

# Middle Income Trap And Roles of Agriculture in Avoiding MIT



The 3th SUT International Agricultural Colloquium 2015  
at Suranaree University of Technology,  
Nakorn Ratchasima Province,  
September 14, 2015



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# Outline

1. Thailand Economic Progress and Middle-income Trap
2. Situation of Thailand Agriculture: Past and Present
3. Problems Encountered Thailand Agricultural Growth
4. Renovating Thailand Agriculture in Avoiding From the MIT





# 1. Thailand Economic Progress and Middle-income Trap



# 1.1 What Explained Past Growth in Thailand Economy?

✓ Before 1960s, Thailand was considered to be one of low income countries.

✓ Basic infrastructure and market improvements in the 1<sup>st</sup> to 3<sup>th</sup> development plans stimulated a significant growth in agriculture in the late 1960s and 1970s.

✓ High industrial growth in a sub-sequent period as a result of industrial promotion, FDI, and a better access to infrastructure facilities has made Thailand moving into the middle income level since early 1980s.

✓ Although economic crisis in 1997-99 was disrupted the economic but the situation was recovered in the early 2000s in couple with financial reform.

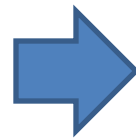


# 1.2 Translation of Economic Progress

✓ Raising average per capita income reflecting a well-being of the citizen.

• Per capita in term of NNI dramatically changed in the past five decades which reflects well-being of the citizen.

✓ Better access to public goods and services.



Economic and social development plans	Year	Baht/head <sup>1/</sup>
beginning of 1 <sup>st</sup> Plan	1962	2,199
End of the 1 <sup>st</sup> Plan	1966	3,063
End of the 6 <sup>th</sup> Plan	1991	45,084
End of the 8 <sup>th</sup> Plan	2001	59,098
End of the 11 <sup>th</sup> Plan	2010	123,934
In middle of the 11 <sup>th</sup> Plan	2011	131,579

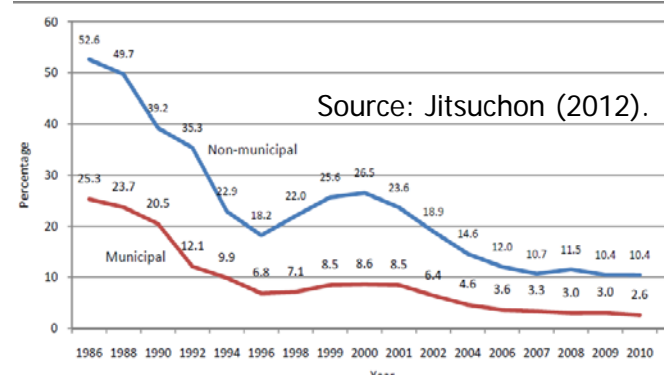
Note: 1/ in nominal term

Source: NESDB various issues

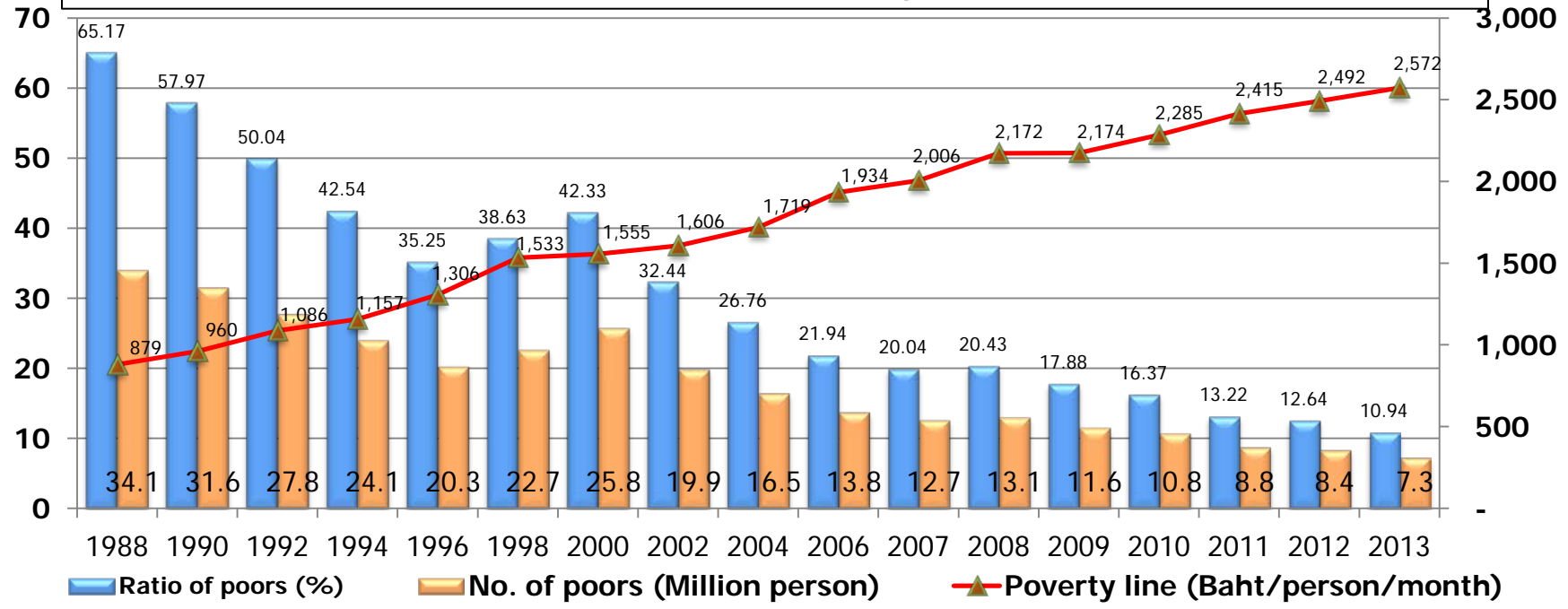
# 1.2 (Cont.)

✓ Reduction in poverty but remaining issue of income inequality.

• Headcount ratio indicating declining poverty from 1986-2010 in both urban and rural.



• Increasing employment opportunities in cities and reallocation of labor force from rural to urban helped to reducing no. and ration of the poors.



Source: NESDB, 2015

## 1.3 Thailand Lost Its Competitiveness

- ✓ In the past few decades, Thailand like other low income countries, had gaining competitive in international markets by producing labor-intensive, low cost products using technologies imported from abroad.
- ✓ Productivity gains were largely achieved through labor reallocation from the low-productivity agr. sector to high productivity manufacturing sector. When they reach middle-income levels, the pool of underemployed rural workers drains and wages begin to rise thereby eroding the competitiveness.
- ✓ It is no longer possible to boost productivity by shifting additional workers from agriculture to industry and the gains from importing foreign technology diminish significantly.
- ✓ With escalating wages, it lose cost competitiveness and cannot compete in export markets.

# 1.4 Moving Status from Low to Middle Income Level

Productivity growth from sectoral reallocation and technology catch-up are eventually exhausted, international competitiveness is eroded, output and growth slow and economies become trapped, unable to transcend to high-income status.

Using imported technologies, late-developing economies reap productivity gains as workers shift from the agricultural sector to the manufacturing sector.

As economies move from low-to middle-income status, they can compete internationally by moving from agricultural to labor intensive, low-cost manufactured products.

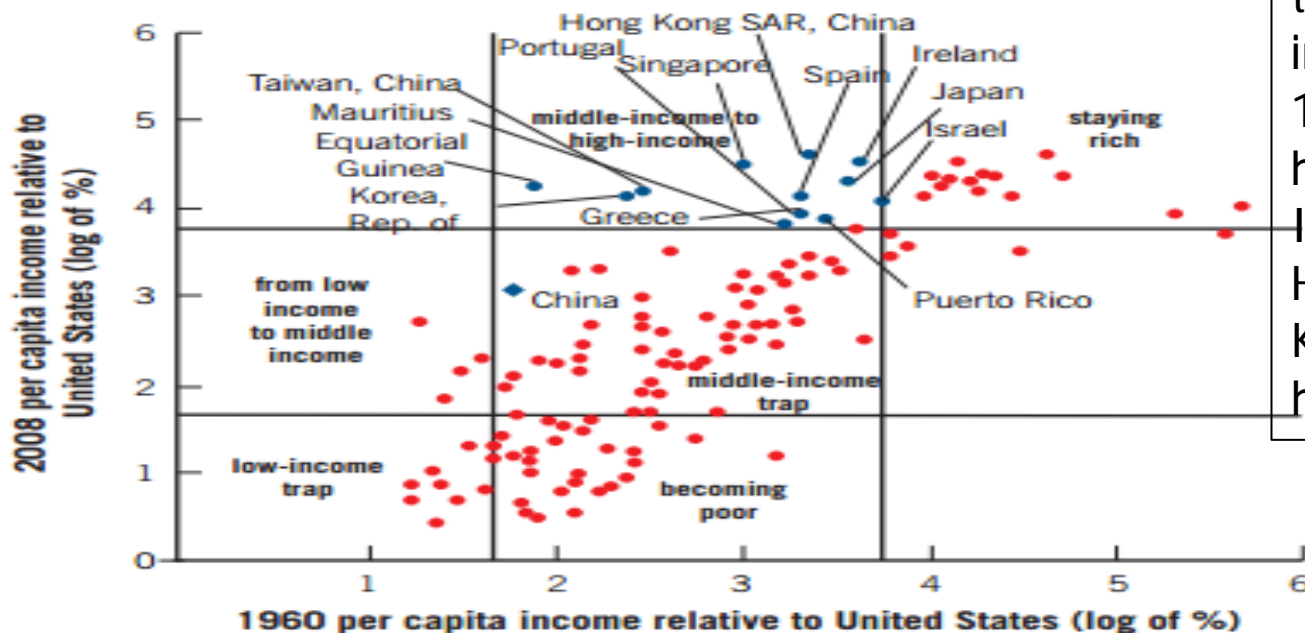
Low-income status and dependent on traditional agricultural economy

Moving from low-income status to middle-income status and middle income growth trap

# 1.5 What Situation Demonstrated a Falling into Middle Income Trap (MIT)?

✓ A middle-income trap is a situation in which a country that is successful in lifting its economy from the a low-income country to a middle-income one but remains at that level without much prospect of becoming an advanced or rich country (World Bank 2011).

Figure 1. Per Capita Incomes Relative to the United States, 1960 and 2008

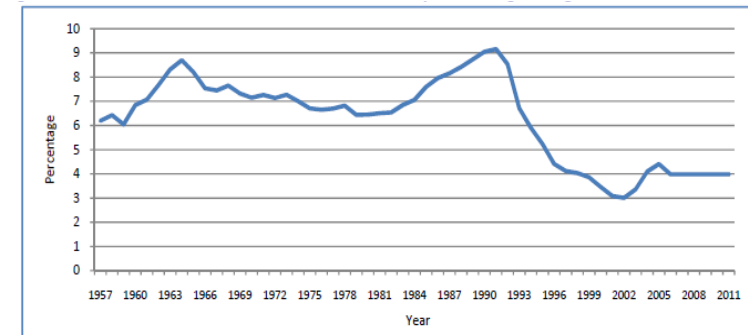


• World Bank estimates that of 101 middle – income countries in 1960, only 13 became high income by 2008. In Asia, only Japan, Hong-kong, Singapore, Korea, and Taiwan have passed the test.

# 1.6 Whether Thailand Falling into MIT ?

✓ Thailand enjoyed its economic growth at the ave. real rate of 7% per annum during 1963-1993. But, a subsequent period was found a sharp decline to 4% or less.

•Medium term growth rate 1952-2011 by 11-year moving average.



Note: The moving averages for the years 2006-2011 are calculated using 2001-2011 data.

Source: Calculated by the author using national income data from the Office of the National Economic and Social Development Board, Thailand.

Source: Jitsuchon (2012).

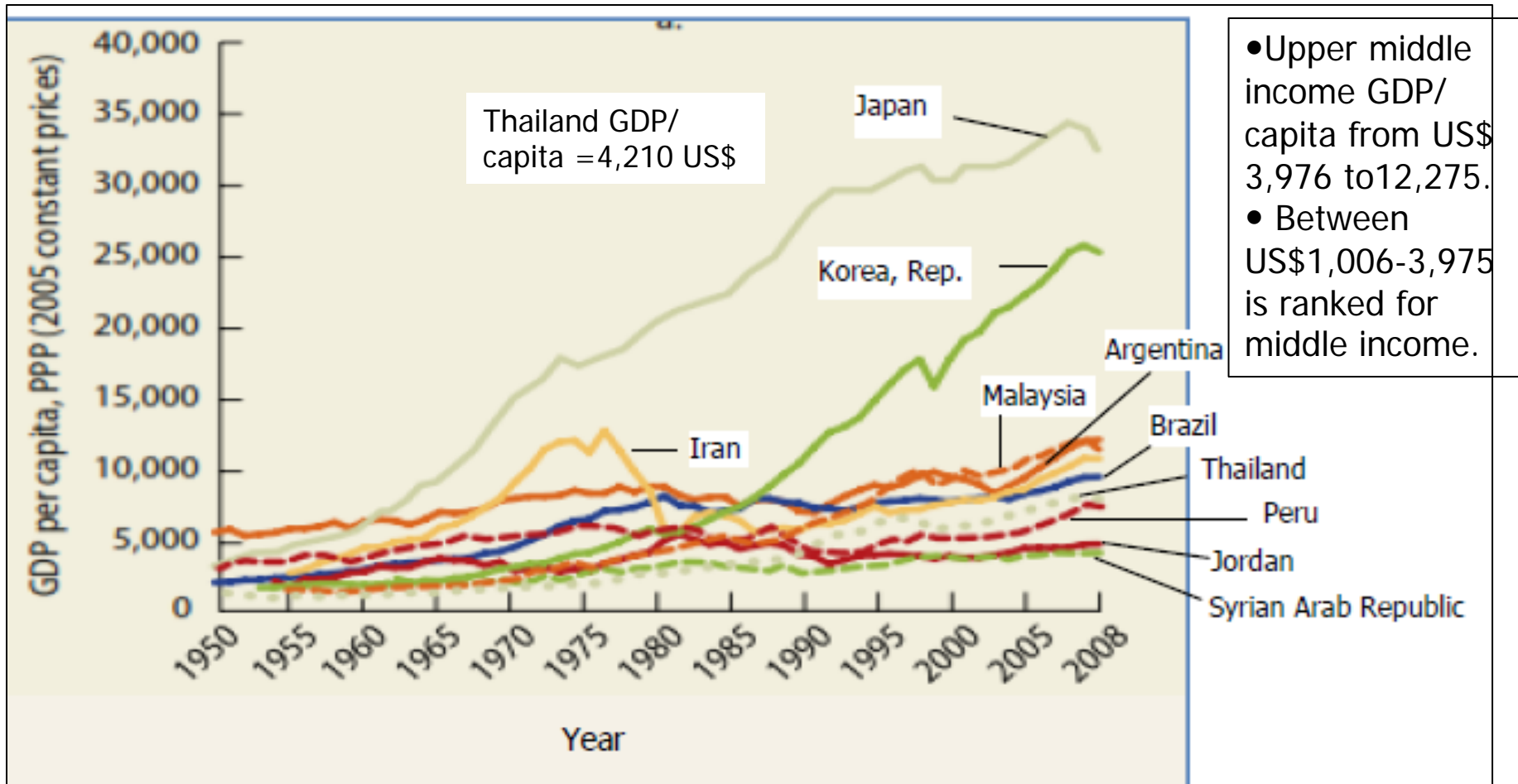
## •GDP growth rates in selected periods

	Pre-boom 1968-86 <sup>1/</sup>	Boom 1987-96 <sup>1/</sup>	Econ. Crisis 1997-99 <sup>1/</sup>	Recovery 2000-06 <sup>1/</sup>	Instability 2007-11 <sup>2/</sup>
Total GDP	6.7	9.5	-2.5	5.0	2.62
Agriculture	4.5	2.6	0.1	2.7	2.06
Industry	8.5	12.8	-1.7	6.2	2.46
Services	6.8	9.0	-3.6	4.3	3.24

Source: 1/Warr, 2011; 2/NESDB, 2015

# 1.7 Comparing GDP Growth Trends of Some Selected Countries

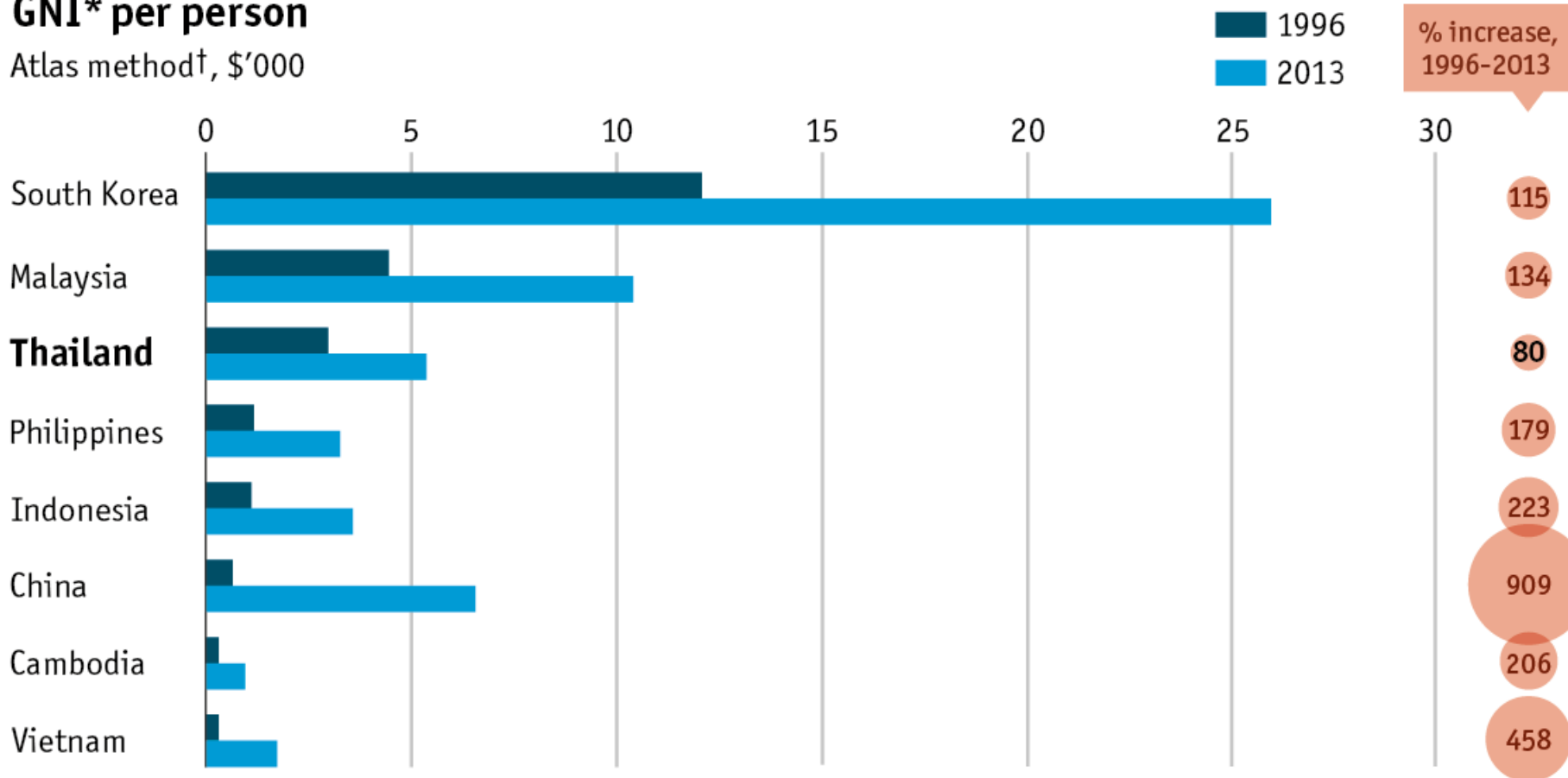
✓ According to GDP/capita Growth of Some Selected Countries, Thailand is one in the MIT. Its GDP growth performance is slowly growth.



# 1.8 Comparing Per Capita Incomes of Some Selected Countries

## GNI\* per person

Atlas method†, \$'000



Source: World Bank

\*Gross national income †A moving average of official exchange rates adjusted for inflation

[Economist.com/graphicdetail](http://Economist.com/graphicdetail)

Source: Economist.com



## 2. Situation of Thailand Agriculture: Past and Present

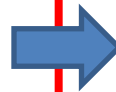
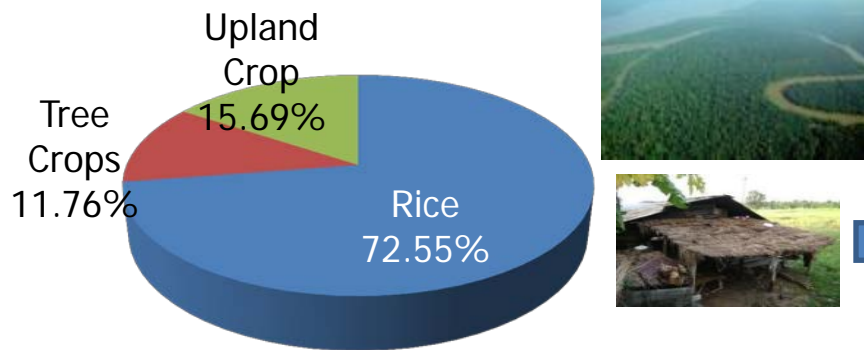


## 2.1 Past Dominant Role of Thailand Agricultural Economy

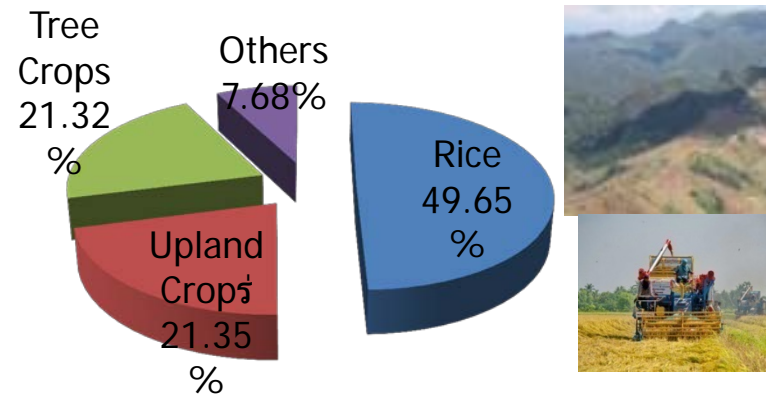
- ✓ Nearly a century ago, agriculture was a predominant sector of the national economy. Economic activities were primarily involved in crop production both for food security and income source.
- ✓ Large number of production resources, particularly land and labor, were accumulated in agriculture.
- ✓ Despite Thai farming mainly produced for subsistence, the surplus was large enough for both domestic and export markets. An industry was small sector and little contributed to the economy.
- ✓ The export income was mainly derived from agriculture. The top four major export items were rice, rubber, teak, and tin.

## 2.2 Development Plans Accelerating Resource Adjustment improving Agriculture and Raising Farm HH Income

### ✓Ratio of crop land in the 1<sup>th</sup> plan (1963-1966)



### ✓Ratio of crop land in the 10<sup>th</sup> plan (2007-2011)



- ✓ Forest area 186 million rai or 58.2% of the country land area;
- ✓ Crop area 51 million rai;
- ✓ Ratio of agr. GDP 34.91%;
- ✓ Ratio of agr. Labor to the country's labor force 67%;
- ✓ Farm HH income in 1953 was about 3,905 Baht/HH.

- ✓ Forest area 107.2 million rai or 33 % of the country area.
- ✓ Crop area 149 million rai.
- ✓ Ratio of Agr GDP 8.8%
- ✓ Ratio of agr. Labor to the country's labor force 41.8%;
- ✓ Farm HH income in 20123 was about 110,700 Baht/HH.



## 2.3 Thailand Plays Essential Role in Export of The Food Surplus

- ✓ Thailand is a food surplus country with planted land area approximately 149 million rai (24 mil. ha).
- ✓ Major important crops are rice, rubber, sugarcane, cassava, maize, oil palm.

Items	Rice	Maize	Rubber	Sugarcane and sugar	Cassava	Oil palm and palm oil
Planted area(mil. rai)	79	7.4	19.28	8.1	8.8	4.3
Ratio of planted area(%)	53.02	5.0	12.94	5.09	5.90	2.88
<b>Farm HH(million)</b>	<b>3.8</b>	<b>0.41</b>	<b>1.26</b>	<b>0.21</b>	<b>0.47</b>	<b>0.13</b>
Production(mil.)	22.23	4.79	3.6	10.75	24.15	2.94
Ratio of domestic utilization(%)	54.2%	91.23	14%	24.58	26.17	94.07
Ratio in export market (%)	27.5%	0.34	34	11.18	89.37	1
Ranking in export market	(1)	-	1	(2)	(1)	(-)

Source: Calculated from OAE data

Conversion ratio: 1 ton of sugarcane = 0.108 ton of raw sugar; 1 ton of oil palm = 0.26 ton of palm oil; 1 ton of paddy = 0.650 ton of white rice.

## 2.4 Main Export Commodities of Agriculture and Agro Industry

✓ Thailand is ranked one of the tenth in agricultural and food export to the world market.

• The top ten agricultural product export in 2013 and 14

Items	2013 (mil.baht)	2014 (mil.baht)
1. Rubber	249,296.4	193,754.8
2. Rice	133,851.2	174,854.7
3. Cassava product	98,344.6	114,644.9
4. Processed chicken	60,470.1	61,315.2
5. Frozen shrimp	28,531.7	27,700.4
6. Fresh, frozen, and dried fruits	32,012.7	40,730.8
7. Fresh and frozen squid	10,291.6	11,383.6
8. Fresh and frozen fillet	8,711.7	10,311.8
9. Fresh and frozen chicken	6,744.4	12,650.0
10. Maiz	6,000.1	8,933.1

• The top ten agro-industry products export in 2013 and 14

รายการสินค้า	2556 (mil. baht)	2557 (mil.baht)
1. Can seafood	146,052.9	138,547.1
2. Sugar	85,494.5	87,942.4
3. Can and processed fruit	49,247.1	55,672.0
4. Beverage	37,868.2	43,719.4
5. Animal feed	35,179.9	39,962.4
6. Wheat products and instant food	35,795.5	42,669.6
7. Vegetable and animal oils	24,748.4	17,667.2
8. Food flavor and additive	16,796.3	19,076.5
9. Can and processed veg.	10,192.7	11,619.1
10. Beef and processed beef	9,637.6	10,485.9

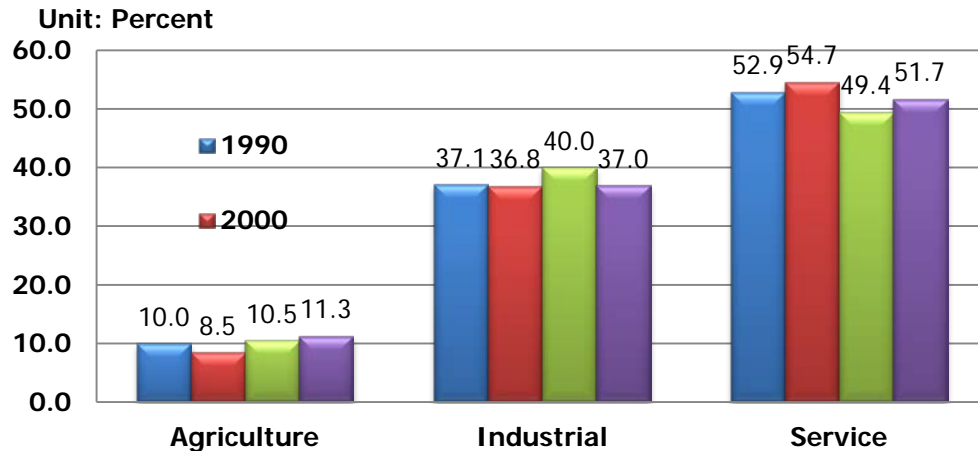
## 2.5 Recent Development in Thailand Economic Structure

- ✓ A result of economic progress under previous development plans has consequently transformed Thailand economy toward the more importance of industrial and service sectors.
- ✓ Share of labor force by sectors in 2013: agriculture 38%; manufacturing 14%; and services 48%.
- ✓ In recent years, The top five major export items are automobile and parts, data processing machines and parts, refined fuel, precious stones and jewelry, polymer products.
- ✓ However with the movement toward global and regional free trades, there are strong competition in production and trade in all sectors.

## 2.5 (Cont.)

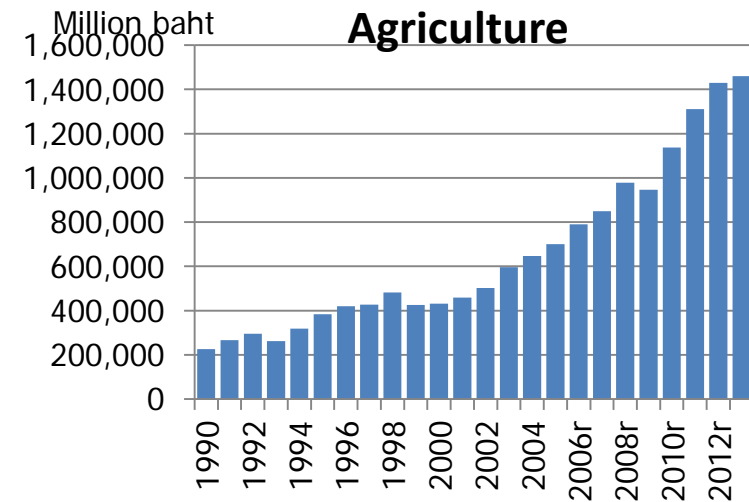
✓ Despite the GDP in Agriculture has been continuously increased but its share in the total GDP consistently declined.

- Value of GDP in 2012 = 12.91 trillion Baht
- Income Per capita 131,579 Baht.



Source: Calculated from NESDB data , 2013

- Absolute value of GDP in agriculture (Baht).



Source: Calculated from NESDB data , 2013

✓ Also agricultural growth remains sluggish in the past few decades.

	Average GDP growth in selected period				
	1968-86 <sup>1/</sup>	1987-96 <sup>1/</sup>	1997-99 <sup>1/</sup>	2000-06 <sup>1/</sup>	2007-11 <sup>2/</sup>
Total GDP	6.7	9.5	-2.5	5.0	2.62
Agriculture	4.5	2.6	0.1	2.7	2.06

## 2.5 (Cont.)

- ✓ A faded agricultural sector and declining growth were reflected in agricultural export income and income inequality.
- ✓ But agriculture still be a main occupation of rural HH.

	unit: billion baht		
฿	1992	2002	2014
1. Industry	572.25	2,399.58	5,647
2. Agriculture	169.77	305.42	719
% share of Agriculture	20.60	10.14	9.83
3. Agro-industry	82.12	218.94	547
4. (2+3)	251.90	523.36	1,266
% share of agr. and agro industry to total export	30.56	17.90	17.31
5. Total Export earnings	824.15	2,923.94	7,314



## 3. Problems Encountered Thailand Agricultural Growth



## 3.1 A Decline in Agricultural Productivity

✓ Agricultural growth in the past was stemmed from increasing number use of production resources but lacked concern on quality and productivity enhancement.

- Increasing number of Land, labor, and capital but not technology which is represented by TFP.

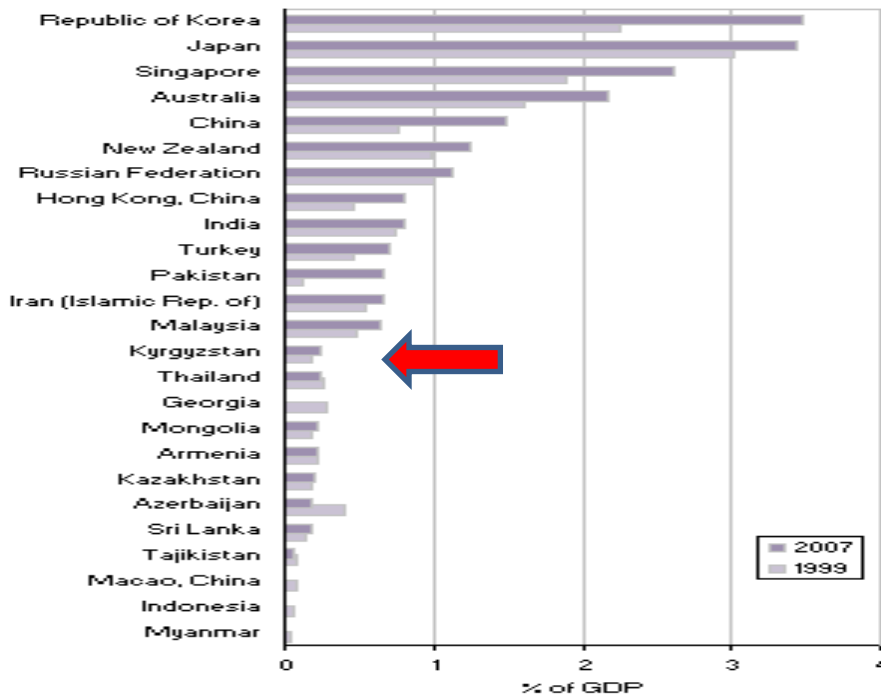
Agricultural Sector	Ave. the 6 <sup>th</sup> Plan (1987-91)	Ave. the 7 <sup>th</sup> Plan (1992-96)	Ave. The 8 <sup>th</sup> Plan (1997-01)	Ave. the 9 <sup>th</sup> Plan (2002-06)	Ave. The 10 <sup>th</sup> Plan (2007-11)
GDP Growth	4.55	2.98	2.04	2.90	1.64
Source of growth					
Labor	0.11	-0.27	-0.07	0.08	0.07
Land	0.06	0.05	0.06	0.14	0.05
Capital	3.01	6.57	3.34	3.19	3.55
TFP	1.36	-3.37	-1.29	-0.51	-2.18

## 3.2 Threat from Previous Low Investment in Technology and Innovation Development

✓ Small-scale farmer shares a large ratio of Thailand agriculture. Lack of fund and skills prevented them to access to technology and innovation.

✓ Government investment in R&D in Thailand is very low about 0.21% of GDP; Lower than Korea, Singapore, and Taiwan.

**Figure 15.1 Gross domestic expenditure on research and development (% of GDP), Asia and the Pacific, 1999 and 2007**

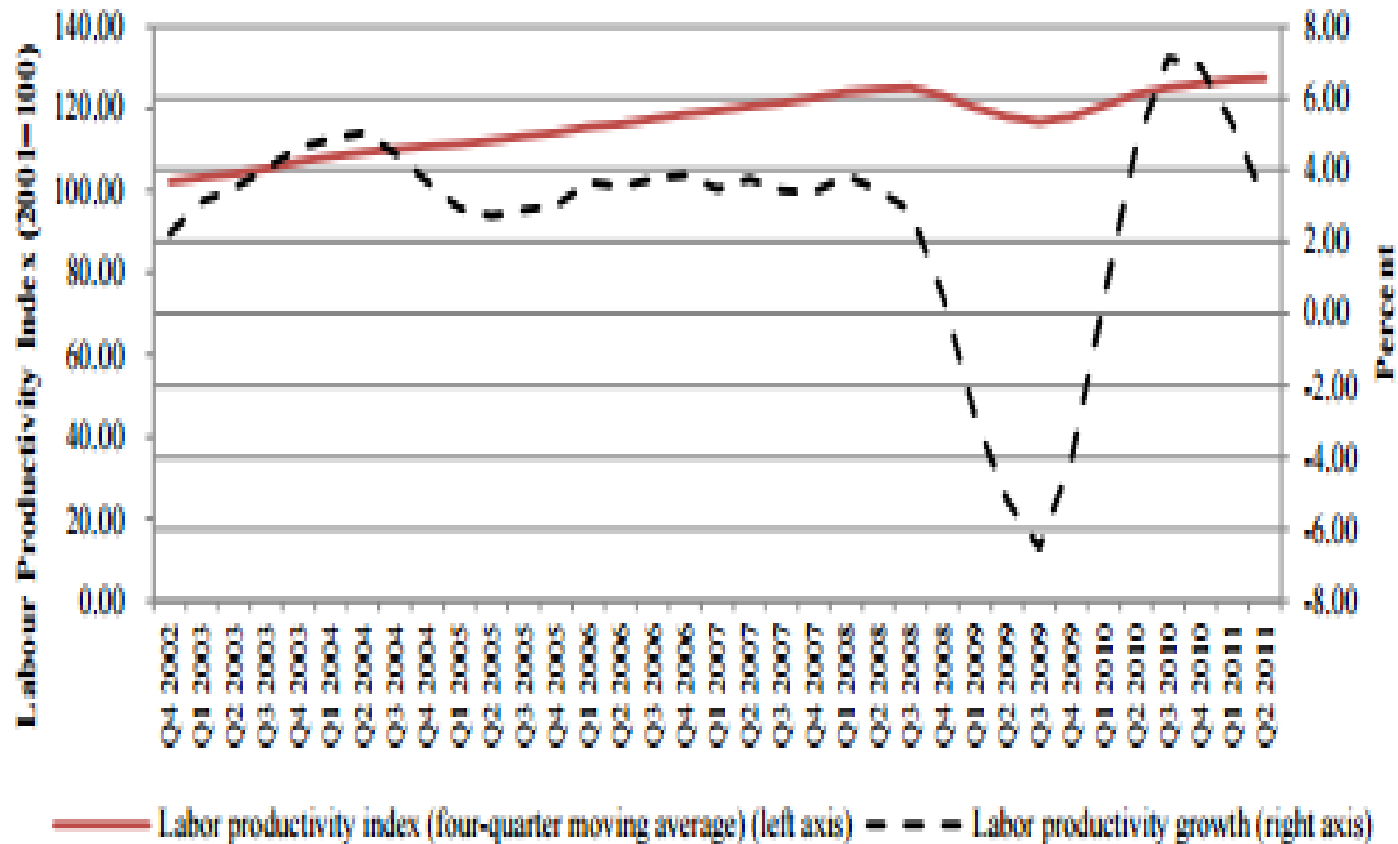


➡ Gove. Research Budget in Agriculture about **1,318 million baht** (average during 2007-2010).

✓ Low research investment consequently resulted slow progress in **new technology and innovation development**, losing **competitive capacity**, increasing **cost**, and reducing **market share**.

## 3.3 A Sluggish Labor Productivity Improvement

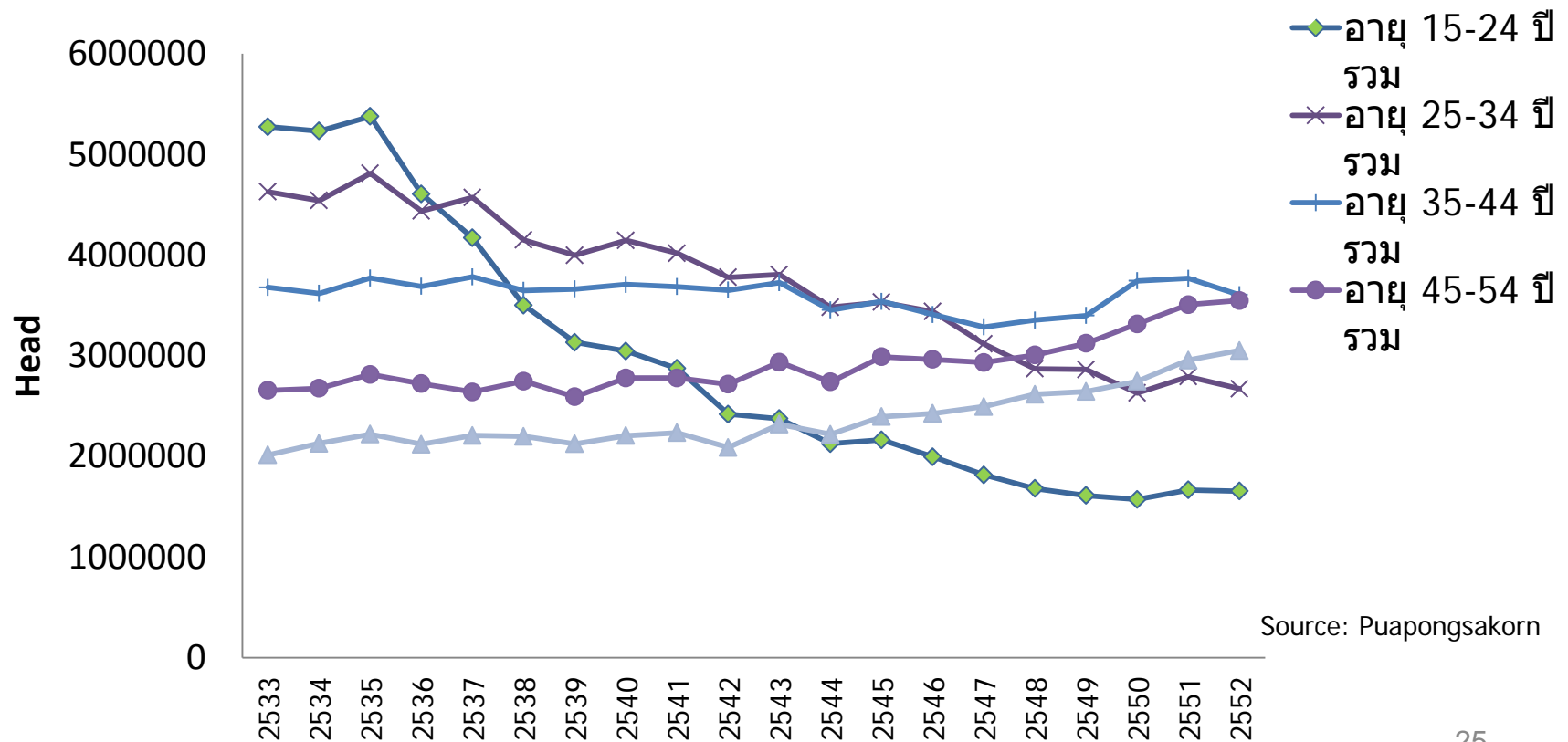
✓ Thus its impact on smaller return to labor



## 3.4 Encounter Farm Labor Shortage and Aging Farmers

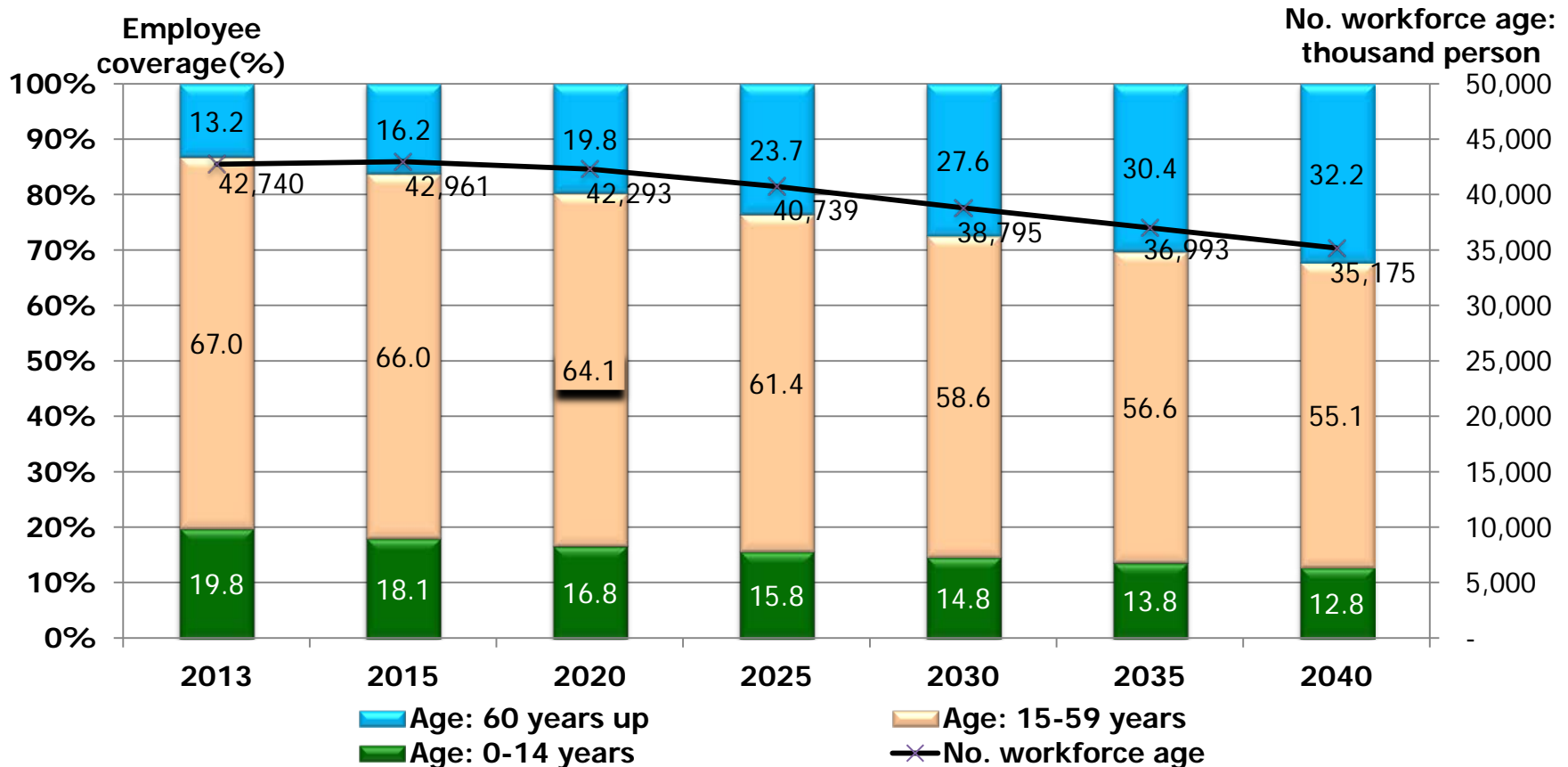
✓ Continuously declining agricultural labor force and demonstrating an increasing trend of aging farmers.

No. of farm laborers who work more than 20 hr/week by age



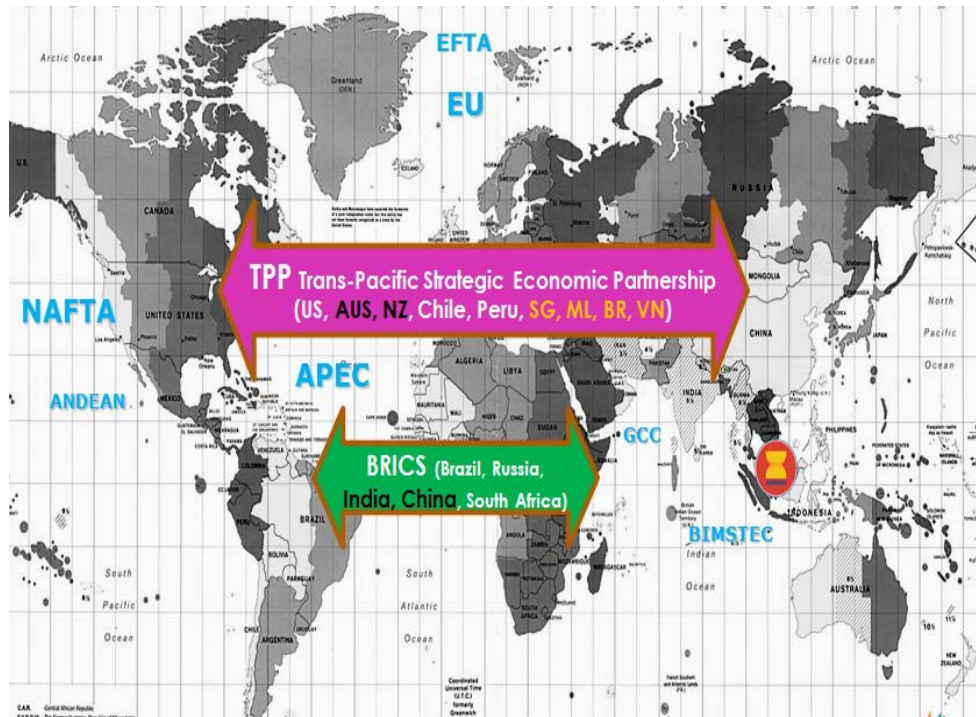
## 3.4 (Cont.)

✓ Thailand has already moved into aging society with increasing trend of dependent citizen



## 3.5 Moving Toward Free Trade Policy Threatening Small-scale Farmers

✓ Economic and market integrations are important but they create differential impacts from the agreements and leads to having new development measures of NTB or TBT.



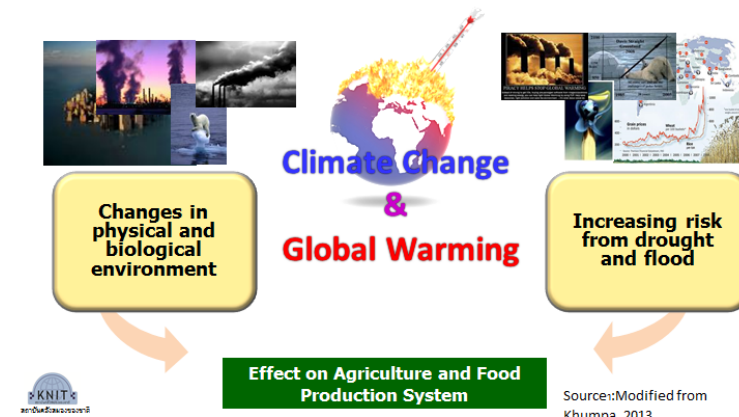
- Developed countries have stronger implementation of standards and quality which developing countries are difficult to achieve.
- Increasing new development measure for technical barrier to trade (TBT);
- Agriculture in Thailand largely consists of small-scale farmers. They are facing difficulty in adjusting themselves to the new trade regulation.
- Access to new technology for better production and high quality standards is rather difficult.

# 3.6 Global Climate Change and Its Linkage to New Trade Regulation and Standards

✓ Extreme weather events, particularly drought and flood, increasing risk to agricultural production, threatening natural and agricultural ecosystem, increasing variation in food supply and farm income.

✓ Distress in global climate change leads to reconsider in the use of global natural resources and environment.

✓ Establishing a clear link between sustainable development and disciplined trade liberalization.



Source: Modified from Khumma 2013

CARBON TRADING.....  
a new Trend towards a GREEN Planet

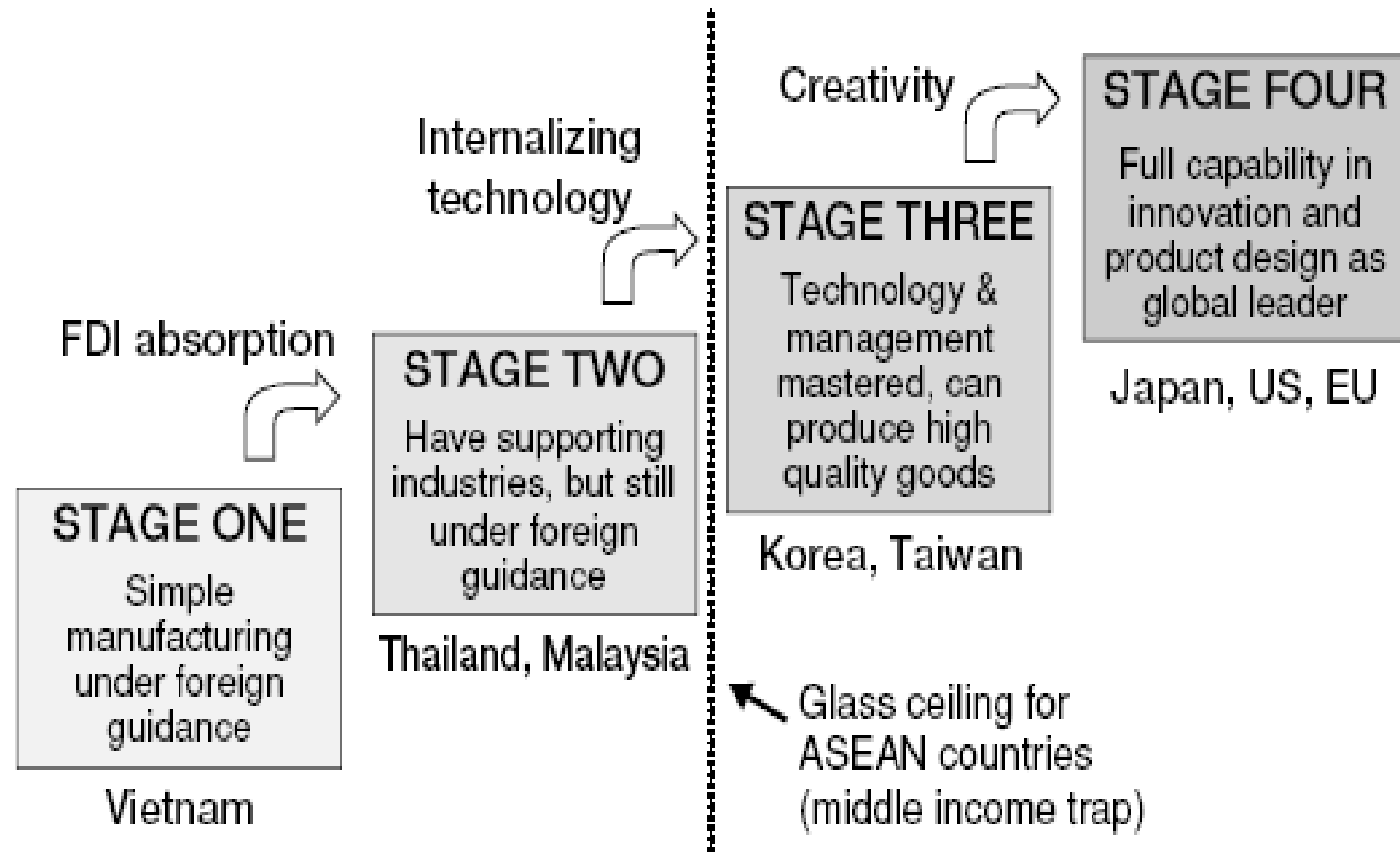




## 4. Renovating Thailand Agriculture in Avoiding From the MIT



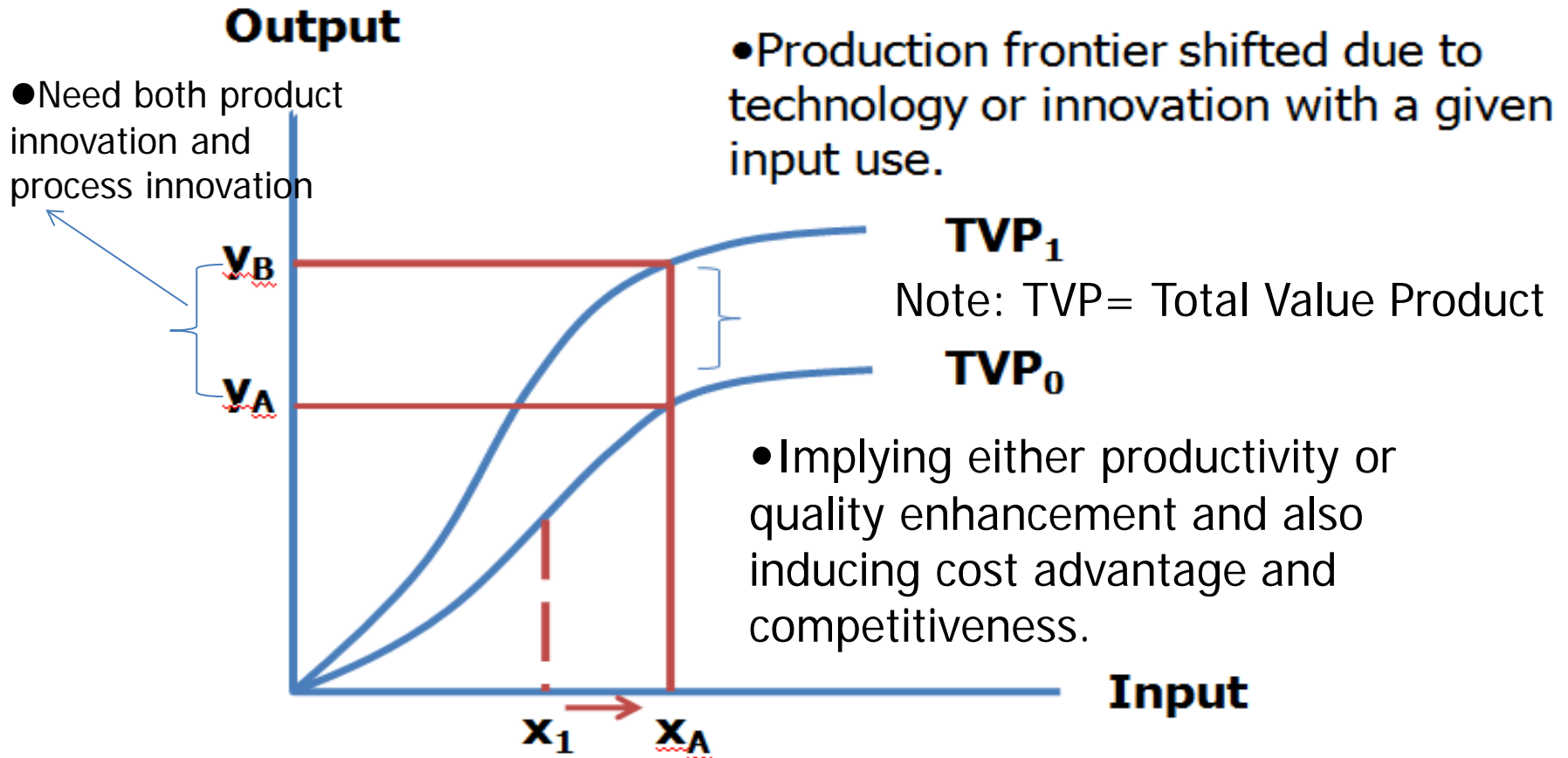
# 4.1 Stages of Caching-up Industrialization of Some Selected Countries



## 4.2 Essential Need to Reform the Agriculture for Escaping MIT

- ✓ Shifting away from growth that is driven primarily by factor accumulation. They should rather embrace growth based on **productivity increases** driven by improvements in the **quality of human capital, product and innovation**.
- ✓ Proactive policies on technology and innovation development. Enhancing productivity through **creativity of new products with high quality and value** for enable them to compete in the international markets.
- ✓ **Creating new strategies for developing new products, processes, and markets are necessary.**
- ✓ Promoting physical capital accumulation and improvement through advanced infrastructure development, reducing regulation rigidity, including market reform.

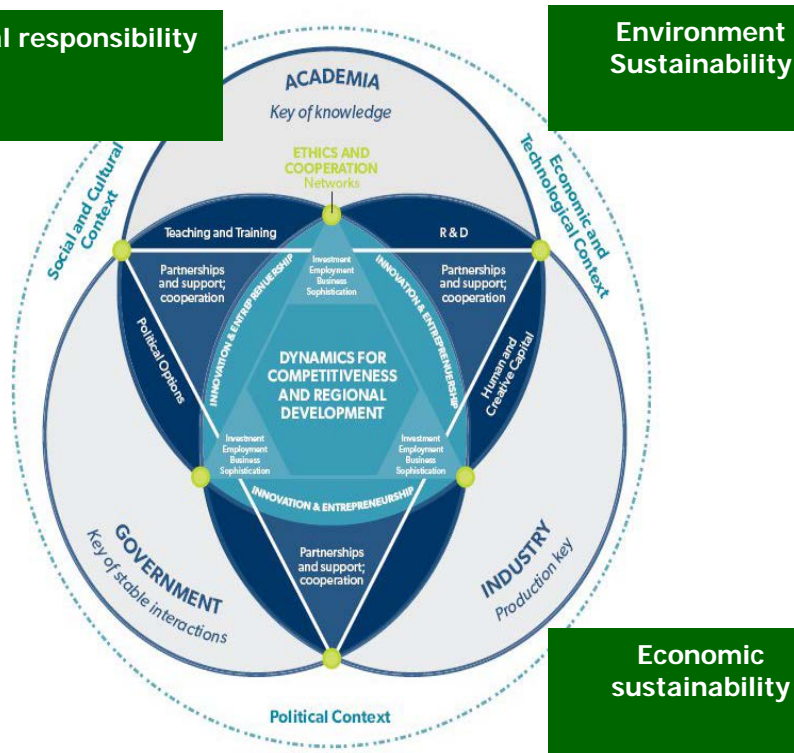
## 4.3 Theoretical Concept for Productivity and Capacity Enhancement



- Both product Innovation and process innovation are necessarily to create and develop.

## 4.4 Triple Helix Model: A Synergy for Technology Transfer and Moving Up Agricultural Economy

✓ The the triple helix is used to explain the relations between the academy, industry and government since innovation has become the decisive challenge for global competitiveness.



- The competitiveness of firms help to determine the flows of income and employment, creating regional and sectoral development and wealth creation.
- The academy takes leading role as enhancing skills of human capital by knowledge and technology transfer.
- The government is a key interactions between the economic and social networks to ensure cooperation, partnership and institutional support.

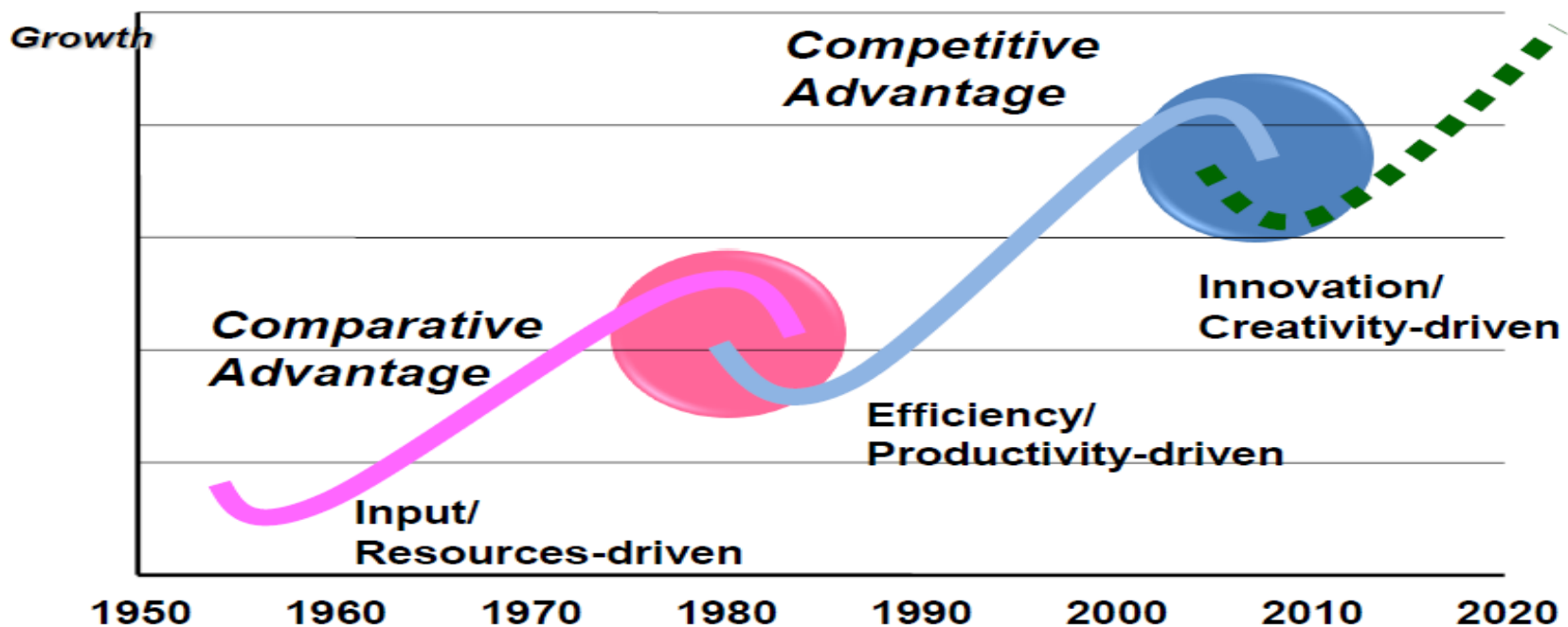
## 4.5 Transforming Agriculture Toward Knowledge Base Driven Economy

✓ A scarcity of production resource and environment, advanced in technology, in coupled with the free trade policy, have changed classical concept from let “Factor Driven Economy” to be a new concept of “Innovation Driven Economy” or “Knowledge-based Economy”.

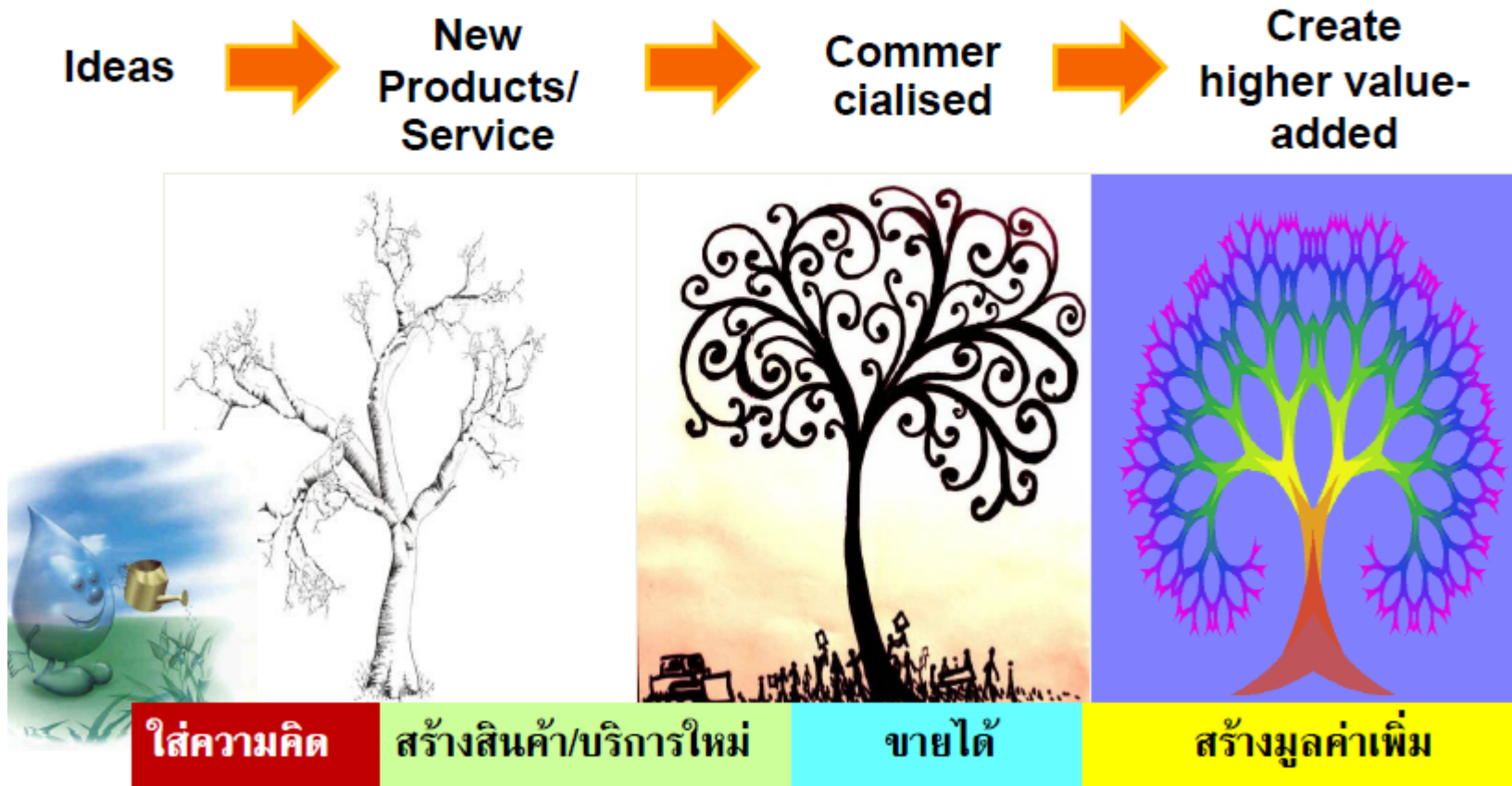


## 4.5 (Cont.)

- ✓ The concept is how to make use of the same certain amount of resource for a better quality and production value?
- ✓ Integration of **innovation, technology, social capital, local wisdom, and environmental value** into the creation of product value.



# 4.5 (Cont.)



- Newness
- Knowledge or Creativity
- Economic Benefits

# 4.6 Empowering Rural Poors Through Enhancing Management Skills and Developing New Supply Chain

Community engagement

New management skill

- Specific variety
- Innovative products
- innovative technique
- Social enterprise
- Fair trade



Empowering farmers and community in production and business management skills



Creating new and fair share supply chain linking up stream and down stream business activities

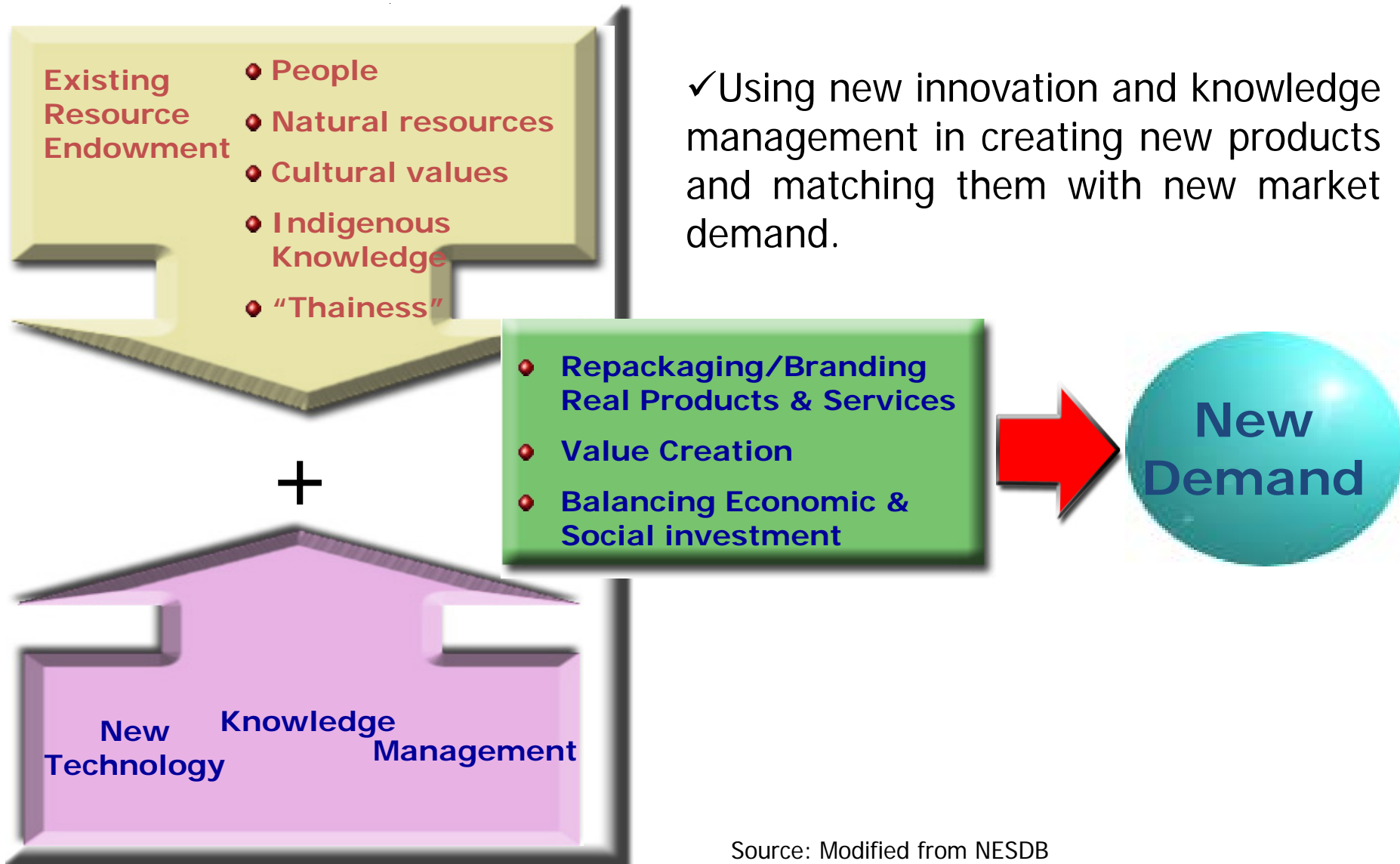
University engagement

Business engagement

Public sector and government engagement

Infrastructure improvements; ensuring property rights; regulatory governance; better extension services.

# 4.7 Matching New Innovative Products with New Demand



# 4.8 Rice : Can It Be Innovated Beyond a Basic Staple Food?

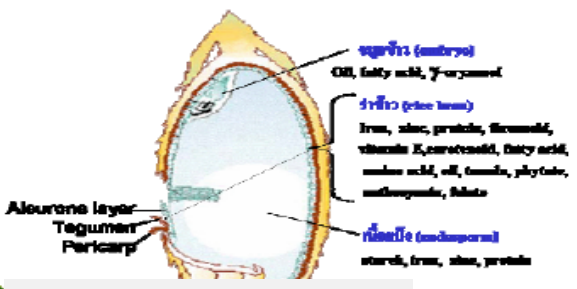
Let Your Rice be Your Medicine

Iron and high Fe bioavailability

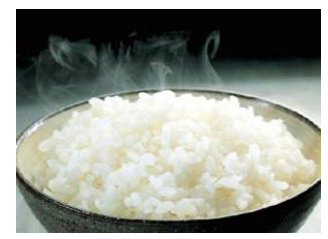
High Antioxidants Selenium/ Folate/ Phytonutrients (สารพฤกษเคมี)



Grain for Life: นวัตกรรมพันธุ์ข้าวที่มอบคุณค่า  
สารอาหารและคุณค่าทางโภชนาการ  
Composition rice grain



Low – medium glycemic index



ที่มา: รัชณี คงคาฉุยฉาย 2556

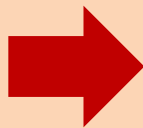
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# 4.8 Rice (cont.)

✓ Development toward healthy food & cosmetic



Rice production



Organic Paddy  
15 B/kg



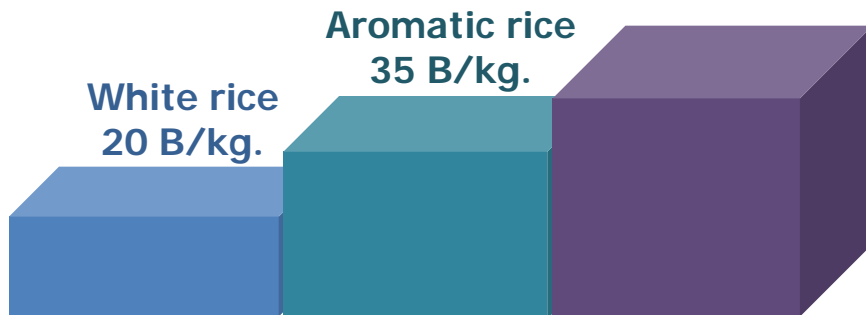
Organic white  
rice  
30 B/kg



Cosmetic/spa  
5000 B/kg

Nutritive rice  
>80 B/kg.

Medicinal material  
6,500 B/kg



# 4.9 Moving up Traditional Agricultural Supply Chain to Become Value Chain

✓ Using innovation and creativity for upgrading product value and value added.

**ระบบการผลิต**  
*(Production System)*



**ระบบการแปรรูป**  
*(Processing System)*



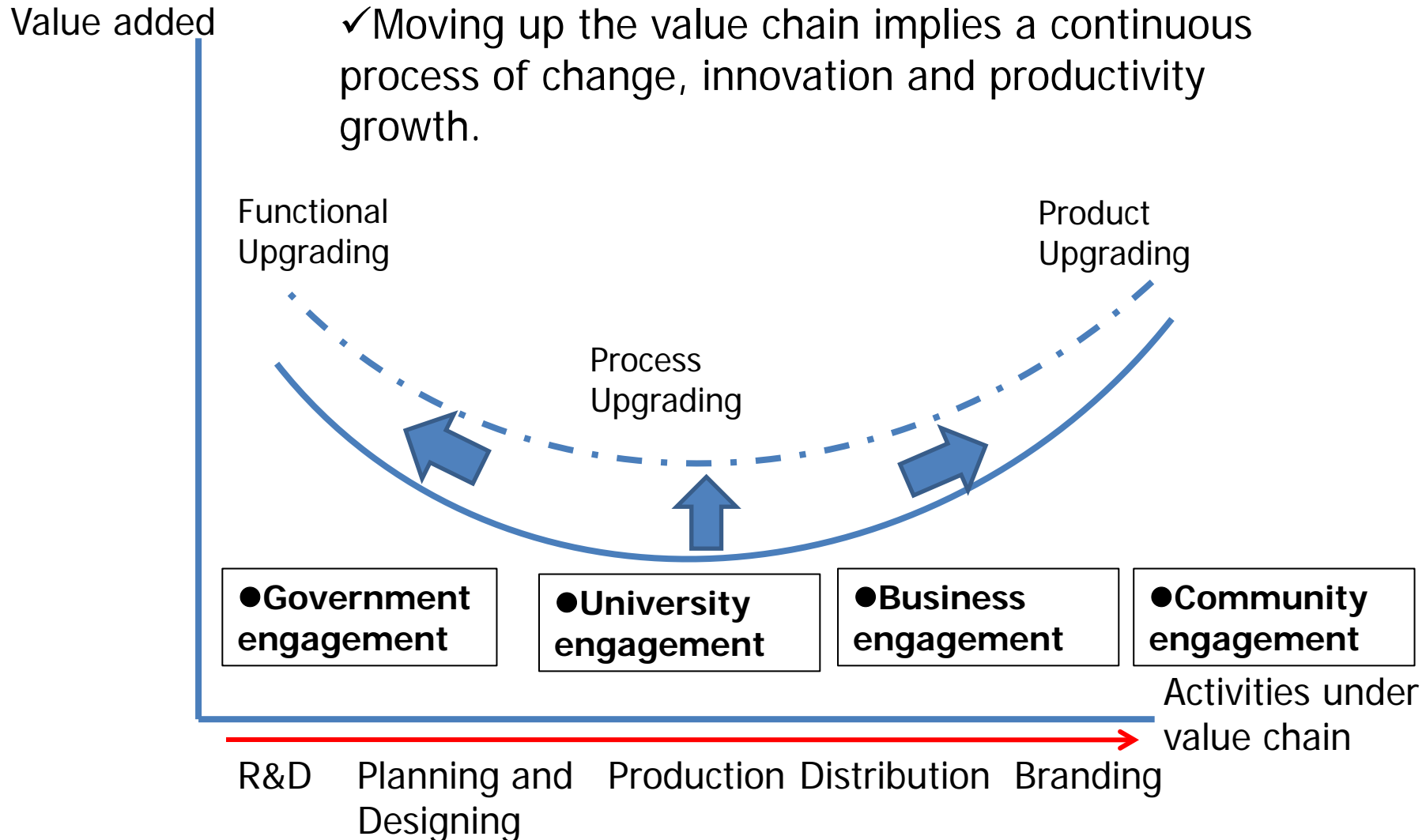
**ระบบการตลาด**  
*(Marketing System)*



**ระบบการบริโภค**  
*(Consumption System)*



# 4.10 R&D: An Important Gearwheel for Moving Up the Value Chain



# 4.11 Renovating Agricultural-Base Economy to be Specialized in Bio-Base Economy

New Investment Promotion Strategy Direction

**THAILAND**

Sustainable Development, More Competitive Economy



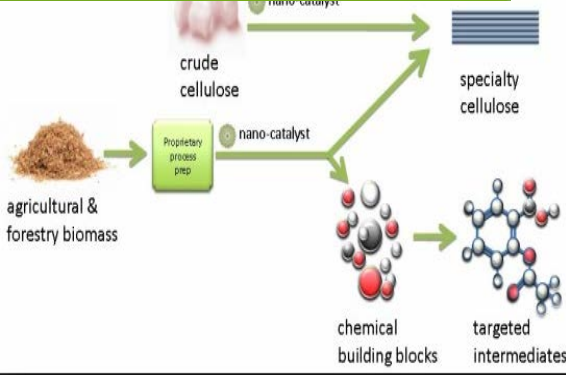
**INNOVATION  
HIGH VALUE-ADDED  
GREEN TECHNOLOGY  
RESEARCH & DEVELOPMENT**

THAILAND: An Asian Hub, a World of Opportunity



- Industrial biotechnology;
- Biorefineries;
- Biobase chemistry;
- Biobase plastic and composites.

## The Evolving Biobased Plastics Landscape

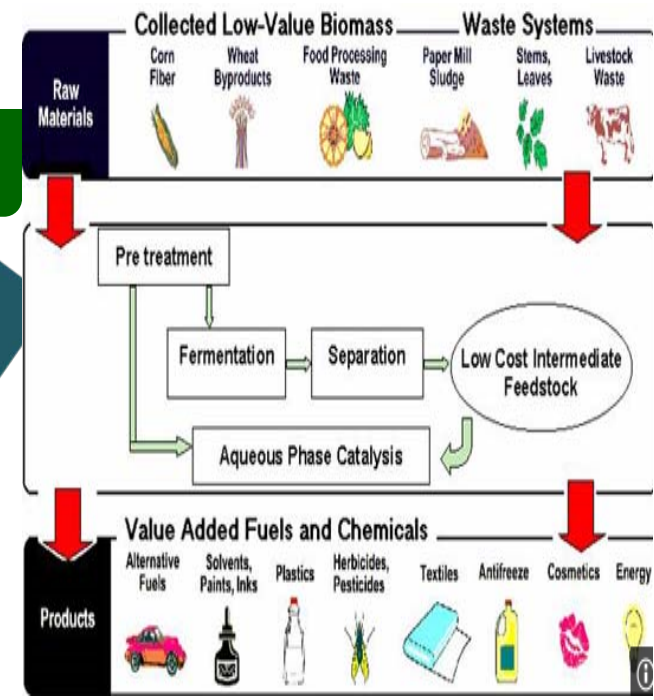


✓ To be specialized in bio-base commodity

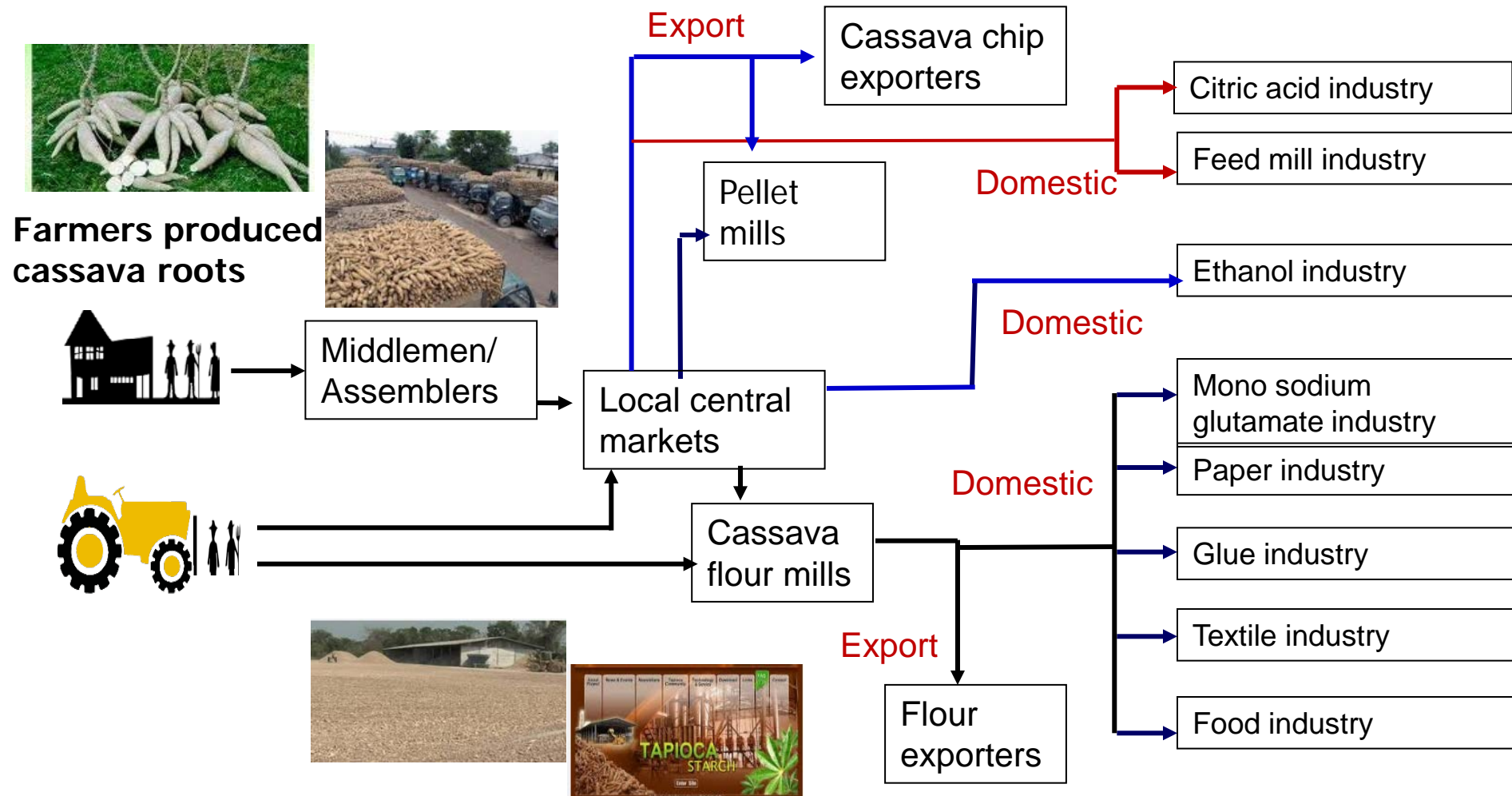
**Agriculture base**



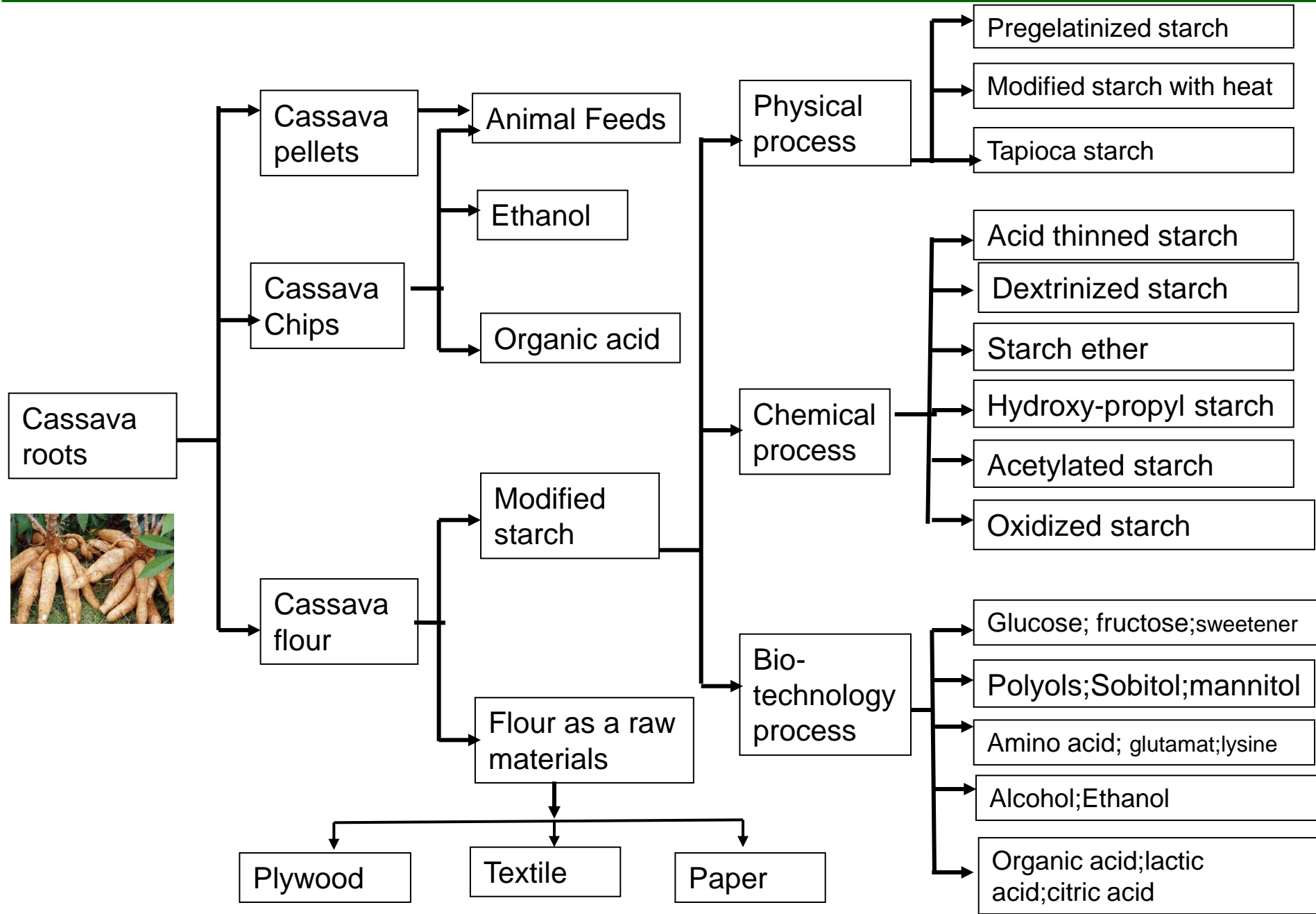
Time dimension



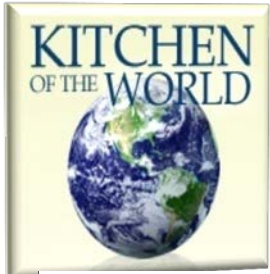
## 4.11 (Cont.)

Up stream  
productionMiddle stream  
productionDown stream  
production

## 4.11 (Cont.)



# 4.12 Transforming Agriculture As a Regional and Global Food Hub



- ✓ Responding to the need and interest of consumers in domestic and global markets
- ✓ Developing food technology and quality in comply with international food and safety standards



- ✓ Certifications,
- ✓ Inspection,
- ✓ Testing,
- ✓ Health-related labeling



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- ✓ Adopting WTO agreements on SPS measures for food quality and safety standards and other related agreements on trade.



**International standards**  
**ISO/HACCP/Codex/OIE/IPPC)**



- ✓ Environmental protection,



- ✓ Investing in innovation for agro-industry food processing.

# 4.13 Moving Up Agriculture as a Source of Renewable Energy and Green Technology

## Bio-energy from biomass and agricultural residues

Husk from rice mills  
Residues from oil palm crushing mills

วัสดุจากกระบวนการผลิตการเกษตร



Electricity



Bio-gas

Gasifier

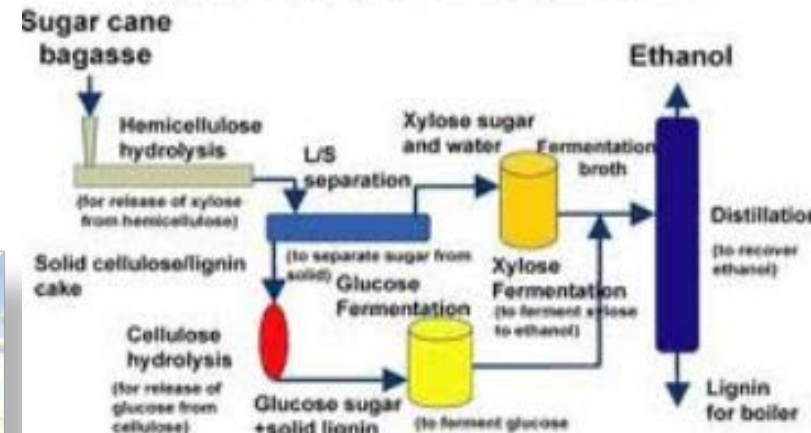
Clean gas

Generator

Source: google.co.th

## Cellulosic Ethanol

Celunol Corp. Ethanol from Biomass Process



## Agricultural fields and Windmills



## 4.12 Policy Challenges

- ✓ Enhancing R&I for raising competitiveness:
  - increase the level of knowledge and technology embodied in production and exports, which would make competition through rising investment in R&D.
- ✓ Upgrading the human resource base:
  - Support a shift of economic activity towards more high value-added areas, raising productivity and quality. Addressing this through education and training policy requires a growing focus on life-long learning.
- ✓ Creating new areas of economic activity:
  - Stimulating green and creative innovation and technology for new firms and entrepreneurs;
    - Agricultural-Base Economy to be Specialized in Bio-Base Economy.
- ✓ Enhancing the country and location attractiveness .
  - No political conflict would enhance FDI.

## Q&A

