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Technical Paper

The role of rattan in the socioeconomic development of Indonesia

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About this Working Paper

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Executive summary

The rattan market in Indonesia has been experiencing a boom and bust cycle since the 1970s. A series of regulations has been issued and applied but not aligned. Different government regimes have different interpretations of and strategies in rattan trade. Rattan farmers and traders, as well as exporters, are the stakeholders most affected by the inconsistent regulations. In a certain period, the government gives freedom to the market; but in a different period, the government restricts the market from export and inter-island trades. Policies discriminate between natural and cultivated rattans. The rattan market has experienced challenges for nearly half a century. In the last few years, the rattan market and industry have found a way to survive. Price, trade and export values have been increasing in the last four years since 2017. The growing export trend, followed by the increase in production and in the farm or forest gate price, is indicating the strong influence of the global market on rattan trade in Indonesia.

The rattan trade and industry in Indonesia have been able to survive despite all changes across the value chain. Those involved in the trade are specialised. They are aware of the risks and the benefits. Many of them are consistently involved in the trade for cultural reasons, such as the indigenous peoples in Kalimantan who have been utilising rattan in their daily lives for more than a century.

The challenges in the rattan value chains remain unsolved but need attention, especially from the government as the regulator. The natural rattan harvesters still have to pay the government for their harvesting quota to enable them to harvest the rattan from the forest. The processing industries are expecting support from the government or investors to access machinery and innovation for faster and more efficient production. Traders and exporters are expecting support from the government to enable them to penetrate the global market. They are willing to contribute to the recent innovations involving rattan, that is, to the rattan fiber innovation in the furniture industry and to the use of rattan technology to replace bones. This report offers several key recommendations especially to the Government of Indonesia for the development of the rattan trade and industry.

1. Introduction

1.1 Background

Rattan is one of the most important Non-Timber Forest Products (NTFPs) in Indonesia. There are more than 350 species of rattan in Indonesia out of the total of 631 species of rattan distributed in the tropical and subtropical rainforests of Africa and the Asia Pacific region (Vorontsova et al, 2016). Kalimantan, Sulawesi and Sumatra Island in Indonesia have been commercially trading rattan for decades, and the industry is located mainly on Java Island. Local communities in Kalimantan, Sulawesi and Sumatra islands are mainly using 17, 15 and 16 species of rattan, respectively, to produce baskets, handicraft, mats and furniture (Kalima and Jasni, 2015).

From the 1970s to the end of the 1990s, rattan contributed to Indonesia's income mainly from their export, which had a significant multiplier effect on the national and local economies. The exported rattan products were mainly furniture, handicraft and semi-processed and raw materials, and they were supplied to the industries in Japan, China and Europe.

From 2000 to 2005, rattan production and trade had a declining trend due to the expansion of rubber and oil palm production and trade as well as the expansion of coal mining, especially in the Eastern and Central Kalimantan regions. Meijaard et al (2014) reported a significant decline of half to one-third of the income of farmers from rattan production in East Kalimantan in the period 2004–2010.

Thus, understanding the changes in and the key drivers of the rattan industry is critical to analysing its contribution to the socioeconomic development, especially to the livelihood development, of rural stakeholders in Indonesia.

1.2 Objective

The objective of this study is to analyse the recent trends in the rattan market and their importance to the livelihood of rattan harvesters and growers in Indonesia, and to draw recommendations for enabling rattan sector development in Indonesia.

1.3 Method

This study was based on secondary literature—previous studies and official government data—and utilised the unpublished data collected by the author before the coronavirus disease 2019 (COVID-19) pandemic. To describe the current scenario at the microlevel, the data were collected through key informant interviews (KIIs).

The KIIs were conducted in the following geographies:

- Aceh, North Sumatra and West Sumatra to describe rattan production on Sumatra Island;
- Katingan Region, Central Kalimantan; and
- Central Sulawesi.

The respondents were rattan farmers and harvesters, rattan traders and local collectors, and government officials. Due to the COVID-19 pandemic and the travel restrictions, most of the data for this study were collected from limited KIIs rather than from an extensive household survey of many farmers.

2. Rattan in Indonesia

2.1 Rattan industry in Indonesia

Although rattan in Indonesia is mainly produced in Sumatra, Kalimantan and Sulawesi Island, the major industry is located in Java, especially in Cirebon and Gresik. Cirebon Regency, located at the border of West and Central Java, is known as the largest rattan industry region in Indonesia. The Cirebon Regency Government reported that the value of the rattan exports of the regency in 2019 was about 165 million USD or 40% of the total value of the rattan exports of Indonesia[1]. Cirebon has been known for decades as the centre of the rattan industry in Indonesia, which has been experiencing a boom and bust cycle.

The subdistrict of Menganti in Gresik Regency, East Java has the second largest rattan industry in Java, after Cirebon. Large industries and microscale, household-level industries there are working together to produce rattan finished products, from handicraft to furniture. The microscales are supporting the industries by taking contracts to provide semi-finished products.

2.2 Commercial rattan species

The National Standardization Agency of Indonesia (*Badan Standardisasi Nasional*) recognises 51 commercial species of rattan in the Indonesia National Standard (Badan Standarisasi Nasional, 2017). Among these species, 11 are the most important commercial species harvested and traded by the community in the study area (Table 1). Based on the diameter size, the rattan is divided into two types, the small species with a diameter smaller than 18 mm and the large species with a diameter equal to or larger than 18 mm. This diameter sizes division is widely known in the rattan industry in Indonesia. The small species are mainly used for production of rattan mat, webbing, and basket, the large species mainly used for furniture, sticks, and baskets.

[1] https://www.cirebonkab.go.id/ekspor-funitur-rotan-cirebon-menuju-pasar-global

Table 1. List of commercial species, uses, diameters (physical profiles) and distributions of rattan.

Trade and scientific name	Island of distribution	Uses	Diameter* (Large/Small)
Manau *Calamus manan* Miquel	Sumatra, Kalimantan	Furniture	Large
Tabu-tabu *Daemonorops sabensis* Beccari ex Gibbs	Sumatra, Kalimantan	Furniture	Large
Semambu *Calamus scipionum* Loureiro	Sumatra, Java, Kalimantan	Furniture	Large
Seel *Daemonorops malanochaetes* Blume	Sumatra, Java, Kalimantan	Webbing	Large
Cacing, Srimit *Calamus heteroideus* Blume	Sumatra, Java, Kalimantan	Webbing, basket	Small
Sega *Calamus caesius* Blume	Kalimantan	Webbing, mat	Small
Irit, Jahab *Calamus trachycoleus* Beccari	Kalimantan	Webbing, mat	Small
Lacak *Daemonorops crinita* Blume	Sumatra, Kalimantan	Webbing, basket	Small
Batang, Mandola *Calamus zollingeri* Beccari	Sulawesi, Maluku	Furniture	Large
Lambang *Calamus ornatus var celebicus* Beccari	Sulawesi	Furniture	Small
Tohiti *Calamus inops* Beccari	Maluku, Sulawesi	Furniture	Large

**Small diameter < 18 mm, Small diameter = 18 mm or larger*

2.3. Regulations

Rattan has been strongly regulated by the Government of Indonesia for 40 years. More than 10 Ministerial decrees have been released by the government to regulate rattan trade. Each of these decrees has a different rationale, aimed at developing the national industry, increasing its domestic added value or improving the livelihoods of the rattan harvesters, traders and industries (Table 2).

Government regulations on rattan had been inconsistent across presidential administrations. However, the regulation in 2012 was the last significant regulation that controlled rattan exports. The last regulations prohibiting raw and semi-finished rattan product exports affected most rattan harvesters and farmers as well as raw rattan exporters. However, industries were expected to benefit most from the regulations by having better opportunities to access raw materials.

Table 2. List of government regulations to control rattan trade since 1979.

Year	Decree	Substance
1979	Decree of the Minister of Trade and Cooperative No. 492/Kp/VII/1979	Prohibited raw rattan exports
1986	Decree of the Minister of Trade No. 274/Kp/X/86	Prohibited exports of raw and semi-finished rattan from Indonesia, especially rattan mats (*lampit*), except by registered rattan mat exporters
1988	Decree of the Minister of Trade Nos. 1907KP/VI/88 and 410/KP/XII/88	
1992	Decree of the Minister of Trade No. 179/Kp/VI/92	Cancelled Decree Nos. 492/1979 and 274/86 to allow exports of raw and semi-finished rattan and rattan products but applied export tariffs to unprocessed, washed, smoked or sulfurised rattan, polished rattan, rattan core and peel and rattan webbing
1996	Decree of the Minister of Trade No. 666/KMK/017/1996	Cancelled the export tariff applied in Decree No. 179/Kp/VI/92

<table>
<tr><td>1998</td><td>Decree of the Minister of Trade and Industry No. 440/MPP/Kep/4/1998, No. 410/MPP/Kep/XII/1998 and No. 33/MPP/Kep/1998</td><td>Lifted major export restrictions</td></tr>
<tr><td>2004</td><td>Decree of the Minister of Trade and Industry No. 355/ MPP/Kep/5/2004</td><td>Prohibited exports of raw rattan and natural/wild rattan but allowed exports of cultivated rattan (only specific species)</td></tr>
<tr><td>2005</td><td>Regulation of the Minister of Trade No. 12/M-DAG/PER/6/2005</td><td>Allowed semi-finished rattan exports for specific cultivated rattan but applied a quota</td></tr>
<tr><td>2008</td><td>Regulation of the Minister of Trade No. 28/M-DAG/PER/7/2008</td><td rowspan="2">Strengthened the Decree in 2005 by applying some conditions for semi-finished rattan exports with a minimum volume for supply to the domestic market and restricted exports of rattan from outside Sulawesi and Kalimantan</td></tr>
<tr><td>2009</td><td>Regulation of the Minister of Trade No. 33/M-DAG/PER/7/2009 and
Regulation of the Minister of Trade No. 36/M-DAG/PER/8/2009</td></tr>
<tr><td>2011</td><td>Regulation of the Minister of Trade No. 35/M-DAG/PER/11/201</td><td>Prohibited exports of raw rattan, round rattan, washed/sulfurised rattan and semi-finished rattan</td></tr>
<tr><td>2011</td><td>Regulation of the Minister of Trade No. 36/M-DAG/ PER/11/2011</td><td>Regulated inter-islands raw rattan trade</td></tr>
<tr><td>2012</td><td>Regulation of the Minister of Trade
No. 44/M-DAG/PER/7/2012</td><td>Prohibited raw and semi-finished rattan exports</td></tr>
</table>

3. Socioeconomic development of rattan

3.1 Livelihood of rattan farmers and harvesters

Meijaard et al (2014) and Belcher et al (2004) found that about 15–20 years ago, 30–50% of the income of rattan farmers in East Kalimantan came from rattan harvesting. However, the same community in West Kutai, East Kalimantan is now relying mainly on rubber and oil palm for their livelihoods. Their rattan farms were converted into oil palm and rubber farms as well as coal mining sites. Only a few of them still have activities related to rattan, particularly in the community that produces baskets for niche markets. They harvest the rattan mainly from their gardens.

Bizard (2013) found that the communities in Katingan, Central Kalimantan were willing to convert their rattan garden into an oil palm or rubber garden. The indigenous peoples in East and Central Kalimantan harvest their rattan mainly from their cultivated rattan garden (Dransfield, 2022). Ten years ago, rattan production in this area was declining due to low demand for the rattan from various industries and bad access to the gardens. The farm gate price of rattan was not competitive, so it did not encourage farmers and harvesters to harvest the rattan from their garden or from the jungle.

In East and Central Kalimantan, rattan with mainly small diameters were planted and used as the land markers post-swidden agriculture. However, based on the recent survey, this is no longer commonly applied in communities.

3.2 Contribution of the rattan industry to the national economy

The rattan furniture and handicraft industries in Indonesia are centralised in Java. The value of the national rattan exports ranges between USD 350 and 400 million a year. This figure is considered smaller than the estimated export values of other agriculture products, such as coffee (USD 800 million a year), rubber (USD 2 billion a year) or oil palm (USD 18 billion per year.

However, rattan production is very specific. Those involved in raw rattan production, farmers and rattan harvesters, are marginalised, living mainly in remote areas and still rely on the forest, although also applying specialised economies, this means these households are relying their income mainly from rattan harvesting and production activity (Belcher et al, 2005). Those involved in semi-finished and finished products production live in more developed areas with better access to infrastructure. Those who are highly reliant on rattan production and processing, especially those involved in the downstream, that is, the laborers in the rattan industries, specialise in rattan production activities.

The multiplier effect of the rattan industry is relatively high. Two regions with major rattan industries, Cirebon, West Java and Gresik, East Java, have a significant number of workers and contribute to the local economy from the micro scale at the household level to the large factories. Many households work as subcontractors of the larger industries by producing semi-finished furniture components. These are the stakeholders most affected by the global rattan markets.

4. Rattan trade in Indonesia from the pre-reform to date

4.1 Phases of rattan trade to date

Rattan trade in Indonesia has been experiencing a boom and bust cycle for 40 years now. The year 1970 to the mid-80s saw production peak. Rattan furniture and handicraft were widely produced and consumed domestically. Indonesia exported rattan mats mainly to Japan and China, and the rattan mat producers enjoyed the success (Meijaard, 2014).

However, in the era of the 1990s, the rattan industry experienced challenges due to restrictions in exports of semi-finished products (Table 2). The Ministry of Trade released the Decree on the rattan mats monopoly, the Minister of Trade Decree No. 410/KP/XII/88. The decree stated that only registered rattan mat exporters may export such products. The Government of Indonesia barred the exporters from competing in the market amidst the rattan mats export boom. Due to this decree, thousands of rattan mat makers in Amuntai, South Kalimantan, one of the greatest rattan mat producer regions in Indonesia, collapsed (Belcher, 1998).

After the rattan industry reform in 1998 following the monetary crisis in Indonesia, the International Monetary Fund (IMF) intervened, and the Government of Indonesia had to lift some of the export bans for raw to semi-finished rattan products. This increased the rattan farm gate price (Meijaard, 2014).

This situation did not last long, however, as the government had to ban raw and semi-finished rattan products in 2004. This regulation was issued with the purpose to protect domestic industry to have better access to the raw material. Since then, the government regulations mainly restricted the export of raw rattan or applied some conditions for the export of semi-finished rattan products. The raw rattan prices flattened or slightly decreased.

Since 2018, the value of rattan exports has been slightly increasing again as industries start adjusting to the regulations and to restructure their strategies for entering the international market. Quality improvements and innovations have been initiated to make the rattan products more competitive in the global market.

The export values of the rattan mats, webbing and screen (HS Code 406122) and of rattan basketry (HS Code 406212) have been increasing since 2018 and significantly increased by as much as 12% during the start of the COVID-19 pandemic from 2019 to 2020 after a long period of flat or slightly declining exports from 2012 to 2017 (see Figure 1).

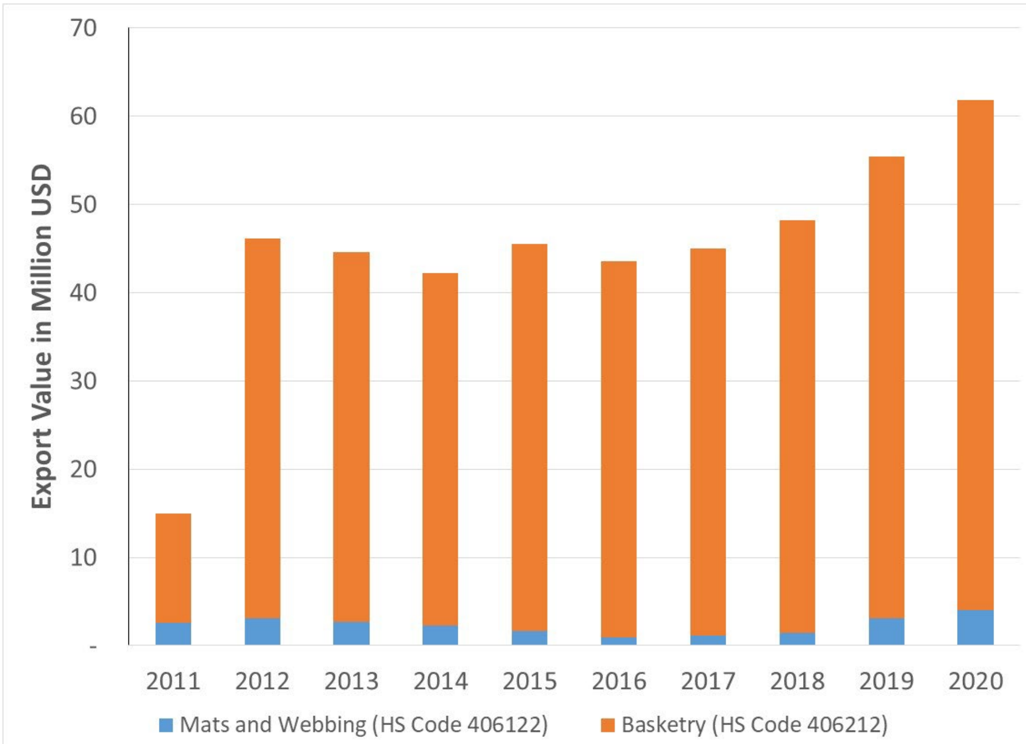

Figure 1. Export of rattan mats, webbing and screen (HS Code 406122) and basketries (HS Code 406212) (Source: UNCOMTRADE).

The period of rattan trade in Indonesia is divided into six major phases. In the 70s to the mid-80s, rattan production and price increased. In the second phase, 1986–1998, rattan declined with the extensive restriction and the strong government regulation of its export (see Table 2). In the third phase, post-reform, 1999–2004, rattan production slightly expanded. Meijaard et al (2014) described the rattan price as highly declining until the IMF intervened, and the Government of Indonesia had to lift all its bans and restrictions on raw and semi-finished rattan exports. The fourth phase, 2005–2011, was characterized by restrictions and separate policies for natural and planted rattan. The fifth phase, 2012–2017, saw the industry adjusting to uncertainty for a very long time and trying to find a way to survive. In the sixth and last phase, 2018 to today, the rattan industry has found its position in the market and has started to expand again from raw material production to export (Table 3).

Table 3. Phases of Indonesia's rattan trade

Period	Regulation	Production and export
1970–1985	Less regulated	Increasing
1986–1998	Highly regulated and uncertain	Decreasing
1998–2004	No export restriction	Slight increase
2005–2011	Export and inter-island trade restrictions	Stable or slight decline
2012–2017	No new regulation	Stable or slight decline
2018–2021	No new regulation	Increasing

4.2 The wake-up phase

In the interviews with the farmers and traders in Sumatra, Kalimantan and Sulawesi, the farmers and traders claimed that rattan prices and production increased by around 10–20% from 2017 to 2021. In 2021, the farmers and traders reported that they are receiving better prices (Table 4). The trader in Sumatra reported that the demand for raw rattan from various industries was increasing. One of the respondents in Limapuluh Koto Regency in West Sumatra reported experiencing higher demand for Manau and Tabu-tabu rattan since 2020. In a month, he has to ship 20 metric tons or 10,000 poles of Manau rattan to Cirebon, equal to about 230 million IDR (see Figure 2). The interviewed trader claimed that he is now focusing on rattan and has left other commodities that he used to trade.

Figure 2. Manau ready for shipping from Sumatra.

The traders reported that the rattan industry in Java has been growing in the last five years, and this has increased their income from rattan. The rattan harvesters in Sumatra are also relying on oil palm for their income, either by growing their own oil palm garden or working as laborers on other farms. They also earn from harvesting rubber. They indicated that their incomes from oil palm, rubber, and rattan started increasing recently. However, the competition to harvest rattan is stiffer than working as a laborer in an oil palm or a rubber garden. Harvesting rattan requires specific skills, as the harvester has to walk further into the forest and must be able to harvest the rattan poles properly. In our KIIs with farmers in Sumatra, they claimed that their income from harvesting rattan from the forest for one month is equal to that for tapping the rubber for a week. The increasing trend in rattan production and exports is indicated by the increase in the exports of rattan mats, webbing and basketry from 2018 to 2020 (see Figure 1).

The farmers and traders in Sumatra and the farmers in Kalimantan also reported an increasing demand and price for the small-diameter rattan that they harvested. Meanwhile, the dried small-diameter rattan, namely, *jahab* and *irit*, were shipped to Cirebon to meet the demands of the furniture, handicraft and basketry industries there. However, the farmers in Kalimantan were expecting support to get the added value of the rattan that they produce in their region. They expect to be able to produce the traditional baskets (*anjat*) and sell them locally or send the finished product to other regions rather than just supplying the raw material.

Table 4. Current price and production in three major islands in Indonesia.

Item	Sumatra	Sulawesi	Kalimantan
Type of rattan	Tabu-tabu, Manau	Mandola, Lambang	Sega, Lacak
Green Rattan Farm gate price (USD/Kg)	0.10	0.14	0.14
Dried rattan from village trader (USD/Kg)	0.49	0.21	0.56
Production per farmer/harvester per month (metric tons)	2	12	2
Change in production before COVID-19 pandemic (2019) to date (2021)	Increasing volume	Slight decline	Stable

Note. Exchange rate: 1 USD = 14,300 IDR

4.3 The challenge remains

Despite the increase in the prices and volumes of rattan exports, the actors in the rattan value chains remain the same. These are specialised actors. Very few new **farmers, harvesters and traders** are involved in rattan harvesting and trade. The challenges in 2019 in the rattan value chain, which were identified in the authors' focus group discussions with the actors, remain, as described in Table 5.

The natural rattan harvesters are still concerned about the fee for getting the permit to harvest rattan from the forest. Natural rattan harvesters claimed that they still have to pay a fee to get their quota volume for harvesting rattan from the natural forest. Currently, the fee varies, but it averages around 100–200 USD per 10–20 tons.

The processing industries are expecting more incentives to be able to produce finished products more efficiently, such as support for purchasing machinery. Currently, not all factories and especially home industries can access machinery, such as splitters and other machines that support rattan production. They have to pay for the rattan splitter service to be able to get the split rattan. Often, the cost of the service is high.

The local traders and exporters are still hoping to receive an incentive for export, support from the Government for marketing to the global market, and support for entering a wider global market. They are further expecting to have better knowledge of innovations in rattan. They had heard that rattan can now be used not only for handicraft, furniture or construction, but also for bone replacement. The local industries said they want to be part of all these innovations—to be allowed to access them and to enjoy the benefits of all such innovations in the global rattan industries.

Rattan furniture is still competing with bamboo, wood and synthetic product in the market. Nowadays, synthetic rattan is still being used in the industry to imitate real rattan, especially for outdoor furniture. The challenge of rattan in terms of outdoor durability still has to be overcome for it to be able to compete in the outdoor furniture market. Thus, rattan product expansion is still dominated by handicraft, basketry, ornaments and indoor furniture.

The demand for sustainable resources is another challenge that has to be faced by rattan from Indonesia. Until today, certified sustainable resources for rattan are still very rare. Only one scheme, the participatory guarantee system, has been tried in Kalimantan for specific rattan basketry products. This certification is required by European customers for small-quantity basket producers. From the interview with the certification agency on this scheme, some standards have to be adjusted to match the local context and to make the scheme more applicable to the current rattan farming or harvesting system in Indonesia.

Table 5. Challenges of the actors in the rattan trade.

Group	Concern
Raw material producers (farmers and harvesters)	Fees or taxes, transport costs, labor costs, rattan diversification in the industry
Processing industry	Permit and incentives to the industry, access to machinery, innovation
Traders (local collectors and exporters)	Tax, transport cost, promotion to global market

5. Conclusion

After Indonesia's long history of commercial rattan trades and industries since the 1970s and after its long uncertainty due to inconsistent regulations, raw or semi-finished rattan exports were banned or opened until finally, rattan trade and industry started to take shape. In the last two years, evidence from the ground and the official export figures indicate that rattan is waking up. The rattan market has again started to find its way to survive.

However, it is too early to conclude that rattan has achieved success in the market and won over the competition. The recent increase in finished rattan product export is presumably due to the strong global market-driven of rattan finished products, i.e. rattan handicraft, rattan mat and rattan basket. Indonesia's domestic rattan industry has not yet reached the stage when it can set a level playing field. The classic problem in the rattan market remains unsolved. These problems include low supply of raw material, low raw material price and lack of interest of new traders or investors to enter the rattan business. It has to be anticipated before it comes back and affects the actors in the value chains.

The Government of Indonesia, as the major stakeholder, is encouraged to adopt the following proposed solutions:

- Promotion of the rattan agroforestry system to increase rattan raw material production;
- Elimination of fees and levies for rattan harvesters who are marginalised households and fall into the low-income category;
- Technology transfer from the advanced and global industry to the smaller local industries;
- Promotion support for the national industry to enable it to enter the global market;
- Improvement of access to machinery of the small and microscale industries;
- Technology innovation to improve rattan durability;
- Incentives for export; and
- Establishment of a clear road map for policy and strategy development.

References

Belcher, B. (1998) ‘A production-to-consumption systems approach: Lessons from the bamboo and rattan sectors in Asia‘, *Incomes from the Forest: Methods for the Development and Conservation of Forest Products for Local Communities*, p815–22.

Belcher, B., Rujehan, Imang, N. and Achdiawan, R. (2004) ‘Rattan, rubber, or palm oil: Cultural and financial considerations for farmers in Kalimantan’, *Economic Botany*, 58, p77–87.

Belcher, B., Ruiz-Perez, M. and Achdiawan, R. (2005) ‘Global patterns and trends in the use and management of commercial NTFPs: Implications for livelihoods and conservation’, *World Development*, 33(9), p1435–1452.

Bizard, V. (2013) *Rattan futures in Katingan: Why do smallholders abandon or keep their gardens in Indonesia’s ‘rattan district’?* Working Paper 175. Bogor, Indonesia: World Agroforestry Centre (ICRAF) Southeast Asia Regional Program, p23.

Badan Standarisasi Nasional. (2017) *Jenis, sifat, kegunaan dan persebaran rotan*. SNI 7208:2017. Jakarta, Indonesia: Badan Standarisasi Nasional.

Dransfield, J. (2002) *General introduction to rattan: The biological background to exploitation and the history of rattan research*. Rattan Current Research Issues and Prospects for Conservation and Sustainable Development, FAO, p23–34.

Kalima, T. and Jasni. (2015) ‘Research and development priority of local important rattan species’, *Prosiding Seminar Nasional Masyarakat Biodiversitas Indonesia,* 1(8), p868–1876.

Meijaard, E., Achdiawan, R., Wan, M. and Taber, A. (2014) *Rattan: The decline of a once-important non-timber forest product in Indonesia*. Occasional Paper 101. Bogor, Indonesia: CIFOR.

Vorontsova, M.S., Clark, L.G., Dransfield, J., Govaerts, R. and Baker, W.J. (2016) *World checklist of bamboos and rattan*. International Network of Bamboo and Rattan & the Board of Trustees of the Royal Botanical Gardens, Kew, p1–453.

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