216.3
Low	Processing	9.8	-	-	203,769.6	206,602.4	209,346.0	211,945.4	214,226.9	216,374.4
Population Growth	Other uses (non-food)	54.3	-	-	1,129,049.9	1,144,746.2	1,159,947.9	1,174,350.6	1,186,991.8	1,198,890.7
Very Low	Tourist consumption	0.2	-	-	4,158.6	4,216.4	4,272.4	4,325.4	4,372.0	4,415.8
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		-	-	4,054,599.1	4,110,967.0	4,165,558.8	4,217,281.1	4,262,677.7	4,305,408.6

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2026	2027	2028	2029	2030	2031	2032	2033
10	Food	100.0	2,256,270.0	2,280,055.2	2,302,831.0	2,324,367.8	2,344,697.5	2,363,243.8	2,380,612.2	2,396,218.2
Scenario CODE	Feed	20.0	451,254.0	456,011.0	460,566.2	464,873.6	468,939.5	472,648.8	476,122.4	479,243.6
G2-P4	Seed	2.9	65,431.8	66,121.6	66,782.1	67,406.7	67,996.2	68,534.1	69,037.8	69,490.3
GDP Growth	Losses	7.8	175,989.1	177,844.3	179,620.8	181,300.7	182,886.4	184,333.0	185,687.8	186,905.0
Low	Processing	9.8	221,114.5	223,445.4	225,677.4	227,788.0	229,780.4	231,597.9	233,300.0	234,829.4
Population Growth	Other uses (non-food)	54.3	1,225,154.6	1,238,070.0	1,250,437.2	1,262,131.7	1,273,170.7	1,283,241.4	1,292,672.4	1,301,146.5
Lower-Medium	Tourist consumption	0.2	4,512.5	4,560.1	4,605.7	4,648.7	4,689.4	4,726.5	4,761.2	4,792.4
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,399,726.5	4,446,107.6	4,490,520.4	4,532,517.2	4,572,160.1	4,608,325.5	4,642,193.8	4,672,625.4
11	Food	100.0	2,226,092.8	2,246,548.2	2,265,710.7	2,283,298.7	2,299,339.2	2,314,014.2	2,327,896.0	2,340,318.3
Scenario CODE	Feed	20.0	445,218.6	449,309.6	453,142.1	456,659.7	459,867.8	462,802.8	465,579.2	468,063.7
G2-P5	Seed	2.9	64,556.7	65,149.9	65,705.6	66,215.7	66,680.8	67,106.4	67,509.0	67,869.2
GDP Growth	Losses	7.8	173,635.2	175,230.8	176,725.4	178,097.3	179,348.5	180,493.1	181,575.9	182,544.8
Low	Processing	9.8	218,157.1	220,161.7	222,039.6	223,763.3	225,335.2	226,773.4	228,133.8	229,351.2
Population Growth	Other uses (non-food)	54.3	1,208,768.4	1,219,875.7	1,230,280.9	1,239,831.2	1,248,541.2	1,256,509.7	1,264,047.5	1,270,792.8
Low	Tourist consumption	0.2	4,452.2	4,493.1	4,531.4	4,566.6	4,598.7	4,628.0	4,655.8	4,680.6
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,340,881.0	4,380,769.0	4,418,135.7	4,452,432.5	4,483,711.4	4,512,327.6	4,539,397.2	4,563,620.6
12	Food	100.0	2,227,275.0	2,244,154.7	2,259,571.8	2,273,280.2	2,285,291.2	2,295,078.8	2,303,317.0	2,309,574.3
Scenario CODE	Feed	20.0	445,455.0	448,830.9	451,914.4	454,656.0	457,058.2	459,015.8	460,663.4	461,914.9
G2-P6	Seed	2.9	64,591.0	65,080.5	65,527.6	65,925.1	66,273.4	66,557.3	66,796.2	66,977.7
GDP Growth	Losses	7.8	173,727.5	175,044.1	176,246.6	177,315.9	178,252.7	179,016.1	179,658.7	180,146.8
Low	Processing	9.8	218,273.0	219,927.2	221,438.0	222,781.5	223,958.5	224,917.7	225,725.1	226,338.3
Population Growth	Other uses (non-food)	54.3	1,209,410.3	1,218,576.0	1,226,947.5	1,234,391.1	1,240,913.1	1,246,227.8	1,250,701.1	1,254,098.8
Very Low	Tourist consumption	0.2	4,454.6	4,488.3	4,519.1	4,546.6	4,570.6	4,590.2	4,606.6	4,619.1
Unit	Residuals	0.0	-	-	-	-	-	-	-	-
tonnes	Total		4,343,186.4	4,376,101.7	4,406,165.0	4,432,896.4	4,456,317.7	4,475,403.7	4,491,468.1	4,503,669.9

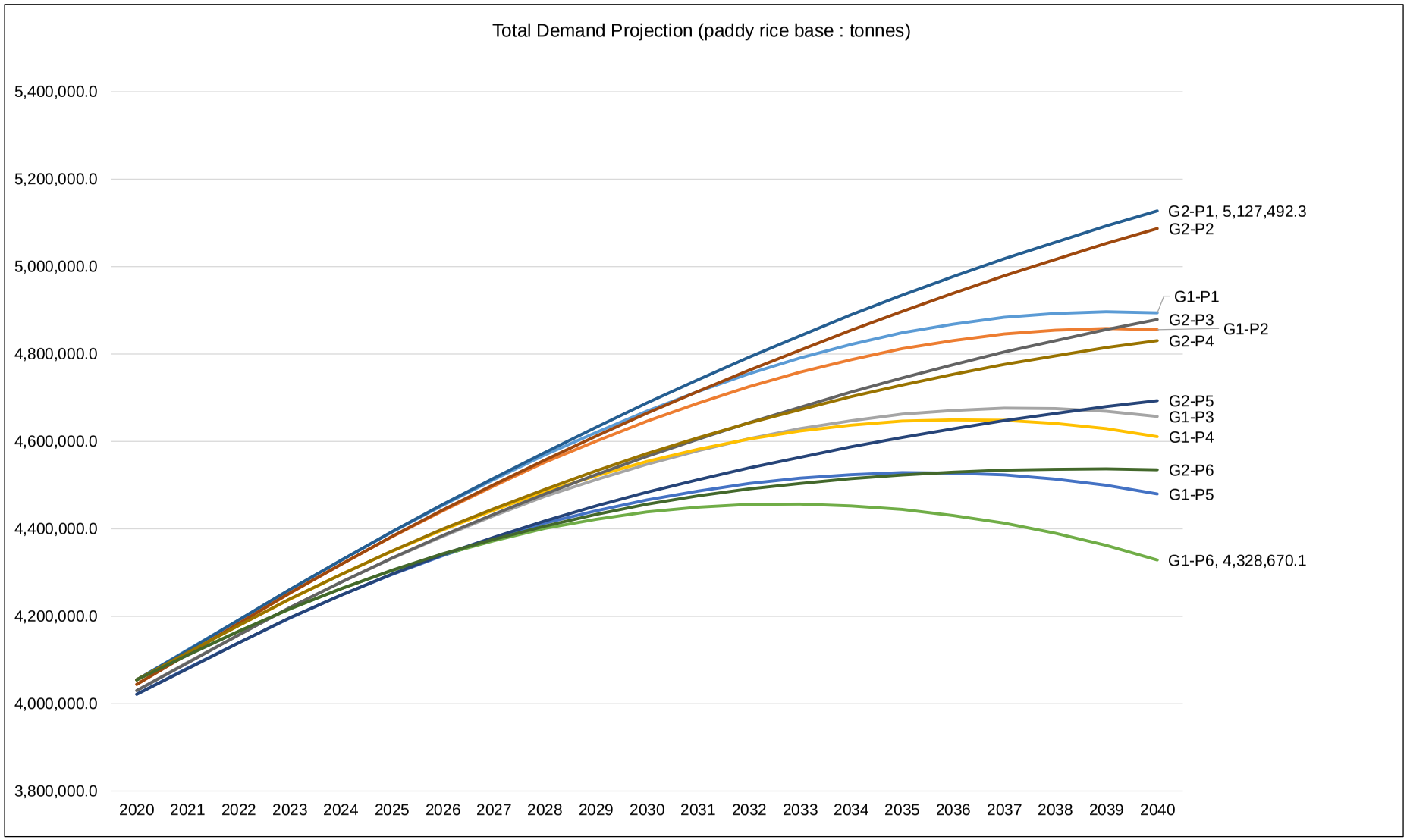
11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined

Scenario	Element	% to Foods	2034	2035	2036	2037	2038	2039	2040
10	Food	100.0	2,411,514.7	2,425,110.5	2,437,686.8	2,449,350.3	2,459,282.7	2,469,086.3	2,477,220.7
Scenario CODE	Feed	20.0	482,302.9	485,022.1	487,537.4	489,870.1	491,856.5	493,817.3	495,444.1
G2-P4	Seed	2.9	69,933.9	70,328.2	70,692.9	71,031.2	71,319.2	71,603.5	71,839.4
GDP Growth	Losses	7.8	188,098.1	189,158.6	190,139.6	191,049.3	191,824.1	192,588.7	193,223.2
Low	Processing	9.8	236,328.4	237,660.8	238,893.3	240,036.3	241,009.7	241,970.5	242,767.6
Population Growth	Other uses (non-food)	54.3	1,309,452.5	1,316,835.0	1,323,663.9	1,329,997.2	1,335,390.5	1,340,713.9	1,345,130.8
Lower-Medium	Tourist consumption	0.2	4,823.0	4,850.2	4,875.4	4,898.7	4,918.6	4,938.2	4,954.4
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,702,453.5	4,728,965.4	4,753,489.3	4,776,233.1	4,795,601.3	4,814,718.4	4,830,580.2
11	Food	100.0	2,352,692.7	2,363,615.0	2,373,853.3	2,383,517.3	2,391,722.0	2,399,996.7	2,406,791.0
Scenario CODE	Feed	20.0	470,538.5	472,723.0	474,770.7	476,703.5	478,344.4	479,999.3	481,358.2
G2-P5	Seed	2.9	68,228.1	68,544.8	68,841.7	69,122.0	69,359.9	69,599.9	69,796.9
GDP Growth	Losses	7.8	183,510.0	184,362.0	185,160.6	185,914.3	186,554.3	187,199.7	187,729.7
Low	Processing	9.8	230,563.9	231,634.3	232,637.6	233,584.7	234,388.8	235,199.7	235,865.5
Population Growth	Other uses (non-food)	54.3	1,277,512.1	1,283,442.9	1,289,002.3	1,294,249.9	1,298,705.0	1,303,198.2	1,306,887.5
Low	Tourist consumption	0.2	4,705.4	4,727.2	4,747.7	4,767.0	4,783.4	4,800.0	4,813.6
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,587,750.7	4,609,049.2	4,629,013.9	4,647,858.7	4,663,857.8	4,679,993.5	4,693,242.4
12	Food	100.0	2,315,421.5	2,319,632.8	2,322,924.2	2,325,385.2	2,326,194.2	2,326,781.8	2,325,631.5
Scenario CODE	Feed	20.0	463,084.3	463,926.6	464,584.8	465,077.0	465,238.8	465,356.4	465,126.3
G2-P6	Seed	2.9	67,147.2	67,269.4	67,364.8	67,436.2	67,459.6	67,476.7	67,443.3
GDP Growth	Losses	7.8	180,602.9	180,931.4	181,188.1	181,380.0	181,443.1	181,489.0	181,399.3
Low	Processing	9.8	226,911.3	227,324.0	227,646.6	227,887.7	227,967.0	228,024.6	227,911.9
Population Growth	Other uses (non-food)	54.3	1,257,273.9	1,259,560.6	1,261,347.8	1,262,684.2	1,263,123.5	1,263,442.5	1,262,817.9
Very Low	Tourist consumption	0.2	4,630.8	4,639.3	4,645.8	4,650.8	4,652.4	4,653.6	4,651.3
Unit	Residuals	0.0	-	-	-	-	-	-	-
tonnes	Total		4,515,071.9	4,523,284.1	4,529,702.1	4,534,501.1	4,536,078.6	4,537,224.6	4,534,981.5

11. Total Demand

PCE・PCC Relation： [Urban] Urban② & [Rural] Combined



12. Export Demand

Element	Scenario	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Other uses (non-food)	G1-P1	-	-	1,129,049.9	1,148,152.6	1,167,225.6	1,186,387.5	1,205,103.1	1,223,125.9	1,240,257.6	1,256,604.7
	G1-P2	1,085,036.9	1,106,443.5	1,126,128.6	1,145,740.4	1,165,025.5	1,184,125.1	1,202,573.0	1,220,135.9	1,236,743.4	1,252,483.1
	G1-P3	1,083,488.7	1,103,831.3	1,122,168.0	1,140,229.7	1,157,757.9	1,174,888.7	1,191,157.0	1,206,330.3	1,220,437.5	1,233,567.9
	G1-P4	-	-	1,129,049.9	1,146,690.1	1,163,705.0	1,180,309.4	1,196,091.0	1,210,890.4	1,224,541.7	1,237,147.7
	G1-P5	1,082,456.4	1,102,090.1	1,119,838.2	1,136,494.3	1,152,726.7	1,168,355.9	1,182,917.1	1,196,176.6	1,208,163.7	1,218,967.0
	G1-P6	-	-	1,129,049.9	1,145,093.2	1,160,027.3	1,174,147.0	1,187,063.1	1,198,654.4	1,208,805.3	1,217,668.4
	G2-P1	-	-	1,129,049.9	1,147,804.8	1,167,145.8	1,186,593.2	1,205,030.6	1,223,366.9	1,240,878.4	1,257,541.4
	G2-P2	1,085,036.9	1,106,443.5	1,126,128.6	1,145,393.2	1,164,945.8	1,184,330.5	1,202,500.7	1,220,376.4	1,237,362.5	1,253,416.7
	G2-P3	1,083,488.7	1,103,831.3	1,122,168.0	1,139,884.2	1,157,678.7	1,175,092.3	1,191,085.3	1,206,568.1	1,221,048.3	1,234,487.3
Unit	G2-P4	-	-	1,129,049.9	1,146,342.7	1,163,625.5	1,180,514.2	1,196,019.0	1,211,129.1	1,225,154.6	1,238,070.0
tonnes	G2-P5	1,082,456.4	1,102,090.1	1,119,838.2	1,136,150.0	1,152,647.8	1,168,558.5	1,182,845.8	1,196,412.4	1,208,768.4	1,219,875.7
	G2-P6	-	-	1,129,049.9	1,144,746.2	1,159,947.9	1,174,350.6	1,186,991.8	1,198,890.7	1,209,410.3	1,218,576.0

*Demand for "Other uses (non-food)" might be implication about the potential volume of (informal) Export.

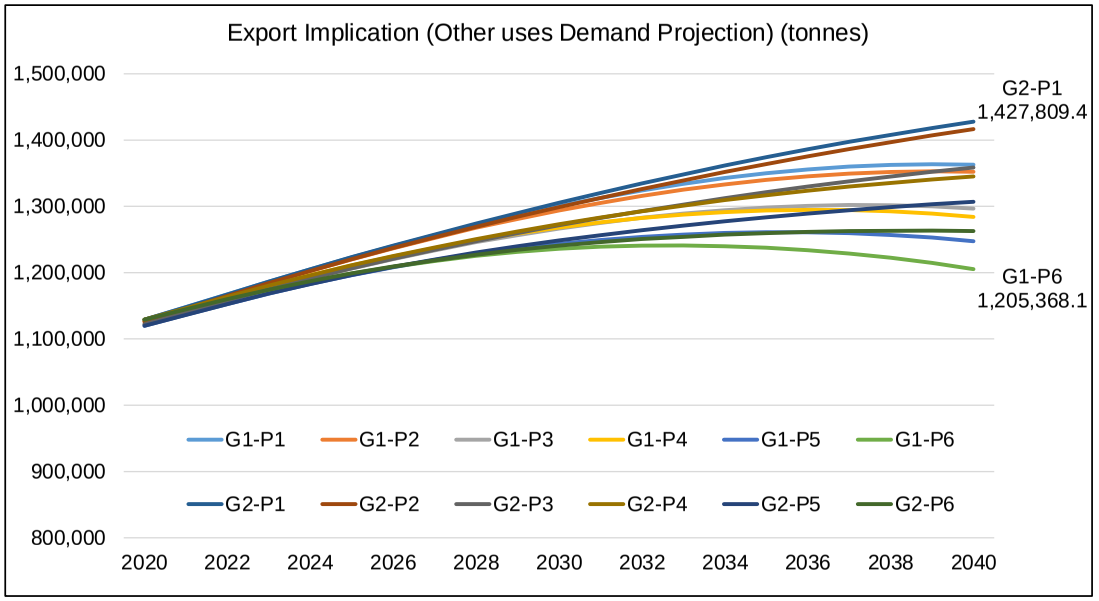
12. Export Demand

Element	Scenario	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Other uses (non-food)	G1-P1	1,272,452.1	1,286,622.2	1,300,286.8	1,312,680.8	1,324,098.3	1,334,136.3	1,342,718.1	1,350,159.8	1,355,637.7	1,360,000.0
	G1-P2	1,267,638.8	1,281,011.5	1,293,772.7	1,305,273.4	1,315,839.0	1,325,086.2	1,333,024.5	1,340,003.6	1,345,187.7	1,349,412.3
	G1-P3	1,246,003.5	1,256,568.6	1,266,418.8	1,275,022.0	1,282,695.9	1,289,069.7	1,294,156.4	1,298,297.9	1,300,684.7	1,302,124.2
	G1-P4	1,249,000.3	1,258,948.9	1,268,156.7	1,275,886.7	1,282,469.5	1,287,591.2	1,291,272.4	1,293,884.0	1,294,672.3	1,294,438.3
	G1-P5	1,228,867.0	1,236,704.8	1,243,624.1	1,249,308.2	1,254,070.6	1,257,553.8	1,259,775.5	1,261,074.0	1,260,769.8	1,259,646.7
	G1-P6	1,225,537.4	1,231,278.5	1,236,026.2	1,239,085.4	1,240,829.6	1,241,033.8	1,239,818.4	1,237,607.9	1,233,721.0	1,228,924.9
	G2-P1	1,273,916.0	1,289,874.9	1,305,427.9	1,320,247.6	1,334,632.3	1,348,181.7	1,361,622.3	1,374,109.0	1,385,994.6	1,397,359.9
	G2-P2	1,269,097.2	1,284,250.0	1,298,887.9	1,312,797.6	1,326,307.4	1,339,036.1	1,351,792.4	1,363,772.6	1,375,310.7	1,386,481.4
	G2-P3	1,247,437.0	1,259,745.2	1,271,426.0	1,282,371.8	1,292,900.6	1,302,640.4	1,312,377.0	1,321,327.1	1,329,811.2	1,337,894.3
Unit	G2-P4	1,250,437.2	1,262,131.7	1,273,170.7	1,283,241.4	1,292,672.4	1,301,146.5	1,309,452.5	1,316,835.0	1,323,663.9	1,329,997.2
tonnes	G2-P5	1,230,280.9	1,239,831.2	1,248,541.2	1,256,509.7	1,264,047.5	1,270,792.8	1,277,512.1	1,283,442.9	1,289,002.3	1,294,249.9
	G2-P6	1,226,947.5	1,234,391.1	1,240,913.1	1,246,227.8	1,250,701.1	1,254,098.8	1,257,273.9	1,259,560.6	1,261,347.8	1,262,684.2

*Demand for "Other uses (non-food)" might be implication about the potential volume of (informal) Export.

12. Export Demand

Element	Scenario	2038	2039	2040
Other uses (non-food)	G1-P1	1,362,475.9	1,363,557.0	1,362,853.6
	G1-P2	1,351,838.8	1,352,894.7	1,352,133.4
	G1-P3	1,301,804.5	1,300,137.9	1,296,795.3
	G1-P4	1,292,424.5	1,289,056.6	1,283,936.4
	G1-P5	1,256,919.4	1,252,986.5	1,247,432.8
	G1-P6	1,222,482.6	1,214,762.7	1,205,368.1
	G2-P1	1,407,770.8	1,418,199.6	1,427,809.4
	G2-P2	1,396,780.2	1,407,110.2	1,416,578.1
	G2-P3	1,345,082.4	1,352,239.3	1,358,602.7
Unit	G2-P4	1,335,390.5	1,340,713.9	1,345,130.8
tonnes	G2-P5	1,298,705.0	1,303,198.2	1,306,887.5
	G2-P6	1,263,123.5	1,263,442.5	1,262,817.9



*Demand for "Other uses (non-food)" might be implication about the potential volume of (informal) Export.

13. Seed Demand

13.1. Seed demand projection

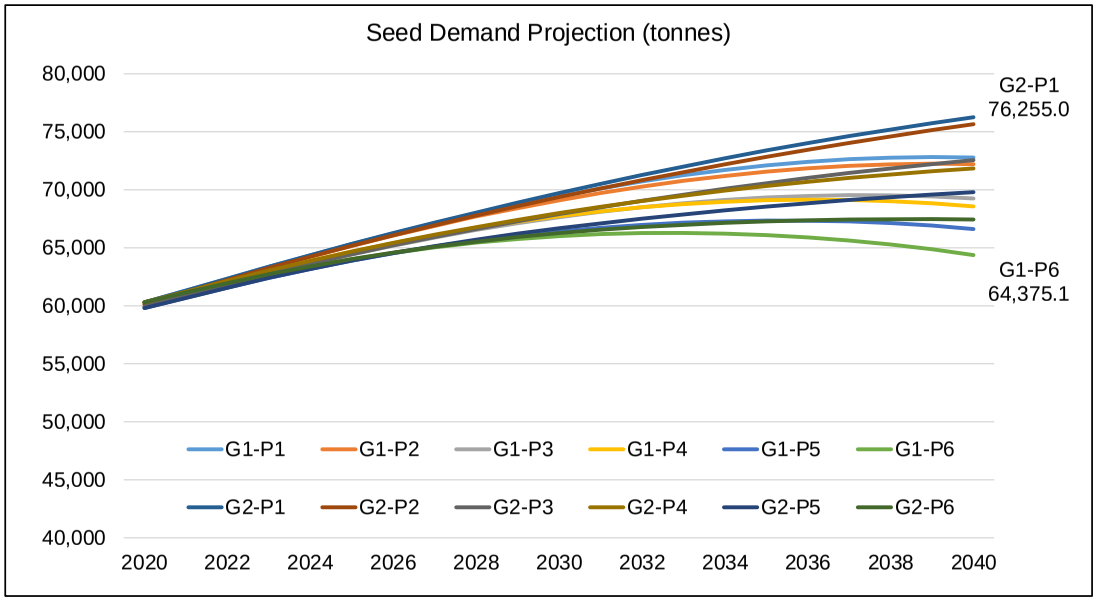
Element	Scenario	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Seed	G1-P1	-	-	60,299.2	61,319.4	62,338.0	63,361.4	64,360.9	65,323.5	66,238.4	67,111.5
	G1-P2	57,948.6	59,091.8	60,143.1	61,190.6	62,220.5	63,240.6	64,225.8	65,163.8	66,050.8	66,891.4
	G1-P3	57,865.9	58,952.3	59,931.6	60,896.2	61,832.4	62,747.3	63,616.1	64,426.5	65,179.9	65,881.2
	G1-P4	-	-	60,299.2	61,241.3	62,150.0	63,036.8	63,879.6	64,670.0	65,399.1	66,072.3
	G1-P5	57,810.7	58,859.3	59,807.2	60,696.7	61,563.7	62,398.4	63,176.1	63,884.2	64,524.4	65,101.4
	G1-P6	-	-	60,299.2	61,156.0	61,953.6	62,707.7	63,397.5	64,016.5	64,558.7	65,032.0
	G2-P1	-	-	60,299.2	61,300.8	62,333.8	63,372.4	64,357.1	65,336.4	66,271.6	67,161.5
	G2-P2	57,948.6	59,091.8	60,143.1	61,172.0	62,216.3	63,251.5	64,222.0	65,176.6	66,083.8	66,941.2
	G2-P3	57,865.9	58,952.3	59,931.6	60,877.8	61,828.1	62,758.2	63,612.3	64,439.2	65,212.5	65,930.3
Unit	G2-P4	-	-	60,299.2	61,222.7	62,145.7	63,047.7	63,875.8	64,682.8	65,431.8	66,121.6
tonnes	G2-P5	57,810.7	58,859.3	59,807.2	60,678.4	61,559.5	62,409.2	63,172.2	63,896.8	64,556.7	65,149.9
	G2-P6	-	-	60,299.2	61,137.5	61,949.3	62,718.5	63,393.7	64,029.2	64,591.0	65,080.5

13.1. Seed demand projection

Element	Scenario	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Seed	G1-P1	67,957.8	68,714.6	69,444.4	70,106.3	70,716.1	71,252.2	71,710.5	72,108.0	72,400.5	72,633.5
	G1-P2	67,700.8	68,415.0	69,096.5	69,710.7	70,275.0	70,768.9	71,192.8	71,565.6	71,842.4	72,068.1
	G1-P3	66,545.3	67,109.6	67,635.6	68,095.1	68,504.9	68,845.3	69,117.0	69,338.2	69,465.7	69,542.5
	G1-P4	66,705.4	67,236.7	67,728.4	68,141.3	68,492.8	68,766.4	68,963.0	69,102.5	69,144.6	69,132.1
	G1-P5	65,630.1	66,048.7	66,418.2	66,721.8	66,976.1	67,162.2	67,280.8	67,350.2	67,333.9	67,273.9
	G1-P6	65,452.3	65,758.9	66,012.4	66,175.8	66,269.0	66,279.9	66,215.0	66,096.9	65,889.3	65,633.2
	G2-P1	68,036.0	68,888.3	69,719.0	70,510.5	71,278.7	72,002.3	72,720.2	73,387.0	74,021.8	74,628.8
	G2-P2	67,778.7	68,587.9	69,369.7	70,112.6	70,834.1	71,513.9	72,195.2	72,835.0	73,451.2	74,047.8
	G2-P3	66,621.9	67,279.2	67,903.0	68,487.6	69,049.9	69,570.1	70,090.1	70,568.1	71,021.2	71,452.9
Unit	G2-P4	66,782.1	67,406.7	67,996.2	68,534.1	69,037.8	69,490.3	69,933.9	70,328.2	70,692.9	71,031.2
tonnes	G2-P5	65,705.6	66,215.7	66,680.8	67,106.4	67,509.0	67,869.2	68,228.1	68,544.8	68,841.7	69,122.0
	G2-P6	65,527.6	65,925.1	66,273.4	66,557.3	66,796.2	66,977.7	67,147.2	67,269.4	67,364.8	67,436.2

13.1. Seed demand projection

Element	Scenario	2038	2039	2040
Seed	G1-P1	72,765.7	72,823.5	72,785.9
	G1-P2	72,197.7	72,254.0	72,213.4
	G1-P3	69,525.5	69,436.5	69,257.9
	G1-P4	69,024.5	68,844.6	68,571.2
	G1-P5	67,128.3	66,918.2	66,621.6
	G1-P6	65,289.1	64,876.8	64,375.1
	G2-P1	75,184.8	75,741.8	76,255.0
	G2-P2	74,597.8	75,149.5	75,655.2
	G2-P3	71,836.8	72,219.0	72,558.9
Unit	G2-P4	71,319.2	71,603.5	71,839.4
tonnes	G2-P5	69,359.9	69,599.9	69,796.9
	G2-P6	67,459.6	67,476.7	67,443.3



13.2. Yield data from 2 sources

Source	Element	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average
FAO	Area harvested	ha	817,250	933,767	891,190	957,836	965,152	973,327	956,134	848,174	807,239	821,188	897,126
	Production	tonnes	3,065,760	3,489,210	3,414,560	4,002,425	4,102,000	4,148,800	4,039,779	3,584,700	3,534,500	3,687,336	3,706,907
	Yield	kg/ha	3,751.3	3,736.7	3,831.5	4,178.6	4,250.1	4,262.5	4,225.1	4,226.4	4,378.5	4,490.2	**4,132.0**
Agricultural Statistics Year Book	Area harvested	ha	817,250	933,767	891,190	957,836	965,152	973,327	963,754	854,605	843,524	929,929	913,033
	Production	tonnes	3,065,760	3,489,210	3,414,560	4,002,425	4,102,000	4,148,800	4,055,409	3,279,110	3,534,500	3,506,812	3,659,859
	Yield	kg/ha	3,751.3	3,736.7	3,831.5	4,178.6	4,250.1	4,262.5	4,207.9	3,837.0	4,190.2	3,771.1	**4,008.5**

13.3. Required area for seed

Element	Scenario	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	G1-P1	-	-	14,593.2	14,840.1	15,086.6	15,334.3	15,576.2	15,809.2	16,030.6	16,241.9
Required	G1-P2	14,024.3	14,301.0	14,555.4	14,809.0	15,058.2	15,305.1	15,543.5	15,770.5	15,985.2	16,188.6
Area for	G1-P3	14,004.3	14,267.3	14,504.3	14,737.7	14,964.3	15,185.7	15,396.0	15,592.1	15,774.4	15,944.1
Seed Production	G1-P4	-	-	14,593.2	14,821.2	15,041.1	15,255.8	15,459.7	15,651.0	15,827.5	15,990.4
	G1-P5	13,991.0	14,244.7	14,474.2	14,689.4	14,899.2	15,101.3	15,289.5	15,460.8	15,615.8	15,755.4
Yield	G1-P6	-	-	14,593.2	14,800.6	14,993.6	15,176.1	15,343.1	15,492.9	15,624.1	15,738.6
FAO	G2-P1	-	-	14,593.2	14,835.6	15,085.6	15,337.0	15,575.3	15,812.3	16,038.6	16,254.0
4,132.0 kg/ha	G2-P2	14,024.3	14,301.0	14,555.4	14,804.5	15,057.2	15,307.7	15,542.6	15,773.6	15,993.2	16,200.7
	G2-P3	14,004.3	14,267.3	14,504.3	14,733.3	14,963.2	15,188.3	15,395.0	15,595.2	15,782.3	15,956.0
Unit	G2-P4	-	-	14,593.2	14,816.7	15,040.1	15,258.4	15,458.8	15,654.1	15,835.4	16,002.3
ha	G2-P5	13,991.0	14,244.7	14,474.2	14,685.0	14,898.2	15,103.9	15,288.5	15,463.9	15,623.6	15,767.2
	G2-P6	-	-	14,593.2	14,796.1	14,992.6	15,178.7	15,342.1	15,495.9	15,631.9	15,750.4
	G1-P1	-	-	15,042.8	15,297.3	15,551.5	15,806.8	16,056.1	16,296.2	16,524.5	16,742.3
Required	G1-P2	14,456.4	14,741.6	15,003.9	15,265.2	15,522.1	15,776.6	16,022.4	16,256.4	16,477.7	16,687.4
Area for	G1-P3	14,435.8	14,706.8	14,951.1	15,191.8	15,425.3	15,653.6	15,870.3	16,072.5	16,260.4	16,435.4
Seed Production	G1-P4	-	-	15,042.8	15,277.9	15,504.6	15,725.8	15,936.0	16,133.2	16,315.1	16,483.0
	G1-P5	14,422.0	14,683.6	14,920.1	15,142.0	15,358.3	15,566.5	15,760.5	15,937.2	16,096.9	16,240.8
Yield	G1-P6	-	-	15,042.8	15,256.6	15,455.6	15,643.7	15,815.8	15,970.2	16,105.5	16,223.5
Agri SYB	G2-P1	-	-	15,042.8	15,292.7	15,550.4	15,809.5	16,055.2	16,299.5	16,532.8	16,754.8
4,008.5 kg/ha	G2-P2	14,456.4	14,741.6	15,003.9	15,260.6	15,521.1	15,779.3	16,021.5	16,259.6	16,485.9	16,699.8
	G2-P3	14,435.8	14,706.8	14,951.1	15,187.2	15,424.2	15,656.3	15,869.4	16,075.6	16,268.6	16,447.6
Unit	G2-P4	-	-	15,042.8	15,273.2	15,503.5	15,728.5	15,935.1	16,136.4	16,323.3	16,495.3
ha	G2-P5	14,422.0	14,683.6	14,920.1	15,137.4	15,357.2	15,569.2	15,759.6	15,940.3	16,105.0	16,252.9
	G2-P6	-	-	15,042.8	15,252.0	15,454.5	15,646.4	15,814.8	15,973.4	16,113.5	16,235.6

13.3. Required area for seed

Element	Scenario	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
	G1-P1	16,446.7	16,629.9	16,806.5	16,966.7	17,114.3	17,244.0	17,354.9	17,451.1	17,521.9	17,578.3
Required	G1-P2	16,384.5	16,557.4	16,722.3	16,870.9	17,007.5	17,127.0	17,229.6	17,319.8	17,386.8	17,441.5
Area for	G1-P3	16,104.9	16,241.4	16,368.7	16,479.9	16,579.1	16,661.5	16,727.3	16,780.8	16,811.6	16,830.2
Seed Production	G1-P4	16,143.6	16,272.2	16,391.2	16,491.1	16,576.2	16,642.4	16,690.0	16,723.7	16,733.9	16,730.9
	G1-P5	15,883.4	15,984.7	16,074.1	16,147.6	16,209.1	16,254.2	16,282.9	16,299.7	16,295.7	16,281.2
Yield	G1-P6	15,840.3	15,914.5	15,975.9	16,015.4	16,038.0	16,040.6	16,024.9	15,996.3	15,946.1	15,884.1
FAO	G2-P1	16,465.6	16,671.9	16,872.9	17,064.5	17,250.4	17,425.5	17,599.3	17,760.6	17,914.3	18,061.2
4,132.0 kg/ha	G2-P2	16,403.4	16,599.2	16,788.4	16,968.2	17,142.8	17,307.3	17,472.2	17,627.1	17,776.2	17,920.6
	G2-P3	16,123.4	16,282.5	16,433.4	16,574.9	16,711.0	16,836.9	16,962.8	17,078.4	17,188.1	17,292.6
Unit	G2-P4	16,162.2	16,313.3	16,456.0	16,586.2	16,708.1	16,817.6	16,925.0	17,020.4	17,108.6	17,190.5
ha	G2-P5	15,901.6	16,025.1	16,137.7	16,240.7	16,338.1	16,425.3	16,512.1	16,588.8	16,660.6	16,728.5
	G2-P6	15,858.6	15,954.8	16,039.1	16,107.8	16,165.6	16,209.5	16,250.5	16,280.1	16,303.2	16,320.5
	G1-P1	16,953.4	17,142.2	17,324.3	17,489.4	17,641.5	17,775.3	17,889.6	17,988.8	18,061.7	18,119.9
Required	G1-P2	16,889.3	17,067.5	17,237.5	17,390.7	17,531.5	17,654.7	17,760.5	17,853.5	17,922.5	17,978.8
Area for	G1-P3	16,601.0	16,741.8	16,873.0	16,987.7	17,089.9	17,174.8	17,242.6	17,297.8	17,329.6	17,348.8
Seed Production	G1-P4	16,641.0	16,773.5	16,896.2	16,999.2	17,086.9	17,155.1	17,204.2	17,239.0	17,249.5	17,246.4
	G1-P5	16,372.7	16,477.2	16,569.3	16,645.1	16,708.5	16,754.9	16,784.5	16,801.8	16,797.8	16,782.8
Yield	G1-P6	16,328.4	16,404.9	16,468.1	16,508.9	16,532.1	16,534.8	16,518.6	16,489.2	16,437.4	16,373.5
Agri SYB	G2-P1	16,972.9	17,185.6	17,392.8	17,590.2	17,781.9	17,962.4	18,141.5	18,307.8	18,466.2	18,617.6
4,008.5 kg/ha	G2-P2	16,908.7	17,110.6	17,305.7	17,491.0	17,671.0	17,840.6	18,010.5	18,170.1	18,323.9	18,472.7
	G2-P3	16,620.2	16,784.1	16,939.8	17,085.6	17,225.9	17,355.6	17,485.4	17,604.6	17,717.6	17,825.3
Unit	G2-P4	16,660.1	16,815.9	16,963.0	17,097.2	17,222.9	17,335.7	17,446.4	17,544.8	17,635.7	17,720.1
ha	G2-P5	16,391.6	16,518.8	16,634.9	16,741.0	16,841.5	16,931.3	17,020.9	17,099.9	17,173.9	17,243.9
	G2-P6	16,347.2	16,446.3	16,533.2	16,604.0	16,663.6	16,708.9	16,751.2	16,781.7	16,805.5	16,823.3

13.3. Required area for seed

Element	Scenario	2038	2039	2040
	G1-P1	17,610.3	17,624.3	17,615.2
Required	G1-P2	17,472.8	17,486.4	17,476.6
Area for	G1-P3	16,826.1	16,804.6	16,761.4
Seed Production	G1-P4	16,704.9	16,661.3	16,595.2
	G1-P5	16,246.0	16,195.1	16,123.3
Yield	G1-P6	15,800.8	15,701.1	15,579.6
FAO	G2-P1	18,195.7	18,330.5	18,454.7
4,132.0 kg/ha	G2-P2	18,053.7	18,187.2	18,309.6
	G2-P3	17,385.5	17,478.0	17,560.2
Unit	G2-P4	17,260.2	17,329.0	17,386.1
ha	G2-P5	16,786.0	16,844.1	16,891.8
	G2-P6	16,326.1	16,330.3	16,322.2
	G1-P1	18,152.9	18,167.3	18,157.9
Required	G1-P2	18,011.2	18,025.2	18,015.1
Area for	G1-P3	17,344.5	17,322.3	17,277.8
Seed Production	G1-P4	17,219.5	17,174.7	17,106.4
	G1-P5	16,746.5	16,694.1	16,620.1
Yield	G1-P6	16,287.7	16,184.8	16,059.6
Agri SYB	G2-P1	18,756.3	18,895.3	19,023.3
4,008.5 kg/ha	G2-P2	18,609.9	18,747.5	18,873.7
	G2-P3	17,921.1	18,016.5	18,101.3
Unit	G2-P4	17,792.0	17,862.9	17,921.8
ha	G2-P5	17,303.2	17,363.1	17,412.2
	G2-P6	16,829.1	16,833.4	16,825.1