

SOUTH-SOUTH IDEAS

**SUSTAINABLE RUBBER VALUE CHAIN DEVELOPMENT:
ANALYZING MYANMAR'S OPPORTUNITIES AND CHALLENGES
FOR GREEN TRANSFORMATION THROUGH SOUTH-SOUTH
COOPERATION**



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TABLE OF CONTENTS

| | |
|--|-----------|
| List of Tables and Figures | 4 |
| Acknowledgements | 5 |
| Abbreviations and Acronyms | 6 |
| Executive Summary | 7 |
| 1. Introduction | 8 |
| 2. Objectives and Research Methodology | 12 |
| 3. Current State of Rubber Value Chain in Myanmar | 16 |
| Cultivation | 16 |
| Production and Field Processing | 18 |
| Productivity and Yield | 19 |
| Export | 21 |
| 4. Mapping Rubber Value Chain in Myanmar | 24 |
| Rubber Planters and producers | 24 |
| Tappers and Migrant Workers | 26 |
| Cooperatives and Processors | 27 |
| Traders and Exporters | 29 |
| Modern Joint Venture Factories | 30 |
| Rubber Wood Industry | 31 |
| 5. Sustainable Value Chain: Policy Recommendations and Priority areas for South-South Cooperation | 31 |
| Safeguarding Land Concessions and Supporting Smallholders with Eco-certification | 32 |
| Sustainable agro-forestry development | 33 |
| Empowering Tappers through Skill Development | 33 |
| Organizing Smallholder Associations and Enhancing Value Chain Governance | 34 |
| Upgrading Rubber Processing, Grading and Certification Mechanisms | 35 |
| Value Chain Financing | 35 |
| 6. Conclusion | 37 |
| References | 38 |



LIST OF TABLES AND FIGURES

Table

| | |
|--|----|
| Table 1: Top world producers of natural rubber in Asia (in MT) | 9 |
| Table 2: Sample size of survey | 16 |
| Table 3: Composition of rubber planters and producers | 20 |
| Table 4: Official trade data of Myanmar and China | 23 |
| Table 5: Myanmar's Natural Rubber Export Destination | 24 |

Figures

| | |
|---|----|
| Figure 1: Sites of old and young rubber plantation areas in Southeast Asia | 11 |
| Figure 2: Simple rubber value chain in Myanmar – Stakeholders, Functions and Products | 13 |
| Figure 3: Cultivation areas of rubber in Myanmar (acres in 2016) | 17 |
| Figure 4: Major rubber producing areas with their linkages to regional markets | 19 |
| Figure 5: Long-term rubber yield (pound per acre) | 21 |
| Figure 6: Categories of natural rubber processing methods and its products | 28 |



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ABBREVIATIONS AND ACRONYMS

| | |
|-------|--|
| AETS | Agreed Export Tonnage Scheme |
| DFID | Department for International Development, United Kingdom |
| FAO | Food and Agriculture Organization of the United Nations |
| ITRC | International Tripartite Rubber Council |
| GOM | Government of Myanmar |
| M4P | Making Value Chains Work Better for the Poor |
| MoALI | Ministry of Agriculture, Livestock and Irrigation |
| MT | Million Ton |
| MMT | Million Metric Ton |
| MRPPA | Myanmar Rubber Planters and Producer Association |
| NES | National Export Strategy |
| SME | Small and Medium Enterprises |
| RSS | Ribbed Smoked Sheets |
| TSR | Technically Specified Rubber |

EXECUTIVE SUMMARY

Myanmar's rubber sector is at a critical juncture. Rubber production in the country is projected to increase in the coming years while international market demands suggest a continuing downward price trend for natural rubber. Among a few agriculture value chains that exist in southeast Myanmar, natural rubber provides a unique opportunity to address the political economy of inclusive growth. This study uses value chain analysis to understand the challenges and opportunities facing primary producers in Myanmar or rubber small-holders in this case, who are trying to engage with global markets in a manner which would provide for sustainable income growth.

This study has undertaken a rapid survey with 80 upstream on-farm and middle-stream off-farm stakeholders including small-holder rubber farmers, plantation workers, tappers, traders, small and medium enterprises (SMEs) and, primary processors and the workers working in processing factories along the chain. It observes both vertical linkages and horizontal linkages within the sector in Southeast Myanmar. The survey found that the strengthening of vertical linkages between stakeholders can create synergies leading to higher value addition along the whole value chain. More importantly, the findings also highlight the importance of horizontal linkages particularly among primary producers to enable value chain upgrade covering functional, product, and process dimensions critical for Myanmar to achieve sustainable goals in the sector. The study compares and contrasts Myanmar's situations with experiences from neighboring rubber economies and it concludes that horizontal linkages in the forms of farmer organizations or producer cooperatives are important to overcome the scale threshold if farmers wish to upgrade their products from low quality to high quality grades, improve processes from manual to machine processing and innovate functions by focusing more agro-forestry and farm inter-cropping to support the incomes of small-holders.

The study recommends a concerted effort is needed on the part of public institutions to support all value chain actors of the rubber sector. Most important of all, it suggests targeting reform policies towards small-holding farmers who also represent the weakest link in quality and productivity reforms that Myanmar needed critically. Finally, the study suggests that the government of Myanmar can gain immense benefits from learning the lessons of various value chain upgrade experiences from neighboring rubber-producing countries such as the People's Republic of China, Viet Nam, Indonesia and Thailand. Through South-South Cooperation modality, Myanmar may consider seeking technical assistance and capacity building support for effective value chain upgrades that are suitable to Myanmar's context.

1. INTRODUCTION

Myanmar has seen tremendous growth in the production and planting of natural rubber with a three-fold increase of plantation areas in the country over the last 10 years. According to the Food and Agriculture Organization (FAO) statistics, Myanmar became the 10th largest producer of natural rubber in the world by 2015, surpassing traditional world leaders such as Brazil, through rapid area expansion of cultivation between 2005 and 2015. (Table 1) Although the initial expansion plan was mobilized by the military government in 2005, the major impetus came from small holders who later invested in planting rubber following the global surge of natural rubber prices in the period of 2005 to 2011. However, when the global price of natural rubber plummeted in 2012, most Myanmar small-holders faced a difficult time to cope with down-ward demand, particularly when their young rubber trees matured and began to produce rubber. In this context, it is very important for Myanmar to take a long-term view of developing her rubber value chain to be sustainable by investing in small-holders' capabilities in scaling up quality and productivity in the sector. (NES, 2015)

Rubber is an important commodity in the global economy, 76 per cent of natural rubber consumption is driven by tire demand. Global natural rubber demand grew at 5 per cent per annum between 2009 and 2013 to reach 26.7 million tons (MT), further driven by increased motorization around the world.¹ In addition, demand from emerging markets, such as China and India, which have led the global demand over the last decade, is expected to take a long-term trend of upward growth. Top rubber-producing countries are in Southeast Asia, accounting for 75 per cent of global production and 87 per cent of global natural rubber exports in 2013.² However, the region experienced a sustained downward pressure on rubber prices since 2011, caused by a slowdown of demand and the oversupply of stocks. At the same time, relatively cheap crude oil prices also suppressed demand for natural rubber elsewhere and caused a negative impact on natural rubber prices since synthetic rubber, made from petroleum byproducts, became a cheaper substitute for broadly the same market demand. (Kose, Veillard and Harneja, 2014)

Under these circumstances, three major producers of natural rubber namely Thailand, Indonesia and Malaysia worked closely together under the banner of International Tripartite Rubber Council (ITRC) to stabilize natural rubber prices. Viet Nam joined the ITRC in 2017 and followed the earlier commitments of the member states to implement the Agreed Export Tonnage Scheme (AETS). ITRC is a prime example

1 Accenture Strategy. "Extracting Value from Natural Rubber Trading Markets Optimizing Marketing, Procurement and Hedging for Producers and Consumers," 2014, quoting Macquarie Research, "Natural Rubber Outlook: still heavy but not as bearish", Oct 2013, at https://www.accenture.com/t20150523T032721__w_/sg-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Dualpub_6/Accenture-ATIOS-Publication-Natural-Rubber-Trading-Markets.pdf, last accessed on 2 February 2019.

2 Ibid.



of South-South cooperation in terms of ensuring the sustainability of natural rubber industry.³ Although the Council's intended objective of managing commodity price volatility by restricting on production and export among major producers are less successful, its long-term plans for well-being of natural rubber small-holders through supply management schemes is important for other natural rubber producing countries that are currently struggling with oversupply. (Anwar, 2017) Although long-term planning such as "cess" or rubber fund used in major producers like Thailand to shore up farmers' income are not easily replicable in poorer economies, the lessons learned from these producers in terms of quality and skill upgrade are very relevant to emerging producers like Myanmar.

In fact, Myanmar unfortunately headed to over-supply when it responded the rubber price boom between 2005 and 2008 by expanding its rubber plantations and attained nearly 230 per cent increase in production within a decade without developing its value chain to connect with global markets. In 2012, while high volume of Myanmar's rubber trees matured 6-7 years later, global demand for natural rubber began to decline, resulting in downward price impact throughout her rubber value chain. As China was the main buyer of Myanmar's intermediate rubber products, the slowing of Chinese economy and continuing trade frictions further dampen the chances of price recovery. The immediate prospects for Chinese economic recovery and crude oil price surge are low at this moment. In this regard, it is important for Myanmar to improve its value chain efficiency through organizing small-holders, training its labour force, upgrading its processing technologies and investing in quality infrastructures to keep abreast with other producers in a very competitive environment. (NES, 2014)

Table 1: Top world producers of natural rubber in Asia (in MT)

| Country | 1995 | 2005 | 2015 | 2017 (est) | % change 2005-15 |
|-------------|-----------|-----------|-----------|------------|------------------|
| Thailand | 1,693,078 | 2,979,722 | 4,466,063 | 4,600,000 | 50% |
| Indonesia | 1,532,143 | 2,270,891 | 3,145,398 | 3,629,544 | 39% |
| Viet Nam | 124,700 | 481,600 | 1,012,750 | 1,094,519 | 110% |
| India | 472,000 | 802,625 | 950,696 | 964,733 | 18% |
| China | 424,025 | 513,618 | 816,103 | 817,366 | 59% |
| Malaysia | 1,088,900 | 1,126,023 | 722,122 | 740,138 | -36% |
| Philippines | 181,619 | 315,636 | 398,137 | 406,984 | 26% |
| Myanmar | 25,300 | 63,200 | 208,741 | 236,748 | 230% |
| Cambodia | 35,429 | 20,329 | 17,649 | 15,844 | -13% |

Source: FAO Stat, 2018

³ Dr. Chairil Anwar, CEO, International Rubber Consortium (IRCo), 28 November 2017, at <https://www.rubberasia.com/2017/11/28/itrc-focus-nr-sustainability-dr-chairil-anwar-ceo-international-rubber-consortium-irco/>, last accessed on 1 January 2019.

Myanmar will need more targeted strategies to address immediate challenges within its rubber sector because price decline caused more disastrous impact on thousands of small-holders. In the light of tighter price margins, the competitive factors for Myanmar small-holders are not just about cost of production but also quality and value chain management from upstream to mid-stream segments within the country. Therefore, it is important for the government of Myanmar to take a pro-active strategy in learning the lessons from ITRC countries where small-holders and their cooperatives remain very competitive while effective governance and strong government support help their advantage over other producers.

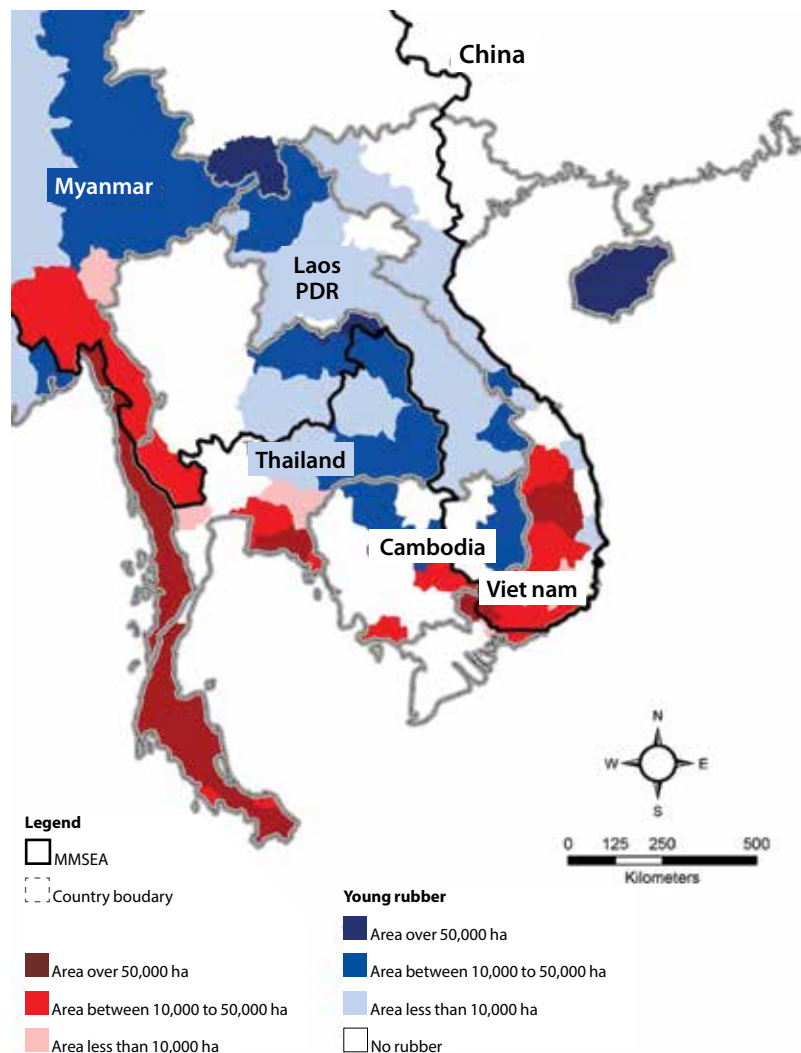
As Myanmar shares border with the world's top rubber producing country, Thailand, there are natural opportunities for Myanmar to learn from her neighbor. As Southeast Myanmar, including Mon, Karen States and Taninthayi Region, accounts for the highest number of planted acres, these regions share not only borders with Thailand but also similarities of small-holding rural farmers engaging in the rubber sector. In fact, many tappers or skilled workers who collect latex from rubber trees, other types of rubber workers and even rubber small-holders migrated recently to Thailand when the price boom caused high labour demand. The labour shortage in Thailand became more critical when rubber plantation workers, who often are from Northeast regions, returned home to plant their own natural rubbers in 2000s. Since then, Thailand drew many thousands of Myanmar rubber workers into its plantations in the South and recently, more Myanmar labour preferred to work in Thailand due to higher minimum wages. Since the two neighbours have already coordinated their migration policies to promote safe migration and contractual employment, it would be better for both countries to collaborate on sectoral coordination particularly in the rubber sector.

In search of solutions for sustainable rubber value chain development in Myanmar through possible South-South trade, this study undertook rapid assessment in Southeast Myanmar. Figure 1 shows the sites of old and young rubber plantations areas in Southeast Asia, this research study will find out possible options for Myanmar to effectively link and integrate with the existing regional value chains. The study involves interviews and focus group discussions among key stakeholders long the value chain with an objective of understanding the challenges and opportunities facing small holding farmers against the decline of global market prices. The study is undertaken in the border regions of Mon, Karen and Tanintharyi that account for 90 per cent of the total rubber planted area actively harvesting at this stage in the country. The study also tries to identify alternative livelihood opportunities for small-holding farmers and their potential scaling up of the current agriculture practices to sustainable rubber initiative, a recent global standard put forward by the downstream industries that consume natural rubber. Sustainable rubber initiative, increasingly demanded by the world's top automakers, trucking companies, airlines and tire producers, requires traceability and mapping of supply chains committed to respecting people, protecting the environment, improving farming practices, careful use of natural resources and good governance. In this regard, Myanmar's plan to upgrade its rubber value chain can align with such goals in order to leapfrog its production, processing and marketing activities to link up with global value chains.⁴

⁴ Sustainable Natural Rubber initiative (SNR-i) is adopted by the International Rubber Study Group (IRSG), based on a proposal from the Industry Advisory Panel (IAP) during the World Rubber Summit held in Singapore in May 2014. By quarter 3 of 2017, forty-three companies and organizations registered to be compliant with voluntary guidelines. Among them, international brands such as Bridgestone, Goodyear, Hankook, Michelin, Pirelli, Yokohama signed their commitment on the initiative. See the details at <http://www.rubberstudy.com/>.



Figure 1: Sites of old and young rubber plantation areas in Southeast Asia



Source: Fox and Castella, 2013.

Note: Southeast Myanmar is geographically connected to rubber corridor of Southern Thailand whereas young plantations in northeast Myanmar are the extension of rubber plantations from Yunnan Province of China.

In addition, the study also aims at informing opportunities and challenges of developing sustainable natural rubber value chain development by looking into specific dimensions along the value chain such as quality control and technology innovation opportunities among small-holders, inclusive and gender-sensitive community development through livelihood opportunities, and female tapper protection strategies. Furthermore, the study also investigated potential areas of South-South cooperation with stakeholders from China and Thailand in terms of promoting responsible investment strategies that respect zero deforestation and good practices of agro-forestry development as well as facilitating knowledge-sharing

and exchange on value chain management practices. Last but not least, this study will explore ways and means for ensuring Myanmar's formal participation in the existing networks of South-South cooperation, particularly how Myanmar could take initiatives in seeking partnership with two important neighbours, China and Thailand, in this regard.

2. OBJECTIVES AND RESEARCH METHODOLOGY

This study will help inform both central government and regional government authorities of Myanmar who are concerned with rubber sector development about challenges and opportunities of linking domestic rubber producers to global value chains. At the same time, the study also intends to provide preliminary analyses on how the government institutions can support the stakeholders in the value chain, particularly the upstream small-holder producers, in terms of narrowing the gaps they need to overcome in achieving remunerative and livelihood benefits in a sustainable way. Finally, the study will also suggest policy options for Myanmar in seeking greater collaboration with its southern partners on sustainable rubber initiative. The options for Myanmar may work well with the emerging regional framework for South-South Cooperation where upstream small-holders can benefit from conscious promotion of green transformation by downstream users such as China as well as middle-stream processors within the Association of Southeast Asian Nations (ASEAN). Such cases are relevant for other least-developed countries in Southeast Asia such as Lao PDR and Cambodia.

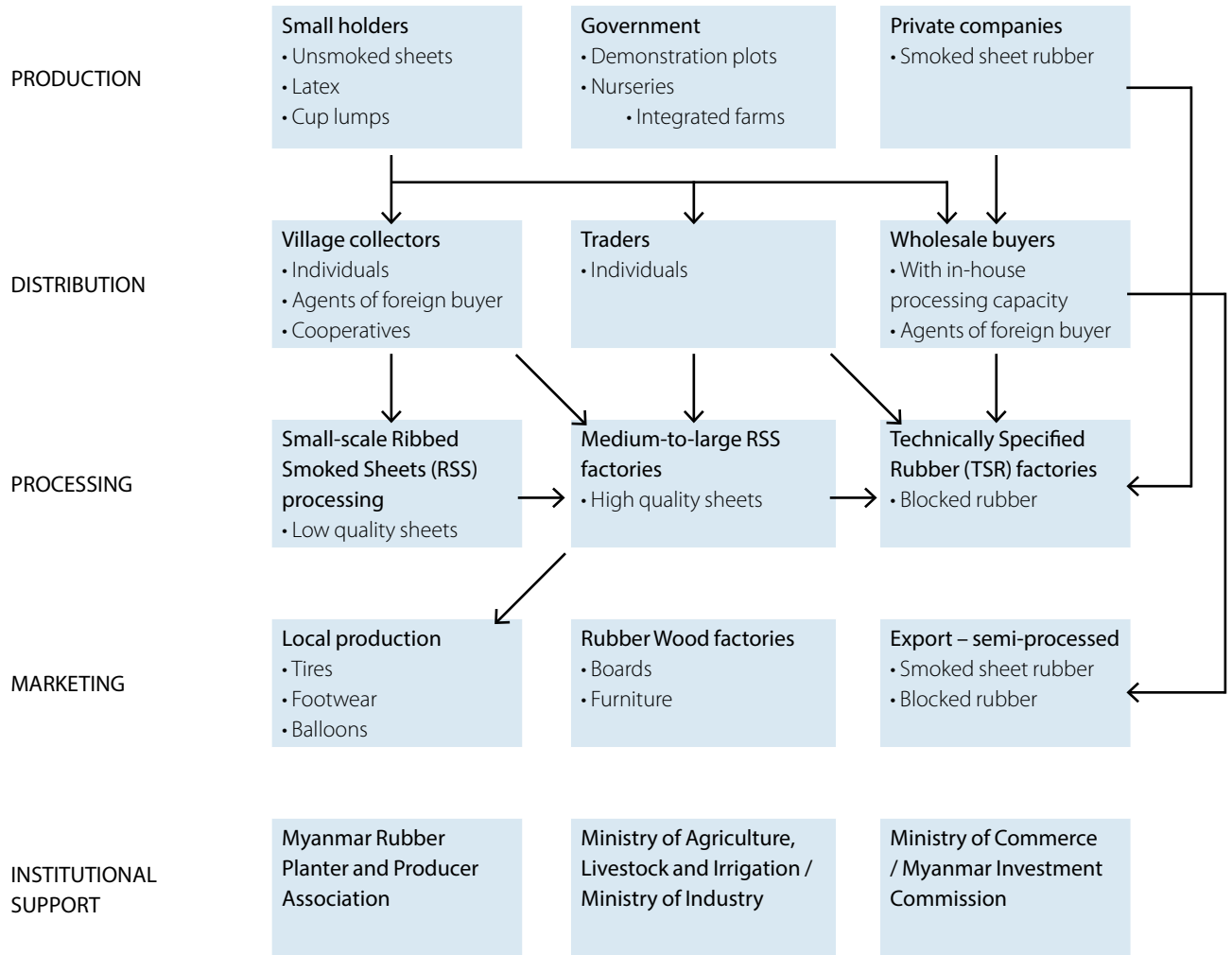
In order to achieve the above-mentioned objective, this study draws upon value chain analyses widely used by international development institutions such as the United Kingdom's Department for International Development (DFID), the International Development Research Centre (IDRC), the German Agency for International Cooperation (GIZ) and World Bank and contextualize them into Myanmar situations.⁵ Many such tools provide frameworks of analyses with different objectives to design development interventions and interactions such as those focusing on policies (e.g., good agriculture practices and improved governance), development goals (e.g., poverty reduction and job creation), and their targeted users (e.g., government agencies and private sector). (Donovan, et al, 2015) However, this study will give priority to analyzing the challenges and opportunities facing new producers in Myanmar or rubber small-holders in this case, who are trying to engage with global markets in a manner which would provide for sustainable income growth. The value chain analysis provides a useful methodology to focus on inter-linkages between producers to other stakeholders while uncovering the barriers and gaps that hamper efficient allocation of resources and equitable returns to the stakeholders involved in the sector. Finally, this analysis can be

⁵ Notable guides include DFID's *Making VC work better for the poor: A toolkit for practitioners of value chain analysis* (2008), GIZ's *ValueLinks Manual* (2008), and IDRC's *Handbook for value chain research* (2000) as well as *Making Global Value Chains Work for Development* (2016), the most sophisticated guidebook developed by the World Bank, which provide a richer understanding of how developing countries can respond to dominant economic powers of GVCs under more dynamic and interconnected global economy.



a useful guide for policy makers to consider effective interventions to support the prospects of raising income and livelihood opportunities for small-holders and SMEs within the sector.

Figure 2: Simple rubber value chain in Myanmar – Stakeholders, Functions and Products



In the rubber sector of Myanmar, one can observe both vertical linkages and horizontal linkages. Vertical linkages are linkages between different participants along a value chain, i.e. between inputs suppliers and farmers and other SME producers, collectors, processors and final customers. Horizontal linkages are linkages amongst actors at the same chain level of the value chain, for instance, linkages amongst small-holding rubber farmers, casual labourers, skilled and semi-skilled rubber tappers and village collectors, or between value chain actor with other supporting institutions and embedded service providers of the value chain, i.e. linkage between a rubber farmers and input providers, public extensive services and rubber plantation research services, agriculture university or with microfinance institutions that borrow

loans to the farmers. Figure 2 shows a simple rubber value chain in Myanmar with linkages and segments of stakeholders who engage in different types of activities and functions.

Since a value chain is a chain of players who act to add value to a product or service provision from the inputs/beginning form to the end of the product formation or service provision at the final customers' utility, strengthening vertical linkages between actors of a value chain can create synergies leading to higher value addition along the whole value chain. This is subject to functional upgrading (Kaplinsky and Morris, 2008), which is defined as "increasing value added by changing the mix of activities conducted within the firm or moving the locus of activities to different links in the value chain."

On the other hand, horizontal linkages with technical and commercial entities can stimulate the innovation of products, namely product upgrading, or change processes of production, defined as process upgrading. These three types of upgrading: functional, product, and process upgrading are the only elements of an upgrading strategy related to the value chain approach. Here, effective coordination at the production levels, particularly among small-holders or poor farmers, is critical to upgrading for all three functions. Experiences from Thailand and Indonesia, two largest rubber producers, suggest that such horizontal linkages in the forms of farmer organizations or producer cooperatives are important to overcome the scale threshold to upgrade their products (from low quality to high quality), processes (from manually at the field to factory processing) and functions (focusing more agro-forestry and farm inter-cropping to support income than time-consuming processing). (Poungchompu and Chantanop, 2017 and Peramune and Budiman, 2007) Another study on small-holders in India suggests that variability primary products decreases the profitability of producers. (Mukundan and Verrakumaran, 2014)

In the past, traditional value chain analyses tend to look at vertical relationships between different levels of actors and price transmission channels to determine allocative efficiency within the chain. For instance, Making Value Chains Work Better for the Poor (M4P), a popular toolkit put forward by the DFID, emphasizes mapping of flows between different levels of value chain and potential solutions to address the gaps between them.⁶ Other literatures emphasize more on market access and export platforms rather than the role of horizontal linkages at the producers' level for the upgrading of value chains.⁷ As a result, more dynamic and market-driven upgrading strategies addressing price transmission mechanisms along the vertical linkages are often recommended to improve the value position of stakeholders. Information asymmetry, access to price information and the need for immediate responses by rubber growers to the change in world price are typical sources of inefficient market systems for natural rubber in Myanmar. During price fluctuations, the profits accumulated by traders and rubber factories are not transmitted

⁶ Agricultural Development International, 2008, *Making Value Chains Work Better for the Poor: A Toolkit for Practitioners of Value Chain Analysis*, Making Markets Work Better for the Poor (M4P) Project, UK Department for International Development (DFID). Phnom Penh, Cambodia.

⁷ See Tallec, F, and Bockel, L. 2005. *Commodity Chain Analysis: Constructing the Commodity Chain Functional Analysis and Flow Charts*. Food and Agriculture Organization (FAO), Rome, Italy; Cattaneo, O, Gereffi, G and Staritz, C. 2010. *Global Value Chains in a Postcrisis World: A Development Perspective*. World Bank, Washington, D.C.



properly to rubber farmers as well as their dependent tappers and casual labourers. The Ministry of Commerce tried to address the problems of price and information asymmetry between the farmers and the traders by proposing the private rubber association to set up a central market mechanism similar to the one in Thailand. However, such mechanism has not emerged yet. In this regard, this study will examine the factors that prohibit the emergence of inclusive market institutions in Myanmar.

In addition, this study will take the view that groups of shared-interests individuals can facilitate collective action amongst group members to effectively achieve a common goal; and cooperation among stakeholders at the same level of value chain is also one way to reduce transaction costs and ultimately, enhance the competitiveness over non-institution individuals. (Eirik G. Furubotn & Rudolf Richter, 1997). In the case of rubber value chains, horizontal cooperation among small-holding farmers to streamline their production to make uniform intermediate products can enhance their bargaining position with the buying agents and processors from the middle segments of the value chain. This model of horizontal cooperation works very well in Thailand as twenty percent of natural rubber transactions occurred through associations or cooperatives, which collectively bargained better price from large buyers or processors. (Poungchompu and Chantanop, 2017) This study will explore how to establish organizations of farmers and producers and how to strengthen such membership organizations.

In order to examine above-mentioned areas in rubber value chain, the study has undertaken a rapid survey with 80 on-farm and off-farm stakeholders including small-holder rubber farmers, plantation workers, tappers, traders, SMEs, primary processors and the workers working in processing factories along the chain. The survey took a representative distribution of small-holders across three regions of Myanmar such as largest concentration of small-holding farmers in Mon State to high percentage of large plantations in Tanintharyi. At the same time, about twenty key informants and experts from the Myanmar Rubber Planters and Producer Association (MRPPA) at the regional level, representatives of government institutions, private sector representatives from large rubber processing firms in Mon and Karen States and Taninthayi Region were interviewed. The following number of survey respondents are being interviewed under the survey:

Table 2: Sample size of survey

| State and Regions | Cultivation Areas | Share of Small-holders (<100 acres) | Number of Farm Respondents | Number of Off-farm Respondents | Institutional Respondents |
|--------------------------|--------------------------|---|-----------------------------------|---------------------------------------|----------------------------------|
| Mon State | 491,100 | 85% | 40 | 20 | 15 |
| Karen State | 266,820 | 40% | 5 | 10 | 2 |
| Tanintharyi Region | 343,052 | 15% | - | 5 | |

Note: Farm respondents include farmers, tappers and other workers on the sites of plantations; and off-farm respondents include processors, collectors and SMEs and their factory workers.

The findings of the surveys are described and mentioned in two parts. The first part deals with the current status of the rubber value chain, focusing on functional segments of the sector from production, cultivation to export. This part makes analyses on general conditions of the rubber sector in terms of challenges and opportunities facing the value chain. The second part discusses the perspectives of key stakeholders who occupy important segments of the value chain—small holders in the upstream segment to exporters in the downstream segment. This part takes a more in-depth look at possible solutions and initiatives, based on the feedback of the survey respondents, to identify potential solutions for further actions. Based on these findings, the study focuses on a few policy areas that could be addressed in the near term by the government of Myanmar. In addition, the study also makes a number of recommendations that the government can consider pro-active steps in seeking south-south cooperation with neighboring economies such as China and Thailand to ensure sustainable development of rubber value chains in Myanmar.

3. CURRENT STATE OF RUBBER VALUE CHAIN IN MYANMAR

This section makes an overview on the current state of rubber value chain in Myanmar. This concerns with the functions and processes of the rubber value chain in Myanmar starting from cultivation, production and field processing, yield and productivity to market access and export.

Cultivation

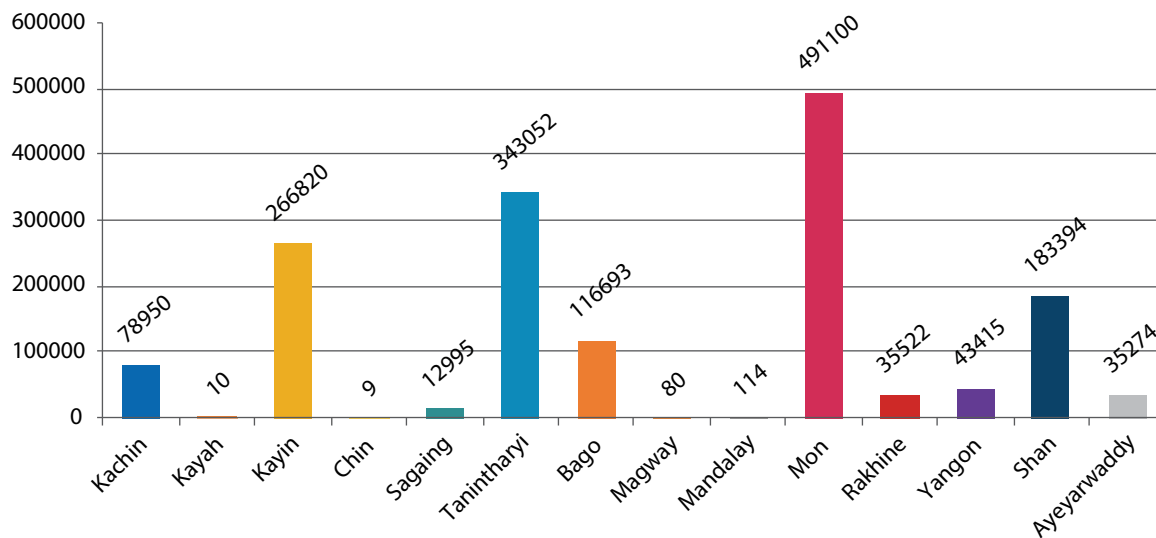
The Ministry of Agriculture, Livestock and Irrigation (MoALI) estimated that in 2015-16, the total rubber planted area was 652,105 hectares and total harvested rubber area was 297,216 hectares or barely 45 per cent of the planted area. There is a huge gap between sown area and harvested area, suggesting that most



small-holders left the trees untapped in recent years due to poor demand and low price of natural rubber. In the past decade, the percentage of trees tapped was well above fifty percent of total trees planted. In 2005-06, forty-eight percent of trees planted were tapped. Starting from 2010-11, harvest area was reduced to 37 per cent for many years before it picked up again in 2015 when the rubber prices spiked again. Irregular harvesting practices hurt the producers as it affects long-term productivity of trees. Even more damage was inflicted on the reputation of producers as the source of reliable supply for downstream processors and exporters.

Historically, rubber was produced only in the southeast of Myanmar. Although the southeast continues to account for the majority of production, planting has increased in northern Shan and Kachin regions recently. In 2014-15 the three southern states and divisions, Mon, Tanintharyi and Kayin accounted for sixty-eight percent of sown rubber area and eighty-seven percent of harvest rubber area (Figure 4). Shan, Bago, and Kachin accounted for twenty-four percent of the sown rubber area, but only ten percent of production.

Figure 3: Cultivation areas of rubber in Myanmar (acres in 2016)



Source: MoALI, 2017.

Kachin and Shan state experienced rapid expansion, growing from 1.2 and 4.0 thousand hectares to 31.0 and 74.2 thousand hectares respectively (Ministry of Agriculture and Irrigation, 2010). Further, in historic rubber production areas, although growth was slower comparatively, the sown area still doubled over the same period. As shown in Figure 4, most of the expanded areas are somewhat adjacent to China and Thailand, indicating linkages with regional markets. As these regions are physically connected to more-advanced rubber-producing regions of neighboring economies, their early experiences and lessons for sustainable expansion and upgrading of rubber value chains can be relevant for Myanmar. As the rapid development of rubber sectors in these frontier regions was also blamed for land grabbing and devastating



CURRENT STATE OF RUBBER VALUE CHAIN IN MYANMAR

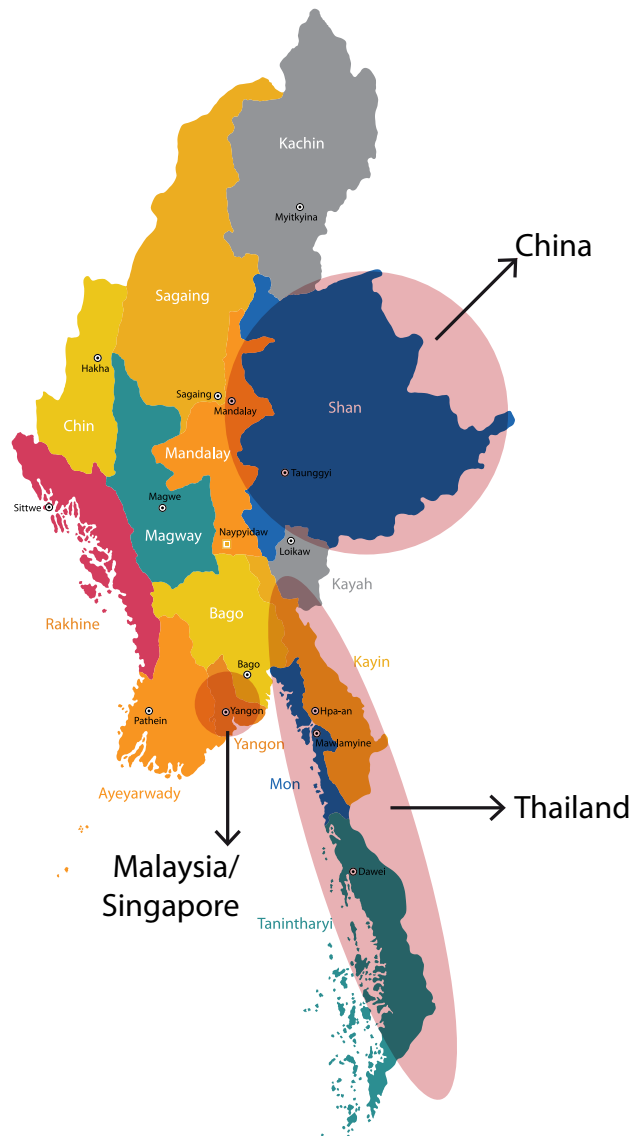
impact on deforestation by international and local environmental groups, Myanmar should also unlearn from these negative consequences. (Global Witness, 2014)

Production and Field Processing

Myanmar experienced the fastest growth of natural rubber production in Southeast Asia after the country rapidly expanded its rubber cultivation during the boom years of 2008-2012. The expansion was driven mainly by small-holders in the upstream segments without any parallel improvement in the efficiency of the rest of the value chain. Nowadays over 88 per cent of cultivation is in smallholdings with an average plot size of less than 20 acres. However, these small holders faced extreme price fluctuations even in the boom years and later, a more downward price decline since 2011. During the price hikes, small holders over-exploited their trees and stopped harvesting when prices became low. Such practices not only affect long-term productivity of the trees but also work against the needs of downstream processing sector that require predicable supply of raw materials for them to operate the factories. The processors then suppress the price offer to small-holders, which in turn negatively affect sustainability of livelihoods for small-holders. However, the dominance of small-holders in the sector does not necessarily cause these problems. For instance, Myanmar's neighboring Thailand, where 90 per cent of rubber production is also grown on small-holders, avoided similar experience and remained competitive in the global market as the leading producer and exporter of natural rubber. The key to resilience of the Thai rubber sector is a strong foundation of farmers cooperatives at the primary level whom the government also targets their various interventions in the wake of global rubber price decline.



Figure 4: Major rubber producing areas with their linkages to regional markets



Productivity and Yield

As discussed earlier, Myanmar became the ninth largest producer of rubber in the world and eighth in the Asia-Pacific region (Table 1) within a decade. Despite the fast expansion of its cultivation areas, rubber production is low compared to her neighbours, suggesting that productivity of the sector remains a serious challenge. Thailand produces twenty-six times more rubber than Myanmar, Indonesia produces twenty-one times more rubber, and Viet Nam produces six times more rubber (FAOSTAT Production Data,

CURRENT STATE OF RUBBER VALUE CHAIN IN MYANMAR

2015). Further, in India, China, and Malaysia production is more than four times as large as in Myanmar. This difference in rubber production is a result of Myanmar's relatively late cultivation with smaller areas mature for latex harvesting, and more importantly, lower yield of her harvested trees.

Table 3: Composition of rubber planters and producers

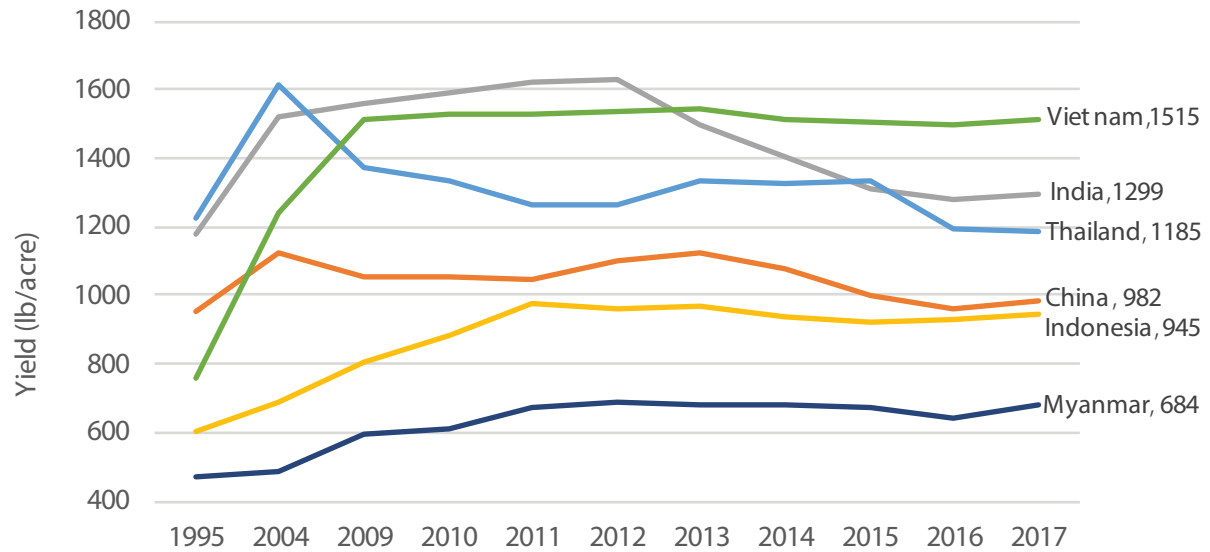
| Size of plot | Number of plots | Percentage of total | Total areas (acres) | Percentage of each plot size as share of total |
|-------------------|-----------------|---------------------|---------------------|--|
| Under 5 acres | 36,795 | 38.4 | 107,492 | 7.5 |
| 5-20 acres | 46,979 | 49.1 | 476,524 | 33.2 |
| 20-50 acres | 8,837 | 9.2 | 267,756 | 18.6 |
| 50-100 acres | 1,614 | 1.7 | 106,865 | 7.4 |
| 100-500 acres | 1,226 | 1.3 | 203,832 | 14.2 |
| 500-1,000 acres | 130 | 0.1 | 88,678 | 6.2 |
| Above 1,000 acres | 56 | 0.1 | 96,289 | 6.7 |
| Other categories | 100 | 0.1 | 88,495 | 6.2 |
| Total | 95,737 | 100.0 | 1,435,931 | 100 |

Source: MoALI, 2017

The FAO (Food and Agricultural Organization of the United Nations) and the Myanmar Ministry of Agriculture, Livestock and Irrigation (MOALI) estimates that rubber yields in Myanmar at 726 kilograms per hectare and 690 kilograms per hectare, respectively). These estimates are also confirmed by recent household survey of Mon State in 2015, which found that the yield was averaging 654 kilograms per hectare, slightly lower than the other two assessments. Regardless of seed and variety, Myanmar has the lowest yields among largest rubber producing countries. Thailand and Viet Nam's yields are more than double of Myanmar's yield levels. Low yields in Myanmar are likely not a result of the smallholder structure of the sector.



Figure 5: Long-term rubber yield (pound per acre)



Source: FAO Stat, 2017

In Thailand, Viet Nam, India, and Indonesia rubber production is also based on smallholder farming and these countries still maintain much higher yields (Figure 3). Two rubber experts from Myanmar suggest that low yields in Myanmar are the result of poor farming practices during the early years of planting when farmers fail to pay attention to proper selection of seeds, low use of inputs, as well as unskilled tapping and harvesting methods. The interviews conducted during the survey also confirmed these factors. Although Viet Nam and Indonesia seemed to have experienced low yields some twenty years ago in a manner comparable to Myanmar, these countries were able to improve their yield through better farming practices, replanting of better varieties and use of skilled labour in harvesting.

Export

Natural rubber witnessed significant price volatility in the world market over the last 5 years, averaging 35 per cent on an annual basis with prices ranging from US\$ 1,000 per ton in 2008 to US\$ 6,500 in 2011. This degree of price fluctuation has also prevented small rubber producing countries like Myanmar from having a stable market balance over the past decade. For Myanmar, natural rubber export became the fourth largest agriculture export commodity in 2017, valued at US\$ 197 million, behind rice, beans and pulses and maize. This ranking led the government to announce rubber as one of seven strategic commodities that the country needs to prioritize in her National Export Strategy, which would guide its sector development during the period of 2015-19.

Myanmar mainly exports natural rubber to China, which accounts for 85 per cent of total rubber export to all other countries in 2017. In return, Myanmar import value added manufactured rubber products such as tires mainly from China, which accounts for 77 per cent of total tire imports from all sources in 2017. The data also suggests that Myanmar has not been able to develop its downstream industries on natural rubber such as pneumatic tire factories and it has to import mainly from China. As the Myanmar economy is expanding, its import of natural-rubber-based finished products from China is also increasing. Between the positions of raw material exporter (natural rubber from Myanmar) and finished product exporter (tires from China), and given the recent drop in natural rubber prices, Myanmar faces a high possibility of declining terms of trade. Under such disadvantaged position of trade relations, Myanmar face greater chances of asymmetric price transmission along their supply chain and distorted incentive for effective supply response. As a result, small-holding farmers are more likely bear the burden to receive a lower profit.

Moreover, most of the cross-border trade on natural rubber is officially unaccounted for. The main reason is prohibitive taxation imposed on rubber exporters in Myanmar. Rubber is the only agriculture commodity subjected to 5 per cent commercial tax, as it was assumed as semi-processed as opposed to unprocessed agriculture export commodities. (NES ((National Export Strategy)), 2014) Although Thailand collected such tax on natural rubber export, all proceeds went into a 'cess' fund that could support small-holders in the time of market decline. Myanmar authorities have considered setting up a similar fund under the new Rubber Act; meanwhile, all stakeholders in the rubber sector felt that the tax was unfairly charged on the sector.

As a result, large volume of natural rubber export to China, which went through land border crossing, were unaccounted for. For instance, 53 per cent and 37 per cent of Myanmar's natural rubber were illegally exported to China in 2016 and 2017 respectively while 42 per cent and 49 per cent of Myanmar's tire import from China is unofficial. (Table 3) Since Myanmar officially recorded data is much lower than actual export (natural rubber) and import (tires), there is a huge possibility that Myanmar producers and consumers are receiving a distorted price signal from this discrepancy. At least for Myanmar's export of natural rubber, the official Myanmar's export value is much lower than the official import value recorded by China; therefore, depriving Myanmar's small-holders of the opportunity to receive actual signals of market demand. During the survey, several producers responded that their sale prices are much lower than the market price while efforts to upgrade their quality did not receive any price incentives. As a result, their sale can be much suppressed by the traders and exporters who are dealing with the China market. Although statistical discrepancies in trade data are common between reporting countries, discrepancies on such a scale suggest illegal channels of cross-border trade.



Table 4: Official trade data of Myanmar and China

| Commodity | Official Data | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------------------|----------------------|-------------|-------------|-------------|-------------|-------------|
| HS-4001: Natural rubber | Myanmar export | 151.15 | 79.43 | 78.16 | 94.67 | 159.31 |
| (Myanmar is producer) | China import | 121.59 | 82.38 | 69.50 | 144.45 | 218.40 |
| | Discrepancy | 20% | 4% | -11% | 53% | 37% |
| HS-4011: Tyres | Myanmar import | 79.98 | 43.36 | 47.40 | 58.92 | 55.39 |
| (Myanmar is consumer) | China export | 74.42 | 82.70 | 75.50 | 83.46 | 82.61 |
| | Discrepancy | -7% | 91% | 59% | 42% | 49% |

Source: UN Comtrade, 2018

In addition to this fundamental weakness in the linkage between Myanmar's natural rubber production to global value chain, Myanmar's natural rubber export is hampered by a wide range of issues such as low-quality grades (RSS 3 and MSR 20) and lack of reliable quality standards. Even when some local exporters tried to upgrade their natural rubber products to higher grades such as RSS5 or MSR50, they could not fetch higher prices for their products due to a lack of any reliable certification to back up their product qualities. Another serious problem is the lack of government-owned or -certified laboratories to certify Myanmar rubber products to support upstream sector's efforts to uplift the quality. Given higher cost of certifying their products in foreign labs, most producers became content to produce low quality grade products and accepting lower price for their sales. According to MRPPA, the prevailing average local rubber price for RSS3 sheet was 20 per cent lower than global average price of rubber for the same grade.⁸

Another shortcoming of Myanmar's natural rubber export is its narrow concentration of export markets, namely three countries, China, Malaysia, and Republic of Korea. Myanmar's dependency on a single buyer has increased since 2010 and by 2017, China import almost 80 per cent of all official export from Myanmar. In 2005, only 21 percent of Myanmar's natural rubber export went to China, with Malaysia being by far Myanmar's largest export destination with a share of 67 percent of total export. Now that trend has been reversed and China seems on the verge of becoming the monopolistic buyer of Myanmar's natural rubber while Malaysia took only 12 per cent of market share in 2017. Myanmar has clearly failed to diversify its export destinations as even traditional buyers such as India and South Korea no longer buy much from the country since 2015.

⁸ May Hnin, "Local rubber price riding rough due to instable dollar exchange rate," *Global New Light of Myanmar*. Yangon.

Table 5: Myanmar's Natural Rubber Export Destination

| | China | Malaysia | Republic of Korea | India |
|------|--------------|-----------------|--------------------------|--------------|
| 2017 | 85% | 12% | 3% | 0% |
| 2016 | 77% | 22% | 1% | 0% |
| 2015 | 76% | 22% | 2% | 0% |
| 2014 | 73% | 20% | 3% | 0% |
| 2013 | 75% | 20% | 5% | 0% |
| 2012 | 63% | 16% | 8% | 1% |
| 2011 | 54% | 35% | 6% | 2% |
| 2010 | 43% | 37% | 4% | 1% |
| 2009 | 18% | 72% | 4% | 0% |
| 2008 | 37% | 59% | 0% | 0% |
| 2007 | 40% | 50% | 0% | 2% |
| 2006 | 36% | 54% | 0% | 4% |
| 2005 | 21% | 67% | 1% | 7% |

Source: MoALI, 2017

4. MAPPING RUBBER VALUE CHAIN IN MYANMAR

This section makes a reflection on the perspectives of various stakeholders engaging in rubber value chain of Myanmar. The section begins with the views of the upstream actors such as producers and planters, tappers and migrant workers while taking into account of positions of middle- and down-stream participants such as processors and traders. The views expressed are taken from the survey.

Rubber Planters and producers

The upstream segment of the Myanmar rubber sector has two forms of producers: plantations and small-holding farms. Among the two types, small-holding farmers own almost 88 per cent of the plots (Table 2). In this regard, Myanmar is very similar to Thailand where 90 per cent of plots are also owned by small-



holders. Small holding farms in Myanmar rely upon family members to produce rubber as the main cash crop. However, due to attractive returns from rubber during the boom years, the farm owners began to use labour to maintain and harvest their extended plots.

In Myanmar, small holders are not well organized and they lack effective linkage with the national rubber producer association. Given budget constraints, the Department of Agriculture can provide only limited services of extension and seed inputs. Small-holding farmers also use traditional processing methods to produce farm-gate products such as field latex, unsmoked sheets and cup-lumps by adding preservative and coagulative acids before they sell to local collectors or processors. Depending on tapping and collection techniques and use of inputs such as formic acids, the quality of farm-gate products vary widely. Since small-holders are not organized and their products vary from one another, they cannot effectively bargain their price with collectors or processors. In addition, they lack up-to-date price information and technical knowledge about quality improvement.

During the survey, most respondents suggested two main constraints facing the small-holders. The first constraint had to do with land use policy of the government, which did not officially include agro-forestry under land classification⁹ and as a result, the farmers had a difficult time to get necessary land certificates that are essential for taking public and private loans for their planting and harvesting operations. Although recent government programs expedited the issuance of land certificates such as “Form-7” in accordance with newly-adopted “Farmland Law” (2012), many rubber small-holders still did not hold a Form-7 certificate. Two groups of farmers in Mon State mentioned that their land use rights were permitted through 30-year land grants from forest land, some of which were not renewed recently as the government policy on forestry has changed. Another group also raised the concerns of insecurity in certain parts of conflict-affected areas within the region where the farmers are still required to pay “land tax” to non-state actors. In general, many farmers perceived that their land ownership is not secure as there are no other parallel public services such as agriculture credit available to rubber small-holders. Sometimes, small-holders also require other types of documentation such as agriculture credit history to seek loans from private commercial banks or micro-finance institutions. Lack of clarity on land use certification processes has become a major bottle-neck for smallholders’ efforts to upgrade their plantations through investment and consolidation.

The second constraint mostly cited by the farmers had to do with lack of organization among small-holders as they strongly perceive that the existing national association, MRPPA, tends to work only on large scale commercial and policy issues. Although MRPPA has township level associations that cover many grassroots small-holders, the main function of these local chapters is more about information sharing and collective advocacy on issues such as land disputes. However, several experts and policy-makers viewed this lack of

⁹ The official land use classifications include paddy, garden, pastoral and forest land type. Planting of rubber can be permitted only when the farmers applied for the conversion of its land type for any commercial use (including plantation or opening of any commercial business), which was a difficult process.

association as a major impediment to any bargaining power with the buyers or any attempts to upgrade the quality of farm-gate products. Many farmer groups also cited this as a source problem of theft or price manipulations by the buyers. During the survey, several farmer groups pointed out the need to have more formal farmers association with stricter registration process to guide the planters and producers to follow standard procedures and certification needs. As many of them had been to Thailand and worked there as plantation workers at some point of their rubber career, they suggested that the government should consider nurturing the formation of such groups and offer financial and other incentives to the farmers to join the group and register to produce rubber.

Tappers and Migrant Workers

Rubber harvesting is labour-intensive and highly seasonal. When a rubber plantation is fully harvested, it requires one or two workers to take charge of a 5-acre plot. In this regard, a total of 1 million acre in southeast Myanmar could potentially employ 200,000 rubber tappers and plantation workers in the region. However, it is found that less than half of the cultivated areas are actively harvested in the survey areas, suggesting that such potentials are not yet realized. The more the plantations intensify their harvesting, by employing mostly tappers, the more employment generation from rubber sector can be significant to the region where such labour-intensive employment opportunities are rare. In normal seasons, small-holders tend to tap their trees on daily basis for seven to eight months a year except in the rainy season. This allowed some seasonal workers to migrate to Thailand where similar jobs are available even in rainy season.

Typically, tapping requires certain skills to cut the bark on the trunk of rubber tree to collect latex; and unskilled extraction can affect the yield as well as the longevity of rubber trees. Except for a small percentage of family-operated small plots, most small and medium-sized farms have to use tappers to collect rubber from the plantations, who are paid with percentage sharing of farm production. Depending on each farm's conditions and yield, the sharing arrangement can vary from 30 per cent to 60 per cent paid to the labourers who work for the farm owners. For example, the 30:70 arrangement means 30 per cent of product income goes to the labourer or tappers and 70 per cent to the owner.

During the survey, many farmer groups suggest that the cost of experienced and skilled tappers became very high as these tappers preferred to migrate to neighboring Thailand where they could earn income three to four times higher than what they were paid in Myanmar. Therefore, many farm owners opted for cheaper but unskilled tappers albeit at the expense of productivity of their work. In addition, they found it difficult to make the right balance of product sharing since higher percentage meant that the unskilled tappers might be adversely incentivized to increase their tapping intensity which in turn affect the long-term productivity of rubber trees. Many farmers were concerned with decreasing level of support from the government with regard to tapper training at government's plantations. Meanwhile, the government's response to the shortage of trained tappers is rather weak while the private sector's intervention to provide training could not cope with increasing scarcity of skilled tappers in the region.



Given the shortage of skilled tapper, many tapping jobs were picked up by local female tappers as well as migrant workers who came to work from other parts of Myanmar. Female tappers interviewed during the survey shared their anxiety of working in early hours such as from 2am to 6am in the mornings. There had been some incidence of violence against women tappers in the areas, and so far such situations were unaddressed. At the same time, migrant workers and their dependent families do not have other livelihood options to earn additional income while living and working in the large plantations. Meanwhile, some plantation owners also perceived insecurity due to the presence of large numbers of migrant populations living and working in the areas, which were locally viewed as the source of rising criminal activities in the areas.

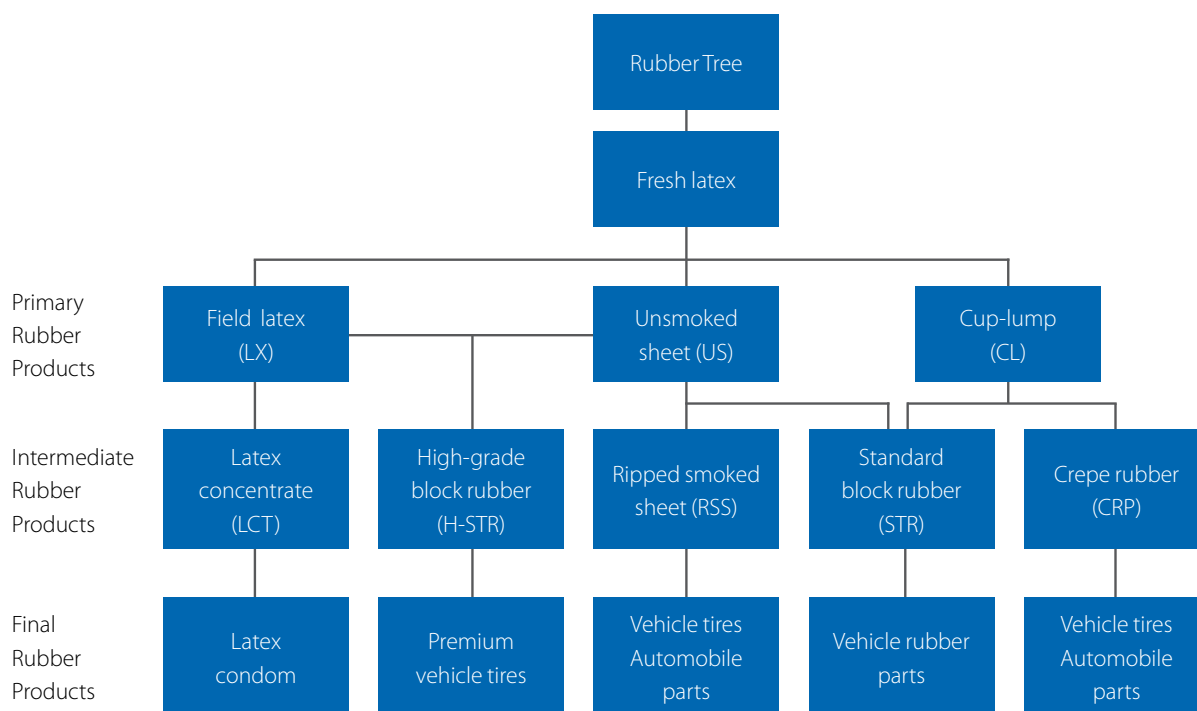
Cooperatives and Processors

In Myanmar, rubber processing factories can manufacture RSS and Technically Specified Rubber (TSR). Presently, these factories are producing low-grade sheets such as RSS3, RSS5 and TSR50 that are not very competitive in the international market. Since these factories receive low quality raw materials from small-holders, they lack any incentives to upgrade their processing technology and equipment. During the survey, almost all processors suggested that small-holders produced less uniform primary products with varying degrees of quality in the same locality, resulting in costly adjustments and quality control measures on the processing factories. As a result, all the products in that locality may receive low price regardless of their quality, thus, disincentivizing farmers' efforts on quality improvement. On the other hand, the government's attempt to develop industrial standards on type specification of rubber products has not materialized into a specific national certification system. Processors expressed their lukewarm response to the government's initiative as poor enforcement of these standards across the region failed to generate sufficient motivation for quality upgrades among the farmers. Lack of national certification left the local processors at a disadvantaged position when called upon to ask foreign buyers to pay competitive prices in a range of prevailing international market price. In addition, Myanmar lacks quality infrastructures such as laboratories to test and certify these products.

Until recently, there were a few cooperatives and small processing factories outside of major cities and business centres. In the absence of processing facilities close to their plantations, small-holders tend to make thick slabs and unsmoked sheets, which later can be sold to TSR factories. Although the primary processing method known as "cup lump," widely used in neighboring Thailand, requires less activity, less labour and less processing time, the farmers during the survey expressed their concerns that these cup lump facilities can be easily stolen and lost. Unlike in Thailand where the government has effective registration system over cup lump ownership as well as a central market that controls legitimate transaction, small-holders in Myanmar have fewer choices but to rely upon inefficient and labour-intensive RSS methods. While neighboring Thailand has differentiated processing and final product diversification as shown in Figure 7, Myanmar produces mainly of ribbed-smoked sheets.¹⁰

¹⁰ Myanmar's RSS gradings are much lower than international standards. While Thailand produces high grades RSS1 and Standard Thai Rubber, Myanmar's so-called RSS1 quality is equivalent of RSS3 of Thailand. There are five grades in RSS: RSS1 to RSS5.

Figure 6: Categories of natural rubber processing methods and its products



Source: Chanchaichujit and Saavedra-Rosas, 2018.

In fact, when small-holders opted for more traditional RSS method during the time of labour shortages, they failed to pay attention to proper latex collection, cleaner unsmoked sheet forming and quality checking to reduce impurities before they sold their sheets to local collectors and processors. Given such shortcomings, small holders tend to produce very poor-quality thick slabs and unsmoked sheets, which local collectors and small RSS factories in turn offering lowest price without differentiating much on the quality of sheets.

When such situations were further investigated during the survey, the processors reasoned that the farmers nowadays neglected the quality of their sheets; therefore, the factories preferred to buy the sheets by weight since the factories could not thoroughly check quality of the sheets supplied to them. At the same time, some processors also complained that a few farmers even let their rubber sheets mixed with gravels to steal extra weight, which led the factories to pay lower prices to all farmers in the neighborhood. These collective problems seemed to have worsened during the time of price decline.

On the other hand, most Myanmar rubber products were exported to TSR factories in China where advanced mechanized technology could reduce impurities caused by inefficient processing methods in Myanmar. Since these factories can operate at a scale to purify all grades of primary rubber products into high-quality finished products, they preferred to buy cheaper and low-quality inputs from Myanmar at



massive volume. Consequently, the Myanmar rubber sector became locked into using the inefficient RSS method to process its low-grade rubber products without ever reaching the stage of processing higher grade rubber sheets that can fetch higher values in other international markets.

In addition to these intrinsic factors, the rubber processing industry in Myanmar also faces other constraints. First, the processors have no fiscal or financial support from the government and the private banking sector is also not interested in financing trade operations or other types of projects. Second, they collect rubber directly from the plantations and small-holders bear the cost of transportation. Given poor infrastructure in many rubber producing areas, they must absorb high logistic costs. Third, there is no meaningful support from the government in terms of marketing and certifying products to access to international markets. Last but not least, they lack up to date industrial and technological knowledge, while the government has not invested much in local research and development activities in support of the industry.

Traders and Exporters

Most farmers interviewed during the survey sell their farm-gate produce to village collectors, accounting for 80 percent. Transactions from farmers up to processors pass through two or more middlemen, resulting in wider price margins, which can rise to up to 10 percent of the FOB price (around 5 percent per trader or collector). However, direct transactions through wholesale buyers or buying agents of foreign destinations account for around 20 percent of transactions. Each marketing route has advantages as well as disadvantages, resulting in competitive relationships between the various routes, especially between different collectors. One of the main attractions for farmers of selling through collectors is on-the-spot cash payments. Although the purchase price can be much lowered than the wholesale buyers, immediate cash payment is attractive for smallholders who are struggling with hand-to-mouth situations.

On the other hand, selling to wholesale buyers guarantee their ability to purchase any time at any quality as they have much resources such as storage place to handle oversupply situations when most smaller agents and collectors do not take risks in buying large volumes. A few wholesale buyers such as Fuxing and Southland Co Ltd., both subsidiaries of Chinese firms, also have their own processing plants and large storage space to process and store large quantity of rubber. As a result, wholesale buyers and agents of foreign buyers have a dominant role in setting local price.

Since rubber is a perishable commodity, small-holders cannot stockpile surpluses during down periods while they wait for prices to rise. During the survey, many farmers shared their frustrations that they have been forced to sell at low prices out of desperation for a long waiting period. Since there are only a few wholesale buyers, anticompetitive practices were said to be rife, but the government could not take any actions against such controlling of prices among major buyers. Although the government tried to announce reference levels for rubber prices on a daily basis in Mudon, the town with highest number of producers and planters, it cannot enforce and influence any private transactions between the farmers and the buyers.

Modern Joint Venture Factories

When the previous military government promoted “White Gold,” or rubber planting campaign in 2006 with the formation of a new department named “Department of Industrial Crop Department (DICD),” the main strategy was to grant land concessions to private Myanmar companies and joint-ventures to develop agri-businesses to increase the export of crops to increase foreign exchange revenue. Under the 30-year Master Plan for the Agriculture Sector, 2000-2030, the government allocated nearly 2 million acres of private agriculture concessions to 204 private companies within a decade from 2000 to 2010. Large concessions in Kachin and Shan State with a total area close to 700,000 acres were planned to grow rubber as the main industry crop to target China market. (Woods, 2012) Many private Chinese companies such as Gaoshen Group, Yunnan Hongyu Group, Dongfeng Tianyu Co. Ltd as well as Yunnan-based state farms have been connected with rubber production in northeast Myanmar. (Oxfam, 2017) Their entry also allowed the biggest shift in export destination of Myanmar rubber in 2010 when China surpassed Malaysia as the top market.

However, much of these agriculture investments into the rubber sector lacks adequate support for small-holders to benefit from technology transfer or market access to global value chains or sound safeguards to mitigate any adverse effects on the host communities. Moreover, only 36 per cent of total land grants have been developed and out of that only 20 per cent have been cultivated with planned industrial crops; therefore, the risks related to large-scale rubber development outweighed the benefits to local economies or small holders. (OECD, 2014) In fact, environmental groups have already criticized the projects as “legal land grabs” with little intention of planting the promised agriculture crop. Worse still, these investments made massive profits from extracting hardwood logs or “conversion timber,” with devastating impact on forest landscapes as well as community livelihoods. (Woods, 2015) With more detailed reports on large agribusiness in northeast Myanmar emerging, there is a true risk of further tarnishing the already poor image of Myanmar rubber as “conflict rubber,” and perhaps, greening of Myanmar’s rubber value chain should also address political economy dimensions of the sector. (Woods, 2018)

Although such large investments involving land concessions are not found in case of southeast Myanmar, there are two examples of foreign investment projects this survey has covered in Mon State, which may suggest potential solutions to achieve sustainable rubber value chain development in whole of Myanmar including its troubled northeast region. The first project is invested by Sri Trang Co. of Thailand in joint venture with local agribusiness company, Aya Hinthar Co. Ltd, to develop middle-stream latex processing plant in Mudon Township of Mon State. Sri Trang has an ambitious plan to source high quality rubber from small-holders in the areas while its project site has already established a proper harvesting process for “cup lump” as well as a small laboratory equipped with a Mooney tester, as well as dirt, ash and plasticity testing capabilities. The company has successfully exported 5,000 tons of high-grade STR10 sheets to Japan. The second project is also a joint-venture between Fuxing Brother (Myanmar) and Southland (Thailand), which planned to upgrade local RSS factory and integrate its supply chain into producing high quality rubber products. These examples involve very little land concessions (only local companies owned lands while



foreign partners did not get any concessions) but accelerated the technological upgrade of the processing segment while enjoying direct access to foreign markets channeled through their established partners from Thailand.

Rubber Wood Industry

At the end of the rubber value chain, Myanmar has recently established rubber wood factories. According to an estimate of the Department of Agriculture, there are as many as 76,308 rubber trees that are over the harvestable age of 30 years. There are nearly 200,000 rubber trees that are above 15 years of age, close to the end of their productive life. Until relatively recently, after it finished producing latex, rubberwood was used mainly for fuel wood in rural southeast Myanmar. Harvesting rubber trees and developing it for furniture may provide a source of carbon sequestration to mitigate climate change. Due to the shrinking area of natural forest and recent ban of logging in Myanmar, the country will depend on planted trees like rubber for chipboard industries as well as sawmillers and plywood/veneer operators. Although rubber plantations are found to improve the soil's physical and chemical properties, however, their potential role of sequestering carbon has not been fully evaluated.

During the survey in southeast Myanmar, a dozen rubber wood factories were found along the highway connecting through the region. Most factories are focusing on production of boards and logs, rather than assembly of furniture. Since the export value of wood furniture can fetch 10 times more value than raw rubberwood and the furniture industry can generate many jobs, it is important for the government to encourage more value-added manufacturing in the nascent industry. A range of supportive activities such as research and development of better-quality rubberwood and for new product designs with the aim of creating high-quality products is urgently needed to sustain the industry. A program could be set up, for example, to connect rubber wood industry with local furniture makers and markets while incentivizing finished furniture export rather than raw rubber wood.

5. SUSTAINABLE VALUE CHAIN: POLICY RECOMMENDATIONS AND PRIORITY AREAS FOR SOUTH-SOUTH COOPERATION

Most stakeholders whom this study consulted, from small-holders to rubberwood entrepreneurs, shared their hopes and frustrations about participating in emergent agriculture value chains and expressed their desire for more pro-active policies of the government to address their needs. Their collective perspectives suggest that the prevailing policy approaches of either sectoral (e.g. agriculture credit and extension) or macroeconomic (e.g. exchange rate, trade and taxation) issues are not sufficient to address institutional weaknesses along value chains that impeded effective price transmission, which in turn distorted incentives for stakeholders within the chain and to overcome market failures constraining smallholder supply responses for quality and productivity gains. Although environmental sustainability of rubber sector in

Myanmar is crucial, there is a comprehensive need for sustainability in terms of livelihood, industry and market encompassing the entire value chain.

More importantly, the potential impact of large-scale land concession programs for rubber plantations without sustainable development of efficient value chain pose devastating consequences of “loss-loss” in all aspects of economic, social and environmental degradation. To address the above challenge, Myanmar must learn from her southern neighbours in terms of developing a sustainable pathway for rubber value chain development. In fact, many stakeholders being interviewed for this study showed their enthusiasm to learn information on available innovations, technologies, financing opportunities, marketing information and policies from Thailand, China, Malaysia and Indonesia, which can be relevant to Myanmar context. Many of them, including a few smallholders, have worked in the same rubber industry in the past; therefore, a strong case for promoting knowledge-sharing and peer-to-peer learning exist. The following recommendations are made in the light of lessons learned from a few select cases in Myanmar’s neighboring economies.

Safeguarding Land Concessions and Supporting Smallholders with Eco-certification

First and foremost, the government needs to establish an overarching national land policy in view of protecting the livelihoods of small-holders and their communities against any negative consequences of large agriculture land concessions such as the ones seen in northeast Myanmar. For the existing projects, the government can enforce environmental and social safeguards in order to prevent negative ecological and community impacts. The government may also consider consulting the China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters, which develop Guidance for sustainable rubber under the auspices of the Ministry of Commerce of the People’s Republic of China, State Forestry Administration in 2017.¹¹ The guidance requires Chinese outward investments in rubber sectors, such as those in Myanmar, to implement the standards throughout their supply chains.

For small-holder communities that have expanded rubber plantations beyond their communal lands, like in case of southeast Myanmar, specific incentives such as eco-certification for their eco-friendly agroforest products or payments-for-environmental services for managing land use practices could be put in place. In fact, the authorities in Yunnan province of China, the source of most Chinese investment in northeast Myanmar, has been experimenting with the communities to make the right balance between conserving biodiversity and heritage landscapes on one hand and economic aspirations of households who prefer rubber expansions in their communities on the other hand. (Smajgl, et al, 2015; Min, et al, 2018). However, these incentive and payment systems have several limitations even in more resourceful and advanced economies like China and elsewhere, the concepts like “sustainable” or “green” rubber may be less practical in Myanmar. Nonetheless, the government can use these concepts with respective counterparts from

¹¹ The Guidance can be accessed at <http://www.mofcom.gov.cn/shfw/201802/20180226075955558.pdf> or at another link at https://www.globalwitness.org/documents/19244/CCCMC_Guidance_for_sustainable_natural_rubber_2017_EN.pdf



China and other investors to request appropriate remedial measures to correct the negative impacts of less responsible investments in rubber sectors.

Sustainable agro-forestry development

In Myanmar, many plantations are mono-culture rubber system; therefore, the source of farm income is totally dependent on rubber price. It is necessary to support these farms with appropriate agroforestry or inter-cropping practices to earn additional income from added crop mixtures such as fruit trees, medicinal plants and livestock farming. (Fox J., Castella J.C., 2013) Given externalities of monoculture production on water availability and quality, stream sedimentation, or biodiversity, intercropping with other cash crops can be a good strategy to mitigate the environmental impacts of rubber plantations. (Langenberger, et al., 2017) In this case, promotion of agro-forestry practices among small holders can be useful for both livelihood strategies and environmental advantages.

In neighboring Thailand, smallholding rubber-based agroforestry system was promoted as a response to decline of natural rubber prices in order to achieve resilient incomes for smallholders with viable economic and environmental functions. A few options such as rubber intercropping with fruits and vegetables such as pineapple, hot pepper, sweet potato, guava, salacca as well as tree plants such as teak, palm plots, mahogany and eagle wood, can also be possible in Myanmar. According to the experiences in Thailand, intercropping also boost rubber latex yield as well as plant nutrient cycling, which in turn improve returns from rubber crop. In addition, more canopies of intercrops can prevent rain drops attacking the topsoil while various root systems of plants will prevent soil erosion, which can provide high environmental benefits such as sedimentary reduction, flood and drought relief. (Jongrungrat, et al, 2014)

Empowering Tappers through Skill Development

Improving skills and human resources for the rubber sector can be one of the possible inclusive strategies to contribute to sustainable value chain development. The survey found that most of rubber plantations in southeast Myanmar nowadays rely upon female tappers and other female workers in general plantation tasks. Lack of access to training and resources have pushed women to accept employment (in this case, rubber tapping) at bare minimum wages attributable to their being unskilled. The country's existing labour laws have not covered tappers as they are regarded as seasonal or casual agriculture labour; therefore, the rights and protection of vulnerable female tappers in rubber plantations need urgent attention. Since tappers occupy one of the most important link between sustainability and productivity of rubber production, provision of skill development training and uplifting their skill standards to regional level can be one of the quick wins the government can achieve under the current circumstances.

At the same time, the government can also consider the suitability of introducing liquid latex collection systems for the plantations that are under shortage of labour. Since liquid latex require shorter time cycles, it is suitable for female tappers and workers, who could save more time to do house chores and look after

children in the family. A more challenging requirement is the establishment of processing plant close to the farms, and the prior arrangement to collect the latex to reach the scale to produce quality sheets. In this regard, the system needs some organization or cooperative with strong horizontal linkages. Here, small-holders must come together to set up their new collection system and point of delivery to the transport of liquid latex to a processing factory which could clear payments on weekly or bi-weekly basis.

This outgrower strategy is not an advanced technological upgrading option but it is innovative in the commercial relationship and networking in the traditional value chain that relies on dispersed individual operations. Such strategy may also become relevant for post-conflict economies where the stakeholders need to build platforms to restore trust and businesses in the conflict-affected regions; In fact, this survey found such innovative approaches in a few spots in Mon State; however, the key is the readiness of a latex processing factory that could collect supplies from the community within a feasible distance. Perhaps, the government should consider supporting such arrangement by learning how such system were introduced, incentivized and improved over time in Thailand and Viet Nam. (Hoang, 2008)

Organizing Smallholder Associations and Enhancing Value Chain Governance

Perhaps, one of the most critical requirement for upgrading the rubber value chain in Myanmar has to do with the task of organizing small-holder rural farmers to be able to work with processors and exporters along specific product grades and quality control procedures. The foundations for such effective organizations already exist in southeast Myanmar. For instance, township chapters of MRPPA are implanted in every township in Mon State and in the majority of cities and towns in other two provinces: Karen State and Tanintharyi Region. Although the MRPPA often has its attention on national policy priorities, their long-term drive for quality and productivity can be easily undermined by the lack of organized small-holders whose time-horizon is more fixed on daily incomes. In this regard, it is imperative for MRPPA to develop effective strategies to strengthen their horizontal cooperation among smallholders to develop a common system to guide their farming, tapping and semi-processing techniques. At this point, many small-holders under this survey expressed keen interest in collaboration on participating in such arrangements.

In order to sustain collective partnership among small-holders, the government should also consider developing necessary institutional mechanisms and governance arrangement to regularize the commercial relationships along the value chain. Here, there are many useful experiences from Thailand that can be instructive for Myanmar to work upon. The first institutional element can be a central market to regulate market transactions through formal registration of all small-holders in the central market registry. More innovative mechanisms such as seller-buyer discovery mechanism, quality assurance certification and transaction-history-linked credit allocation can be added through this central market function. The second institutional element can be an apex authority such as the Malaysian Rubber Board or the Rubber Thai Authority of Thailand (RAOT) to closely govern the value chain participants and to act as a trustee for managing long-term mission as well as any funds that may be collected from the profits made by producers and exporters. In fact, the government has been drawing up a new Rubber Act that may legalize such



board to become functional in the future. However, law drafting became entangled with legislative and enforcement issues and the Act is still pending after two years of work. Perhaps, what can be prioritized is the setting up of a taskforce in lieu of the Board to be tasked with immediate priorities, some of which are being addressed in this study as well as finalizing the law draft.

Upgrading Rubber Processing, Grading and Certification Mechanisms

A rubber grading system as well as a standard payment method for graded rubber will be essential for growth in the rubber sector. Only by adopting these standards will Myanmar be able to improve the cleanliness and consistency of its rubber. Most rubber exporting countries have issued standards concerning technical specifications for block rubber. These standards have become recognizable brands on the world market. TSR in Thailand is known as STR (Standard Thai Rubber), in Indonesia as SIR (Standard Indonesia Rubber), and in Malaysia as MSR (Standard Malaysia Rubber). Based on interviews with Sri Trang project in Mudon, small laboratory set up that can test dirt, ash, volatile matter, and nitrogen content as well as plasticity and color can be established at a reasonable cost. Such grading facilities can be established at the township level of government offices to test the quality of produce owned by smallholders and collectors before the intermediate processors. The processors should only export their rubber products as standardized sheets such as MSR10 or MSR20. Only by adopting strict grading, marketing, and payment standards across the rubber value chain will the government be able to improve prices to producers and develop the rubber sector. (Filipski, et al., 2017)

Many of Myanmar's neighboring rubber producers such as Thailand, Malaysia and Indonesia have well-established rubber certification system; and in particular, the Thailand and Indonesia models are relevant for Myanmar case. The rubber sector in these two neighbours are dominated by smallholders while the sector in Malaysia is mainly composed of large plantations. Without a proper certification system, processors will receive lower prices (they pay much lower price to smallholders in return) and will not be able to access important rubber markets. The Government has already established one laboratory in Yangon; however, it still requires proper accreditation with industrial standard series ISO 9000. While the government can encourage private sector to develop viable test facilities near plantation areas, it can focus on establishing quality assurance procedures and accreditation mechanism to assure compliance of private labs. In fact, the Government of Japan has already assisted the MRPPA to develop "Quality Verification System for Natural Rubber Products of Myanmar" in 2013 and such cooperation can be expedited as the government has also approved the Myanmar Standard Rubber scheme and specifications in 2017.

Value Chain Financing

During the survey, there is a single most important consensus among respondents—the need for financing at all segments of value chain. Under the present schemes of Myanmar Agriculture Development Bank, rubber small-holders are not entitled to receive agriculture loan from the government. SME loans and trade financing facilities are not yet available to other stakeholders, leaving only internal financing between

buyers and sellers at different segments of the value chain to mobilize resources to each other. Such internal resource mobilization mechanism became less efficient when price decline and quality rejection accumulated over recent years. In this regard, external financing is crucial to address certain gaps in the value chain; however, the sector needs government-sponsored program to access finance as commercial loans are too costly to finance long-term upgrading options. (IFAD, 2012)

Under these circumstances, the recent initiative of Mon State Regional Government to bring an innovative value chain financing program to experiment in upgrading processing facilities with a few SMEs is a novel intervention worth further replication throughout the sector. According to the focus group discussions, the pilot program requires group lending on process innovation to one or more points in a value chain in order to upgrade the quality-grade of the product to boost their market profits. The regional government facilitated the group formation by inviting farmer groups to submit applications on their respective business plans on value chain upgrade. Recently, one round has been approved to grant medium-term loan for 14 applicants worth of 2 billion kyat (US\$ 1.3 million).

Among them, eight groups of lenders from one township, Kyaikmayaw—an outstanding business model that can be replicated elsewhere. In that portfolio, as all groups focus on the setting up of a chain of modern processing plants to service small-holders who can supply them high grade latex fluid to process better-quality RSS sheets. The group leader, who is also secretary of the township producer association, committed the biggest investment to acquire new technology and cutting-edge equipment to produce export-quality sheets. His loan was guaranteed by other members of the association on the same terms whereby microfinance institutions disburse loans to group members. Other members of the association also took smaller loans to improve their collection and processing of unsmoked sheets that will be later transported to the modern factory for further processing. All the members of the association including group lenders are confident that their initiative will bear fruit in the coming year.

The abovementioned initiative is something similar to what farmer cooperatives in Thailand are attempting in order to achieve their goal of value chain upgrading. (Yamamoto, 2015)

Although Myanmar government may not be able to afford to provide subsidies to some innovations, there is a number of ways that the government can consider non-financial support to these innovative cooperatives. First, technical assistance can be given to enhance the design, performance indicators and delivery plans of loan project. Second, linkages with exporters and markets can be facilitated to sustain sufficient value-added potential at the local level. Third, it may broker contacts with microfinance institutions and other financial institutions to support cash-flows and additional investment should the project succeed. However, the government must also recognize the limitations of value chain finance to address process gaps and unequal relationships in a given chain as there are other prerequisites that must be met in order to create an enabling environment for value chain development.



6. CONCLUSION

Myanmar's rubber sector is at a critical juncture. Rubber production is projected to increase in the coming years as the trees planted during the rubber price spike mature. Despite this production increase, the country will still need to overcome several major problems in order to become a large rubber exporter. Further, if some of these weaknesses are not addressed, the rubber sector will not only fail to grow, but may actually collapse. Over the past five years rubber prices have dropped substantially, making tapping of rubber too expensive for many smallholders. If rubber prices continue to fall, or wages increase, smallholder rubber production will no longer be sustainable. Rubber prices, however, are projected to increase steadily. Nevertheless, in order for Myanmar to take advantage of this improved global rubber climate, major changes are needed.

Thus, a concerted effort is needed on the part of public institutions to support all value chain actors of the rubber sector; most important of all, small-holding farmers who also represent the weakest link in quality and productivity reforms Myanmar needed critically. The government of Myanmar can reap immense benefits from learning the lessons of various value chain upgrade experiences from neighboring rubber-producing countries such as China, Viet Nam, Indonesia and Thailand. Through South-South Cooperation framework, Myanmar may consider seeking technical assistance and capacity building support for effective value chain upgrade that are suitable to Myanmar's context.

Among a few agriculture value chains that exist in southeast Myanmar, natural rubber provides a unique opportunity to address the political economy of inclusive growth. The careful selection of rubber as a common endeavor to local CSOs to facilitate farmers-to-farmers cooperation along horizontal linkages may also contribute to social capital building and local democratization beyond commercial benefits from such cooperation within the value chain. Such opportunities are ripe for Myanmar to develop effective post-conflict development strategies with technical assistance from multilateral institutions. Then, the study could also become an instrument for evidence-based advocacy for coalition building for peace and reconciliation—all of which activities can be further formulated with a verifiable and actionable platform. Such innovative strategies in Myanmar can be considered for further support from the government of China in South-South cooperation framework since it has recently mediated Myanmar's peace process.

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