Chapter 1

Summary

October 2016

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Chapter 1

Summary

1.1 Thai NR supply and demand

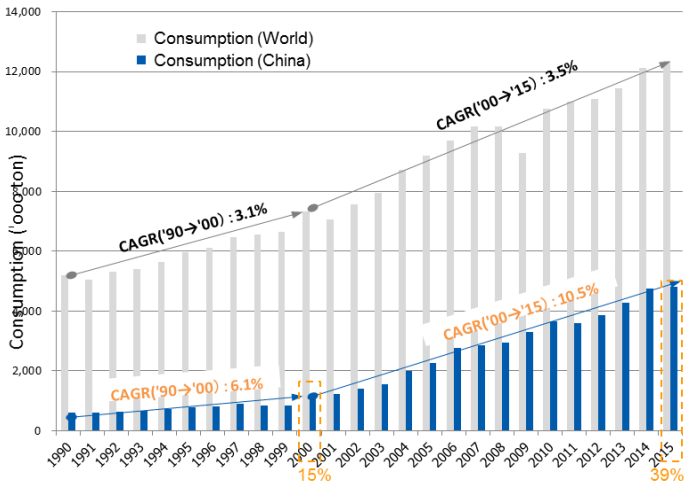
1.1.1 Trend of NR supply and demand / price

The Chinese market, which drives world rubber demand, has stagnated, resulting in inventory levels increasing and prices declining.

- NR demand has been led by rapid increases in demand in China since 2000. China's share of total consumption increased from 15 percent in 2000 to 39 percent in 2015.
- Along with rapid growth in demand in China, inventory levels have decreased since 2000, and the price continued to increase until 2011 (the price in 2011 was around 7.2 times the price in 2000).

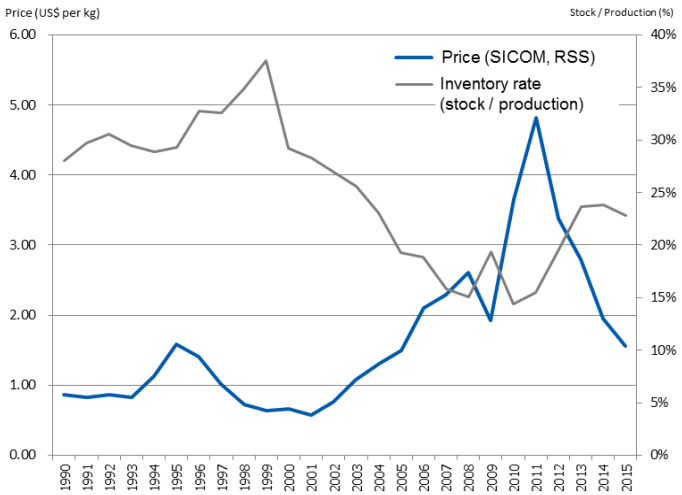
However, due to the slowdown in China's economic growth, inventory levels have increased and prices have declined since the beginning of 2012.

Figure 1-1: Trends in NR Consumption



Source: IRSG statistics.

Figure 1-2: Trends in NR price and inventory level



Source: IRSG statistics.

1.1.2 Trends in NR production

Thailand cannot control production increases and the country has seen continual increases in production even though prices have fallen since 2012.

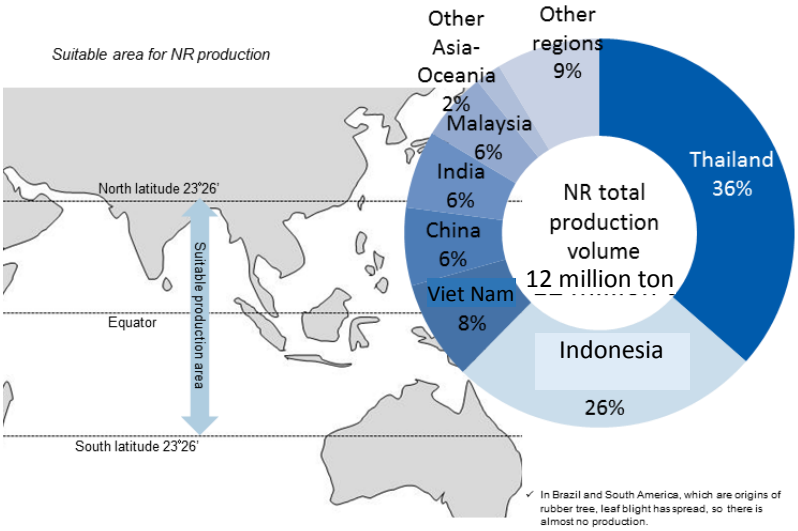
- NR producing countries are concentrated in Southeast Asia. Among these countries, Thailand accounts for 36 percent of total production volume, and Indonesia accounts for 26 percent, and the two countries lead world production.

- Thailand has continued to increase production at an annual rate of 4.4 percent from 2000 to 2015, and has also maintained this production increase despite the decline in prices since 2012.

- Indonesia has a high ratio of new estates and the climate is suitable for palm production, so it is easy to change production to palm oil depending on the price situation.

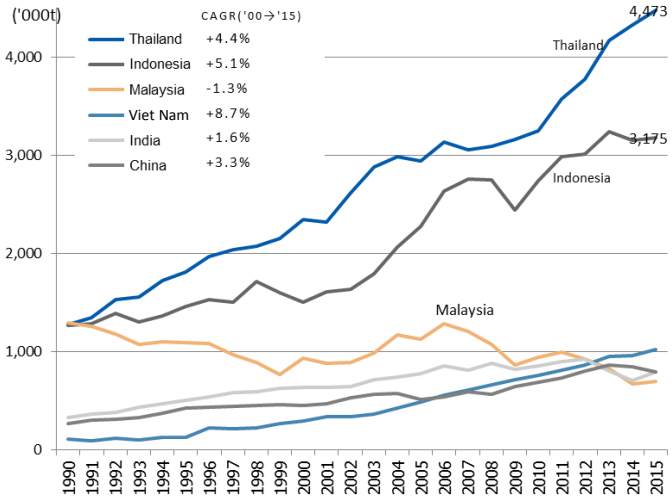
    - Oil extraction within 24 hours after harvest is required for palm oil, so it is difficult for smallholders to change production. It is particularly disadvantageous for farmers producing RSS.

Figure 1-3: Distribution of major producing countries



Source: IRSG statistics.

Figure 1-4: Trends in production volumes in major producing countries



Source: IRSG statistics.

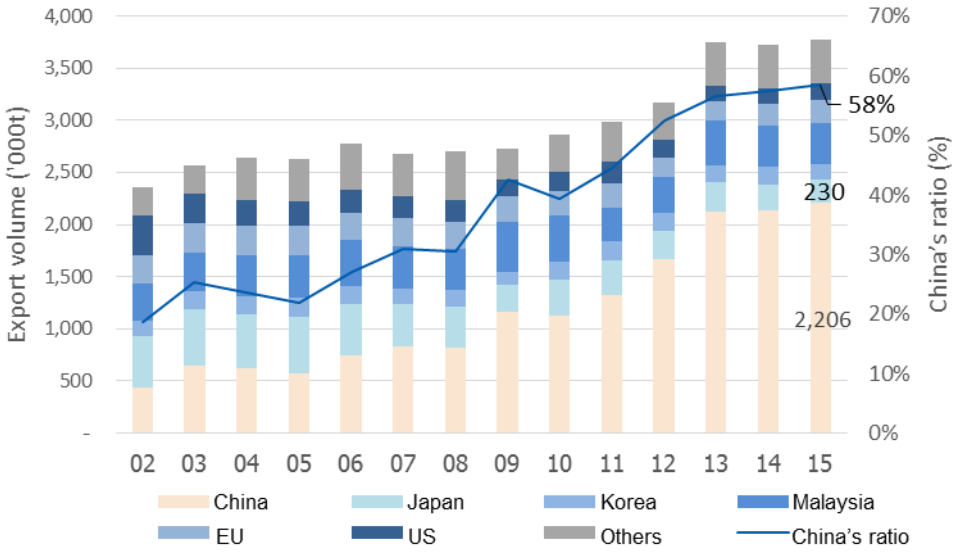
1.1.3 Thailand's supply has increased to meet Chinese demand

Mutual interdependence on NR between China and Thailand has been growing rapidly since 2000, when the import dependence of China and the export dependence of

Thailand were both close to 60 percent.

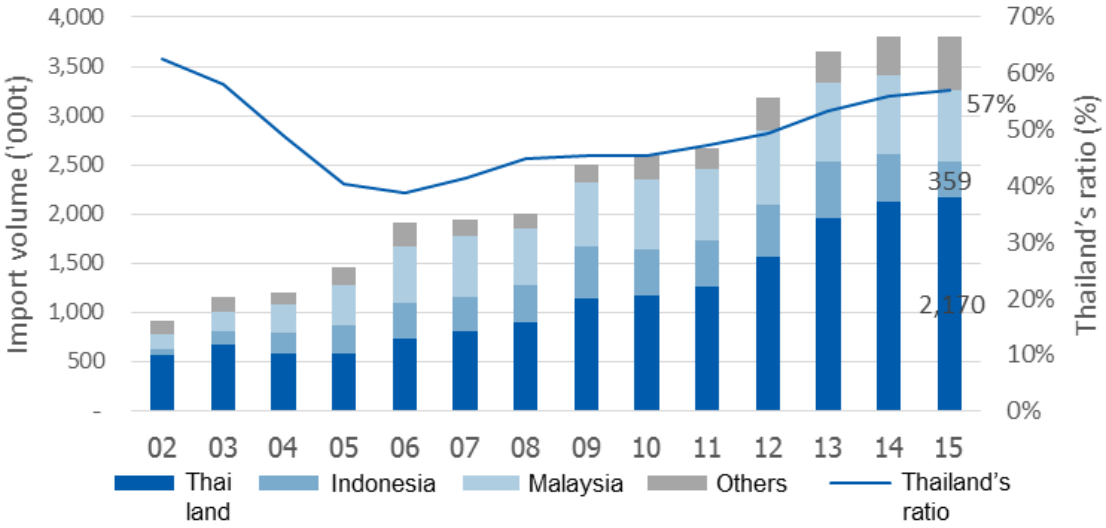
- Thailand expanded its exports to China in response to increasing Chinese demand. In 2015, this expanded China's dependence rate to 58 percent. (In the same year, China's dependence rate on Indonesia was only 13 percent.)
- 57 percent of China's import volumes also come from Thailand.
- However, Japan's imports from Thailand decreased from 69 percent in 2012 to 34 percent in 2015, while imports from Indonesia increased.

Figure 1-5: Trends in Thailand's export volumes by destination country



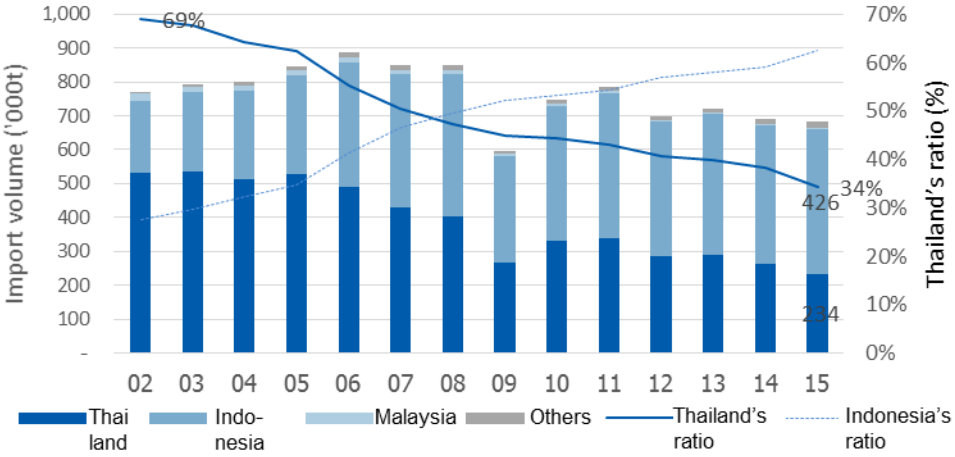
Source: IRSG statistics

Figure 1-6: Trends in China's import volumes by country of origin



Source: IRSG statistics

Figure 1-7: Trends in Japan's import volumes by country of origin



Source: IRSG statistics.

1.1.4 NR production increases in Thailand

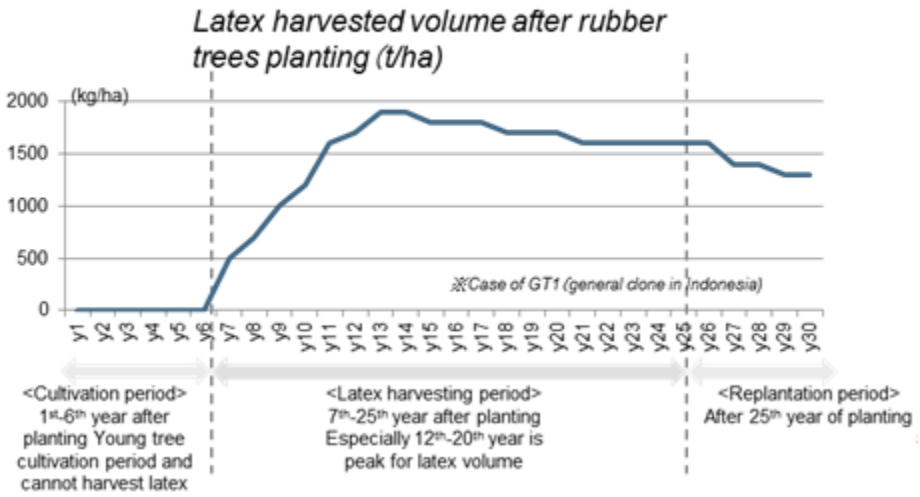
Active farm development in the 2000s made production adjustments more difficult and increases in production are expected to continue into the future.

- Thailand has expanded new farm development since 2005. Thailand's production volume has continued to increase because production expansion in new farms has an impact only after 7 years. (For example, a farm that was developed in 2011 will only start producing from 2019 onwards.)

- However, replanting has made limited progress because production adjustments have not been implemented as planned.

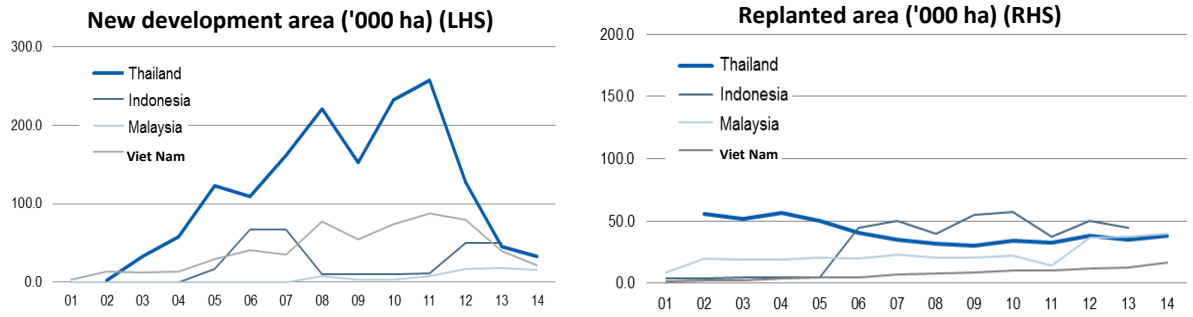
As shown in Figure 1.8, in order to increase harvested volume, it is necessary to develop new farms or replant mature trees over 25 years' old to increase latex harvest efficiency.

Figure 1-8: Life cycle of rubber farms



Source: NRI

Figure 1-9: New farm development and the trend in replanting areas in major producing countries



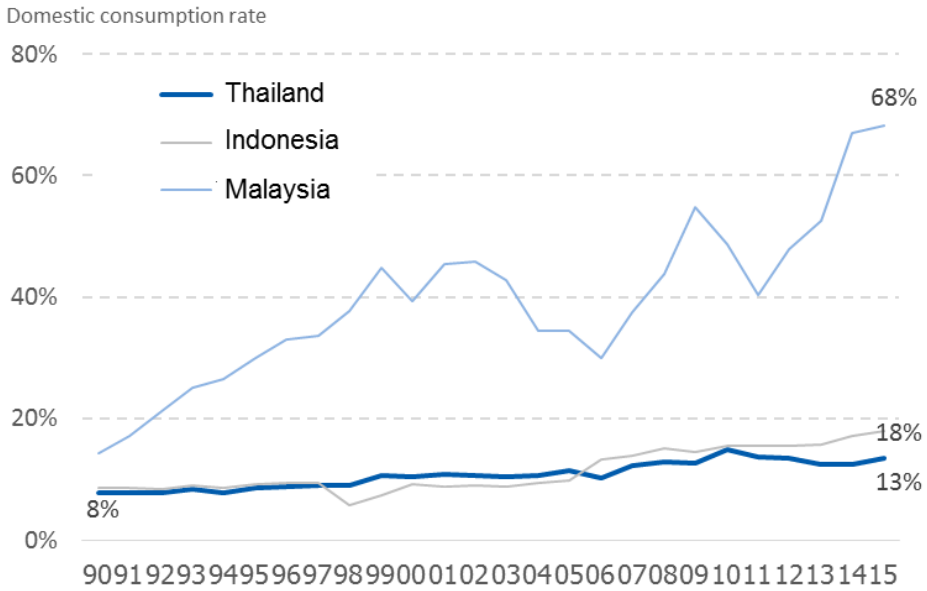
Source: IRSG Statistics.

1.1.5 Thailand's domestic demand for NR

As seen in Figure 1-10, although cluster integration of the automotive industry is ongoing, the domestic consumption rate is at a low level of around 10 percent. Thailand is dependent on domestic consumption of only 13 percent and relies on exports for almost 90 percent of its production volume. This implies that the industry cannot create added value within the country. In contrast, Malaysia is focusing on the development of the downstream industry concentrated in the glove industry, and Top Glove Corporation in Malaysia has the highest share in the world for rubber gloves.

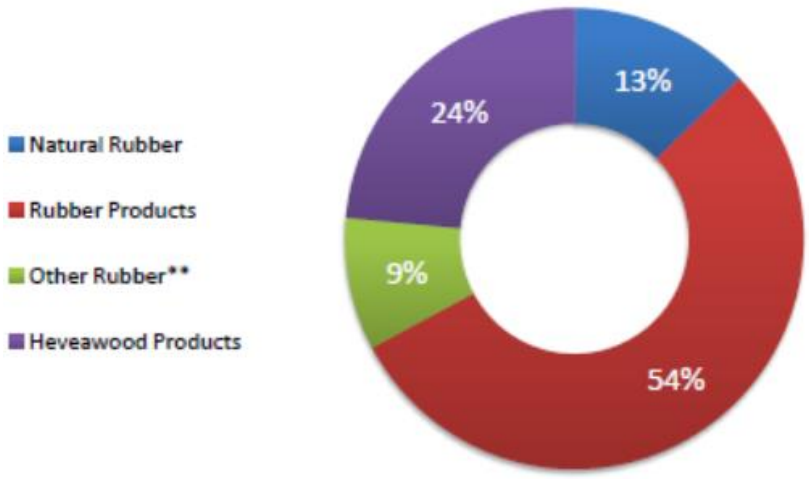
Figure 1-11 and Figure 1-12 illustrate the situation in the NR downstream industry in Malaysia.

Figure 1-10: Trend of domestic consumption rates in major producing countries



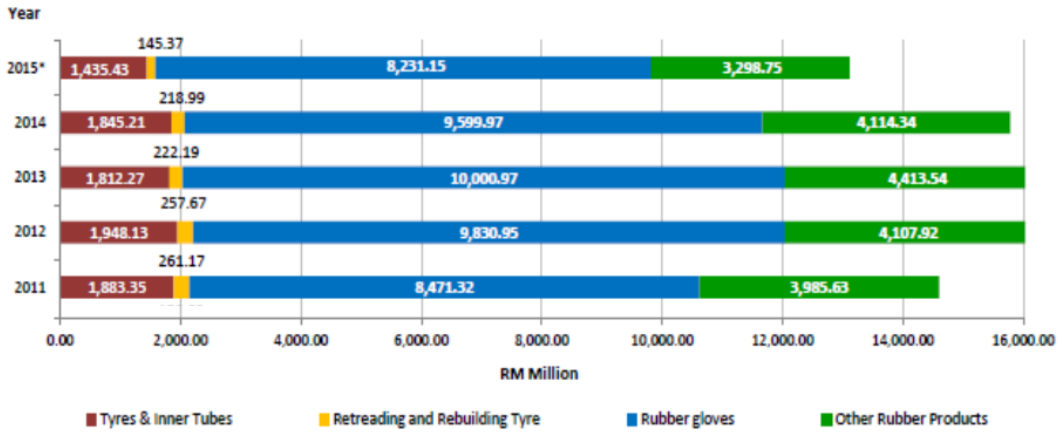
Source: IRSG statistics.

Figure 1-11: Export value structure of rubber-related industries



Source: MRB Stats 2015.

Figure 1-12: Sales Value (ex-factory) of Locally Manufactured Rubber Goods (RM Million)



Source: MRB Stats 2015.

1.1.6 (Ref) Asian production base development situation of domestic tyre makers

Table 1-1: Asian production base development situation of domestic tyre makers

	Raw material rubber factory	Tire factory
Thailand		
Indonesia		
Malaysia		
China		

Note: This could be imprecise as it is possible that it counts subsidiaries as one factory.

Source: Website of each company.

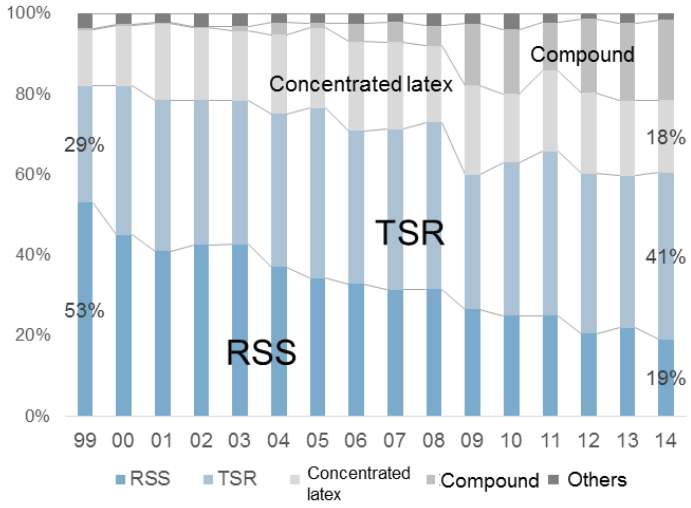
1.2 Issue of the Thai NR Upstream Industry

1.2.1 Structural change of product – Change of RSS main production

The production structure once dominated by RSS has changed towards a TSR structure during the rapid expansion of rubber demand.

- High value-added RSS had been mainstream in Thailand, but in recent years there has been a rapid expansion in low value-added TSR production.
- There appear to be three factors explaining the reason for the rapid increase in TSR production.
    - There has been farm development by farmers using low technology and new entrants in response to the sharp rise in rubber prices, and the new entrant layer produces up to cup lump.
    - For farmers producing RSS, this requires labour and man-hours, but it may be difficult over time to maintain labour as wages rise. Therefore, there is a tendency to change production to cup lump.
    - With expansion of export to China, demand for TSR increased, as Chinese market requires cheaper material.

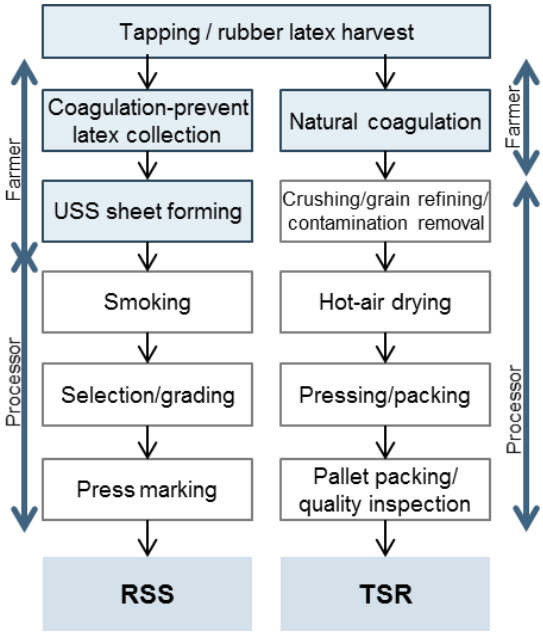
Figure 1-13: Trends in NR raw material production in Thailand



Note: A compound is raw rubber mixed with synthetic rubber. It is not NR so CESS is exempt when exported to China. However, synthetic rubber content in a compound if it is raised from 1% to 10% due to the law amendment in China to make it more difficult to mix. As a result, it is expected that compound production volume will decrease.

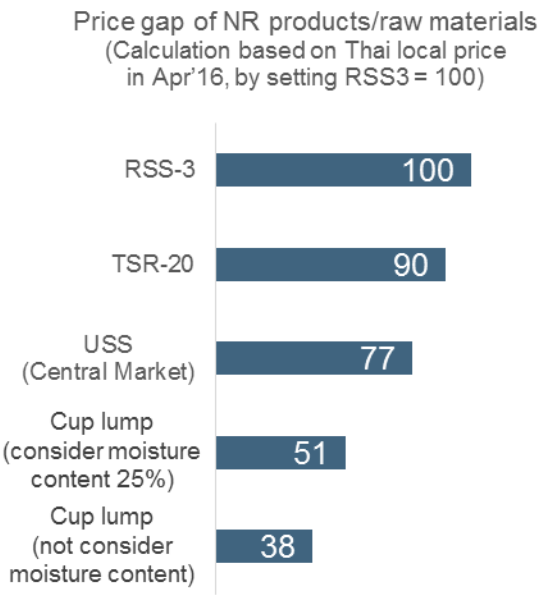
Source: Thai Rubber Association Stats.

Figure 1-14: NR processing



Source: NRI

Figure 1-15: TSR/RSS price gap



Source: NRI

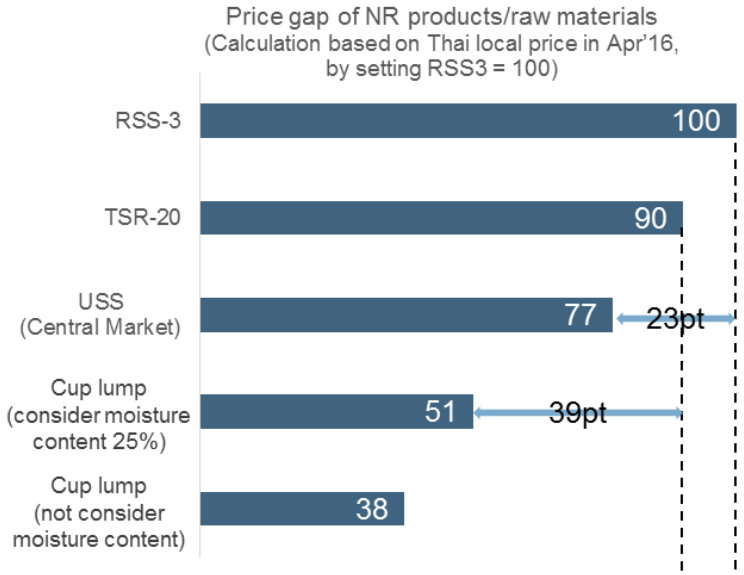
- In Thailand, spot trading markets (central markets and local markets) have been established in various places across the country to enhance market accessibility and the price bargaining power of farmers. Also, RSS can be kept in a half-finished product form, so farmers can consider market conditions and choose when to stock or sell.

Table 1-2: Overview of NR market in Thailand

	Name･Number	Role and overview
International market	International Commodity Exchange *5 places in the world*	• Spot and futures trade • RSS and TSR • Trade by rubber users and investors • Make index for international price (SICOM,TOCOM)
Thai local market	Central Market *6 places in domestic*	• Spot trade focusing on USS • Sales by collectors and agricultural institution, purchase by processors • Make index for domestic price
	Local Market *108 places in domestic*	• Spot trade of USS, cup lump • Sales by farmers, purchase by collectors/makers • Maintain by current RAOT (Rubber Authority of Thailand)

Source: NRI.

Figure 1-16: Price situation of NR products and raw materials



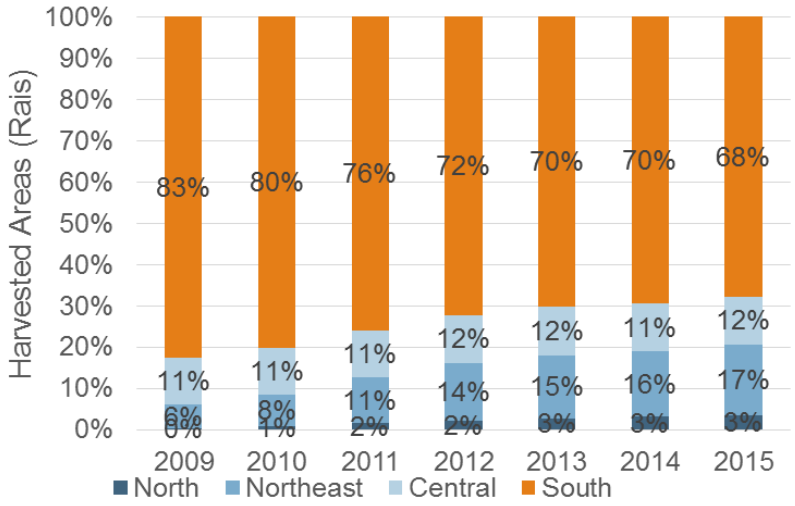
Source: NRI.

1.2.2 Location of major NR processing factories and regional characteristics

In Thailand, the development of new NR plantations occurred after the 2000s. Since many TSR process factories are located in the Northeast and Central regions, TSR is a major product in these regions.

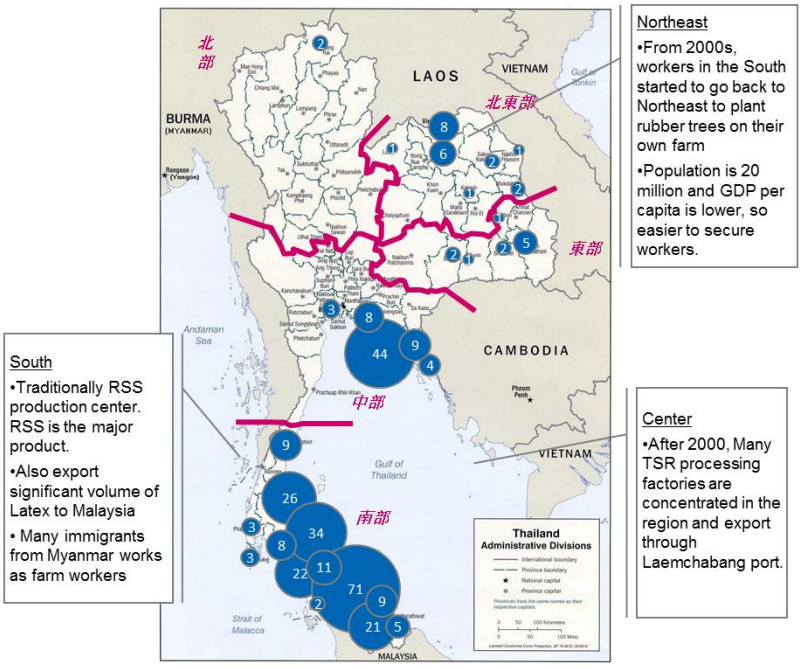
Since harvesting of new plantations can only start 7 years after planting, these plantations are now entering their peak harvest period. The production environment for palm oil is also not as good as in Indonesia or Malaysia, so it is more difficult for Thai NR farmers to switch to other crops. These two factors make it difficult for Thailand to control production volumes even when the NR price drops.

Figure 1-17: Rubber's harvested areas in Thailand, by region



Source: The Thai Rubber Association.

Figure 1-18: Location of major NR processing factories and regional characteristics



Source: Various sources.

1.2.3. Price competitiveness against Indonesia – CESS and the shift in tyre makers

CESS, a fund for agricultural development measures, is one factor behind Thailand's low competitiveness in terms of price. Tyre makers have also reduced their RSS usage.

- Thailand and Malaysia collect tax (CESS) from exported rubber and use this to fund replanting seedling distribution for farmers and NR R&D for the NR research institutes in each country (for example, the development of high-productivity seedlings).
- Indonesia does not collect CESS, so a price gap occurs between producing countries. Indonesia also does not distribute seedlings to farmers, etc., and the support framework offered by the government is very weak. Therefore, unit yields have remained at around half of those found in Thailand.

Table 1-3: Taxation (CESS) in major producing countries

	Taxation condition	Tax amount	JPY
Thailand	RSS price ≦ 40 THB/kg	0.9 THB/kg	2.7 JPY/kg
	RSS price 41~60 THB/kg	1.4 THB/kg	4.3 JPY/kg
	RSS price 61~80 THB/kg	2.0 THB/kg	6.2 JPY/kg
	RSS price 81~100 THB/kg	3.0 THB/kg	9.3 JPY/kg
	RSS price > 100 THB/kg	5.0 THB/kg	15.5 JPY/kg
Indonesia	None	None	None
Malaysia	Uniform taxation regardless of processed products price	0.14 RM/kg	3.9 JPY/kg
Viet Nam	In Dec 2013, reduced CESS from 3-5% to 1% of processed product price, and abolished CESS since Oct 2014		None

※ As of Apr 2016, 3.1 JPY/THB, 27.7 JPY/RM

Source: NRI

Table 1-4: NR selection by tyre makers

Difference between RSS and TSR	✓ RSS price is higher than TSR price around 10% ✓ RSS has visual inspection for every sheet so contamination rate is low ✓ RSS has higher Po (Plasticity) and PRI (Plasticity Retention Index) than STR, and it has advantage in term of strength ✓ For anti-vibration rubber, conveyor belt, etc., mainly use RSS ✓ Listed product of TOCOM is RSS only
Trend of tire makers' selection	✓ In the past, they produced tires by focusing on RSS ✓ TSR usage rate increases as technology development since '90-'00 with the purpose of procurement cost reduction by using TSR ✓ RSS has been distributed in 110kg bale so need machine to handle, while TSR is 35kg bales so it is easy to handle ✓ Currently TSR usage rate is higher that RSS ✓ It is prospect that tire makers also proceed technology development to enhance TSR usage rate in the future

Source: NRI

1.2.4 Difficulty of implementing a price support policy

The rice pledging scheme by the previous government contributed to regime collapse and a subsequent coup d'état in Thailand. As a result, the current government has resisted implementing excessive price support/intervention measures.

- Thai government policy has focused on supply adjustments through replanting promotion, together with domestic demand expansion through downstream industry development to support the NR price. At the same time, the government acted on the spot purchase of 100,000 tons of rubber in January 2016 as an emergency measure to tighten the supply and demand gap.
- The government needs to consider exit solutions after this purchase, taking into consideration lessons learned from the previous rice pledging scheme by the previous government. As such, it may be difficult to select excessive purchase and intervention policies.

Table 1-5: Overview of NR price policy by the Thai government

	Policy	Overview	Budget
Production adjustment	Replantation・plant change promotion	• Promote 110k ha of replantation • Compensate income during replantation period to farmers who do replantation/change plant	120 bn JPY/ 7 years
	Bridge loan	• Provide low-interest loan to farmers for sideline	30 bn JPY/ Multiple years
Market intervention	Spot purchase	• Spot purchase of 100,000-ton RSS from central market (Jan'16)	15 bn JPY/time
	Utilization promotion	• Allocation use of purchased rubber focusing on infrastructure sector by ministries	
Downstream industry development	Industry development	• Develop downstream industry with target of domestic consumption rate from 10%→30%	N/A
	Rubber City concept	• Form rubber industry cluster in Songkhla in South and attract manufacturers	

Source: NRI.

Table 1-6: Overview of the rice pledging scheme

Overview of rice pledging scheme	✓ Loan to rice farmers with amount of assumed yield before cropping x government fixed price (around 1.5 times of actual market price) ✓ Loan repayment complete when farmers deliver cropped rice. It is purchase system from substantial government
Failure under Yingluck government	✓ Implemented under Yingluck government from '11 to '13 ✓ 1.9 million households of farmers received loan in 2013 rainy seasons ✓ Since purchase price is different from actual market price, they were afraid of loss, then sales and stock digestion did not progress, policy funds depleted in 2 years ✓ Loss from this policy was 1.8 trillion JPY (Ministry of Finance (Thailand))
Rice policy under Prayuth government	✓ Stop rice pledging scheme ✓ Do not implement income compensation system (implemented under Abhisit government) ✓ Promote production cost reduction (fertilizer price reduction, etc.) ✓ Lump-sum payment (paid farmers in average of 12,000 THB in '14, budget was 120 bn JPY)

Source: NRI.

1.3 Measures for the Issuance and Direction of Policy Proposals

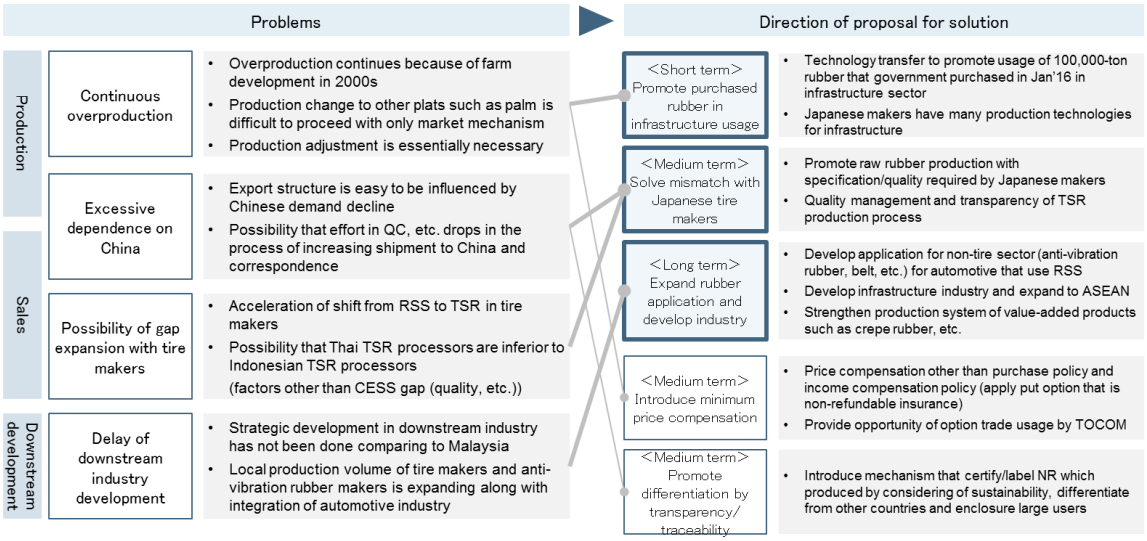
1.3.1 Issues in the Thai NR industry and the direction of proposals for solutions

Table 1-7 shows the problems and the directions of possible solutions and highlights that production adjustments are essential. However, a needs gap between processors and large users such as tyre makers may have developed, so it could be necessary to find a way of closing this gap.

In the long term, downstream industry development that increases added value by domestic consumption is required.

1.3.2 The Thai government announced domestic utilisation plans for the purchase of NR in January 2016, mainly for the infrastructure sector as mentioned below.

Table 1-7: Problems and the direction of proposals for solutions



Source: NRI.

Table 1-8: Thai government's plan for NR utilisation

Ministry	Project	Rubber Use (Tons)	Budget (MB)	Year
Ministry of Defence	Road construction and roadworks in 3 southern border provinces	813	164	
	Macadam road (76 areas)	285		
Ministry of Public Health	Purchasing of surgical gloves, Foley Catheter and condoms		1,050	Q2 of year 2016
Ministry of Education	Sports ground improvement, road pavement in schools	N/A	25,231	
Ministry of Tourism and Sports	Road construction in 12 provinces	230	120	2016
	Football ground, rubber pavement for racetrack	763	389	
	Rubber lucky doll, welcome gift set	2,500	329	
	10 sports stadiums	108	114	
Ministry of Transportation	Tires for automobiles Mixing in asphalt (modified asphalt)	57,713 (latex)	36,503	2016-2017
Ministry of Interior	Sport stadium construction 46 projects Road construction and maintenance 2,071 projects	9,808 (latex)	13,130	2016-2017
Ministry of Agriculture and Cooperatives	Rubber pavement for footpath Road surface improvement Pond coating (water-resistant coating) 	36,606	16,395	2016-2017
Ministry of Industry	Open more rubber industrial factories	N/A		

Source: Nation TV news.

1.3.3 In terms of NR infrastructure utilisation technology, Japanese rubber makers have products and technology in various fields as mentioned below.

Table 1-9: Infrastructure-related products of Japan rubber makers and their applicability to Thailand

Field	Product	Use application	Applicability in Thailand and concern	Maker (★: Interview destination)
Footpath / ground pavement	Chip/elastic pavement for sports ground	Elastic pavement using rubber for impact mitigation	• As NR is not strong enough, reinforcement material (black carbon) is required. In that case, it is high hiding power of black and difficult for coloring. • NR concern is degradation. Poor heat resistance. Tires can use anti-aging agent that has stain property but it is difficult to use for infrastructure. • For usage that does not appear on the surface (putting sponge sheet underground, etc.: micro foam is needed), it is possible to use NR. • Construction requires technological capability for urethane binder mixing. • Sumitomo Riko and 3 tire makers did experimental study at Civil Engineering Research Institute about rubber pavement for road with noise prevention purpose in the past, but does not put into practical use.	★Toyo Rubber Chip ★Sumitomo Riko Muraoka Rubber
	Elastic block	Same as above		
Road pavement	Modified asphalt	Asphalt spill prevention, road performance improvement (slip resistance)	• If there is no performance requirement same as Japan, it is also possible to use in Thailand. • However, as company uses macromolecular polymer without using NR, there is no technology reserve for NR usage in the company.	★Nichireki
Sports facility	Coating in facility	Impact mitigation and falling prevention in facility	• NR usage volume is limited because of thin layer coating and high usage ratio of macromolecular polymer.	★Sumitomo Rubber
	Rubber chip for artificial grass	Tennis court Football ground	• Use as cushion material installing under resin layer of green surface is possible consideration. However, tire scrap is more proper for cost and performance. • Because rubber processing and utilization technology is not that high.	★Toyo Rubber Chip ★Sumitomo Rubber
Waterway infrastructure	Rubber dam	Flood countermeasure	• Total volume of rubber used for bag is SR. Using NR is difficult due to weak light and heat resistance. It may not have makers that use NR.	★Bando Chemical Sumitomo Electric
	Impermeable sheet for civil engineering	Waterproof pond/reservoir Shrimp pond	• NR had been used in the past, but now focus on SR. NR maybe difficult to use.	★Bando Chemical Maeda Kosen
Harbor	Fender	Impact absorption when ships come alongside the pier	• There is large usage volume of NR for each product. However, they do not have continuous demand. The technology is not high comparing to tires, etc.	★Sumitomo Rubber Yokohama Rubber, Bridgestone
Earthquake resistance	Seismic isolation rubber for bridge and construction	Earthquake countermeasure	• If there is no needs for earthquake resistance, it is difficult to diffuse	3★Sumitomo Rubber Yokohama Rubber, Bridgestone

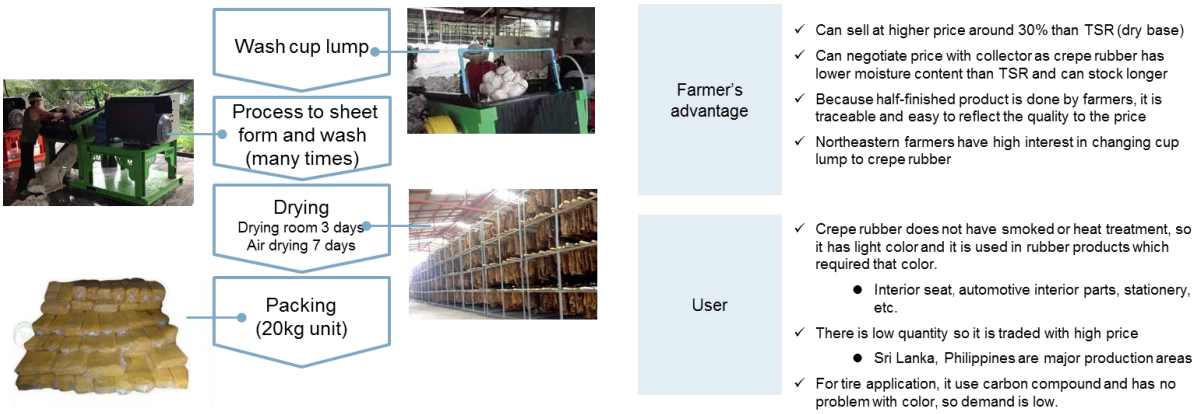
Source: Based on Sumitomo Rubber, Sumitomo Riko, Bando Chemical, Nichireki interview.

1.3.4 Improvement of the production environment for low-quality rubber in new production areas in the Northeast

Crepe rubber is processed NR that uses a creper machine (including washing) to change coagulated cup lump into sheet form. It can add value at farmers' farms or at agricultural institutions by processing in addition to selling cup lump for TSR. However, crepe rubber-making machines are expensive, at around JPY10 million, so it can be assumed that such machines would be shared by an institution or a community unit.

Consideration should be given to various options, such as cost reductions of the processing machines, promoting the shared use of machines, etc.

Figure 1-19: Process of crepe rubber production



Source: Rubber Economics Magazine.

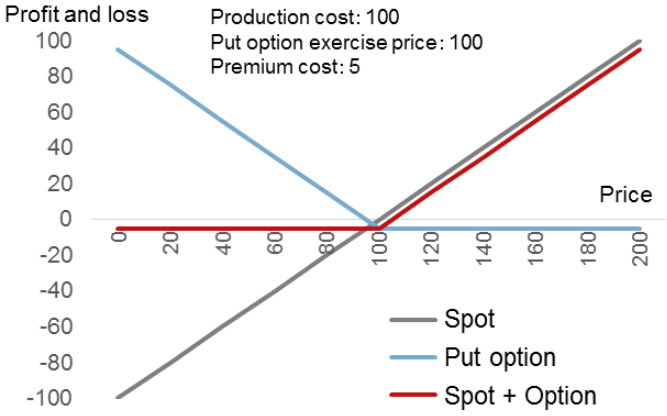
1.3.5 Introduction of a minimum price compensation mechanism through options trading, etc.

The Tokyo Commodity Exchange (TOCOM) is also interested in establishing an NR options trading market.

If options trading on the Tokyo Stock Exchange could be linked to create a put option for minimum price purposes, this should directly contribute towards price stability support.

However, further consideration is needed regarding how to set the premium cost and whether there is PIC on the Thai government side for funding and operating.

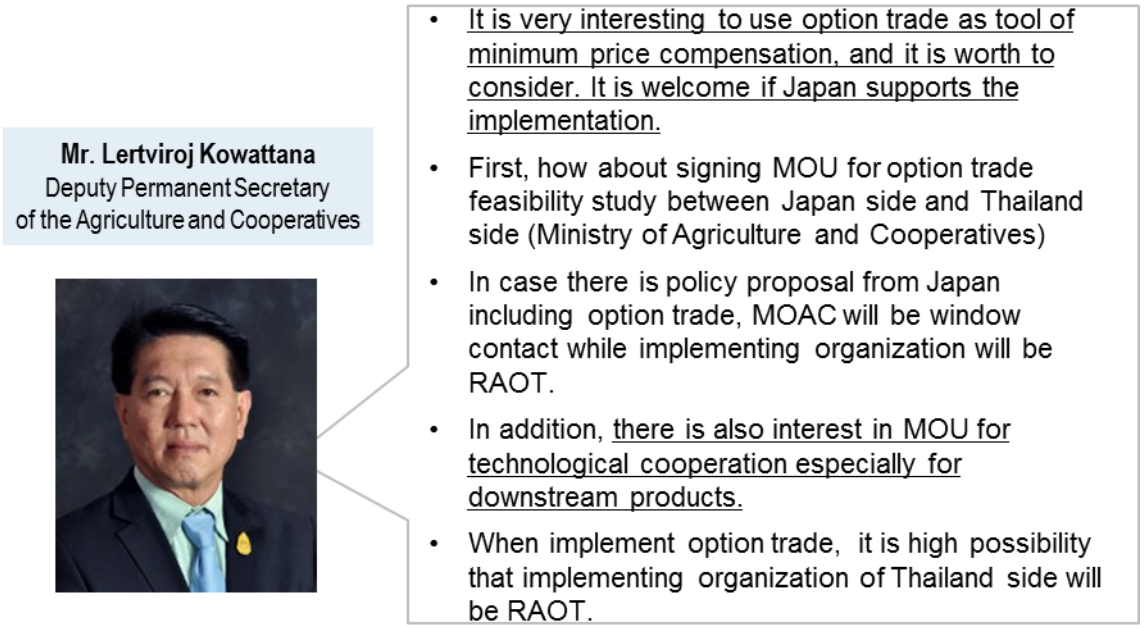
Figure 1-20: Minimum price compensation by using options trading



NR option trade market	✓ There is futures market but no option trade market ✓ Have trade market for major agricultural crops such as wheat ✓ TOCOM is willing to open option trade market

Source: NRI.

Figure 1-21: Senior Thai official of the Ministry of Agriculture and Cooperatives' expresses interest in options trading



Note: Deputy Permanent Secretary (NR policymaker) interview by NRI Thailand on 15 March 2016.