BIF Burma (Myanmar): Bamboo Market Analysis and Strategy

February 2016
Cover note: how the BIF programme has used the MAS

As the Market Analysis and Strategy (MAS) makes clear the bamboo market in Myanmar is in a very dynamic state. It is subject both to the many forces of change that have been unleashed in the country since 2011 and also to the actions of the entrepreneurs who have seen multiple opportunities in value-added activities and are driving change from the inside. We can add to this the fact that there are still many significant aspects of the bamboo sector that are not yet visible, such as the nature and quality of the natural bamboo stocks and even the varieties of bamboo that grow and what they can best be used for.

Taking these factors into account it is not surprising that any programme such as the Business Innovation Facility (BIF) that is seeking to support the development of the market has to be flexible and nimble. It also has to continually adjust its priorities bearing in mind the limited resources and time available to have an impact. This has proved to be the case, and BIF is not undertaking all of the interventions that were identified in the strategy, and neither are the interventions as in the MAS that BIF is implementing always being done in the way the MAS describes them. There are also some new activities that BIF has taken on that emerged following the completion of the MAS. It is not an exaggeration to say that every day the BIF team working on bamboo learns something new about the market and has cause to consider doing something differently as a result.

At the time of publishing the MAS the suite of BIF interventions is as follows:

1. Intervention A1 – Support to the Myanmar Rattan and Bamboo Entrepreneurs Association (MRBEA): some support to MRBEA but not as much as was envisaged in the MAS. For example the development of the website and database for MRBEA is thought to be a lower priority and has been removed from the activity list and support to the association was scaled back. However support to the MRBEA to launch the first World Bamboo Day in Myanmar on 18th September 2016 and this has been very successfully implemented.

2. Intervention A2 – Address lack of planning and mapping: This intervention is not being implemented because it became clear that it was too large and time consuming a task with the resources available to BIF. Mapping of degraded land will still need to happen at some stage within the sector, and BIF will aim for this activity to be funded by other development partners or the private sector. Various methodologies are currently being explored for land and resource mapping (e.g. sampling surveys of bamboo clump density, satellite imagery, open source imagery, smart phone based geo-inventory mapping, and drone).

3. Intervention B1 - Support to traders and Community Forest User Groups (CFUGs): This intervention is providing support to traders, aggregators, or Community Forestry User Groups. Market facilitation and linkages, as well as technical assistance will be provided around business planning, innovation, inclusiveness, and sustainability. This scope differs from what was proposed in the MAS as the intensity of the support has been scaled back.

4. Intervention B2 - Support to pioneers: This intervention will provide support to innovative bamboo production and processing companies. Market facilitation and linkages, as well as technical assistance, will be provided around business planning, innovation and inclusiveness, access to finance and market, and sustainability for these businesses to produce value added products such as flooring and furniture and establish reliable and sustainable supply chains. BIF will also support the private sector to embed ground truth due diligence processes into their business practices. BIF might also fund TA for environmental impact studies, however BIF is looking at alternative funding for this activity. This is broadly the same as outlined in the MAS.
5. Intervention C – Influence policy and the National Export Strategy (NES): Although due to time and budget constraints, no budget has been allocated specifically to this intervention, the BIF team will work in the policy space in an informal basis, for example, sharing BIF outputs with government representatives through MRBEA. BIF’s contribution to the transformation of the bamboo sector is envisaged be to develop a proof of concept on the economic and social benefits of bamboo manufacturing, and setting the standard for responsible and inclusive development at scale. Once confirmed, this proof of concept will be used to further inform policy changes required to support the growth of bamboo manufacturing. BIF will also seek to collaborate where possible with other donor programmes working in the bamboo market, especially where this can leverage BIF’s work to influence government.

If you are a private company, or a public organisation, or a donor funded project working in the forestry sector or willing to support the inclusive and responsible growth of the bamboo sector in Myanmar then BIF is would be very keen to hear from you and explore potential synergies to work with you for the benefit of rural populations in line with the above Market Analysis and Strategy. You can contact us on [http://www.bifprogramme.org/contact-us](http://www.bifprogramme.org/contact-us)
Table of Contents

Cover note: how the BIF programme has used the MAS..........................................................2
1 Introduction .................................................................................................................................8
  1.1 The Myanmar bamboo sector ..............................................................................................8
  1.2 Regional competition .........................................................................................................10
2 Potential for sustainable pro-poor market transformation ...................................................11
  2.1 Relevance to the poor .......................................................................................................11
  2.2 Opportunities for pro-poor growth ..................................................................................12
3 BIF research methodology ......................................................................................................14
  3.1 Political Economy Analysis ...............................................................................................14
  3.2 Competitiveness Study ....................................................................................................15
4 Market structure and performance ...........................................................................................17
  4.1 Core functions of the bamboo market .............................................................................17
  4.2 Summary of assessment of market core function performance .......................................29
  4.3 Supporting Functions .......................................................................................................30
  4.4 Rules ..................................................................................................................................42
  4.5 Cross Cutting Issues .......................................................................................................51
  4.6 Other development activities in the bamboo sector .......................................................54
5 Constraints Analysis ................................................................................................................55
  5.1 Main constraints ...............................................................................................................55
  5.2 Root causes .......................................................................................................................60
6 Market Strategy ........................................................................................................................63
  6.1 Overview of opening portfolio of interventions ...............................................................65
  6.2 Intervention A1 ...............................................................................................................67
  6.3 Intervention A2 ...............................................................................................................71
  6.4 Intervention B1 ...............................................................................................................73
  6.5 Intervention B2 ...............................................................................................................78
  6.6 Intervention C ...................................................................................................................81
  6.7 Market Results Chain .....................................................................................................87
Annex A: Carbon market systems by BIF ................................................................................90
Annex B: Conflict sensitivity consideration for bamboo sector development .........................94
List of Figures

Figure 1: Myanmar bamboo export profile 2007 – 2014 (US$m) ................................................................. 9
Figure 2: Economic impact by enterprise model .............................................................................. 13
Figure 3: The bamboo market system .............................................................................................. 17
Figure 4: Bamboo value chain ...................................................................................................... 17
Figure 5: Bamboo market supporting functions ................................................................................. 30
Figure 6: Bamboo market rules ...................................................................................................... 42
Figure 7: Bamboo market results chain ............................................................................................ 88
Figure 8: Bamboo causality tree ..................................................................................................... 89

List of Tables

Table 1: Trends in area under bamboo forest from 1990-2010. Source: FAO 2009 ................................. 8
Table 2: Bamboo competitor landscape 2014 ......................................................................................... 10
Table 3: Key bamboo suppliers ........................................................................................................... 19
Table 4: Current spectrum of processed bamboo end markets ............................................................ 21
Table 5: Key policies and legislation and their relevance to bamboo .................................................. 43
Table 6: Constraints and feasibility summary table ............................................................................... 56
Table 7: Bamboo market logic table .................................................................................................. 60
Table 8: Summary of intervention areas ............................................................................................... 65
Table 9: Intervention A1 .................................................................................................................... 70
Table 10: Intervention A2 ................................................................................................................... 72
Table 11: Intervention B1 .................................................................................................................... 76
Table 12: Intervention B2 .................................................................................................................... 80
Table 13: Intervention C ...................................................................................................................... 83
Table 14: Summary of risks associated with BIF interventions in the bamboo sector ...................... 85
Table 15: Potential costs and benefits of supporting bamboo production in contested areas .......... 94
Table 16: Potential conflict risks for bamboo production systems ..................................................... 97

List of Text Boxes

Text Box 1: Resource base .................................................................................................................... 19
Text Box 2: Processing of edible shoots cottage industry .................................................................. 22
Text Box 3: Community aggregator Bago Region .............................................................................. 24
Text Box 4: Different categories of land and relevance to bamboo .................................................... 31
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFOLU</td>
<td>Agriculture, Forestry and Land Use</td>
</tr>
<tr>
<td>BIF</td>
<td>Business Innovation Facility</td>
</tr>
<tr>
<td>CCVFV</td>
<td>Central Committee for the Management of Vacant, Fallow and Virgin Lands</td>
</tr>
<tr>
<td>CDM</td>
<td>Clean Development Mechanism</td>
</tr>
<tr>
<td>CERs</td>
<td>Certified Emissions Reductions</td>
</tr>
<tr>
<td>CF</td>
<td>Community Forestry</td>
</tr>
<tr>
<td>CFC</td>
<td>Community Forestry Certificate</td>
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<tr>
<td>CFI</td>
<td>Community Forestry Instruction</td>
</tr>
<tr>
<td>CFUGs</td>
<td>Community Forest User Groups</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development</td>
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<tr>
<td>DICA</td>
<td>Directorate of Investment and Company Administration</td>
</tr>
<tr>
<td>EAG</td>
<td>Ethnic Armed Group</td>
</tr>
<tr>
<td>EAO</td>
<td>Ethnic Armed Organisation</td>
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<tr>
<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
</tr>
<tr>
<td>EUTR</td>
<td>The European Timber Regulation</td>
</tr>
<tr>
<td>FAB</td>
<td>Farmland Administration Bureau</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation</td>
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<tr>
<td>FD</td>
<td>Forestry Department</td>
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<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
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<tr>
<td>FIL</td>
<td>Foreign Investment Law</td>
</tr>
<tr>
<td>FLEGT</td>
<td>Forest Law Enforcement, Governance and Trade</td>
</tr>
<tr>
<td>FOB</td>
<td>Free On Board</td>
</tr>
<tr>
<td>FSC</td>
<td>Forest Stewardship Council</td>
</tr>
<tr>
<td>FSWG</td>
<td>Food Security Working Group</td>
</tr>
<tr>
<td>FUGs</td>
<td>Forest User Group</td>
</tr>
<tr>
<td>GAD</td>
<td>General Administration Department</td>
</tr>
<tr>
<td>GHG</td>
<td>Green House Gas</td>
</tr>
<tr>
<td>IIED</td>
<td>International Institute for Environment and Development</td>
</tr>
<tr>
<td>INBAR</td>
<td>International Network for Bamboo and Rattan</td>
</tr>
<tr>
<td>IRD</td>
<td>Internal Revenue Department</td>
</tr>
<tr>
<td>ITTO</td>
<td>International Tropical Timber organisation</td>
</tr>
<tr>
<td>KNU</td>
<td>Karen National Union</td>
</tr>
<tr>
<td>LCG</td>
<td>Land Core Group</td>
</tr>
<tr>
<td>LIFT</td>
<td>Livelihoods and Food Security Trust Fund</td>
</tr>
<tr>
<td>MAS</td>
<td>Market Analysis and Strategy</td>
</tr>
<tr>
<td>MBLN</td>
<td>Myanmar Bamboo Lover Network</td>
</tr>
<tr>
<td>MCRB</td>
<td>Myanmar Centre for Responsible Business</td>
</tr>
</tbody>
</table>
1 Introduction

1.1 The Myanmar bamboo sector

The ubiquitous nature of bamboo in the household, construction and tourism economy is recognised by all, with its multiple uses due to its versatility as well as in the food sector for edible bamboo shoots. Nevertheless, the paucity of formal statistics makes it difficult for planners, investors and decision-makers to build on Myanmar’s comparative advantage in bamboo. In addition, as a broader economic opportunity for export and industry development, it is obvious that the potential of bamboo has been under-utilised. This potential for export is also underpinned by the domestic market which offers significant opportunities for the development of the sector in Myanmar.

Historical information documents that Myanmar has significant bamboo resource within its forestland. However, it is extremely difficult to obtain accurate data on the status of the bamboo sector, from the raw resource stocks available in Myanmar through to production data and value of production. Nonetheless, the same thin information appears to be repeated with slight variations throughout the literature. For instance, Myanmar has:

- The third largest global reserves of bamboo;¹
- 2.17 million ha of bamboo forest;² and
- 21 recorded genera and 102 species of bamboo in Myanmar.³

In 2010, the United Nations Food & Agriculture Organisation (FAO) considered the overall trend in the area under bamboo forest in Myanmar to be reducing, though with a recent flattening (see Table 1)⁴. However, key informants also suggested that in some areas the amount of bamboo forest was increasing as it expands into deforested areas.

Table 1: Trends in area under bamboo forest from 1990-2010. Source: FAO 2009

<table>
<thead>
<tr>
<th>Year</th>
<th>1990</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myanmar (Ha)</td>
<td>963,000</td>
<td>895,000</td>
<td>859,000</td>
<td>859,000</td>
</tr>
</tbody>
</table>

The International Institute for Environment & Development (IIED) cites the Forestry Department figures on bamboo production and its value in 2009-2010 as a harvest of 1,303,078,000 poles with a low value of circa US$51,101⁵ but accuracy of these figures is likely to be limited given findings from the field discussed in the section on informal governance.⁶

The National Export Strategy (NES) on Forest products also considers bamboo and rattan, as well as other non-timber forest products as promising opportunities for the country. Opportunities listed in the

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² A presentation by Aung Zaw Moe from the Forest Research Institute in Yezin in 2014
³ (Kress et al 2003)². Although UNEP and INBAR⁶ suggest only 75 species. While FAO cite the Forest Department’s number of 96 species in 2009 Source http://www.fao.org/docrep/005/ac648e/ac648e08.htm
⁵ Kyaw Tint, Springate-Baginski, O., Macqueen, D.J., and Mehm Ko Ko Gyi (2014). Unleashing the potential of Community Forest enterprises in Myanmar. Ecosystem Conservation and Community Development Initiative (ECCDI), University of East Anglia (UEA) and International Institute for Environment and Development (IIED), London, UK
⁶ There are often discrepancies between the formal numbers and size of bamboo poles reported and the actual numbers harvested. The exchange rate used here is a historical rate based on figures from July 2010
NES for teak, rattan and bamboo include furniture, and pulp and paper\textsuperscript{7}. However, the NES does not address the real opportunity for pro-poor economic growth in the bamboo sector based on the establishment of a sustainable supply chain, processing of high value-added products, and waste minimisation. This Bamboo Market Analysis and Strategy (MAS) aims to reveal this opportunity and catalyse efforts made by a group of pioneers to deliver a market system change at scale.

Bamboo as a material in Myanmar primarily serves household consumers with general household goods (mats, panels, utensils) and the construction sector (with bamboo poles). In addition there are cottage industries based around handicrafts and bamboo shoots. There is also evidence of the industrial processing of bamboo (primarily panels, but with flooring emerging), although this is relatively small in scale. Generally, hardwood timbers (primarily teak) dominate the industrial processing sector (providing plywood, flooring, panels etc.) and hardwoods and rattan dominate the furniture sector. There is also small-scale food processing of bamboo shoots.

Making estimates of the economic scale of activity is difficult. Production, consumption and export data specific to bamboo material are difficult to determine. Much of the bamboo used in households is not transacted in the formal economy and exports of raw bamboo and edible bamboo shoots cross borders unrecorded. In addition, the qualitative data available from open source and presented in this strategy should be taken with caution since the 12 Harmonised Standard (HS) codes for bamboo were only created in 2005 and are supposed to have been used since 2007.

Figure 1 shows Myanmar’s recent export trends by product. For the period 2007 - 2014 the export data movement is quite sporadic, with the main bamboo export products being pulp, panels, raw bamboo and, to a lesser extent, bamboo furniture (although this reported value does include rattan products).

UN COMTRADE ‘mirror’ export data provides an insight into current trade patterns, but does need to be treated with some caution\textsuperscript{8}. In 2007 total exports of bamboo related products from Myanmar were US$5.3m and this peaked in 2009 and 2011 at around US$12m due to peaks in pulp exports\textsuperscript{9}.

Figure 1: Myanmar bamboo export profile 2007 – 2014 (US$m)

\textsuperscript{8} Mirror data is export data based on the information collected by trading partners rather than the exporting country
\textsuperscript{9} In 2014 $2.7m of pulp of wood and fibrous material (category HS47 which includes bamboo pulp) was primarily exported from Myanmar to Japan (55%), and the balance to China, Korea and Thailand
By 2013 reported exports had fallen to US$3.5m and US$2.2m by 2014 underpinned by raw bamboo, pulp and furniture products. There were no reported exports of bamboo panels in 2014 based on the UN COMTRADE data.

1.2 Regional competition

The leading exporter of bamboo products is China. Table 1 shows, for selected product markets, the shares of China and the relative position of Myanmar and other countries. China dominated the flooring, edible shoots and veneer panel markets with highly significant shares in all other selected markets.

Myanmar’s exports were predominately in the pulp, raw bamboo and veneer panels markets and by 2014 these had fallen to a value of US$2.2m. As shown in the table, Myanmar’s market share internationally in these three markets was 11%, 1% and 0.6% respectively. It should be noted that edible shoots are widely reported to be exported informally across the borders, in particular to Thailand, so are thought to be underreported in trade data.

Of interest to this study is the performance of other developing countries and in particular, neighbouring Thailand and the Mekong countries (Vietnam, Laos, and Cambodia).

Table 2: Bamboo competitor landscape 2014

<table>
<thead>
<tr>
<th>Product Group</th>
<th>Product</th>
<th>Market value ($m)</th>
<th>China market share 2014</th>
<th>Other country share and commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processed bamboo</td>
<td>Flooring</td>
<td>$324m</td>
<td>92%</td>
<td>USA and Netherlands 2.8 and 2.5% respectively, Vietnam 0.2% and Thailand 0.1%</td>
</tr>
<tr>
<td></td>
<td>Veneer panels</td>
<td>$111m</td>
<td>74%</td>
<td>USA and Netherlands 7% and 5.4% respectively, Vietnam at 0.8% and Myanmar 0.6% (down from 1.3% in 2013)</td>
</tr>
<tr>
<td>Bamboo edible</td>
<td>Edible shoots</td>
<td>$287m</td>
<td>85%</td>
<td>Thailand 4% and Netherlands 2% with Vietnam capturing 1% of the market</td>
</tr>
<tr>
<td>shoots</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw bamboo</td>
<td>Poles</td>
<td>$94m</td>
<td>63%</td>
<td>Vietnam held 12% of the market, Thailand 2% and Myanmar 1%</td>
</tr>
<tr>
<td>Bamboo by-products</td>
<td>Charcoal</td>
<td>$58m</td>
<td>52%</td>
<td>Netherlands 17% share and Nigeria 8%, Vietnam capturing 1% of the market’ Laos registered a 0.2% share</td>
</tr>
<tr>
<td></td>
<td>Pulp</td>
<td>$10m</td>
<td>22%</td>
<td>Nigeria entered the pulp export market in 2014 and captured 49%, China’s share fell having been 43% in 2013. Myanmar captured 11% of the market, whilst Laos has lost market share over the period 2009</td>
</tr>
</tbody>
</table>

Source: INBAR based on UN COMTRADE data

Source: ITC trade data 2015

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10 These countries with the help of Oxfam developed a strategy in 2006 to target the growing bamboo market (see Marsh et al, 2006 Oxfam Hong Kong)
Of all the Mekong countries, Vietnam is performing best in class, and the other Mekong countries have yet to register any significant export activity. Whilst Vietnam remains specialised in woven products, it has grown its world market share in raw bamboo materials consistently since 2010. It has also made progress in trading veneer panels, but appears to have fallen back in the export of bamboo flooring. Vietnam could provide an interesting comparator country for Myanmar as it shapes its bamboo market strategy. For edible bamboo shoots, after China, Thailand is the most dominant exporter. More recently Vietnam’s edible shoot exports have shown an upward trend – now at a quarter of Thailand’s market share.

2 Potential for sustainable pro-poor market transformation

2.1 Relevance to the poor

A number of studies have been conducted on bamboo’s potential with regards to poverty reduction, mainly in China. Overall, the studies see a positive correlation between growth of the bamboo industry and poverty reduction. However, the measured impacts vary and the studies can come to substantially different conclusions.

For example, studies found farmers keep vastly different percentage shares of the overall profits of bamboo production. While one study, which looked at 10 townships in China, mentions that around 60% of the value of the product stays with the farmer, another which looked at three counties in China ascertains that it was only 13% on average. Further, the studies do not indicate that the bamboo industry is particularly empowering for women. This needs to be explored further within the specific Myanmar context.

All studies agree that the development of the bamboo industry, if done in the right manner, can help local farmers. However, again, the extent to which this helps the poor and poorest farmers is contested. One study which looked at three counties in China found that it was either the richest or middle-income farmers who benefitted most from the development of the bamboo industry, both in absolute and relative terms. However, another study conducted in a different Chinese county found that while the richest farmers did indeed benefit most in absolute terms, it was the poor farmers that benefitted most in relative terms. Overall, it seems that different local circumstances and conditions can lead to different outcomes with regards to poverty alleviation.

Regardless of this, however, there are a number of aspects of bamboo production which are favourable to poor communities. Some parts of the bamboo production process – such as the harvesting or aspects of basket weaving – do not necessarily require higher levels of skill and can be done by casual labourers who might struggle to find other work. In addition, even if some skills are required – for example soil cultivation if a plantation is established – a lot of these will be known to farmers, as they are similar to agricultural processes. The sector also provides the opportunity to develop higher level skills as required in the processing of value-added products. In addition to being an important source of income to the poor, as a ‘poor man’s timber’ bamboo provides for cost-effective rural and urban housing and housing goods. The poor are therefore engaged in the sector as both producers and consumers.

Moreover, the capital investments needed for the first stage of the bamboo production process – usually establishing a bamboo plantation – are relatively low, in particular compared to investments in timber. Similarly, the return on investment happens relatively quickly as bamboo stems grow and mature rapidly, bamboo has short rotation cycles, and it can be harvested more frequently. All these characteristics give bamboo an advantage over timber when it comes to generating cash for farmers.

11 Nelson, Bryan: Can bamboo help save our forests and help end poverty?
12 Hogarth, N.J. & Belcher, B.: The contribution of bamboo to household income and rural livelihoods in a poor and mountainous county in Guangxi, China
13 Booth, Andrea: Potential of bamboo to alleviate poverty in rural China remains untapped: Expert
Indeed, one study suggests that bamboo generates four to eight times more income per unit of land than Chinese fir plantations.

Finally, because of its flexible use – from edible products to low-value products such as chopsticks to high value products such as furniture – bamboo producers can to a certain extent react in a relatively flexible way to market demand.

### 2.2 Opportunities for pro-poor growth

The domestic and international markets for bamboo products are significant with an international market currently valued at US$1.369bn and expected to grow. In contrast Myanmar’s baseline recorded export trade in 2014 was merely US$2.2m. The value of the domestic market is not fully understood, but population and urban development growth will drive its future demand. In addition the international demand trend for more renewable sources of energy and timber is likely to grow too.

The international bamboo market will continue to be driven by the need for more sustainable materials to substitute for timber. In order to sell into this market, quality and sustainability credentials will matter more as regulations and consumer preferences continue to evolve. Arguably, there are Myanmar companies operating in the rattan and wood processing market that provide local best in class benchmarks for others to emulate.

At a strategic level, the pro-poor opportunities growth can be seen in terms of future sector scenarios. Broadly these scenarios could entail:

- **‘Business As Usual’**: the bamboo sector remains low key in the National Export Strategy, the construction sector is the primary driver of demand, with increasing demand for tourism related handicraft products. Firms looking to supply higher level processed bamboo products struggle to do so due to poor quality resource base and lack of support services. Local firms are at risk of failure and imports of valued added produce rise to meet increased domestic demand. The bamboo resource is poorly managed and becomes increasingly unsustainable; both the poor and the environment are negatively affected;

- **‘Organic development’**: support is provided to current private sector players with an interest in the bamboo sector. The focus is on ‘will-skill’ deficit of firms entering the plantation market and value-added manufacturers targeting the domestic market to build the bamboo sector organically, the initial export market focus is on edible shoots and raw bamboo. A strong public-private partnership is developed to signal a change in the way Myanmar manages its natural resources and provides a sustainable bamboo plantation approach to underpin the development of a new industry. Bamboo waste is minimised; and

- **‘Innovate and compete’**: targets support to valued-added processing export markets, and the comparative advantage of the country evident in the wood flooring sector – the focus would be on promoting quality and material innovation. With international joint venture support the demand for larger plantation investment is likely and integrated supply chains. CSR and resource management principles are not expected to be at the forefront under this scenario, although this will vary by investor.

Each of these scenarios entails a different type of support to the development of the sector. The Business As Usual scenario primarily focuses on Forestry Department support to the sector, with the private sector seeking to promote the sector with limited external support. The other two strategic scenarios are more facilitative; helping the private sector to grow. These scenarios may well vary in their pro-poor, conflict sensitive and environmentally impacts.

To better understand the impact of different business models, an impact assessment was commissioned as part of the Competitiveness Study (see section 3). The purpose of this impacts assessment is to consider the likely economic and financial impact of different production and processing models based on the different markets. This impact assessment has been developed for
each of the selected enterprise models based on information garnered from enterprises during the BIF fieldwork.

Each of these enterprises (or processing typologies) primarily source raw bamboo material from natural forests, but the plantation production business model is emerging and is regarded as essential in the developing a more competitive bamboo processing sector.

The assessment for each enterprise model examines production yields and the income/expenditure of operations to estimate (i) jobs per hectare and (ii) net income per hectare. The impact profile using these two metrics is set out below. It illustrates the relationship between the different business models and the jobs intensity (jobs per hectare based on the integrated supply chain effect) and the income potential (income per hectare from income to labour).

Figure 2 illustrates the jobs intensity (based on the jobs created per hectare) and the income potential (based on annual income per full time employee, FTE) for four different type of enterprises analysed during BIF fieldwork in 2015. The analysis is based on taking into account the jobs created in production and processing of bamboo and is shown for (i) Commercial plantation and value-added processing, (ii) Commercial plantation for the poles and edible bamboo shoots market, (iii) Family bamboo reserve for the poles market; and (iv) Traders/Aggregators for the poles and household goods market.

The analysis leads to the conclusion that commercial plantation and value-added business models provide for greater job density and average income per job impact compared to activity with lower levels of processing of bamboo. Further, the commercial value-added processing business model shows a higher income return per employee than the plantation model; although the plantation model displays a higher jobs density. Overall the analysis indicates that higher levels of economic impact can be achieved through promoting greater value-addition in the bamboo sector.

**Figure 2: Economic impact by enterprise model**

The above analysis uses income to labour as the metric to illustrate the pro-poor impact of the enterprise models. The underlying assumption is that urban and rural beneficiaries have equal pro-poor impact weighting; as do lower and higher skilled labour in the production process. However, the Bamboo PEA analysis notes the importance of considering interventions based on a number of criteria, as the areas of greatest social need and economic opportunity may not coincide. For this reason, the PEA recommends adopting a mixed model approach - supporting small plantations and Community Forest Enterprise – and testing the pro-poor characteristics of each enterprise model.
BIF could test the findings and views above during the pilot phase of the programme with the aim of improving the evidence base on pro-poor and conflict sensitive approaches to developing the sector in Myanmar.

3 BIF research methodology

Our approach to designing this Market Analysis and Strategy is based on our initial market research conducted during the market selection process, a Political Economy Analysis (PEA) and Competitiveness Study of the bamboo sector. The Competitiveness Study also considers the potential positive and negative impacts of a Myanmar bamboo sector growth on climate change and the environment.

These work streams included desk reviews of relevant reports and literature as well as primary research in the form of surveys, stakeholder interviews and attendance at workshops and meetings. Main field activities, observations and consultations took place in Yangon, Shan State, Rakhine State, Bago Division, Ayewraddy Division and Tanintharyi Division conducted from October to December 2015. See Annex C for a list of interviews, field activities and meetings.

3.1 Political Economy Analysis

The PEA found that the bamboo sector has been undervalued as a potential sector, and there appears to be little detailed knowledge on the status of the bamboo resource base. However, what can be seen is that the political economy of bamboo is heavily defined by locations. Regional and local variations in the political and economic landscape - particularly in terms of key stakeholders - are significant, and shape both the enabling environment and potential strategic and pragmatic business options. Mapping bamboo reserves against the political landscape shows that some bamboo reserves are found in contested areas, or even areas of active conflict. In addition to dealing with different stakeholders, there are major implications associated with location, including: the costs of doing business; proximity to regional markets; and social and cultural dynamics such as different production systems and their associated land management and governance systems. The species of bamboo and their distribution are also key drivers of quality and usage within the different value chains.

The PEA also found that the design of the BIF strategy should pay particular attention to the fact that the key resource underpinning the bamboo sector is land - access to which is often a source of conflict and grievance in Myanmar. While some categories are directly managed by the Forestry Department, others lie under the State/Region Minister of Agriculture and Irrigation. There are other areas of overlap and contestation between different ministries and tiers of government that create some confusion, tensions and issues that may impact, to some extent, on the bamboo sector as it develops.

As has been the case since 2011, the national policy environment is changing rapidly and positively as old policy and legislation is revised or updated. There are a large number of laws and policies governing the forestry and land sectors that have implications for the bamboo sector, particularly surrounding recognition of land rights, ownership and land use. These different laws and policies that were identified and analysed during the PEA are presented in section 4 of this MAS. These sit alongside customary tenure systems. However, few policies specifically identify bamboo, or guide its development, and this presents an opportunity to inform and develop policy in conjunction with like-minded stakeholders.

The PEA found that the enabling environment for the informal ‘rules of the game’ is also evolving, with an increasingly active and capable civil society, increasing scrutiny from the media, and a reducing fear of the consequences of criticism. As a result, accountability and transparency is increasing throughout most sectors, and time will tell whether the recent elections accelerate this process. In the past, informal power-brokers at the higher levels have acted with impunity. Despite positive recent
changes, the system remains highly hierarchical with centralised systems of governance both within Union government institutions and parallel administrations overseen by Ethnic Armed Groups (EAOs). These stakeholders have differing interests, policies and objectives concerning resource extraction, agribusiness and poverty alleviation. While there were those who felt that the so-called ‘cronies’ were increasingly looking to diversify their economic portfolios, others felt that the profit margins and degree of work necessary to enter the bamboo sector would not make it attractive to this group. On a positive note, while overt ‘land-grabbing’ is still an issue in conflict-affected areas, overall it appears to be on the decline.

At the township level, where relationships and patronage patterns are still apparent, informal governance and the ‘rules of the game’ have major impacts on the bamboo sector. The economic dynamics of the bamboo sector at this level and the full costs of doing business are opaque and lack accountability. This situation drives poor management practices and potentially undermines the viability of bamboo development in some areas. Overall, the combination of the formal and informal policy and institutional landscape creates opposing ‘push and pull factors’ that may ultimately contribute positively if carefully managed.

At the macro-level, there is little danger that increasing bamboo activity with a focus on a small-scale managed or natural supply (while more sustainable supply chains are being established) will negatively contribute to structural issues, such as perceptions of inequity or higher-level conflict. However, small plantations and Community Forestry (CF) models do have the potential to cause conflicts at the community level between communities around rights to harvest, and allegations regarding illicit cutting. More broadly, the approach taken at these early stages, even at this smaller scale, may influence long-term perceptions of stakeholders and harm may not be manifested in shorter time horizons.

Large-scale agribusiness-type developments involving large plantations have a much higher risk of ‘doing harm’, creating or contributing to conflict dynamics. Activity near to active conflict-affected areas will need to be particularly carefully considered, with BIF advised to undertake a conflict and risk assessment before supporting any potential activity in this type of context.

### 3.2 Competitiveness Study

The Competitiveness Study found that Myanmar has extensive natural forest bamboo resources (although the volume of resource is not certain) and a wide range of species (although again it is not clear how extensive commercial species are), which, combined with relatively lower, wage rates, affords the country a comparative advantage. Moreover, the availability of secondary forest and degraded land presented an opportunity to bring land back into use on a more sustainable basis. However, the re-use of land still ran risks of being poorly managed and therefore having potential harmful effects on the environment and the poor.

The policy and regulatory environment is generally regarded as poor, although progress has been made over recent years. The major concerns raised relate to (i) land use, rights to land, speed at accessing land for economic use and the increasing price of land, (ii) informal taxes on doing business impacting on cost competitiveness with tax policy acting as a brake on investment in the processing sectors, (iii) poor enforcement of the use of natural forests and poor management of natural bamboo resources, and (iv) although improving there is an inadequate recognition at a policy level of the potential role of Non-Wood forest resources.

The supply of bamboo is presently geared to low value-added and local markets and is inefficiently harvested. Stakeholders interviewed stated that there is growing domestic demand for bamboo in the construction industry and as a substitute material for timber. There is also growing interest from export markets in the potential of Myanmar to supply bamboo chips for energy use (for example Japan driven by its energy strategy) and overseas investors (for example Taiwan in the flooring market). The Myanmar Rattan and Bamboo Entrepreneurs Association members have been examining the potential opportunity for a number of years and are now starting to invest in the sector.
In terms of exploiting the opportunities associated with bamboo participants noted three areas where support was required: (i) access to finance, (ii) selection and adoption of technology/management of resources with R&D support, and (iii) gaining market access and establishing new markets for bamboo end uses. It is worth noting that many of the workshop participants were already active in the timber and rattan trade and had long standing experience of international trade in craft and furniture related products.

The overall finding of the competitiveness study is that Myanmar potentially has a comparative advantage in bamboo underpinned by its climate, the opportunity by virtue of its degraded land to develop efficient bamboo plantations, and relatively low labour costs. However, to turn these fundamental attributes into a sector competitive advantage there is work to be done. Existing activities are trapped in low-value-added low profitability segments with dwindling accessible bamboo resources.

The evidence base on the net environmental impact of the bamboo sector is less than clear-cut – baseline conditions matter and will determine the extent of any positive contribution compared to alternative land uses. Against this background there are a number of precautionary principles that can be adopted that will aid the sustainable development of the sector. These are highlighted in the cross cutting section of the strategy covering climate change and the environment in section 4 of this MAS.
4 Market structure and performance

Figure 3 below outlines the structure of the bamboo market system in terms of the core value chain, supporting functions and rules, which can be formal and informal. Each part is described in details in the following sections.

Figure 3: The bamboo market system

4.1 Core functions of the bamboo market

The bamboo value chain from inputs to end-user is shown in Figure 4. Each function of the value chain and the corresponding actors are described in the following sections.

Figure 4: Bamboo value chain
4.1.1 Input

Overall BIF research found that very little vegetal and mineral inputs were used in the current exploitation/plantation systems. Apart from bamboo seedlings grown in Bago Yoma (from bamboo seeds harvested in the Tanyinhtaryi region) none of the value chain actors met by BIF use fertilisers or any other agricultural inputs for the production, maintenance or propagation of bamboo. This is mainly due to the fact that the value chain relies heavily on natural bamboo stocks. However, it is likely that the production of seedlings will emerge as a new value chain function if the plantation model, whether it is commercial or Community Forest based, was going to expand. Similarly, use of fertiliser and other plant treatment – organic and/or chemical - could also emerge. Cases of bamboo seeds and seedlings purchased by Thai traders have been reported in the border area of Tanintharyi where Dendrocalamus Asper flourished in 2015. BIF came across a number of Web references on bamboo tissue culture but our fieldwork did not establish the existence of such innovation in Myanmar.

**Market under-performance**:14:

- C1: Lack of high input production system; and
- C2: Lack of high input production systems for bamboo, and associated scientific techniques such as tissue culture.

4.1.2 Supply

Production bamboo is primarily sourced from government natural forests (some of which is designated as Community Forest and some privately owned) with an emerging plantation production model using government land under licence. Specifically:

- **Natural bamboo forests**: resources taken by family cutters/ harvesters, village group cutters/ harvesters, cutters/ harvesters, and Community Forest operating in private licensed forests; and
- **Bamboo plantations**: operated by enterprises, as well as Community Forest, although only one example of the latter was found during the fieldwork.

While the sustainability of properly managed bamboo plantations has been demonstrated (e.g. China and Australia), the dependence of an industry on natural stocks for processing value-added products such as flooring is unsustainable despite the fast growing rate of bamboo. None of the areas visited within Bago, Ayeyarwady and south Rakhine were assessed as providing natural forest bamboo of any quantity or quality. However, these areas do appear to provide good locations for bamboo plantations given the climatic conditions. It was also apparent that across the locations there is a significant amount of deforested or degraded land requiring re-vegetation (although no known data exists on the exact scale of such land). In addition, there was evidence of overharvesting.15

Cutting of bamboo poles from natural forests, called war taw, happens all year-round while cutting of shoots happens during the new shooting seasons that correspond to the months of monsoon.

The field assessment done by BIF in October-November 2015 enabled a better understanding of current extraction and production challenges and practices.

Several respondents pointed out to the need to go further every year to access good quality resource which indicates that, despite the fast growing rate of bamboo, the natural stocks are being overharvested in certain areas. For example, Asia Green Gold stressed the difficulties to access good quality resource for manufacturing boards in the absence of sustainably and systematically managed

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14 Note that for ease of reference these market under-performance issues, or constraints, are labelled
15 BIF Competitiveness Study, December 2016
stocks. The indiscriminate harvesting of young poles is also an issue. Access to good quality poles and edible shoots because of increased areas under shifting cultivation or as a results of over-indiscriminate cutting of young poles has also been mentioned on several occasions. Direct field observations have also shown that youngest and easily accessible poles are taken first, leaving the oldest, strongest culm in the forest.

The field assessment highlighted that the primary issue for extraction from natural forests is resource management. Better resource management would lead to improved quality of the bamboo stock and a more sustainable resource. Text Box 1 below describes some of the challenges and opportunities associated with an organic, or planned development of the Myanmar bamboo sector.

**Text Box 1: Resource base**

Knowledge of the Myanmar resource base is far from being perfect. There is uncertainty over the scale and quality of the bamboo resource base that needs to be better understood. Whilst there are indeed large areas with bamboo growing freely, the initial field assessment found both a weakness in the density of bamboo and its quality (in terms of species and diameter/height observed). Local informants indicated that better quality is to be found in more remote locations and in conflict affected areas.

Given the generally positive climatic conditions, overharvesting and poor management have been identified as underlying causes for a poor bamboo resource supply. As a bamboo cutter stated, each year they have to walk further into the forest to find the bamboo, a clear consequence of poor resource management.

The degraded land observed during the regional field visits presents a real opportunity for Myanmar; there appears to be large amounts of land reforested and bamboo can play a role long-term in rebuilding a more sustainable forest resource (Myanmar has lost 2% of its forest resource over the past years).

However, in the short term, there is a potential constraint on the availability of higher quality bamboo resource to feed an emerging value-added processing sector of scale. It also highlights the vital importance of protecting what is in place, alongside developing well-managed plantations. This is having real business consequences now for companies who report being unable to secure quality bamboo supplies.

*Source: BIF Bamboo Competitiveness Study – December 2015*

BIF identified five main potential supply systems of bamboo. The table below shows the characteristics of the bamboo suppliers in Myanmar.

**Table 3: Key bamboo suppliers**

<table>
<thead>
<tr>
<th>Suppliers</th>
<th>Characteristics of the production/exploitation system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutters/cutter groups</td>
<td>Cutters and cutter groups enter natural forest within, or outside of, government managed forestry areas to access bamboo. At present the majority of domestic market demand and domestic needs are fulfilled through this system. Their focus is on poles, in which case, cutters are generally young men. They harvest bamboo in the vicinity of the villages or further out into the bamboo forests and sale to traders/aggregators.</td>
</tr>
<tr>
<td>Bamboo shoot collectors</td>
<td>Collectors and collector groups, which can be a family, enter natural forest within, or outside of, government managed forestry areas to harvest edible shoots. Bamboo shoots are rarely harvested systematically. The edible shoots that are used for processing are supplied via shoot collectors. They collect shoots from the natural forest and sell to processors or direct to market (fresh), and may keep some for household consumption. They are generally women but that would depend on each region and location and other economic opportunities available to women. For example BIF met women cutters in Minhla township who supplied edible shoots to the local market in Dawei and were also sometimes operating as processors and traders. They said bamboo shoot cutting is a high source of income comparing to other agricultural activities.</td>
</tr>
</tbody>
</table>

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16 BIF Field Research: Interview with shoot processor, 22 December 2015.
activities and they can make up to 7,000 kyat a day during the shooting season.

| Community Forestry (CF) | Community Forestry is a successful policy around the world for communities to protect and sustainably manage their forests and continues to derive benefits. Community Forestry Enterprises are defined by Kyaw Tint et al (2014) as “enterprises that are formed from the cooperative action of forest-farmers for the production and commercialization of forest and farm products”\(^{17}\). In Myanmar, the Community Forestry Instruction (CFI) issued in 1995 initiated the promotion of CF in the light of increasingly degraded forest reserves. This form of production system is starting to expand in the hard wood sector. The Forestry Department (FD) has initiated some CF enterprises as well as working with an NGO like ECCDI in a number of States and Regions, assisting Forest User Groups (FUGs) to manage areas of timber. There is only one example (based on the responses we received so far) of bamboo CF enterprise (visited by the team). These groups, are classified by IIED, are managing two types of resource base: natural forest and plantation. Areas managed by CF can vary from a dozen of acres to several thousand acres (Source IIED). |
| Family bamboo reserve | This production system is characterised by a low level of input and a low level of output. Output from this system is mainly geared to the township level market. They supply the local market and meet local demand for processing of traditional bamboo produces (mats, walls, baskets etc.). This is a low input - low output production system that is generally part of a wider production system based on diversification. Family plantations are generally one source of diversifies income and plantations are not managed systematically. Plantations can contain bamboo, hardwood and other productive and non-productive species. The traders or clients coming to the plantation to buy bamboo poles provide cutters. Shoots are generally used for household consumption with the surplus sold on the market. |
| Commercial plantation | This model is just starting, with only a few players involved so far. There aims are to establish a sustainable source of supply for industrial processing, demonstrate the benefit of bamboo as a substitute to timber, create viable business opportunities for themselves promote the emergence of bamboo and create jobs for the rural population. |
| Large commercial plantation | There are no known, existing large-scale commercial plantations in Myanmar, according to respondents. Plantation in this context means a large-scale agricultural operation systematically producing bamboo products managed by a company with a paid labour force. The scale of the plantation is important as this alters the approval mechanism for the allocation and use of the land (above 500 ha requires approval at Ministry level in Nay Pyi Taw). |

Source: Adapted from the BIF Bamboo PEA – December 2015

**Market under-performance:**

- **C3:** The natural forests where bamboo is harvested are not productive and therefore people who are dependent on them have low incomes;
- **C4:** Existing stocks of bamboo are not well managed and therefore are depleting; and
- **C5:** There are very few bamboo plantations, and no large commercial ones, to supply the varieties of bamboo needed for value-added processing at the scale required by a modern industry.

4.1.3 Processing

The main end markets and market players evident during the BIF field research are set out in Table 4 below.

\(^{17}\) Page 8 Kyaw Tint, Springate-Baginski, O., Macqueen, D.J., and Mehm Ko Ko Gyi (2014). Unleashing the potential of Community Forest enterprises in Myanmar. Ecosystem Conservation and Community Development Initiative (ECCDI), University of East Anglia (UEA) and International Institute for Environment and Development (IIED), London, UK.
### Table 4: Current spectrum of processed bamboo end markets

<table>
<thead>
<tr>
<th>Categories of products &amp; processing</th>
<th>End market</th>
<th>Trading activity during BIF field visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poles and splits(^{18})</td>
<td>Construction poles and splits for handicraft and manufacturing</td>
<td>Traders operating as aggregators, transporting poles to cities and also splitting bamboo for the export market</td>
</tr>
<tr>
<td>Food</td>
<td>Bamboo edible shoots</td>
<td>Cutters selling to local cottage industry enterprises for processing with retail outlets</td>
</tr>
<tr>
<td>Handicrafts and Goods</td>
<td>Handicrafts</td>
<td>Established village level activity, many multi-generational firms some of which have exported products</td>
</tr>
<tr>
<td></td>
<td>Bamboo household goods</td>
<td>Aggregators or villages employed in weaving bamboo products (e.g. bamboo mesh for walling and fencing), often undertaken to supplement their main income source</td>
</tr>
<tr>
<td>Bulk</td>
<td>Pulp</td>
<td>Previously used to feed local paper mills, but now largely defunct (such activity was reported to have wiped out whole bamboo forest areas some of which are now being replanted with rubber)</td>
</tr>
<tr>
<td>High value-added</td>
<td>Flooring</td>
<td>Emerging factory looking to specialise in industrial processing for valued-added flooring market (both domestic and international markets)</td>
</tr>
</tbody>
</table>

Much of the bamboo-related economic activity takes place near the source, in particular handicrafts and shoot processing.

**Processing of poles and splits**

Near source processing happens on and off cutting sites. Primary processing generally consists of cutting the bamboo to size and removing the leaves and unnecessary parts considered waste in order to extract the pole from the forest. The bamboo is then transported to the roadside where it is collected. However, the development of the bamboo sector in China is based on waste minimisation and effective use of all parts of harvested bamboo is key to a profitable and sustainable sector. Waste reduction has important pro-poor impacts (for example the introduction of small kilns for processing waste into charcoal at a village level) as well as reducing business power input costs.

Secondary processing takes place in workshops or cottage industry and generally involves the splitting (e.g. for flower sticks) or flattening of bamboo (e.g. for mats and walls).

A more advanced level of near source processing involving the use of machinery, and requiring power and water supply near the cutting site is being piloted by at least one company. However the supply of natural bamboo has become financially stranded by the lack of accessibility and availability of good quality poles near the processing facility as well as the availability of manpower. Cost and accessibility of the raw material is also correlated to the transportation costs. Achieving the right factory gate price for the raw material is therefore key to establishing a reliable and effective supply chain.

Bulk processing used to take place while Myanmar still had around nine companies producing bamboo based pulp and paper. These state owned enterprises have been privatised and according to the information available to BIF these factories have been stripped of their assets and buildings have been converted for other purposes. Several informants have indicated that the poor management of the plantations feeding these factories undermined their sustainability and financial viability. A new

\(^{18}\) Noted: bamboo splits are poles chopped at different lengths and width to cater for the particular need of different type of processing. In this context, splits are produced manually for processing into handicraft and household goods or mechanically for the production of flooring for example where the outer layer of the pole and inner membrane need to be removed before further processing. In the MAS splits is used in reference to manually splits bamboo poles
Food Processing

In Myanmar, bamboo shoots are called *myahait*. Processing of edible shoots takes place on off-cutting sites but needs to happen on the day of harvest to preserve the quality of shoots. The processing of edible shoots happens during and after the shoot-harvesting season, which occurs – depending on the rainfall patterns of the different areas – between June and October. Processing is a seasonal activity that makes up to one third of the income of those involved according to BIF.\(^{20}\)

Women seem to be more involved than men in processing, packaging and marketing of shoots. Both men and women are involved in the transportation of shoots to the roadside where there are picked up by vehicles to be transported to the processing site (in Shan state, elephants are also used to transport the freshly cut shoots). Shoots can be sold fresh, dried, fermented or preserved. The following paragraphs describe the processing of fermented and preserved edible shoots as observed by BIF during its field research.

Some processors have built concrete processing basins where fresh shoots wrapped in plastic are left to drain for several days, during which time the shoots go through an anaerobic fermentation process. Fermentation may also be done using a traditional method which involves leaving the shoots in clay sealed containers for several days.

The preservation of edible shoots is carried out using large (200 litre) containers where the shoots are macerated in ionised water. Containers are then regularly topped up with fresh shoots once the volume of the shoots added initially reduces. Preserved shoots can be kept in these containers for a year. The shoots are then packaged and sold in local shops, and on local markets.

**Text Box 2: Processing of edible shoots cottage industry**

There are numerous types of edible shoots available and they are normally sold per vis (equal to 1.64 KG) at a price of US$0.98 per KG with a raw input cost price of around US$0.15. This processed product price can be contrasted with a fresh shoot market price of up to $1 per KG (in Yangon) or an export price for edible shoots of US$1.6/KG Free on Board (FOB) from China or US$1.3/KG from Thailand.

*Source: BIF Bamboo Competitiveness Study – December 2015*

Women shoot processors explained to BIF that they were willing to improve the quality of their products as well the packaging to attract better prices. One issue mentioned was the undifferentiated harvesting of species – should certain species get mixed into the processing system, it can result in turning an entire batch of shoots a yellowish colour, rather than the grey-white colour that they should be.

**Handicrafts and household goods processing**

Traditional processing of bamboo household goods generally takes place in rural houses where workers, generally groups of 3-7 women, assemble split bamboo parts from species with different physical and mechanical characteristics that are sometimes associated with other materials such as wood. This activity can be done during quieter periods when they have more availability, for example during the low agricultural season, but more often than not is a full-time activity.

Traditional processing of mats, walls and other construction items BIF came across during the fieldwork takes place at the traders/aggregators’ sites. One or several workers or members of the family can do this activity, and the workers BIF met were seasonal workers coming from the dry zone to weave mats each year during the agricultural off-season.

\(^{19}\) Source: BIF Interview with Aw Myin, Pulp and Paper Specialist

\(^{20}\) Source: BIF Interview with woman bamboo shoot collector in Minlha, north of Dawei, 22nd December 2014
One cottage handicraft business, making traditional umbrellas, was also found near the city of Pathein. This business illustrated the range of skills involved and the challenges faced by what is a traditional segment of the bamboo market. The business indicated that there were five to six other cottage industries involved in crafting the famous umbrellas and the owner expressed an interest in support to upgrade the quality of their products to compete in the export and tourist markets.

**Bulk processing**

Bulk processing of bamboo for production of pulp and paper provides low to medium value-add. There are a few examples of bulk processing (pulp, paper and charcoal), for example a joint venture with the Chinese in Rakhine and one with a Thai company near the border. However, details about these bulk processing operations were sketchy and some respondents noted that of the nine large plants identified involving State-owned Enterprises, none of them were now operating. About 100 bamboo charcoal manufacturing kilns exist in these border areas; most of the exports of bamboo charcoal are illegal.21

**High value-added processing**

The use of bamboo as a substitute wood material for value-added products is limited in Myanmar. However, it is evident from discussions with members of the Myanmar Rattan and Bamboo Entrepreneurs' Association that this is changing, with some members viewing bamboo as an opportunity to innovate or diversify their businesses.

There is a small group of three other players that have started to invest time and resource in learning, for example by attending bamboo workshops and training at RECOFTC in Laos or visiting bamboo commercial plantations and processing sites and universities in Thailand. Others have started to invest in bamboo nurseries with a view to setting up plantations, albeit they are yet to define the end market and product for their projects - an opportunity for them to better understand the market before defining their commercial and market entry strategy. One of these companies is TK Interior while another company – said to be the leading exporter of rattan processed products in Myanmar – is building a better understanding of the potential of the sector by looking at the different projects that are being developed.

In addition, BIF literature review shows that bamboo veneer factories in provinces of Thailand, adjacent to the Myanmar border, totally rely on the supply of raw bamboo from Myanmar.22 This information indicates that the processing of veneer has probably a high value-addition for Myanmar businesses also.

So investment for value-added processing has started – supported or not by foreign investment and/or technology. This provides an incentive to create success stories for the industry as well as an economic and financial return. All companies BIF met were very willing to work in collaboration with the programme to move their projects forward.

**Market under-performance:**

- C6: The market for value-added bamboo is largely undeveloped in Myanmar, so there is a lack of market players fulfilling key roles in the value chain for these kinds of products;

- C7: There is a lack of clustering or related businesses that can be mutually beneficial and create skills and resource pools for value-added bamboo development; and

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21 Report on the status of Bamboo and Rattan resources and their product market in Myanmar, CFC- INBAR/01 Project & Myanmar Forest Research Institute (MFRI), 2010

22 Report on the status of Bamboo and Rattan resources and their product market in Myanmar, CFC- INBAR/01 Project & Myanmar Forest Research Institute (MFRI), 2010
• C8: There is a lack of awareness from planners, investors, implementers, decision makers and consumers alike on the versatility and potential of bamboo as a substitute for timber to produce high value-added products such as flooring, veneer and furniture.

4.1.4 Aggregation

Traders/aggregators are the main conveyors of the bamboo supply chain in Myanmar. Their role is to link demand to resource, transport, aggregate, dry, grade and sort bamboo – although near source sorting and grading can also be done by head cutters. The transportation component of their activities involves forward transportation and logistics (loading-unloading) to wholesalers. Their number of workers is often proportional to their volume of trade.

They sell locally but also to other areas and may produce basic bamboo products like mesh for walls/fences. They generally sell other construction materials e.g. timber posts, roofing materials, thatch and nipa palm and bamboo products e.g. mats and handicrafts.

Figures from the industry are scarce about the number of aggregators involved in the bamboo trade in Myanmar, although several sources have confirmed that, on average, there are probably one to two aggregators/traders of bamboo in each township. Myanmar has 325 townships.

Aggregators are key actors who apply for bamboo extraction rights (yearly quota) from the Forestry Department and organise bamboo cutters. They have a good understanding of the local demand and contacts with wholesalers and buyers/consumers. Traders have a commercial interest in trading larger volumes, currently driven by the construction market (e.g. Yangon and Dawei). They have limited awareness of or interest in the need to sustain the resource base as long as the market price mirrors the rising costs of extracting bamboo due to the decrease in accessibility and availability of natural bamboo, an increasingly competing market labour, and rising demand.

Aggregators generally trade medium to large volumes of bamboo. One aggregator in Dawei, who claims to be the largest of a group of six to seven bamboo traders in town, trades 12 to 5,000 bamboo poles per week during the dry season, which coincides with the construction season. Sourcing bamboo has never been an issue for this businesswoman who has been in this trade for over ten years, although she said the price of poles has been rising slowly but consistently since she started her business. Her supply comes for the natural bamboo forests along the Dawei River and is floated down to her aggregation site along the bank of the river in the town of Dawei.

Aggregators interviewed during the BIF research suggested traders are relatively well off but the workers they employ were generally from a more modest background and sometimes are clearly poor. Aggregators met, often have a small processing unit producing mats, roofing material and other produce for the local/traditional construction market.

One aggregator/trader explained that his family business passed down over several generations, was noticing profit margins becoming increasingly low due to the following factors: (i) cutters were having to go further to harvest good bamboo (increasing costs); (ii) more people were involved in the business and thus there was more competition; (iii) costs were increasing for transport and formal costs (i.e. with Forestry Department); while (iv) the price in the marketplace was staying steady. This particular trader considered they would only be able to continue in the business for another few years before being squeezed out.

Text Box 3: Community aggregator Bago Region

During its field research in November 2015 BIF met with is a community group leader aggregator/trader for around 100 members from the surrounding villages. This role arose from an initiative by the Forestry Department to organise individual farms involved in bamboo cutting to ensure better resource management. The business is located about 20 miles from the forest resource and employs around 150 people directly (including people working in the transport of bamboo and 50 in the manufacturing of bamboo mats and wall panels).
The group leader manages a 20,000 acre permit with the government which is renewed on a 5 year rolling basis. An annual fee (up to 5m kyats) and charge for extraction of 10 kyats per piece is made, with rights held to extract up to 800,000 pieces a year. The community aggregator also pays a small profit tax to the government. They currently harvest culms every 2 to 3 years.

The role played by the community aggregator is to collect poles from farmers (around 200 cutters within member families) and sell them on to wholesalers. He pays on average 150 kyats per pole to farmers and sells on at between 350 and 500 kyats per pole depending on the size (the larger size being 5 metres).

Cutting is undertaken by village members. The matting workers are from near Mandalay (in the dry zone) and are on site working from November - June. They migrate looking for work due to it being the dry season and are also regarded as being more skilled in weaving bamboo. The community leader pays workers primarily on a piece rate basis (for example 20 kyats a piece to load trucks) while skilled workers involved in weaving bamboo mats, for example, can earn 7,000 to 10,000 kyats a day.

This aggregator operates a transport fleet of seven trucks, selling on to wholesalers inclusive of transport costs. Generally business has been steady. Wholesaler mark-ups are reported to be in the region of 5 - 10 kyats per pole.

Source: BIF Bamboo Competitiveness Study – December 2015

Market under-performance:

- C9: Existing low-value-added products in the market are not able to provide high margins or growth potential to market players so incomes from those involved in production activities in the market will remain low.

4.1.5 Export

The following section provides an overview of export activities (classified by end market) and export market prices tags which BIF came across during the fieldwork conducted in 2015.

Construction poles and splits

Some companies export lower value processed bamboo products (for example split bamboo, bamboo incense sticks, charcoal and flower sticks) to Bangladesh and Pakistan for example.

According to data received from the Directorate of Border Trade, raw bamboo poles (culms) are exported to Bangladesh via the Maungtaw border checkpoint, earning about US$50,000 in 2005. Raw bamboo is cut from the natural forests in Buthidaung Township in Rakhine State for export to Bangladesh.

The average world market price was US$0.61/KG in 2014 while Myanmar achieved significantly lower at a tenth of the average world price. Export of bamboo poles to Bangladesh fetches from US$0.2 to 0.4 per pole.

Bamboo edible shoots

BIF did not come across any business that was exporting shoots although edible shoots are widely reported to be exported informally across the borders, in particular to Thailand, so are thought to be underreported in trade data. Thailand achieved $1.3/KG in 2014.

Handicrafts and households goods

Past export of Pathein umbrellas was reported by a business but the market could not be sustained due to lack of quality and a lack of proper packaging to export the umbrellas. Good quality lacquer products using bamboo as a base are sold into the domestic market and to tourists. BIF did not
explore the export of bamboo lacquer products produced in Bagan or in the region, but synergies between the work that will be done by BIF in the tourism sector could positively contribute to the pro-poor development of the bamboo supply chain servicing the handicraft businesses in Bagan as well as the export of high quality handicrafts. Export price tags are product specific - for example a small umbrella wholesales at 5,000 kyats and retails at 6,000 kyats.

**Pulp**

Figure 1 shows export movement of pulp but based on our research and on extensive discussions with MRBEA we did not identify any company exporting pulp or paper made of bamboo. However, we met one paper and pulp engineer who had been contracted by a private company to develop a feasibility study for a paper and pulp processing facility and a bamboo plantation that could supply 75 tons of bamboo a day for throughout to the factory. To our knowledge there is currently no export of bamboo pulp and paper from Myanmar.

However according to the Customs Department data (2009) the export of pulp to China saw a sharp rise in 2005-2006 and reached a peak in 2006-2007. Other export countries were Singapore, UAE, Korea and Thailand. Myanmar exported at $390/MT in 2014, when the world average price was $1,120/MT.

Bamboo charcoal is not known to be produced in quantities in Myanmar, nor exported. However there seems to be demand from this from Japan. Bamboo charcoal is used in Japanese restaurants for indoor barbecues and also for care and maintenance of bonsai.

The export trend of bamboo charcoal is not stable. In 2007, there was almost no bamboo charcoal export companies in Myanmar due to the effect of the regional economic crisis. Moreover, orders were not received from the market abroad and shipping freight charges were high. Nowadays, some companies are beginning to export bamboo charcoal again due to orders being received from the Republic of Korea, Taiwan and Japan.

**Value-added products**

Emerging factories looking to specialise in industrial processing for the valued-added flooring market target both domestic and international markets. Based on our research and extensive discussions with the industry association, BIF could only identify one experienced and one emerging bamboo flooring company. The world market price for flooring is US$1.7/KG. The emerging local processing company is targeting US$1.3/KG in the domestic market.

**Market under-performance:**

- C10: There are very few market players with the expertise to make bamboo products of export quality.

4.1.6 Wholesale & retail

**Construction poles and splits**

Many wholesalers are also retailers. Wholesalers of poles are often traders/aggregators in rural areas where in urban areas they are traders/wholesalers. In both cases consumers can often purchase bamboo poles, as well as traditionally processed bamboo products such as mats and walls, from these wholesalers, meaning they are also retailers.

**Bamboo edible shoots**
Bamboo edible shoots are sold in bulk by processors when retailers place large orders, generally not exceeding a few dozen kilogrammes.

Fruit and vegetable retailers sell bamboo edible shoots on food markets. They can be bought fresh, dry, fermented or preserved in plastic bags of different sizes/weights (generally 1 vis) or in more professional packaging displaying the logo of the retailer and sometimes an expiry date.

Bamboo shoots can also be found in supermarkets where they are sold in a more professional packages generally costing around 2,000 kyat for 1 vis. There is a major price difference according to the species of edible shoots. For Wabo (Dendrocalamus brandsii), 1 vis costs 2000 kyat while for Hmyn (Dendrocalamus strictus), 1 vis costs 1500 kyats, both of them are fermented. The shoots from different origins get mixed during processing by the wholesaler or the retailer meaning there is no price difference according to different qualities.

The price of edible shoots varies according to the type of processing (i.e. fresh, dry, fermented, or preserved), the season (i.e. monsoon corresponding to the shooting season, or dry season), and the quality of the packaging, and the retailer (i.e. shoots sold in the supermarket are more expensive than those sold on the market).

All bamboo shoot processors met by BIF would like to improve the quality of their products, packaging and marketing to attract a higher market price.

**Handicraft and household goods**

Wholesale of traditional products such as bamboo hats is generally organised by wholesalers who then sell to retailers. Retail of bamboo household goods products generally takes place in traditional markets.

Selling handicrafts to tourists generally takes place at the main tourist destinations and attractions such as Bagan and Bogo market where lacquer products and Pathein umbrellas made with bamboo are sold at varying prices, depending on the quality of the products. BIF did not explore the export of handicrafts market although a producer of Pathein umbrellas indicated they have been exporting but were not able to sustain orders due to lack of consistent quality.

**Other value-added processed product**

One company is considering selling bamboo flooring to construction companies building condominiums in Yangon. The construction companies have tested the product and would be willing to buy large quantities of bamboo flooring from this company if they were able to produce in large quantities. At US$30 per square meter, the price of bamboo flooring is half that of teak which can offer a good alternative and cost saving option for the construction companies while still providing a wood type flooring to their customers.

Another company indicated that demand for imported bamboo flooring from China also exists. While Free On Board (FOB) price in Yangon may be lower for the Chinese products, the quality of the Myanmar product was found to be better and the company indicated that the construction companies were prepared to pay a premium for the better quality Made-in-Myanmar product.

**Market under-performance:**

- C11: The market is performing well in supplying low value-added bamboo products such as poles for housing, with a well-developed network of traders and cutters, but these may not be the quality and volume required for value-added processing and the existing systems are leading to depleted stocks; and
- C12: The market for value-added bamboo is largely undeveloped in Myanmar, so there is both a lack of market players fulfilling key roles in the value chain for these products. Many value-added products are not tried and tested in Myanmar.
4.1.7 Consumption

Construction use of poles and split

Traders/aggregators are selling bamboo poles to individual households, handicraft and household goods producers (for weaving of walls and roofs), builders, and construction companies. Informal trade of poles, seeds and shoots is reported to take place across borders with China, India and Thailand.

Handicrafts and household goods

Bamboo used by household goods varies with locations. There are many local markets trading in wide ranges of bamboo products. Some products are for use by businesses but the vast majority are for household use.

The most commonly used products are: baskets (business use, construction use, household use), crab baskets, sieves (sakar), round bamboo trays (sakaw), bamboo mats, conical hats with wide brim, bamboo chairs, bamboo walls, bamboo fences (wakatt), and bamboo curtains. Nowadays, bamboo is used as substitute for wood and timber in home construction.

Souvenir shops for bamboo product markets are mostly in Yangon, Mandalay, and other popular traveller and tourist destinations in Myanmar. Bamboo hats are now famous in the Min-Gun area, riverside of Ayeyarwaddy, and tourist destinations.

Bamboo edible shoots

Bamboo shoots are not only delicious but are also rich in nutrients, and rank among the five most popular healthcare foods in the world. The main nutrients in bamboo shoots are protein, amino acid, fat, sugar and inorganic salt. In Japan, the bamboo shoot is called the King of Forest Vegetables.24

Processors get bamboo shoots from nearby villages and take them to nearby enterprises that process, package and wholesale/retail of their produce. In many villages and towns there are cottage industry shoot processors, receiving raw shoots from their supply chain (normally individual cutters) and then processing them for packaging and sale. Many operate their own retail outlets in the local markets.

Bamboo shoots can be boiled, pickled, dried, and processed with salt. Bamboo shoots are processed by traditional methods, but the products seldom reach export markets because of low quality and packaging. The shoots are therefore normally sold locally and at prices which fluctuate depending on seasonality. There is no canning of edible bamboo shoots taking place in Myanmar.

4.1.8 Transport and logistics

Transport and logistics mainly take place at different time points in the value chain. First, after the freshly cut bamboo or shoots are transported by men (poles) and women (shoots), buffalos, or elephants to the nearest accessible track, road or river. Motorised vehicles (two, three or four wheels) are then generally used to transport the poles and shoots to the aggregation point or the processing facility. Alternatively, bamboo poles are tied together to form a raft that will be floated down to the aggregation point – in this case, an initial sorting is done to bundle bamboo of the right size to form a raft.

Once the bamboo is processed (for mats, walls and other household and construction goods), and the poles are sorted and graded the materials and products are generally delivered by the trader/aggregators by small or large trucks or three-wheeled tuk-tuk directly to buyers and consumers.

alike. Consumers can also come to the collection point directly to buy poles and processed bamboo and transport the bamboo to the construction site / their houses.

Loading and unloading of bamboo poles is highly labour-intensive work, generally done by young men who are either casual workers or employed by the collectors. Generally, workers do not wear safety gear or use safety equipment. A supervisor is responsible for the loading and unloading operation. The role of the supervisor is also to account for the number of poles loaded or unloaded in order to a) record the quantities cut from the forest in relation to royalty payments and licenses issued by the Forestry Department, and b) to track the number of poles loaded and unloaded by each worker, if they are paid on a piece rate and not a fixed wage.

**Market under-performance:**

- C13: The market is performing well in supplying low value-added bamboo products but is not configured for value-added processing.

### 4.2 Summary of assessment of market core function performance

- The natural forests where bamboo is harvested are not productive and therefore people who are dependent on them have low incomes. There are a number of causes for this, including poor management techniques employed by cutters and collectors;

- The market is performing well in supplying low value-added bamboo products such as poles for housing, with a well-developed network of traders and cutters. However the market is not able to provide high margins or growth potential to market players so incomes from those involved in production activities in the market will remain low. The market also depends on bamboo that is not well managed and therefore suffers from an ever-depleting stock; and

- The market for value-added bamboo is largely undeveloped in Myanmar so there is a lack of market players fulfilling key roles in the value chain for these products. The gaps include plantations, well-managed Community Forest, and successful processing companies, as the current pioneer companies are not performing to their potential. This means that the rural populations that might benefit from value-added processing activities (including bamboo production to supply this) have very few opportunities to do so.
4.3 Supporting Functions

Figure 5 below shows the bamboo market supporting functions.

**Figure 5: Bamboo market supporting functions**

4.3.1 Infrastructure

4.3.1.1 Land

Land is the fundamental resource at the foundation of bamboo growth and use. There are various classifications and categories of land under Myanmar law, which determines their jurisdiction and use. There are a number of key concerns that can impact on the development of the bamboo sector – and indeed other commercial plantations, and the risks associated with land. These are summarised below:

- Rural land classifications do not accord with the actual land use on the ground or perceptions of its status by customary land tenure and systems;
- Demarcation of different land categories (described in Text Box 4) is not always clear and often disputed;
- There is a degree of confusion on the status of land and ownership due to the number of old, conflicting laws on land classification and consequential differing and overlapping understandings and definitions which can then potentially contribute to land conflicts and tenure insecurity. This can particularly impact on smallholders, women and ethnic communities practicing traditional farming;
- There are overlapping ministerial jurisdictions on land, particularly between the Ministry of Environment Conservation and Forestry (MOECAF) and Ministry of Agriculture and Irrigation (MOAI). For instance, management of bodies of water on forestry land is under the MOAI and provides for different types of public access;
- Formal land ownership and extent of registration at the individual and household levels are low and possibly in the region of 15%;
- Customary land tenure systems based on community land tenure and management systems appear to be very prevalent across the upland areas, noting that this is where some of the major reserves of bamboo are located;

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26 Land Core Group, 2015. Powerpoint presentation on the customary land studies in Chin and Shan States
Existing customary land tenure and land use systems are, to date, poorly documented. Where some research has been conducted\textsuperscript{27} there appear to be broad rules concerning community tenure and systems for allocation for household and individual use across the ethnic group with variations in practice at the community level; and

The existing legal frameworks appear inadequate for the formal recognition and protection of customary communal land tenure rights and a new legal mechanism specifically designed for the Myanmar country context is needed (LCG, 2015).\textsuperscript{28}

Fundamentally, there are no legal barriers to growth of the sector, but as shown above there is little that positively and transparently articulates specific support to the emergence of a sector like bamboo within current policy and legislation. Indeed, any significant investment in processing requires securing a reliable source of supply provided by clear land and resource rights to ensure an economic return whether it is by the private sector or communities.

While some companies and individuals enjoy fairly good access to land and resources for commercial and industrial projects, insecurity over land tenure and rights remains an obstacle for the vast majority, including Community Forest User Groups (CFUGs). However, democratisation and the improvement of the business environment should improve this area and provide more opportunities for new entrants to the sector and Community Forestry.

There are ambitious formal targets for Community Forestry in the Government’s Master Plan that present an opportunity for bamboo expansion under this model. However, tenure and use rights to commercial land and its resources will need to be clearly secured and require the enactment of CFUG commercial forest use rights.

In addition, the Forestry Department has expressed an intention to rehabilitate degraded forest lands using bamboo, but these ‘informal policies’ do not appear to have been formalised in the literature.\textsuperscript{29} Most importantly degraded land does not seem to be recognised as a category of land in Myanmar and, even if it was degraded land, could still be associated with different land and resource rights that could jeopardize investments in the supply chain or in processing.

**Text Box 4: Different categories of land and relevance to bamboo**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Protected Public Forest Land</strong></td>
<td>(under the Forest Law and Protection of Wildlife and Conservation of Natural Areas Law (1994)). This is for national parks and conservation areas. Communities may encroach for traditional livelihoods or where they are newly designated and there are disputes (e.g. in Tanintharyi) but this land cannot be used for formal or informal bamboo production.</td>
</tr>
<tr>
<td><strong>Reserved Forest Land</strong></td>
<td>(Forest Law 1992). This category is also under the jurisdiction and management of the Forestry Department. It is protected for production of timber and forest products and can be used for Community Forestry (including bamboo) and allocated for small-scale plantations (such as bamboo). Local villages can use the reserved land for domestic purposes and production technically in violation of the Forest Law. Border demarcation is not clear and in some areas land is still used by farmers. There was a recent ‘amnesty’ allowing some of this land to be privatised if proof of long-term use (reportedly abused). According to Land Core group (LCG) existing maps do not match current use and there may be mixed informal use. For instance the bamboo Community Forest area visited, was also being used temporarily by farmers while timber was growing.</td>
</tr>
<tr>
<td><strong>Public Forest Land</strong></td>
<td>is under both the Forest Law 1992 and the Vacant, Fallow, Virgin Lands Management (VFV) law (2012). Outside of forest estate but a forest covered area at the disposal of the Government (as all land is owned by the State). Communities use this land to harvest timber and bamboo for domestic use. According to</td>
</tr>
</tbody>
</table>

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\textsuperscript{27} See for instance Gret, 2012, LCG, 2015 on Chin and Shan
\textsuperscript{28} Land Core Group (2015), A Summary of the National Dialogue on Customary Communal Tenure of Rotational & Fallow Taungya: Policy Brief prepared for Land Core Group, LIFT, Yangon
\textsuperscript{29} Source: BIF Bamboo PEA December 2015
LCG, the MOAI may also request MOECAF to use these lands for State economic development under the VFV. Smallholders in uplands use this land for swidden agriculture.

Farmland is a classification under the Farmland Law with some sub-classifications under Article 3 for tax purposes BUT does not recognise customary land use and agricultural land practices such as ‘taungya’ (upland shifting cultivation). Although there may be some tenure, it can be appropriated in the interests of the nation or public.

Virgin Land – Article 2 of VFV defines it as “new land or other woodland, in which cultivation has never been done before” (LCG, p.9 2012), it may or may not be covered in forest and includes land ‘cancelled legally from Reserved Forest Land, Grazing Land and Fisheries Ponds” and usually fall outside of the Settlement and Land Records Department (SLRD) land surveys. There are mechanisms by which CF arrangements (including bamboo) can be secured for these areas. MOAI and MOECAF have overlapping authority here.

Vacant and Fallow Land – Under Article 2 of VF law this is land cultivated before, and then ‘abandoned’ by the tenant for any reason. This creates problems as many areas being cultivated by farmers and community groups in a traditional manner could be classified as ‘vacant and fallow’.

Grazing Land - Not in mentioned in Farmland Law but briefly covered in the definition of ‘virgin land’ under VF law.

Source: Adapted from FSWG-LCG, (2012) and drawing on Kyaw Tint, Springate-Baginski, Mehm Ko Ko Gyi (2011)

The actual process for obtaining land is ultimately dependent on the amount, type and location of land required as well as the connections one has in the relevant department. If it appears to be Vacant, Fallow or Virgin Land (rather than under the Forestry Department management), which may well be the case in ethnic controlled areas and borderland areas, then an application needs to be made to the VFV Committee, which has the power to allocate it for agribusiness.

If a business makes an application to the Forestry Department for land, then they assess the vacancy and status of land under their jurisdiction and suggest an allocation. This may be a lengthy process because where the land is located is critical for the viability and economics of production. Therefore, the main risks for any proposed bamboo venture in this regard will depend on the area where production is proposed, and the type and scale of the intervention.

Market under-performance:

- C14: A lack of transparency and clear procedures for accessing land and commercial rights over resource is currently constraining private sector and community investment in the sector;
- C15: Absence of land zoning, including the identification of land suitable for investment in bamboo plantations (such as degraded land) and processing clusters;
- C16: Lack of detailed information on the current stocks of bamboo, where they are and whether they are commercially useful species; and
- C17: Individual investors with the incentive to develop value-added bamboo assets lack the resources necessary to do a comprehensive study of potential sites for bamboo plantations and processing clusters and the market has not provided a mechanism for either the government to address this gap or for collective action between market players.

4.3.1.2 Roads

The road and river system provides the basic infrastructure to support the development of the bamboo sector. It is of course variable but there are potential production sites, many having benefiting from infrastructure constructed to support hardwood extraction.
The institutional structure for Myanmar’s transport sector is complex as there is no single agency with clear oversight of the sector. Currently, responsibilities are shared between six ministries, various city development committees and state-owned transport enterprises, where relevant. There is no formal coordinating platform to develop an overall strategy for the sector and no clear lines of responsibility within the fragmented institutional structure. Among the government agencies overseeing the transport sector, the Ministry of Transport (MOT), the Ministry of Rail Transportation (MORT) and the Ministry of Construction (MOC) play pivotal roles.\textsuperscript{30}

Roads are covered/surfaced between major cities such as Yangon, Mandalay, Nay Pyi Taw, Malawmyaing, Taungyi. But those in mountains, forests and rural areas are primarily dirt, narrow, rough and gravel. There are three main highways or corridors running north-south in Myanmar, namely:

- Yangon – Mandalay (Rangoon – Mandalay) Highway. The road passes through major cities in the central Burma such as Bago (Pegu), Taungoo, Pyinmana, new capital Naypyidaw and Meikhtila (Meiktila). This road is 695 km long;
- Yangon – Pyay (Rangoon – Prome) Road. This road was built by the aid of the Japanese Government, and considered the best road in Myanmar. It runs west of the Pegu Range (Bago Yoma) is 288 km long; and
- Western Union Highway. This is part of a proposed Pathein – Monywa Highway, which connects towns and cities on the west of Irrawaddy River (Ayeyarwaddy). The road is still under construction and for the most part the condition and the quality of the road is very bad.

Another important road network extends from these three corridors that are economically important in Myanmar. These are:

- Mandalay – Lashio Road, 262 km, an important for road for the China-Burma border trade;
- Meikhtila – Taunggyi Road, 205 km in length; and
- Pyay – Magway Road (Prome – Magwe Road), 202 km, a continuation of Yangon-Pyay Highway, along the east bank of Irrawaddy.\textsuperscript{31}

About 10% of roads in Myanmar are developed, and about 40% are graded roads while the remainder are mostly dirt tracks. During the monsoon season, some roads can’t be used for transportation. Some mountain and rural roads are in poor condition, and become impassable during the rainy season. Some roads have pavement sections that run only a few miles and then deteriorate into potholes, washboard ripples, dirt and rocks. Maps showing roads are often unreliable. Sometimes well-defined roads on maps disappear into dried creek beds. Most of the paved roads are in the cities and main towns.

\textit{Market under-performance:}

- C18: The existing road system has led to the over exploitation of some bamboo that is readily accessible to markets but has meant that other resources have been preserved as they are too remote to exploit commercially; and
- C19: The lack of roads may limit the potential for processing clusters close to areas where natural bamboo could be harvested sustainably.

\textsuperscript{30} ASEAN-Japan Transport Platform Project, Myanmar Road Transport Administration Department
\textsuperscript{31} http://www.asiatradehub.com/burma/roads.asp
4.3.1.3 Rivers

The river system presents a real opportunity for a sustainable approach to the movement of raw bamboo material.

There are four major rivers in Myanmar used for transportation namely Ayeyarwady, Chindwin, Thanlwin and Sittaung. Several minor rivers can also be found in Ayeyarwady Delta, Rakhine State, Kayin and Mon States. The rivers and their tributaries offer over 8,000 kilometres of commercial navigable waterways used for travel and transportation. The most extensive river system used for transport is the Ayeyarwady river and its delta.32

The Ayeyarwady river is used for transportation of bamboo by bamboo rafts to the Gaw-wain Bamboo Rafting Depot which is situated on the bank of Ayeyarwady River in Mandalay. Bamboo from Katha and Htigyaik regions, in Sagaing, is floated down the Shweli River to the Mandalay Depot also. The Depot provides raw material to 20 traders/aggregators who supply bamboo poles to the Mandalay market.

The following information is based on different interviews conducted by BIF in November-December 2015. However, this information is only partial as each region and location has its own river transportation system based on major and minor rivers for the circulation of people and goods. In the north-east, bamboo from Kachin is floated down the Chindwin River (1,207 km) to the Monywa market place. In the southeast bamboo from the Tanintharyi region is also floated down on Tanintharyi river to Dawei market place. In lower Myanmar, bamboo from Bago Yoma is floated down on the Sein Yay stream to sell to various markets or traders/aggregators along the bank of the stream. All of this bamboo is assembled into rafts to be transported.

Other minor rivers distributed among states and divisions still play a vital role in transporting agricultural commodities and bamboo from one place to another. One of the main advantages offered by river transportation is the low cost of transportation, particularly for bamboo.

**Market under-performance:**

- C20: Public sector plans for investment (including promoting regional clusters) do not sufficiently prioritise the river asset base to ensure its contribution to sector competitiveness.

4.3.1.4 Ports

The Myanmar Port Authority (MPA) is the government agency responsible for regulating and administering the costal port of Myanmar. The Port of Yangon handles around 90% of the country's exports and imports.33 In addition to the historical port on the Ayeyarwady river in Ahlone township in Yangon, Myanmar inaugurated the Thilawa Special Economic Zone (SEZ) on 23 September 2015. This US$1.5 billion manufacturing and port complex, aimed at luring investment and creating jobs, is the first international standard SEZ of the country. The first phase of the 2,400 hectare (5,900-acre) complex is open and the Thilawa port can currently handle 6,000 tonnes of edible oil with two more tanks being built to raise its capacity to 10,000 tonnes. The country's largest port, Thilawa, is currently operated by a Hong Kong-based firm while the one in Ahlone is run by Asia World.

**Market under-performance:**

- C21: Thilawa port is the largest of the country but some of the shipping companies do not use this port due to the toll charges to cross the bridge to Thilawa from Yangon.

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32 PowerPoint Presentation, “Current Status on River Transport and Challenges in Myanmar” presented Inland Water Transport, by Ministry of Transport, Republic of the Union of Myanmar, 7.03.2014
33 http://www.mot.gov.mm/mpa/ygn_ports.html
4.3.1.5 Electricity

Electricity in Myanmar is by far the poorest of infrastructure services: it is expensive and unreliable. Power cuts to factories occur frequently and, as an industry that is heavily reliant on electricity to power machines, factories rely on expensive diesel generators that require significant investment to purchase, fuel and maintain.

For processing facilities access to affordable power is a particular constraint. The national grid system sells power at 100 kyats/KWh compared to 300 kyats/KWh where diesel is used (or has to be used as a back-up to poor availability).

Co-location of processing facilities near to the national grid network will be important to firm competitiveness, but this can work against near source processing and therefore potential pro-poor impacts. Near source processing is a feature of the Chinese model which has helped ensure benefits are captured by the poorest the rural poor. Production of bamboo chips and pellets can provide an opportunity for near source power generation.

**Market under-performance:**

- C22: The lack of availability of low cost power undermines private sector competitiveness. The bamboo sector/cluster support strategy will need to be cognisant of government planned national grid provision and upgrading; and
- C23: Market players are currently not examining and promoting the full use of bamboo waste material and the fact that it can assist firms in reducing power costs, which potentially provides an off-grid solution to lower production costs.

4.3.1.6 Communications

Communication services including telephones, IT and Internet are poor in Myanmar but are improving. This impacts on market players’ ability to access information and innovation as well as to communicate and engage with potential customers and investors. While this is now becoming less of an obstacle for those who have been in business in urban areas this remain a major obstacle for those in rural areas. Communication plays a key role in networking, innovation and creation of market linkages. In addition the level of communication infrastructure makes Myanmar less attractive for foreign investors. Compared with China, Cambodia and Bangladesh, who have heavily invested in infrastructure over the past few years.

The provision of better telecommunications services with the award of telecoms licences to Ooredoo and Telenor, since 2014 and the modernisation of state telecoms company, MPT, is now a reality with more and more Myanmar citizens in rural areas accessing mobile telephony services and 2G/3G Internet. Customers leapfrogging of GSM devices to smartphones and the prevalence of social media as a way to do business and stay connected with others provides numerous opportunities for dissemination of market information, creation of market linkages, networking, and learning.

Significant gaps remain, not least in the capacity of businesses to purchase and use computer equipment and IT packages.

**Market under-performance:**

- C24: Market players are not yet exploiting the information and communication technology revolution.

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34 Marsh 2006
4.3.2 Labour market

A key attribute that is attracting interest from foreign investors is the Myanmar labour market. With a high literacy rate and low labour costs the country is considered to have the foundations to develop and sustain an industrial base.\(^{35}\) A comparative survey in 2012 noted that Myanmar had the lowest wages in East Asia.\(^{36}\) The Myanmar Rattan and Bamboo Entrepreneurs Association (MBREA) members quoted daily rates of US$10 day for bamboo day labourers in China compared to US$3-4 a day in Myanmar. Whilst labour wages are relatively low compared to competitor countries such as China these rates are rising driven by competition for skilled and day labourers.

The government has introduced a Minimum Wage Law\(^{37}\) although it only applies to companies employing over 15 people. A flat rate of 3,600 kyats a day has been established, or US$2.8 a day.\(^{38}\)

The field assessment found that wage rates were generally at or above the new minimum rate. For bamboo cutters when paid on daily rate this was in the order of 4,000-5,000 kyats, for female processing factory workers 3,500 kyats, and for skilled workers and site supervisors 7,000-10,000 kyats a day. In most cases it was reported that skilled craft workers operating on piece rates would significantly exceed the minimum wage rate.

A particular issue raised by businesses interviewed during the field research was that it was getting harder to find labour. The difficulty was due to a range of factors including alternative jobs paying better wage rates (for example road construction) and the difficult nature of the work (in particular extracting bamboo culms from natural forests).

This situation was leading to increasing wage rates being offered and businesses offering a broader incentive package to ensure labour being available. Employers report supporting communities and key workers through, for example, providing advance payments for seeds on their farms, again to ensure a regular and reliable supply of labour.

**Market under-performance:**

- C25: Productivity of labour is low and there is a lack of skills training (e.g. on planting and harvesting techniques) and the market has not adopted appropriate equipment to improve production efficiency in the context of commercial plantations (e.g. bamboo poles trolley);
- C26: Labour productivity should not be increased in the context of bamboo extraction from natural forest unless bamboo resource is managed sustainably; and
- C27: Use of health and safety equipment (e.g. helmets and gloves) on working sites and factories is not common. Similarly first aid training and kits and well as fire and safety procedures and equipment are not yet systematically embedded into business practices sometimes posing serious risk to workers, supervisors and managers alike.

4.3.3 Access to finance and financing

Discussions with businesses highlighted the difficulty of accessing finance capital for projects with a high dependency on their own financial resources. The investment cost of a small scale-processing factory for bamboo is in the order of US$0.7m - $1.4m.

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\(^{35}\) The Report Myanmar 2014, Oxford Business Group
\(^{36}\) A comparative survey noted that Myanmar had the lowest wages in East Asia with manufacturing workers receiving an annual salary of US$1,100 compared to US$1,424 in Cambodia, US$1,478 in Bangladesh, US$2,602 in Vietnam and US$6,734 in China.\(^{36}\) Source: Jetro Survey 2012
\(^{37}\) The new minimum wage law took effect on 4 July 2013 but the rates were not set at the time. A rate higher than those finally proposed was expected
\(^{38}\) Using an exchange rate of 1,250 kyats to the dollar
For those firms interested in investing in new plantations or processing facilities there was concern over the cash-flow requirements in the early years of any investment. Fortunately, harvesting, processing and sell of edible shoots after the second shooting season following the establishment of a new plantation provides an opportunity to build companies cash-flow albeit the volume of trade will depend on the planted area, the production costs and the market price. In addition, there is willingness to invest own funds alongside other funding sources as was evident in discussions with some businesses.

The funding landscape is changing and there is the emergence of new financial support to SMEs provided by local banks and donors (for example the IFC\(^{40}\) in Myanmar. Another area of interest in relation to bamboo is the potential for green bank funding or projects although it may be that the minimum deal size will be a constraint. For example Infra Capital Myanmar, another DFID funded facility, sets its smaller project investment value at $3.5m.\(^{41}\)

\textbf{Market under-performance:}

- C28: Project/risk finance is still lacking in Myanmar; and
- C29: Access to market and business planning services are not widely used in Myanmar. This is mainly driven by the lack of access to finance that has driven the business behaviour of 'trying by doing' and incremental scale up of success. This practice has also led to some failures in the bamboo value-added sector.

\textbf{4.3.4 Research and Development (R&D)}

There is little in the way of R&D being undertaken in the bamboo sector, although the Forest Research Institute in Yezin, Nay Pyi Taw, is undertaking some research associated with the production of handicrafts.

Business led R&D would provide an opportunity to achieve quality at the right production costs while the local market provides an opportunity for testing and further developing the products. Market-driven and demand-led R&D should be promoted and supported and buyers' feedback should be sought on a regular basis. The versatility of bamboo offers significant possibilities for innovation and differentiation in the market place.

Interestingly, emerging firms are undertaking their own R&D tests. But these firms have indicated that technical support is required for them to develop their businesses. They also point to the scope and level of support provided by the bamboo associations in China which includes strong R&D components. It is recognised that design is weak across the sector, but there is a high level of skill in the craft and furniture sectors (timber and rattan) to draw on.

Companies that have managed to develop trade linkages to enter export markets have retreated due to being unable to provide consistent quality (as reported by bamboo handicraft and flooring firms). On the other hand there are examples of companies that represent best-in-class in the rattan sector trading in high value export markets. These companies show what is possible in Myanmar despite the many constraints.

\textbf{Market under-performance:}

- C30: Government R&D is not addressing many value-added bamboo opportunities as it has mainly focused on handicrafts and souvenirs. The Forest Research Institute lacks the

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\(^{39}\) Issue raised in a meeting between BIF and GMC, November 2015

\(^{40}\) In September 2014 Yoma Bank received a loan from the IFC to provide financial services to SMEs. In August 2015 the IFC announced a similar facility with the Myanmar Oriental Bank. The IFC will provide a $7 million convertible loan to help the lender expand financing for small and medium enterprises in urgent need of capital to grow their businesses and create jobs; IFC News August 19 2015 IFC Home

\(^{41}\) Meeting held between BIF and Infra Capital Myanmar December 2015
incentive to work more closely with businesses and the association to undertake commercial research into high value-added products to ensure the quality and commercial viability of the products (i.e. low production costs).

4.3.5 Access to knowledge/training

For commercial plantations or Community Forest plantation to make a financial return for the investors they must be professionally managed and maintained. The range of issues identified during the fieldwork indicated that training across a range of issues would be beneficial, including site selection and species selection, selection of quality rootstock, planting procedures, maintenance and weed control, initial thinning shoot and pole harvesting, and logistical system requirements.

Because the companies engaged in value-added bamboo are at the pioneer stage there is a lack of a knowledge base for how to develop and manage bamboo plantations. On the plantation side there is a lack of knowledge about the viability and adaptability of different commercially useful species to various agro-climatic zones, and then very little experience as to how to establish and manage a bamboo plantation.

The lack of information about the suitable sites to establish plantations, such as degraded forestry land, has already been mentioned, as has the lack of data on existing bamboo stocks that could be integrated into a sustainable supply chain. General market data is also lacking as was explained in section 1 of the MAS.

There is also a lack of knowledge of bamboo processing, both in terms of what value-added products there is a market for (both locally and for export) and then the expertise to manage a bamboo factory efficiently. During the fieldwork BIF visited one factory in which the basic quality of the product was good but there were many examples of technical deficiencies within the operation.

BIF also ran a short training workshop with industry players, which was very well received. This demonstrated that there is an appetite for information and training, but also a lack of access to appropriate expertise in the current market.

**Market under-performance:**

- C31: The market does not provide much of the information and training that are needed by businesses and investors in order to have the confidence to set up new bamboo plantations and value-added processing factories; and
- C32: The market lacks bamboo experts who can provide training and consultancy services.

4.3.6 Industry bodies

The Myanmar Rattan and Bamboo Entrepreneurs Association is part of the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI) and is organised by businessmen involved in timber, bamboo and rattan related businesses. The association is a spill over from the Myanmar Timber Merchant Association (MTMA) that was created in 2013 to better represent the economic importance and potential of rattan and bamboo. The association is based out of the chambers of commerce and industry.

The association’s role is to promote export opportunities, ease bureaucratic processes and generally develop the sector. At present it has 27 members, many of whom are engaged in exporting to various markets such as Europe and countries in Asia and S.E. Asia. However, this is a young association whose capabilities are not clear so in the course of developing the industry base on best practices.

Promoting the trade and business in this sector is a core business and mission of the association. A lot of the fieldwork and knowledge gathering done by BIF would have taken a lot longer without the support of the association. It is also clear that the association plays a key role in facilitating field visits and sector understanding for those who are assessing the potential of bamboo reserve, industry
growth and poverty reduction in Myanmar. For example the association has recently been in contact with Japanese investors willing to understand the quality and coverage of the resource base. This market and foreign direct investment facilitation role is made possible by the senior members of the association.

The association is pioneering a new business model for an industry growth based on good resource management principles, high value-added processing and waste minimisation with a clear target for the domestic and export market. The members of the association are doing this through the creation of Green Move Company Ltd and the development of their own plantation, and they are exploring different market options for high value processing of bamboo. It is clear that the experience of the seventeen directors of Green Move, most of whom are also senior members of MBREA, in the wood and rattan industry provide strong credentials for market-led and demand-driven development of the company into high value-add processing.

The association, which currently employs one full time coordinator, also has plans to create a website which may be a useful repository of information and data that are currently held by the different members on computers, hard-disks and hand held devices. It is not clear how much resource the association has available to invest in its own development and who could further support the emergence of the association beyond their charismatic Chairman.

Given the diversity of background and projects by the association’s members there may be different philosophies and approaches within the umbrella that do not accord with BIF approaches. For example in the case of a company seeking BIF support for a bamboo plantation to be established on natural forest. There may also be positive or negative competition between different companies or cliques within the umbrella and unknown politics that have yet to emerge.

**Market under-performance:**

- C33: The MRBEA is not reaching its potential ability to catalyse political and donor interest as well as financial and technical support from third parties, or to act as the main focal point for coordination, planning, information sharing, and investment; and

- C34: The MRBEA vision, mission and objectives are yet to be formalised. This prevents the association from defining a sector and resource plan to accompany the growth of the industry and attract investment.

4.3.7 Access to market and market information

Poor IT infrastructure and historically poor connections to many international markets make marketing of Myanmar bamboo difficult, especially for businesses that are domestically owned. However, the business and management skills demonstrated by those entrepreneurs pioneering the bamboo sector development represent an asset for this market. These businessmen are generally experienced in the rattan and wood industry and have established networks across pretty much the entire country, with Government and some ethnic administrations, as well as with international organisations and buyers.

Interestingly some of these family run businesses have now brought in a second generation of young entrepreneurs that are active agents for transformation and change at a time where Myanmar is experiencing a major economic revolution.

BIF could not find much open source information on existing and forecasted export and import data for bamboo. Having access to this information is critical for the programme to advise businesses and build a solid knowledge base that can support robust market strategies. Hence, it is recommend that BIF acquires the market assessment report that is being prepared by Future Market Insight as a matter of priority at the outset of the implementation of this strategy. Of key importance to supporting the private sector would also be the development of a single repository source of information for the bamboo sector.
**Market under-performance:**

- C35: Market information flows to support the growth of the sector are weak and limited, although networks are emerging to share market knowledge. There is an un-met demand amongst firms with an interest in bamboo for market and technical information.

**4.3.8 Marketing and market linkages**

Those entrepreneurs met by BIF typically do not have established bamboo marketing strategies, which is fine as they are in the infancy of their development. However, it will soon become critical for them to choose target markets through market analysis and market segmentation. This lack of market analysis and segmentation can lead to a lack of specialised service offerings to customers and reduces the amount of new business and new business opportunities they receive.

Another area of importance would be customer relationship management, and understanding of customer needs. Here again, the experience of pioneers as well as their networks in Europe and Asia would provide a strong basis for customer service while newcomers could benefit from the emphasis of this business community on sharing, cooperation and lesson learning.

**Market under-performance:**

- C36: Bespoke market intelligence services to support business plans is lacking and will be critical in the future, in particular where external funds are being sought.

**4.3.9 Certification**

Forest certification schemes play an increasingly important role in the global timber market. These schemes offer forest managers/owners and companies the opportunity to be certified against a set of criteria, which are to ensure that the timber is managed sustainably.

Currently, less than 10% of the world’s forests are certified to a standard, many of these being in the developed world. Two-thirds of this is certified under the PEFC scheme, with the vast majority of the remaining 30% certified by the Forest Stewardship Council (FSC). However, despite this relatively low percentage of forests certified, Western companies in particular are paying increasing attention to the sourcing of their timber. In addition, many global banks are putting in place sustainability policies with regards to their lending.

FSC is an independent, non-governmental, not for profit organisation established to promote the responsible management of the world’s forests. The PEFC is the world’s largest forest certification system. It promotes sustainable forest management through forest certification. In contrast to FSC, PEFC endorses national systems which are independent from each other. Neither PEFC nor FSC currently certify bamboo on its own. However, a forest owner with an FSC/PEFC-certified forest could then also certify bamboo within their land as a non-timber forest product.

Myanmar currently doesn’t have its own certification system and is thus not affiliated with the PEFC. One Burmese company currently has FSC Chain of Custody certification for eucalyptus.

Both certification schemes could be applicable to bamboo in Myanmar.

**Market under-performance:**

42 PEFC: Expanding forest certification globally. http://www.pefc.org/projects/forest
44 http://www.diy.com/one-planet-home/forest-friendly/
46 The full list can be found here: https://ic.fsc.org/the-ten-principles.103.htm
• C37: There is an interest in certification, but a lack of awareness of the benefits of bamboo certification; and

• C38: There is no local market for the provision of certification services.

4.3.10 Climate change protocol and systems

Overall, bamboo can adapt to climate change relatively well, and possibly better than trees.47

However, bamboo is set to be affected by extreme weather events such as floods and droughts, or catastrophic storms. As bamboo is a C3 plant, it is in fact more susceptible to droughts than C4 plants.48

As bamboo has short rotation cycles, a lot of these potential negative impacts could be mitigated. If one species succumbs to warming, it could be replaced by another which thrives in the new climate. Similarly, if a plantation is affected by extreme weather events such as storms, floods or droughts, it could be replanted relatively quickly. To mitigate the risk of gregarious flowering, plantation owners could plant a variety of species to hedge against the flowering of one of them.

Specific to Myanmar, there are currently no studies on the impact of climate change on its forest ecosystems, so the potential concrete effects would have to be researched more.

BIF environmental impact and climate change research, part of the Competitiveness Study, reviewed and analysed different carbon markets in relation to potential market failure and constraints. The systems reviewed, presented in Annex A, are the compliance market, the Clean Development Mechanism, the European Emission Trading Scheme (EU ETS), the California’s emission trading scheme, the China’s model, Voluntary Markets, REDD+, verified carbon standards, the private sector and bilateral and multilateral initiatives.

Market under-performance:

• C39: There has been little examination of the potential for bamboo carbon markets to operate in Myanmar; and

• C40: At the investment level there is no toolkit for assessing climate and environmental impacts of value-added industrial bamboo projects.

47 Lobovikov et al: The poor man’s carbon sink. Bamboo in climate change and poverty alleviation
48 The main difference between C3 and C4 plants is the way in which their photosynthesis works. C3 plants draw the CO2 needed for photosynthesis directly from the air, while C4 plants draw it out of malate. C3 plants tend to thrive in areas where sunlight intensity is moderate, temperatures are moderate, carbon dioxide concentrations are around 200 ppm or higher, and groundwater is plentiful – which is why bamboo would struggle in drought conditions. C4 plants on the other hand are most efficient at photosynthesis in hot, sunny climates
4.4 Rules

Figure 5 below shows the bamboo market supporting rules.

**Figure 6: Bamboo market rules**

4.4.1 Foreign Direct Investment

A new Foreign Investment Law (FIL) was passed in 2012 to encourage exports, develop capital-intensive extractive industries, improve technology, create employment and skills transfer.

The Foreign Investment Law provides the framework for foreign investment in Myanmar including business involving the land. It allows for foreign investment in agriculture in partnership arrangements or joint ventures (Article 35). It gives foreign investors additional tax incentives and more clearly defines lists of restricted sectors. Land can be leased for up to 50 years (with two times 10 year extensions) from government or private owners (Article 31 and 32). Longer leases are possible if it is designated as an undeveloped area of the country (Article 36). Land acquisition is however a complex issue, as explained in section 4.3 of this MAS, that needs to be dealt with carefully given the historical and conflict legacy of land grabbing.

Generally, the new FIL is viewed as a positive step with the first wave of inward investment being focused on the garment manufacturing and tourism sector. Other sectors are expected to follow. The Foreign Investment Law allows for the possibility of large foreign investment (up to 100%) in agribusiness, including bamboo plantations.

In discussions with business informants it was apparent that external investors are actively considering the bamboo sector. Examples include Taiwanese and Thai interests in bamboo processing and external investor interest in the pulp and green energy markets.

The process for foreign investment is as follows: the Myanmar Investment Commission (MIC) assess investment proposals from both domestic and foreign investors and the Directorate of Investments and Company Administration (DICA) acts as secretariat to the MIC under the Ministry of National Planning and Economic Development (MONPED). It is noteworthy that an investor can simply set up a manufacturing or agriculture business with DICA without submitting the proposal to MIC, as the route through MIC is typically to get tax incentives.

DICA is the key department for business registration and assessing investments. Export and import licensing is under the Ministry of Commerce (MoC), which is also the owner of the National Export Strategy (NES). The SME Centre under Ministry of Industry is yet to become a strong player but can be a partner for work on industry i.e., factories of different scales.

50 The Report Myanmar 2014, Oxford Business Group
Market under-performance:

- C41: There is a lack of information in the NES on the potential for bamboo to attract Foreign Direct Investment.

4.4.2 Policies and legislation

The management of bamboo as a natural resource falls under the jurisdiction of MOECAF. The bamboo sector is potentially affected by a large number of policies and legislation falling under MOECAF. Once at the commercial level, its harvesting, management, transport and sale is monitored and under the jurisdiction of the Forestry Department. However, domestic use of bamboo on private land is essentially unregulated until it is sold commercially or in large amounts. Table 5 below identifies these different policies and laws, briefly describing them and their relevance to bamboo. As can be seen, while broadly applicable, they are rarely specific to bamboo – presenting an opportunity to consider what regulations or policy might improve the enabling environment for the sector.

Table 5: Key policies and legislation and their relevance to bamboo

<table>
<thead>
<tr>
<th>Statutory Legislation or Policy</th>
<th>Brief Description</th>
<th>Relevance to Bamboo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constitution (2008)</td>
<td>Supreme law of the land</td>
<td>The government is the ultimate owner of all land (Article 37), therefore land use property rights may be granted and rescinded. Ownership and protection of private land property rights are recognized (Articles 35, 37, 356, 372)</td>
</tr>
<tr>
<td>Forest law (1992)</td>
<td>Covers all forest resources in the country including protected areas (Reserve Forest (RF) and Protected Public Forest (PPF Land) as well as public forestlands covered by the Vacant and Fallow Virgin Land Law (VFV law)</td>
<td>Rights may be granted for local supply plantations (e.g. bamboo or timber) or firewood plantations</td>
</tr>
<tr>
<td>National Land Use Policy 6th Draft (2015)</td>
<td>Aims to promote: (a) sustainable land use management and protections of environment/ culture and natural resources; (b) strengthen land tenure systems including customary systems; (c) responsible economic development</td>
<td>Harmonising the approaches to forest, agriculture and other lands as well as setting out the responsibilities of the National Land Council and its established Regional or State bodies (and Township) will enable improved land management, zoning, demarcation of categories, ESIA for land projects, acquisitions and dispute resolution. It also includes guidance on taxation. The intent is eventually to have ‘one map’ of the country as well as a new National Land Law – all of which would be beneficial for an industry where land is so key</td>
</tr>
<tr>
<td>Vacant, Fallow and Virgin Lands Management Law (VFV) (2012)</td>
<td>Purpose is to create a mechanism for citizens and domestic investors – but not foreign investors - to lease VFV lands for agriculture developments (and others)</td>
<td>This is relevant if land for bamboo plantations, Community Forestry is not formal Dep’t of Forestry managed lands (RF and PPF), i.e. it applies to perceived ‘empty land’ and applications for use then go to the Central Committee for the Management of Vacant, Fallow and Virgin Lands CCVFV. The mechanism can be used to allocate 5,000 acres at a time, up to a cumulated 50,000 acres (i.e. increasing plots of 5,000 a.)</td>
</tr>
<tr>
<td>Law/Mandatory Obligation</td>
<td>Description</td>
<td>Note</td>
</tr>
<tr>
<td>--------------------------</td>
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<td>------</td>
</tr>
<tr>
<td><strong>Farmland Law (2012)</strong></td>
<td>Governs the management of land (including its sale or lease) categorised as Farmland. It has dispute mechanisms within it to adjudicate over transfer of rights providing the land has been registered.</td>
<td>Only relevant if private land is being used for small-scale bamboo production</td>
</tr>
<tr>
<td><strong>Environment Conservation Law (2012)</strong></td>
<td>Looks at protecting the environment rather than land per se, although calls for the development of an ESIA mechanism to mitigate environmental or social impacts relating to projects in the natural resource sector.</td>
<td>Could ensure that potential large-scale bamboo projects utilise an ESIA</td>
</tr>
<tr>
<td><strong>Community Forestry Instruction (1995)</strong></td>
<td>Intended to meet the basic needs of local communities and encourage their active participation in planting trees and to reforest degraded areas.</td>
<td>Can apply to bamboo management as much as teak or other hard wood timbers. New Community Forest User Groups (FUGs) are emerging albeit at a pace well below the target of 918,000 hectares by 2030 in the government’s Forest Master Plan. (IIED, 2013)</td>
</tr>
<tr>
<td><strong>Myanmar Forest Policy (1995)</strong></td>
<td>Six ‘imperatives’ including: protection; sustainability of forest resources for basic needs e.g. fuel, shelter, food and recreation; efficiency to harness their full economic potential; participation of the people in the conservation and utilization of the forests; public awareness about the vital role of the forests in socio-economic development.</td>
<td>Aims for sustainable and intensive forest management for environmental and economic prosperity as well as to contribute to the amelioration of issues holding back the sector (e.g. pricing, shifting cultivation, land use etc.). Does not mention bamboo specifically as it is a broad document looking at general blockages to sustainable forest use.</td>
</tr>
<tr>
<td><strong>National Forestry Action Plan (2001)</strong></td>
<td>Outlines forestry plans to 2030/31 and how to achieve objectives of sustainable harvesting of teak, protection of forests against degradation, environmental conservation, and earn foreign exchange by exporting more value-added products.</td>
<td>Does not specifically identify bamboo within the document but applies to the sector more broadly.</td>
</tr>
<tr>
<td><strong>Myanmar agenda 21, the national code of practice for forest harvesting</strong></td>
<td>The agenda aims for sustainable forest resources management, reservation, protected areas; participatory, harvesting and use; and capacity building. Part of this is the code of practice.</td>
<td>The code of practice is not usually applied to bamboo, but the principles are also suitable for improved bamboo harvesting and management, to improve reserves. It identifies a system (The Myanmar Selection System MSS) for selective harvesting based on size, timing and ensuring that ‘mother trees’ are left for seeds.</td>
</tr>
</tbody>
</table>

Source: Adapted from FSWG-LCG, (2012) and drawing on Kyaw Tint, Springate-Baginski, Mehm Ko Ko Gyi (2011) and Bissinger and Linn Maung Maung (2014) as well as Woods (2013).

**Market under-performance:**

- C42: The National Land Use Policy is not yet finalised;
- C43: The Community Forestry Instruction does not cover the commercial rights of communities; and

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51 This practice is effectively is one of the recommendations for improved management of bamboo by the Technical specialist on the team Mr. Durnford Dart
• C44: New community Forest User Groups (CFUG) do not emerging at a path in line with the government Forest Master Plan.

4.4.3 Forestry rules and regulations

The Forestry Department of the Ministry of Environment Conservation and Forestry is the main regulator for forest management in all capacities. They provide permission to bamboo traders for extraction rights (using a yearly quota) and also collect forest revenue, in the form of royalties. They monitor the amount of bamboo being harvested and its quality at field level. They are also the ‘gatekeepers’ for monitoring and permitting bamboo to be transported out of the Township of origin to end market destinations. For export they also have the power to issue certificates for bamboo export and accompanying exemption from tax. There is now a growing environmental structure alongside the traditional forestry department structure as well.

Ethnic Armed Groups have multiple different governing authorities with varying levels of functional institutional disaggregation. Some Ethnic Armed Groups and SSAs may have their own forestry departments while others may not. This will depend on their size, how long they have been in control in their areas and the degree to which they are recognised within the constitution or by the National Government. The Forestry Department is generally keen to support bamboo but Forest Officers have little incentive to promote sustainable management of resource and commercial development of Community Forest. At township level they have an incentive and interest to continue to meet their rising revenue targets.

It is likely that incentives and interests for change are high from Ethnic Armed Groups (EAOs), for reasons such as (i) the need to raise revenue; (ii) a possible decline in other sources of income such as timber; (iii) implicit recognition of their authority through working with business that legitimises them. If able to ‘bring’ jobs and income to local communities, they strengthen relationships with their local constituency.

However some EAOs (or commanders within EAOs) consider any development that enters their areas is an expansion of the sphere of influence of government and so they resist. Similarly, they may consider that ‘normalising’ of conditions undermines their political position (e.g. it is harder to return to conflict).

Market under-performance:

• C45: Forestry law creates some mixed incentives for market players in respect of bamboo that may prevent value-added bamboo from being developed in some areas; and

• C46: Forestry governance and rules are likely to be different in conflict areas.

4.4.4 National climate change policy

Myanmar ratified the UNFCCC in 1994 and the Kyoto Protocol in 2003. The country is one of the highly vulnerable countries to the adverse impacts on climate change. Climate change models find it difficult to predict what will happen to rainfall patterns as South East Asia is affected by the monsoon. However, it is expected that there will be a substantial increase in rainfall.

The National Environmental Conservation Committee (NECC) guides national activities to tackle climate change-related problems. It develops climate change-related policies and the National Adaptation Programmes of Action (NAPA) in 2012. The NAPA emerged from the multilateral discussions on adaptation measures within the UN Framework Convention on Climate Change (UNFCCC). Myanmar’s NAPA specifies 32 priority activities for effective climate change adaptation for eight main sectors/themes (i.e. four Project Options per sector/theme), namely: i) Agriculture; ii) Early
Warning Systems; iii) Forest; iv) Public Health; v) Water Resources; vi) Coastal Zone; vii) Energy, and Industry; and viii) Biodiversity.\textsuperscript{52}

The NECC works in conjunction with the Environmental Conservation Department, established in 2012 as one of six sub-departments of the MOECAF. This department is responsible for all national environmental policy. MOECAF monitor and evaluate the effectiveness and efficiency of government policies and programmes addressing environmental concerns in Myanmar such as deforestation, water resource management and air pollution.

Green House Gas (GHG) emissions for the forestry sector (biomass burning following land clearing) in 2000 were estimated at 40,405 Gigatonnes of CO\textsubscript{2}. Land use change and the forestry sector are a major source of GHG emissions, mainly due to deforestation, shifting cultivation and land clearance.\textsuperscript{53}

The Environmental Conservation Law (No.9/2012) aims to conserve natural and cultural heritage for the benefit of current and future generations, reclaiming ecosystems starting to degenerate and disappear, and promoting international, regional and bilateral co-operation focused on environmental conservation. The law enables the formation of an Environment Conservation Committee and the establishment of an Environmental Management Fund to enable environmental conservation works.

The National Sustainable Development Strategy has been implemented since August 2009. The Strategy published by the Ministry of Forestry, has as an overall goal of “wellbeing and happiness for Myanmar people” and has the goal to sustain natural resource management and social development, and to integrate economic development.

\textit{Market under-performance:}

- C47: There is no mechanism for trading carbon credits in Myanmar; and
- C48: The potential of bamboo contribution to carbon sequestration on degraded land is unknown in Myanmar.

4.4.5 Trade policy

Discussions with local firms highlight the importance of achieving a trading environment similar to Thailand’s and other neighbouring countries. However, the concerns are often not the formal tariff rate, but rather the trading processes and informal charges. For example, in Thailand only one certificate of release from the Ministry of Forestry is required to export in contrast with multiple fees and inspections in Myanmar – impacting their ability to compete effectively in international markets. Local businesses wish to see the full adoption of ASEAN processes and similar practices of neighbouring forestry departments.

\textit{Market under-performance:}

- C49: The trading environment is not conducive to export of bamboo processed products and imports of inputs for high value-added bamboo processing.

4.4.6 Labour law

The Ministry of Labour, Employment and Social Security published the minimum wage law on 28 August 2015 (with Notification No. 2/2015 of the National Committee for Stipulation of Minimum Wage). As a result, from September 2015 owners of factories, workshops and workplaces were required to negotiate and execute employment contracts with both existing and new employees.


\textsuperscript{53} http://www.lse.ac.uk/GranthamInstitute/legislation/countries/myanmar/
Myanmar’s announcement only stated the wage-rule for a "standard eight-hour work day". The Minimum Wage Law\textsuperscript{54} only applies to companies employing over 15 people. A flat rate of 3,600 kyats a day has been established, or US$2.8 a day.\textsuperscript{55}

\textit{Market under-performance:}

- C50: The minimum wage law is still at the development stage and its implications on the bamboo market are not yet fully understood.

\subsection*{4.4.7 Tax and customs}

Discussions with businesses highlighted that the nominal tax and duties per se are not the primary issue.\textsuperscript{56} Rather the procedures and informal charges are where problems arise and discourage trade and investment. The issues raised focus on the length of processes and the extraction of informal charges along the way, which businesses report can add 10 - 20\% to costs and affect competitiveness. A particular issue is the lack of duty claw back on materials as an input to the processing sector, for example chemicals for bamboo processing. This constraint affects other industries and needs to be addressed by government.

The Myanmar Customs Department - under the Ministry of Finance is the main government agency checking quantities of export materials and ensuring that all necessary permits are in order. For instance for bamboo, in addition to the usual documentation such as an export license and permit, exporters require a ‘Forest Pass’ for the shipment of forestry produce. Customs duty is levied according to the tariff schedule and export duty is levied on the tax base ‘Free on Board’ (FOB) value.

Business people must also pay income tax on profit as well as royalties on the bamboo extracted and transported to the Internal Revenue Department (IRD) under the Ministry of Finance. In fact, private companies are required to pay corporate income tax at a rate of 25\% of profits paid to the township officer of the IRD.

Finally, all wholesale and retailers need permission to operate their business in the township. The city development committee or council therefore requires a fee.

\textit{Market under-performance:}

- C51: Lengthy forest and customs administrative procedures undermine competitiveness; and

- C52: The current duty claw-back arrangements on inputs used by exported goods acts as a disincentive to value-addition processing activity. The current duty claw-back needs to be reviewed.

\subsection*{4.4.8 Informal rules and norms}

This section suggests some explanations of why the economics of the sector at the national and community level were not so easy to determine with accuracy during BIF research.\textsuperscript{57}

\textbf{National level}

At the highest levels, those who may later have an interest in large-scale bamboo are the so-called ‘cronies.’ However, stakeholders met by BIF considered that their interest in bamboo is not likely to be significant in the near future. The recent change in government means that, it is likely their

\textsuperscript{54} The new minimum wage law took effect on 4 July 2013 but the rates were not set at the time. A rate higher than those finally proposed was expected

\textsuperscript{55} Using an exchange rate of 1,250 kyats to the dollar

\textsuperscript{56} Whilst the maximum tariff rate is 40\% and the minimum is 0\%, customs tariff rates on imports of machinery, spare parts and inputs generally range from 0.5 \% to 3\% Customs duty is zero rated for all the goods to be exported from Myanmar

\textsuperscript{57} Source: BIF Bamboo PEA December 2015
relationships with military may continue but those with senior government may no longer be as significant.58

In EAO controlled areas, senior leaders may also be able to grant concessions and land for plantation use and the private sector with only recourse to a very informal process (if at all). In one interview with a senior member of an EAO, he explained that the ‘process’ was to explain that forest resources were required to support their broader political conflict with the government, and promising to share some of the benefits at the community level. In his words, this meant wealth sharing along the lines of ‘a lot of logs for the contractor, one log for us, and a sack of rice for the community’. Interestingly he also explained that any large contractor wishing to operate in areas under their control needed to gain full agreement with the Union government before they would be allowed to operate. This suggests that in the past there has been a level of collusion, even if only indirect, between influential businesses, the military and senior government.

Under a new government it remains to be seen whether or not these types of practice are likely to continue, but the risk to the bamboo sector is likely to be low until there is a clear, profitable and successful business case and model to pursue.

State, region and township levels

At the township level the ‘rules of the game’, as at the higher levels, are heavily conditioned by relationships between different stakeholders - particularly between the Forestry Department and the private sector. The areas in which this impacts on the bamboo sector are in the licensing, extraction and transport areas of the value chains.

The Forestry Department initially provides a permit to a business to extract a certain number of poles from an area of Public Forest Land (PFL) or Reserve Forest Land (RFL). This permit also specifies the size and species to be extracted. The cost of the licence in practice, according to one informed stakeholder and off the record, may be as much as twice the formal price due to petty corruption, although this is likely to vary considerably. The location or area over which the rights are extended is also a point of negotiation, which makes a difference to the economics of the extraction depending on the quality of the reserves and their distance from the road.

There are a number of other issues with the process from both a sustainable bamboo harvesting practice as well as a formal economic perspective. The decision on how much can be extracted from an area appears to be fairly arbitrary and decided between the two parties – an arrangement that makes formal monitoring extremely difficult. While Forestry Department staff undertake checks at the aggregation point, there is plenty of ‘room for manoeuvre’. There may be more poles extracted than accounted for and sold within the township (to avoid cross-checking on transport numbers and tax as it appears these poles are for domestic use rather than business), and/or they may be graded as a different size to alter formal payment of royalties on the bamboo.59 The ‘numbers and size game’ of bamboo harvesting is an important field of negotiation for the viability of revenues and income of all stakeholders concerned, which then may translate into inaccurate official data within the system.

Similarly, revenue collection from local bamboo cutters/traders/aggregators for local use also depends on negotiations between FD staff and local cutter/traders/aggregators at checkpoints. Formal permission, valid for two days, is required to transport bamboo between townships or regions (by water or road) and, in theory, if all the paperwork agrees there are no additional charges. However, in practice there are likely to be additional business costs along the transport routes, as the bamboo cutters need to pay informal ‘taxes’ to various departments - including FD personnel - on the highways or waterways.60

59 For each bamboo culm harvested a royalty has to be paid. There are two grades, which have different costs for the larger or smaller size, in terms of diameter, of each pole.
60 The additional costs associated with this type of trade can be significant in the experience of the author in Africa looking at cross-border trade of minerals in the Great Lakes Region.
The drivers for these 'informal' behaviours are difficult to change as they are primarily a combination of (i) income or cash needs and (ii) institutional demands within the Forestry Department that appear to centre on achieving revenue targets which rise each year.

Similarly, the business sector needs to make sufficient profit to survive, which creates a set of pressures that are not compatible with sustainable management of natural bamboo reserves. Thus it is no surprise that the BIF research found consistent feedback from stakeholders that the quality and amount of bamboo available was rapidly declining.

**Market under-performance:**

- C53: The unrestrained power that some market players have creates conditions in which individuals can become corrupt and impose charges that add to the cost and difficulty of doing business in the bamboo sector; and

- C54: Some of these practices have become normalised in the timber market and these are already impacting on non-forest products such as bamboo. These systemic informal taxes make the sector less attractive for potential investors.

**4.4.9 FLEGT**

The FLEGT Action Plan was introduced in 2003 by the EU to eliminate illegal logging and its associated trade and specifically to stop the import of illegally logged timber and timber products into the EU.61

The plan focuses on governance reform as many of the major timber exporting countries suffer from illegal logging and from weak governance, weak law enforcement and corruption. The reforms are to strengthen civil society, promote sustainable forest management, and help governments strengthen and enforce laws on forestry. Two distinct initiatives were started through FLEGT, one of which a voluntary partnership between producer countries and the EU, and the other a regulation affecting all timber and some non-timber forest products imported into the EU. The Voluntary Partnership Agreements (VPAs) are partnerships established between the EU and producer countries, through which the EU helps the countries in governance reform of their forest sectors.

Arguably the most tangible benefits for developing countries of entering into VPAs are economic, as VPAs essentially constitute trade agreements between the EU and partner countries. Timber from VPA countries won’t have to go through the legality checks that are required under the EUTR and players in the EU market – both the private sector and governments – should have increased confidence that the timber they buy comes from legal sources. Both these factors can contribute to buyers choosing VPA-timber over timber from other developing countries.

It could be argued that this incentive isn’t as strong for Myanmar as it is for other countries, as the country currently doesn’t primarily export to the EU. However, this was the case for Liberia as well, which is a VPA partner country but doesn’t export much to the EU. As it was post-conflict and general trust in its systems was low, it saw the VPA as an opportunity to increase this trust. The same could be true for Myanmar, which is regarded as a high-risk country when it comes to illegal timber. Having a VPA would very likely open developed world markets for Myanmar more generally.

Furthermore, if the VPAs are effective in combating illegal logging, they will increase the tax revenues in the partner countries, as one of the major problems with illegal logging today is that developing countries lose billions on lost tax revenues (between $10-15 billion globally, according to the FAO).62

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In addition, the European Union offers partner countries priority for development assistance for FLEGT-related support measures such as the setting up of the LAS - thus taking the financial burden off the partner country.

The government of Myanmar started its VPA process with the EU in late 2013 and a multi-stakeholder group has been established. However, a number of challenges remain to be tackled, in particular around defining and tracking legal timber. The stakeholders and experts that we spoke to asserted that in Myanmar, the understanding of what constitutes “legal timber” remains limited.

From the information available from open source it currently seems relatively easy to effectively launder illegal wood within Myanmar’s system. However, at the same time, 73% of stakeholders believe that if they buy their timber from the Myanmar Timber Enterprise (MTE), it is legal. This indicates that the system needs to be overhauled and stakeholders need to be informed better about how and where they can source legal timber.

The overhaul of the system could potentially be achieved within a reasonable time frame, as Myanmar used to have one of the best timber management schemes in the world, the Myanmar Selection System (formerly the Brandis Selection System). This system estimated the amount of trees that could be cut for the yield to be sustainable, and was a tool that farmers used for management. The system fell into disarray around 20 years ago, but if reactivated might be a good starting point for Myanmar’s Legality Assurance System.

**Market under-performance:**

- C55: Poor practice in resource management to date. The bamboo sector provides an opportunity to demonstrate better practice in resource management and a new benchmark for Myanmar and its extractive sector; and

- C56: There is a need to embed accountability and transparency in the sector – a ‘bamboo transparency initiative’ to influence the current ‘rules of the game’ is an approach that could be explored.

### 4.4.10 European Timber regulation

The European Timber Regulation (EUTR) which was applied to all EU member states in March 2013 prohibits the placing of any illegal timber on the EU market, be it from within the EU or from third countries. In the context of the regulation, illegality is defined as ‘harvested in contravention of the applicable legislation in the country of harvest’. This covers:

- Rights to harvest within legally gazetted boundaries;
- Payments for harvest rights and timber including duties related to timber harvesting;
- Timber harvesting including environmental and forest legislation;
- Tenure rights of third parties; and
- Forest sector related trade and customs legislation.

While no license is needed to prove legality, European businesses do have to go through a due diligence process to prove that the timber they are procuring is legal. Products which have a

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63 Forest Trends Report Series: Timber Trade Flows and Actors in Myanmar: The Political Economy of Myanmar’s Timber Trade

FLEGT/VAP or a CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) license are automatically considered to be legal.65

The EUTR covers most timber products and some bamboo products, even though bamboo is not a timber. Products made from solid bamboo, such as bamboo flooring, bamboo table tops and furniture parts are covered by the EUTR. However, the following product types are exempt:

- Products made from plaited or woven bamboo;
- Pulp and paper made from bamboo; and
- Seats (chairs, sofas, etc.) made from bamboo.66

**Market under-performance:**

- C57: The market is currently not configured to make it easy for European importers of Myanmar bamboo products.

### 4.5 Cross Cutting Issues

#### 4.5.1 Gender Equality and Social Inclusion

In general, the formal position of women in Myanmar is better than in many neighbouring countries.67 Women have access to education and can be the holders of the family finances. However, women still face a number of disadvantages. They are under-represented in politics and the Gender Equality Index ranks Myanmar 80 out of 138 countries.68 More crucially for this context, women very rarely own land and they often earn less than men. This was confirmed during BIF site visit near Nay Py Taw, when we were told that the women at the bamboo board factory were earning $3 per day, while the men earned $4. The reason that was given for this discrepancy was that the men were doing the more labour-intensive work. However, from observations, it did not look like the work that the men and the women did was substantially (or at all) different. Studies also observe that women – partly because they are usually landless – often engage in casual labour. In addition, women rarely have access to finance. Overall, studies suggest that women’s empowerment could be enhanced in Myanmar by granting them more access to resources, including land and credit.

The women we met throughout BIF fieldwork were business leaders (e.g. flooring factory and bamboo shoot processing), handicrafts makers, harvesters of edible shoots, workers involved in the production process of bamboo, or working in an office.

Giving women’s empowerment a crucial role in the context of developing a bamboo industry in Myanmar would have a number of co-benefits, as described above, including helping to lift families and entire communities out of poverty.

#### 4.5.2 Conflict sensitivity issues

Natural resource extraction, land and agribusiness have a history of creating or exacerbating conflict dynamics in Myanmar. There are a number of conflict sensitive risks for BIF that need to be considered when deciding in which areas of the country to support commercial bamboo activity, and which particular business models to support. Annex B considers the national-level conflict risks of bamboo development across different governance environments, followed by those at the regional and local levels. It then touches on the issue of land access as a potential driver of conflict. Finally,

65 European Commission: Timber Regulation.
66 NEPCon: EUTR: Which products are covered?
67 Thorpe, J.: Delivering prosperity in Myanmar’s dryzone. Lessons from Mandalay and Magwe on realizing the economic potential of small-scale farmers
three main production models for bamboo are scrutinised to examine whether there are different levels of risk associated with each of the models.

4.5.3 Environmental impact of bamboo

There are both positive and negative environmental impacts of bamboo.

**Positive environmental impacts**

The positive environmental impacts of bamboo include:

- It can be planted on degraded land and soils which other crops and trees would not survive on. As degradation is a cause of concern in Myanmar, positive impact has an increased benefit;
- Bamboo rhizomes and root systems also help prevent future soil erosions and landslides;
- Bamboo improves soil quality and its falling leaves can return nutrients to degraded soils;
- It can take pressures off forest timber resources and this is particularly relevant for Myanmar. Bamboo’s characteristics are similar to those of timber, and thus its products can be used in similar ways. In China, bamboo is already taking pressure off the demand for timber;
- Bamboo, through its roots, removes pollutants from wastewater. Thus, if for example planted next to a farm, it can filter the agricultural runoff, cleaning streams and groundwater;
- Bamboo forests can be a habitat for a range of other species. Over 20 bird species depend on bamboo, as do other animals including orangutans, elephants, deer and squirrel. Bamboo forest can harbour entire ecosystems of insects and provide shelter during extreme weather events; and
- If processed properly, the vast majority of the bamboo raw materials can be used in commercial products. By comparison, often as little as 20% of trees is recovered in timber production.

**Negative environmental impacts**

Negative environmental impacts from bamboo mostly occur if it isn’t managed properly, and in particular, if it is managed too intensely on plantations.

Plantations, in particular monoculture plantations, can have a negative impact on biodiversity when compared to natural forests. The species richness within them is usually lower, as the plant environment is less diverse and thus supports less animals than a natural forest with a wide variety of plants and trees. In addition, it is argued that monoculture plantations require ongoing human intervention including the use of fertilisers, herbicides and pesticides, which in turn can lead to decreased soil fertility and water pollution, having a negative impact on the surrounding area also. However, arguably, if a plantation is established on previous degraded land, it can help increase biodiversity again.

It is also argued that intense management (which would usually happen on a plantation), can increase the bamboo species’ susceptibility to insects and disease.

While bamboo is credited with preventing soil erosion, if planted on a slope, it can cause slope failure due to its dense root mats, contributing to soil erosion in that area.

Establishing new bamboo plantations can potentially cause more stress on standing forests. Even if the plantation is grown on degraded land, it still needs to be established quite carefully if this land had been envisioned by local communities to be used for something else, in particular agriculture (e.g.
cash crops such as palm oil). If this was the case, then the chances of local communities going into
the natural forest to establish new fields through slash and burn are rather high. This pressure would
only increase were bamboo to become a real industry in Myanmar, as it would need more land. The
question then arises whether there is enough degraded land to support this expansion, or whether
plantation owners would need to encroach on natural forests. As mentioned above, we currently don't
know the extent of degraded land, and thus predictions on a potential growth of the industry without
encroaching on natural forests isn't possible.

**Chemicals used in bamboo production**

There are two steps in which chemicals may be required in the production of bamboo: During its
growth phase and during assembly of the semi-finish and/or final products.

Not many pests are associated with bamboo, so technically pesticides shouldn't be required in its
growth phase. However, as mentioned above, common pesticide, herbicides and fertilisers are
frequently used in particular in bamboo plantations in China, with the main aim of increasing yields
and speed up growth.

With regards to chemicals used in bamboo products, research indicates that the product which
requires the largest amount of chemicals is bamboo flooring. This is due to the fact that glues need to
be used as adhesives to laminate the bamboo strips together. Some adhesives contain resins, such
as urea-formaldehyde, which can have health impacts. However, there are non-toxic alternatives to
this, and sustainably-minded manufacturers might use water-based adhesives which are solvent-free
and non-toxic.

Other bamboo products, such as poles and shots, seem to require no chemicals in their production.
This was certainly true for the shots production process which we saw during our BIF site visit.

Preservatives for bamboo to protect the final product from degradation and pests can also be toxic.
For example, copper chrome arsenic, which is often used to protect outdoor bamboo, has an arsenic
component. However, as before, there are more environmentally friendly alternatives which can be
employed, for example borax and boric acid.

**Mitigation**

There are a number of tools that can be used to manage environmental impacts. Generally, project
proponents should apply the precautionary principle, which states that unless there is a consensus
that an action or policy is not harmful, the proponent must prove that it is not harmful.

Before agreeing to support a project, BIF should support the impact assessments steps highlighted
below to establish environmental risks and impacts, for example by facilitating risk and impact studies
from similar projects. In particular, the following steps should be taken:

1. Identifying and complying with applicable environmental laws and regulatory requirements:
   This applies to Burmese laws.
2. Conducting a ‘baseline assessment’ during which the following questions should be
   answered:
   - What is the current state of the biodiversity and ecosystem services in the area?
   - Does it host any (critically) endangered species?
   - What impact would/will the project have on the biodiversity and the ecosystem?
3. Identifying environmental risks and impacts: This should be done in conjunction with a
   consultation process that involves communities. In this regard, it is particularly important that
   all parties are brought to the table. This, in particular, includes women and (if applicable)
   indigenous peoples. The consultation process with the local communities should be open and
   transparent and follow the principle of Free, Prior and Informed Consent (FPIC) as much as
   possible.
4. Steps 2 and 3 together can be combined into an environmental impact assessment (EIA): EIAs are increasingly common and often mandatory when establishing new projects. Fundamentally, these assessments aim to establish what environmental impacts (both positive and negative) a project might have on the biodiversity in and around the project area and local communities.

5. Establishing an Environmental and Social Management System (ESMS): Any risks or negative impacts that have been identified in the above steps need to be managed and the project proponents should establish some form of ESMS for this purpose. An ESMS is a way to institute a structure approach to managing environmental and social impacts and risks, avoiding as much as possible the negative impacts and any risks, and enhancing positive impacts. The risks should be managed in accordance with a mitigation hierarchy and Good International Practice.

Optional additional steps:

1. Monitoring: Once it has been established that there are no adverse impacts on the environment and/or they and any risks are appropriately managed, it is important to keep monitoring developments. For example, some stakeholders may not be aware of a project until it is operational, and will voice their concerns or claims only then, and some negative environmental impacts may only become apparent once a project has started.

2. Dispute resolution mechanism: Project proponents could consider establishing a dispute resolution mechanism, in particular for grievances that are voiced after the project has begun.

Potential tools and databases:

There are a number of useful tools and databases that could be consulted and used as guidance for environmental impacts and risks. In particular, the guidance by the International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD) provide useful and practical tips to manage environmental impacts:

- IFC Performance Standards on Environmental and Social Sustainability
- IFC Environmental, Health, and Safety Guidelines for Forest Harvesting Operations
- EBRD Performance Requirement 1: Assessment and management of environmental and social impacts and issues
- EBRD Performance Requirement 6: Biodiversity conservation and sustainable management of living natural resources

4.6 Other development activities in the bamboo sector

The bamboo sector in Myanmar is currently experiencing a low level of interest from other donor programmes and some interest from private investors, especially Japan and possibly Thailand although the latter seems to be done through the Government and little update is currently available.

The Myanmar Bamboo Lover Network (MBLN) aims to save nation’s forest, unite people who love bamboo conservation in Myanmar, raise public awareness on the importance of bamboo, and support the development of the livelihood of village communities by sharing sustainable ways to get more income from bamboo. The association participated in activities related to bamboo such as a bamboo preservation treatment training workshop and the Myanmar International Furniture Expo 2015.

The FAO is currently designing a $1-2 m Integrated Bamboo City project with the private sectors in Bago division. This recent development was shared by the MRBEA with BIF shortly before this MAS was finalised hence the details of their plans are not yet known to BIF.
Pyo Pin, another DFID funded project, that has been actively engaged in the governance aspects of Community Forest in relation to rattan and bamboo could also participate to the implementation of the BIF bamboo market strategy.

In addition, there are a number of international and national Non-Government Organisations (NGOs) interested in the sector\(^{69}\) which could make useful partners in various development aspects. The majority is concentrating in the environment, conservation and forestry sectors rather than directly on bamboo and Non-Wood Forest Products (NWFPs). There is a mix of policy, technical support and practical programme-oriented organisations, e.g. Regional Community Forestry Training Centre (RECOFTC) is associated with and located directly in the Department of Forestry's offices in Yangon, supporting the government with technical and capacity building support. BIF has also engaged with one of the RECOFTC specialist working on bamboo processing within the context of forest fires in Laos.

Finally, MCRB, also DFID funded, has done extensive work on responsible business practices in Myanmar and could participate to the dialogue on the principles of a transparent and accountable bamboo sector.

## 5 Constraints Analysis

### 5.1 Main constraints

This section recapitulates the different components of the market system and market underperformance/constraints identified along with their possible root causes. Each constraint is then grouped under four main/fundamental constraints and their feasibility for BIF intervention is analysed.

Through analysis of the market rules and functions, as well as consultations with industry players from different parts of the bamboo market, a clear picture of the issues that lie at the core of the market has emerged. The bamboo market system analysis identified:

- 8 core market functions: input, supply, processing, aggregation, export, wholesale and retail, consumption and, transport and logistics;
- 10 supporting functions: infrastructure, labour market, access to finance and financing, R&D, access to knowledge/training, industry bodies, access to market and market information, marketing and market linkages, certification, and climate change protocol and systems;
- 10 rules: Foreign Direct Investment, policies and legislation, forestry rules and regulations, national climate change policy, trade policy, labour law, tax and customs, informal rules and norms, FLEGT, and the European timber regulation.

A total of 57 market underperformances have been identified for the 28 elements of the bamboo market system and these are described in section 4 of this MAS. Each area of underperformance is identified as a constraint (C) and numbered for ease of reference. The constraints have been grouped into four fundamental constraints (FC). Each of the constraints has been reviewed as part of the analysis and an assessment made of the possible root cause of the constraint. A further assessment has been made as to whether it is feasible for BIF to intervene to address the root cause associated with each constraint. This piece of analysis is included as Annex D, while the table below provides a summary of the constraints and feasibility.

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\(^{69}\) For example: RECOFTC, Bamboo lovers Association, ECCDI, FFI and others
Table 6: Constraints and feasibility summary table

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Feasibility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC1: Low productivity of bamboo natural forests - leading to low income of bamboo forest dependents</td>
<td>High feasibility for BIF</td>
<td>C4</td>
</tr>
<tr>
<td></td>
<td>Medium feasibility for BIF</td>
<td>C16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C43</td>
</tr>
<tr>
<td></td>
<td>Not feasible for BIF</td>
<td>C9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C55</td>
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<td></td>
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<td>C44</td>
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<td>C42</td>
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<td>C3</td>
</tr>
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<td></td>
<td></td>
<td>C26</td>
</tr>
<tr>
<td>FC2: Rural population experience few opportunities to benefit from bamboo production and industrial processing</td>
<td>High feasibility for BIF</td>
<td>C7</td>
</tr>
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<td></td>
<td></td>
<td>C6</td>
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<td>C17</td>
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<td></td>
<td></td>
<td>C12</td>
</tr>
<tr>
<td></td>
<td>Medium feasibility for BIF</td>
<td>C2</td>
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<tr>
<td></td>
<td></td>
<td>C15</td>
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<tr>
<td></td>
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<td>C27</td>
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<tr>
<td></td>
<td></td>
<td>C10</td>
</tr>
<tr>
<td></td>
<td>Not feasible for BIF</td>
<td>C39</td>
</tr>
<tr>
<td>FC3: The enabling environment is not conducive to the growth of a sustainable bamboo industry.</td>
<td>High feasibility for BIF</td>
<td>Medium feasibility for BIF</td>
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</tr>
<tr>
<td>C11</td>
<td>The quality and volume of bamboo needed for high-value processing is lacking</td>
<td>C50</td>
</tr>
<tr>
<td>C1</td>
<td>Lack of high input production system</td>
<td>C34</td>
</tr>
<tr>
<td>C8</td>
<td>Lack of awareness of the role of bamboo as a timber substitute</td>
<td>C36</td>
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<tr>
<td>C41</td>
<td>Lack of information on bamboo in the NES</td>
<td>C35</td>
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<tr>
<td>C36</td>
<td>Lack of market intelligence</td>
<td>C54</td>
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<tr>
<td>C37</td>
<td>Lack of bamboo specific information and training</td>
<td>C33</td>
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<tr>
<td>C32</td>
<td>Lack of bamboo experts</td>
<td>C29</td>
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<tr>
<td>C30</td>
<td>Government R&amp;D does not address value-added bamboo</td>
<td>C28</td>
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<tr>
<td>C13</td>
<td>Market services are lacking for value-added bamboo</td>
<td>C14</td>
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<td></td>
<td></td>
<td>C48</td>
</tr>
<tr>
<td>FC4 (not feasible): Lack of general infrastructure</td>
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<tr>
<td></td>
<td>C22</td>
<td>Lack of availability of low cost power</td>
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<tr>
<td></td>
<td>C21</td>
<td>High toll charges to cross Thilwa bridge</td>
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<tr>
<td></td>
<td>C20</td>
<td>Public investment does not prioritise rivers</td>
</tr>
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<td></td>
<td>C19</td>
<td>Lack of road system limits potential sites for cluster development around natural bamboo</td>
</tr>
<tr>
<td></td>
<td>C18</td>
<td>Existing road system has led to over exploitation of some bamboo</td>
</tr>
</tbody>
</table>
While all market underperformance summarised in the above are important to create a well functioning market it is essential to note that the feasibility for BIF to intervene is linked to a range of factors. First, BIF should only address the binding constraints that are associated with the emergence of a responsible, inclusive and sustainable bamboo industry in Myanmar. Secondly, the feasibility is linked to the tools that are available to BIF’s M4P mandate, duration, size and influence.

These factors enable BIF to focus the scope of its interventions and strategy to an inclusive growth objective but limit our ability to address constraints that are not necessarily specific to this market, and for which an M4P approach may not be the most appropriate vector.

Of the four fundamental constraints identified (table 6), BIF interventions can address root causes that will contribute to a change for three of them. These are FC1, FC2 and FC3 in the above table. BIF should concentrate its efforts on those binding constraints that can be addressed using the BIF toolkit (TA, grants, networks, influence) and create inclusive business opportunities to create a reliable and sustainable source of income for the rural poor.

The following analysis focuses, therefore, on these three fundamental constraints and aims to support an inclusive value added bamboo market. These are both the constraints that BIF is most able to address and offer the greatest potential for replication:

- **FC1: Low productivity of bamboo natural forests - leading to low income of bamboo forest dependents.** Addressing this fundamental constraint is a necessary condition for the development of a manufacturing bamboo industry in Myanmar. Bamboo agribusinesses must rely on a sustainable and cost effective supply chain that can meet their requirements and adapt to the market demand. To do so, the creation of a multiple input supply chain involving small commercial plantation, Community Forestry User Groups and traders will be necessary. In addition, support to different input suppliers will stimulate diversity, flexibility, quality, innovation and cost competitiveness;

- **FC2: Rural population experience few opportunities to benefit from bamboo production and industrial processing.** Addressing this fundamental constraint is core to unleashing commercial opportunities that could be tapped into by careful planning for bamboo basin production and clustering of processing. Market led and demand driven opportunities exist for medium and high value addition of bamboo through cottage, semi-industrial and industrial companies, provided planning and advisory capacity is made available to develop a robust supply chain and introduce innovation. Value addition opportunities depend on the investment capacity and capability of different market players. From a pro-poor market perspective bamboo offers community and on-farm opportunities for near source processing and medium value addition; and

- **FC3: The forestry and Non-Wood-Forest-Product (NWFP) business environment is not conducive to the growth of a sustainable bamboo industry.** Addressing this fundamental constraint is paramount to mitigate the reputational and conflict risks associated with the poor, but nonetheless improving, record of Myanmar’s extractive industry and human rights. Most importantly, from a pro-poor and economic growth perspective, this constraint prevents the emergence of a transparent, inclusive and commercially viable industry. Commercial use of land by communities is restricted and while the private sector has access to land for forestry and agri-production projects, land investment remains generally opaque. Furthermore, due diligence, or the absence of ground truth due diligence process, can fuel grievances and conflict at the local level. Finally, bamboo has been neglected and this had lead to little investment in production, processing, and R&D and missed opportunities for rural populations and communities.

As illustrated in table 6 above, BIF is not equipped to address market constraints associated with the lack of infrastructure (FC4). These are constraints that all businesses in Myanmar face and have learned to navigate and mitigate given these constraints have been part of their environment for years. Bamboo pioneer firms are operating successfully in other timber and non-timber forest product markets and have learned to deal with the lack of infrastructure. In addition, new
programmes such as BEOF, Infrastructure and Cities for Economic Development (ICED) and projects funded by InfraCap are likely to address some of these constraints.

In terms of the other constraints that BIF cannot address (those constraints ranked not feasible for BIF in the above table), none of these are felt to be binding constraints i.e. constraints that, if not addressed, will prevent or severely constrain any pro-poor development of the market. Indeed, consultations with entrepreneurs pioneering the emergence of the Myanmar bamboo industry indicate that most of the binding constraints they face are due to a lack of technical skills, business skills, and knowledge in planning, bamboo production and processing, rather than the difficult business environment. Most entrepreneurs and traders met by BIF have experience running rattan, bamboo, hardwood or furniture manufacturing businesses for export before, during and in the aftermath of the US and EU sanctions.

Other constraints that are not binding include:

- **Constraints that BIF cannot address under FC1**: these constraints are not binding because the option exists for the industry to source bamboo from new plantations and BIF focuses on value add market that offer a potential for growth and particularly on those functions BIF can influence using its tool kit, and during the existing time frame of BIF. For example facilitating a change in FLEGT goes beyond BIF core competencies and falls under a change in Myanmar forestry governance system. The same applies for stimulating the emergence of Community Forest user Groups at a path in line with the Forest Master Plan. Similarly, other projects are addressing the constraint related to the National land use policy and BIF is not the best vehicle to address this complex policy issue.

Low value added products (handicraft) offer limited potential for economic growth, low margins and are not a focus of the entrepreneurs fledgling the transformation of the Myanmar bamboo industry (from poorly managed resource for low value added product to high value added, low waste, and sustainably managed resource). Although poor people are involved in low value-added processing of bamboo, BIF did not find any entrepreneurs willing to invest in this market in particular (this market is targeted to the domestic consumption). However, opportunities exist for poor to benefit from better-managed bamboo stocks and innovations for example through improved design of bamboo houses in industrial areas in and around Yangon, or emergency bamboo shelters in response to natural disasters and emergencies (e.g.: floods).

Finally, BIF should not address the limited productivity of natural forest (as these should be protected) and should not try to improve workers productivity (as this could have negative consequences on the natural forest). Instead BIF should focus on land productivity with a particular focus on restoration of degraded land.

- **Constraints that BIF cannot address under FC2**: this constraint is linked to the relatively short timeframe BIF has to bring about a market system change in this market. Furthermore there is risk of diluting the Facility’s effort by trying to spread too thinly across too many activities instead of focusing on opportunities for generating income as well as safeguarding and creating jobs. The lack of certification will not prevent the growth of bamboo processing through industry pioneers; and

- **Constraints that BIF cannot address under FC3**: there are many constraints in the enabling environment that BIF cannot feasibly address but these not binding for one or more of the following reasons:
  - They are constraints that all businesses in Myanmar face and have learned to navigate and mitigate as explained above;
  - Other agents are also addressing the constraint, e.g. changes in policies and regulations are progressing through the system; and
  - Some of these constraints are largely historic, and while some effects are still being felt there is rapid and positive change happening to reduce them.
### 5.2 Root causes

The following table summarises the three fundamental constraints which BIF can contribute to address; identifies the underlying causes associated with these constraints and the market functions to which they relate; sets out the root causes; and summarises interventions which can be carried out to addresses these root causes and work toward a market system change.

**Table 7: Bamboo market logic table**

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Underlying cause</th>
<th>Related supporting/enabling functions</th>
<th>Root Causes</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC1: Low productivity of bamboo natural forests - leading to low income of</td>
<td>Lack of skills and knowledge leading to poor management of the bamboo resource</td>
<td>Access to knowledge and training Access to market and market information Marketing and market linkages</td>
<td>Cutters, collectors, and Community Forest have limited access to information, technical skills, business skills and knowledge on how efficient and sustainable management of bamboo resource sustainably. Traders/aggregators and Community Forest User Groups (CFUG) have limited technical skills, business skills and knowledge about economic benefits and innovation in efficient and sustainable management of bamboo, and limited support to implement such business models.</td>
<td><strong>Intervention B1</strong>: Through piloting, demonstrate the economic benefits of sustainable management techniques of bamboo resource and innovation. Pilot-support to traders/aggregators, and Community Forest User Groups to build their business skills and the cutters capacity on the importance of sustainable management of natural stocks and Community Forest plantations for commercial and industrial purpose as well as innovation. (e.g. on the production of bamboo charcoal, use of trolley for transporting bamboo, introduction of small machineries for pre-processing of bamboo, etc.). Establishing the link between efficient and sustainable management of bamboo resource and the establishment of plantation, innovation and financial benefits will enable BIF to promote the economic case for better resource management practices.</td>
</tr>
<tr>
<td>rural forest dependents</td>
<td>by cutters, collectors, and Community Forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of economic options leading to reliance of poor cutters and collectors on</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>natural forest contributes to the degradation of the bamboo resource</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC2: Rural population experience few opportunities to benefit from bamboo</td>
<td>Commercial potential of bamboo production and industrial processing has</td>
<td>Access to market and market information Marketing and market linkages Access to knowledge and training</td>
<td>Lack of open source information and analysis-based information on bamboo local and global market outlook to inform sector planning, feasibility studies and business plans (including expected return).</td>
<td><strong>Intervention A1</strong>: Support the development of the Myanmar Rattan and Bamboo Entrepreneurs Association for overseeing sector planning, providing strategic direction for value-added processing, disseminating market intelligence and facilitating market access.</td>
</tr>
<tr>
<td>production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

60
<table>
<thead>
<tr>
<th>barrier</th>
<th>solution</th>
<th>explanation</th>
</tr>
</thead>
</table>
| and industrial processing | R&D Industry bodies | Lack of systematic, detailed and accurate information on the extent and location of degraded land, as investors do not have the resources for large-scale research.
Lack of systematic, detailed and accurate information on the extent, location and quality of bamboo resource, as investors do not have the resources for large-scale research.
Lack of bamboo market intelligence, training and business service providers. |
| | | Intervention A2: Support to local or regional information service providers and consultancy organisations to develop and commercialise demand driven market intelligence, land zoning and business planning services to the association, existing and new business and responsible investors to build a local bamboo service expertise that can respond to the demand of the sector’s growth. Land use planning and mapping will lead to identification of efficient and sustainable approaches to bamboo plantation and stock management. |
| Lack of reliable supply chain for value-added bamboo manufacturing (e.g. flooring, furniture, veneer etc.) | Access to information, knowledge and training. Access to finance and financing investment (domestic and foreign). | No examples of commercially successful value-added processing based on a sustainable supply of bamboo from responsibly managed plantations using a multiple input supply model (e.g. commercial plantation, traders and community forest). |
| | | Intervention B2: Pilot support to emerging bamboo plantation and processing businesses to ensure commercial viability, create/safeguard jobs, and increase rural income through facilitating a sector-wide, sustainable, inclusive, and responsible market-led and demand-driven value chain model for value-added industrial processing of bamboo. |
| FC3: The forestry and Non-Wood Forest Product (NWFP) business environment is not conducive to the growth of a sustainable bamboo industry | Land tenure, land use and commercial rights over bamboo resources are neither clear nor secure | Policies and legislations, Forestry rules and regulations, Informal rules and norms, Industry bodies | National land use policy still at drafting stage and no clear policy on commercial use of forestry products by communities. Lack of transparent process on land acquisition, land rights and commercial rights, and lack of ground-truth due diligence process. |

Government has focused on teak and hardwood and has not supported bamboo production and high value-added bamboo | Policies and legislations, Forestry rules and regulations, Informal rules and norms, Industry bodies | National land use policy still at drafting stage and no clear policy on commercial use of forestry products by communities. Lack of transparent process on land acquisition, land rights and commercial rights, and lack of ground-truth due diligence process. |

In the forestry sector, the government has focused its economic growth strategy on teak and hardwood but these resources have not been managed sustainably and did not have value add as an objective. This is now changing and bamboo offers an opportunity for wood substitution. There is a need to address the lack of prioritisation, capacity and evidence on which to prioritize bamboo production and value added bamboo. |

**Intervention C:** Building on information, analysis and lessons from interventions A and B will create the evidence to influence policy to facilitate the review or creation of rules and regulations to support the bamboo sector and attract investment. BIF’s plan is to address land issues through the lens of the specific partners that we support and to draw learning and evidence from this that the Association can then use to influence policy and set guidelines and standards for the industry. This intervention could also aim for bamboo opportunities to be clearly presented in the National Export Strategy (NES) on forestry products, and/or to create an out-grower scheme policy for non-wood forest products. Bamboo is mentioned in the NES on forestry products however strategic direction and incentives for the industry to grow is not provided, hence the Government and the private sector are missing an opportunity.
6 Market Strategy

The pro-poor vision for the Myanmar bamboo strategy is to catalyse the emergence of a bamboo industry sector growth approach to build a sustainable, inclusive and responsible value chain that will create and safeguard rural jobs, generate regular income opportunities, and promote the uptake of new products and services for businesses and consumers.

The market strategy aims to address the root causes associated with the three fundamental constraints identified by BIF (see 5.1. and 5.2.). This strategy aims to directly and indirectly support entrepreneurs, traders, Community Forestry Users groups and rural populations to get involved in the creation of a demand driven, value added market for bamboo.

We recognise that different business and communities have different abilities, capabilities and resources hence the BIF strategy will tailor support to each service recipient. The two scenarios BIF will aim to pursue, based on the different capabilities of services recipients, are ‘Organic Development’ and ‘Innovate and Compete’. The scenarios are described in section 2.2 of this MAS.

BIF’s Bamboo strategy will also support the Myanmar and Rattan Bamboo Association (MRBEA) to perform the key functions of informing planning, developing industry and export strategies, and influencing policy to create incentives for government, donors and investment.

The third component of the strategy is to support the creation of a bamboo planning, manufacturing, and market information and strategy support function in order to inform newcomers and investors and underpin market creation at scale.

The strategy will support a small group of pioneers from the private sector (entrepreneurs and traders) and Community Forestry User Groups to set the standards, principles, guidelines and sector strategy for newcomers to join a growing market for wood substitution.

In understanding and analysing the main constraints in the private sector, and defining this strategy, BIF and DFID established some key principles to support the industry through this market strategy. The key principles are:

1. Promotion of a clear, transparent and ground-truth due diligence process for private sector, and possibly community, on land investment project. BIF plan is to address land issues through the lens of the specific partners that we support and to draw learning and evidence from this that the Association can then use to influence policy and set guidelines and standards for the industry. The detail of this approach is set in Annex D;

2. Assessment of the economic, social and environmental impact of projects (see sections 2.2. Opportunity for pro-poor growth and 4.5.3.Environmental impact of bamboo) supported by BIF, and where possible, understanding the impact of these projects on climate change;

3. Promotion of protection or preservation of existing natural bamboo stocks through promoting private sector and community projects that provide opportunities for land restoration (on degraded land), biomass increase (for degraded natural bamboo forest), and small-scale bamboo plantations that provide supply chain and value add opportunities for communities and rural population;

4. Supply chain based on Myanmar’s competitive advantage in agriculture and forestry products, and the fourteen bamboo species of commercial interest in the country (out of 102 listed species) and possibly improved species emerging from R&D;

5. Promotion of an industry geared towards high value added processing such as flooring, parquets, veneer and furniture, and the processing of shoots for the domestic (entry) and export markets. Medium value addition products such as charcoal and vinegar will also need to be produced to make efficient use of the raw materials;

6. Support to a ‘Zero Waste’ manufacturing industry approach or aiming to minimise waste by fostering the principles of sustainable bamboo production, including harvesting and processing that will aim to use all parts of bamboo;
7. Design and implementation of market interventions and activities that aim to maximise income opportunities for Community Forestry User Groups through supply chains, value-added processing and marketing;

8. Promotion and planning of bamboo production basins, clustering of processing units in different locations, and an analysis of the pro-poor impact of different models to promote the most inclusive scheme for replication. This approach will require some degree of specialisation for production, processing and marketing by companies, traders and Community Forestry User Groups;

9. Support to providers of land use planning, mapping, forestry, agronomic, processing and marketing services from the outset of market interventions;

10. Pro-active coordination with Pyoe Pin, Infra Capital Myanmar and other DFID funded projects (e.g. BEOF) and facilities that could be involved in Bamboo; and

11. Active coordination with other donor funded projects, such as the FAO, working or planning to work in the bamboo sector.
6.1 Overview of opening portfolio of interventions

Three interventions have been developed as part of the bamboo market strategy. They are summarised below in Table 7. Further details can be found in sections.

Table 8: Summary of intervention areas

<table>
<thead>
<tr>
<th>Intervention area</th>
<th>Root causes addressed</th>
<th>Key constraint(s) impacted</th>
<th>Related underperforming market functions and rules</th>
<th>Prioritisation, status and timeline</th>
</tr>
</thead>
</table>
| Intervention A1:  | • Lack of open-source and analysis-based information on bamboo local and global market outlook to inform sector planning, feasibility studies and business plans | • Rural population experience few opportunities to benefit from bamboo production and industrial processing | • Access to market and market information  
• Marketing and market linkages  
• Access to knowledge and training  
• R&D  
• Industry bodies | • High priority support to the Myanmar Rattan and Bamboo Entrepreneurs Association (MRBEA) association to gain knowledge from the China bamboo sector.  
• High priority market intelligence needs to be obtained from the outset of BIF market interventions  
• Medium priority establish the principles of a sustainable, inclusive and responsible supply chain. |
| Intervention A2:  | • Lack of systematic, detailed and accurate information on the extent and location of degraded land, as investors do not have the resources for large-scale research  
• Lack of systematic, detailed and accurate information on the extent, location and quality of bamboo resource, as investors do not have the resources for large-scale research  
• Lack of bamboo market intelligence, training and business services providers | • Low productivity of bamboo natural forests leading to low income of bamboo forest | • Access to knowledge and training  
• Access to market and market information  
• Marketing and market | • High priority support to information and service providers from the outset of BIF interventions so that they can benefit from the development of the bamboo knowledge base through specific activities and reduce their dependency on TA provided through BIF over time  
• Medium priority at the national level and at the bamboo cluster/basin area level. Initial assessment of land and resource can be undertaken as support to businesses is provided and integrated into TA activities. |
<p>| Intervention B1:  | • Cutters, collectors, and Community Forest User Groups have limited access to information, technical skills on how to manage bamboo resource sustainably. | • Low productivity of bamboo natural forests leading to low income of bamboo forest | • Access to knowledge and market | • High priority. One of the trader identified ‘covers’ 20,000 acres of bamboo forest through Community Forest. Training has already been delivered by BIF to the trader but more specific business and technical |</p>
<table>
<thead>
<tr>
<th>Intervention area</th>
<th>Root causes addressed</th>
<th>Key constraint(s) impacted</th>
<th>Related underperforming market functions and rules</th>
<th>Prioritisation, status and timeline</th>
</tr>
</thead>
</table>
| Intervention B2:  | • Traders/aggregators and Community Forest User Groups have limited business skills and knowledge about economic benefits and innovation in sustainable management of bamboo, and limited support to implement such business models.  
• BIF support has already been sought by traders in Bago and Dawei to utilise waste generated by traditional practices of harvesting bamboo (to produce charcoal) and for product diversification. | dependents, linkages      | • Access to information, knowledge and training  
• Access to finance and financing  
• Investment (domestic and foreign) | • Assistance is required. He could be the main focal point for the Community Forest input supply source of Green Move Company Ltd and others companies in the future.  
• Prioritisation will depend upon the new government however the association recently indicated that the NLD have requested them to work on bamboo development projects in Bago, Ayerwaddy, Rakhine and Tanintharyi as part of the NES.  
• Policies objectives have a low priority unless BIF encounters a major stumbling block in the course of intervention A or B. Both interventions will generate evidence to bring about a change to policies, legislations, rules and/or regulations. |
| Intervention C:   | • No examples of commercially successful value-added processing based on a sustainable supply of bamboo from responsibly managed plantations  
• Potential responsible investors are not aware of the material and its use for value-added processing and do not know what the returns will be from setting up factories and what is the best business model  
• National land use policy still at drafting stage and no clear policy on commercial use of forestry products by communities  
• Lack of transparent process on land acquisition, land rights and commercial rights. | Rural population experience few opportunities to benefit from bamboo production and industrial processing | • The enabling environment is not conducive to the growth of a sustainable bamboo industry  
• Policies and legislations  
• Forestry rules and regulations  
• Informal rules and norms | • High priority. A number of pioneers are currently applying for land and have stocks of seedlings ready to be replanted in 2016. For example one of the objective of Green Move Company Ltd is to commercialise edible bamboo shoots by the World Bamboo Day on 18 September.  
• Responsible investors are currently sought to support the investment required for piloting the processing of shoots. Promotional activities for funding/co-funding are seen as a high priority for businesses in the association. |
6.2 Intervention A1

Intervention summary: Support the development of the Myanmar Rattan and Bamboo Entrepreneurs Association to oversee sector planning, provide strategic direction for value-added processing, disseminate market intelligence and facilitate market access.

Market underperformance: Market information flows to support the growth of the sector are weak and limited, although networks are emerging to share market knowledge. There is a latent demand amongst firms with an interest in bamboo for market and technical information. The association’s limited resources means it has limited capacity to collect, collate, analyse and record information from open-sources and to generate information based on existing business models in a systematic manner which prevents businesses, responsible investors and the government to prioritise the bamboo sector. The absence of land zoning, including the identification of existing and future bamboo plantation areas and processing clusters is an example of a factor preventing investment in sustainable bamboo supply and processing.

Market change: The market system change sought through this intervention is the establishment of a leading Myanmar Rattan and Bamboo Entrepreneurs Association that provides a strong information and knowledge base to inform sector planning and businesses’ strategy. An effective and well-functioning association will also provide a range of information on where bamboo can be planted, where existing stocks are, and global trends and opportunities for Myanmar investors. The association’s limited resources means it has limited capacity to collect, collate, analyse and record information from open-sources and to generate information based on existing business models in a systematic manner which prevents businesses, responsible investors and the government to prioritise the bamboo sector. The absence of land zoning, including the identification of existing and future bamboo plantation areas and processing clusters is an example of a factor preventing investment in sustainable bamboo supply and processing.

Overview of intervention: The intervention will aim to support the association to strengthen their capacity to influence planning, policy and legislation, support and represent businesses and their economic interests, promote a responsible, inclusive and sustainable sector, and attract the investments and subsidies required for the development of a bamboo value-added industry that contributes to the country’s economic growth and transformation.

Specifically this intervention will support the association to generate and systematically collate and disseminate information, knowledge and intelligence available from different sources, including BIF, on bamboo in Myanmar and on the global bamboo market. This intervention will be delivered through a number of activities jointly planned and delivered by the association in collaboration with BIF. These activities will aim to strengthen the functions of the association that can support their objectives, mission and vision.

The MRBEA is able to catalyse political and donor interest as well as technical support from third parties while keeping up with their existing projects and businesses. The association acts as the main focal point for coordination, planning, information sharing, and investment, which makes it a valuable partner to support. The association is led and managed by a group of experienced and innovative businessmen whose vision and plans evolve with their knowledge. BIF will therefore need to be very flexible in its approach to supporting the association while ensuring the programme delivers value for money. The intensity of BIF support to the association will follow the evolution of the sector growth based on the volume of activity handled by the companies operating in the bamboo value-added segment of the market. One of BIF’s key roles will be to support and facilitate the generation and dissemination of information and knowledge for newcomers, donors and investors to crowd-in to foster job-creation and income generation at large.

Support to the association will be provided directly by BIF and through local consultancy organisations (see intervention A2), supported by international TA as and when necessary to strengthen the association’s capacity to collate, manage, and disseminate information as well as to plan for the development of the sector in selected basin/cluster areas of production and processing. The association currently envisions three key principles for the development of the sector. First, integrating production of bamboo through commercial plantation and managed bamboo forests through Community Forest and traders-aggregators. Second, processing of all parts of bamboo in low and high value-added products to minimise waste. Finally, they plan to penetrate the local market and extend their reach to the international market. For example market intelligence from the association...
indicates that there is a large and unmet demand of bamboo edible shoots in Korea. However, the organoleptic qualities of bamboo shoots appreciated by the people from the Republic of Korea is not known nor is the FOB price importers would be prepared to pay for different type of shoots (fresh, dry, preserved etc.). Myanmar’s competitive advantage in bamboo should enable businesses to match or better their competitors’ pricing but it will be important for the association to obtain more information from importers about the volumes, quality and price requirements.

Strengthening the coordination and planning function of the association will also be important. Coordination is likely to take an increasing importance as more and more pioneers; followers and supporters enter the bamboo sector in Myanmar. For example, the FAO have recently started to design a $1-2 m Integrated Bamboo City project to pilot the development of a vertically integrated bamboo supply chain.

The development of bamboo plantation basin and clustering of processing facilities is seen as an important step to develop an effective bamboo business sector. This model has been very successful in China and while the association is very keen to gain knowledge from the Chinese bamboo success story they are also very conscious of the need to adapt this model to the local context. Myanmar would indeed not be able to compete with the scale and subsidies of the Chinese bamboo sector development. However, the bamboo species available, its favourable climate for bamboo production, the availability of degraded land, a significant reservoir of manpower and the labour cost will provide a serious competitive advantage to the country. Quality of the product and marketing could also be a key differentiator for Myanmar bamboo.

A number of possible activities have already been discussed with the association although they have not yet been confirmed or formalised. As for other BIF markets and interventions, BIF will provide a support role and let the association lead most of the activities mentioned below. The association will provide, at a minimum, in-kind contributions to these activities.

Possible BIF activities include:

- Facilitate and [partly] fund a study tour to China to gain knowledge about bamboo production and industrial processing from the market leader;
- Help with the creation of a central bamboo database system (which is seen as key by the association) and build the capacity of the association’s coordinator who will be responsible for the maintenance and active management of this database;
- Help to define their short and medium terms plans and prioritise activities, through an organisational development service provider;
- Connect the association with the American bamboo society and the Australian bamboo society;
- Support the creation of the association’s website and agree the content that needs to be disseminated through the website and other channels;
- Establish a mechanism for the association and/or BIF to purchase the Future Market Insight Market Research on bamboo;
- Help build a better understanding of the market trends, supply, demand and prices for bamboo for the domestic and export market as well as the different business models; and
- Support and advise the association on planning and coordination for the development of bamboo basins/clusters.

The support to the association will need to be proportional to the number of market players and will increase as businesses crowd-in, however they should be set up to be a central point for information, planning and coordination from the outset of these interventions.
Finally, MCRB have shown interest to participate in the development of an accountable and transparent business practice in the sector – a Bamboo Transparency Initiative. MCRB has done extensive work on responsible business practices in Myanmar. This activity will affect a wider market system change by setting the standard for a sustainable and responsible development that will integrate central and peripheries’ opinions.

**Fundamental constraint being addressed:** The fundamental constraint addressed by the intervention is the neglect of commercial potential of bamboo production and industrial processing. This constraint will be addressed by supporting MRBEA capability to promote bamboo and provide detailed information (e.g.: technical, economic, financial, environmental) for robust planning, and to attract investors in the bamboo sectors to generate and safeguard jobs and income opportunities for rural people.
### Table 9: Intervention A1

<table>
<thead>
<tr>
<th>Root causes</th>
<th>Change required</th>
<th>Potential Activities</th>
<th>Potential Results</th>
<th>Potential partners</th>
</tr>
</thead>
</table>
| - Lack of open-source and analyse-based information on bamboo local and global market outlook to inform sector planning, feasibility studies and business plans (including expected return) | - Establish market mechanisms for the systemic gathering and dissemination of open source and protected market intelligence and information through various sources, including customer feedback mechanism | - Support the creation of MRBEA database and website  
- Facilitate the collation and the publication of publicly available open source market information on bamboo through the MRBEA website – for example BIF competitiveness study.  
- Stimulate demand for market information service  
- Support the association planning, coordination, marketing and promotional capacity and activities  
- Round table to establish the principles of a sustainable, responsible and inclusive bamboo value chain | - MRBEA capacity and reputation as a leading industry association for sustainable, inclusive and responsible development is established, strengthened and maintained | - MRBEA  
- Database and web development companies  
- MCRB  
- Local consultancies operating in agriculture, rural development and environment  
- Local consultancies that could provide market information service |

**Assumptions and considerations:**

BIF assumes that the MRBEA will continue to show interest in working with BIF, value our technical expertise and BIF’s objective will remain aligned to that of the association. We also assume that the support provided by BIF and other projects to the MRBEA will not negatively impact association’s relationships with various businesses/their members. We also assume that the next government will take a keen interest in bamboo, and private sector and donor-funded projects will act in a coordinated manner.
6.3 Intervention A2

**Intervention summary:** Support to local or regional information service providers and consultancy organisations to develop and commercialise demand-driven market intelligence, land zoning and business planning services to the association, existing and new businesses and responsible investors to build a local bamboo service expertise that can respond to the demand associated with the sector’s growth.

**Market underperformance:** This intervention will contribute to address the absence of land zoning, including the identification of existing and future bamboo plantation areas and processing clusters preventing investment in sustainable, inclusive and responsible bamboo supply and processing. Bespoke market intelligence and planning services to support business plans is lacking and will be critical in the future, in particular where external funds are being sought.

**Market change:** The market change sought through this intervention is the development of demand-driven and market-led bamboo specialist services that can provide training, business and land use planning services, market information flows and other services to support the growth of the sector and strengthen networks for knowledge and information sharing. These services will enable MRBEA, existing businesses and new entrants to respond to the various requirements of the government, donors and investors to foster the growth of the bamboo sector to generate and safeguard jobs and income opportunities for rural people.

**Overview of intervention:** The intervention will aim to support the demand and supply of bamboo specialist services (business planning, market intelligence etc.) and training for the industry to grow at scale. Business service lines will be developed in line with the vision, mission and objectives set by the association and the principles established for supporting the emergence of a sustainable, inclusive and responsible bamboo value-added processing industry. BIF will contract these consultancy organisations to provide market intelligence and business planning services to support market players and investors decision-making process. These consultancy organisations will be strengthened by BIF as and when necessary by embedding TA build their capacity on the job while delivering the services and outputs required for the development of the association and businesses.

Possible BIF activities include:

- Help identify the appropriate organisations and fund/partly fund the mapping of: degraded land and identification of bamboo basin for plantation and managed bamboo forest as well as processing of various products and produces to minimise waste (see also intervention A2 on support to identification, and support of appropriate organisations). The quantitative and qualitative mapping should be done incrementally as opportunities emerge. It is important to note that BIF does not recommend nation-wide planning for bamboo but would rather aim to understand the positive and negative impacts of different growth scenarios in one or two geographical areas that has degraded land, support planning for these areas and facilitate the presentation of these scenarios by the association to the government and investors; and

- Provide TA to appropriate organisations – identified above – to strengthen their capacity to provide services to the industry, businesses, investors and other parties interested in bamboo (e.g.: donors and government).

**Fundamental constraint being addressed:** There are two fundamental constraints that will be addressed through this intervention. First, the absence of planning for the harmonious development of bamboo basin/cluster for production and processing based on degraded land and species available to create income opportunities and safeguard jobs for the rural population. Second, the lack of information and consultancy services available due to the neglect of commercial potential of bamboo production and industrial processing that has constrained the stimulation of the supply and demand for these services. These constraints will be address by supporting the supply of demand-driven information, training, and marketing bamboo services for MRBEA, existing and new business.
### Table 10: Intervention A2

<table>
<thead>
<tr>
<th>Root causes</th>
<th>Change required</th>
<th>Potential Activities</th>
<th>Potential Results</th>
<th>Potential partners</th>
</tr>
</thead>
</table>
| • Lack of systematic, detailed and accurate information on the extent and location of degraded land, as investors do not have the resources for large-scale research | • Detailed and accurate information on degraded land is available at MRBEA  
• Impact responsible investors see bamboo as a source of business | • Mapping of degraded land in areas surrounding existing or planned bamboo investment (plantation or processing plant) by businesses support by BIF through intervention B2 in Bago Yoma, Dawei area and Shan  
• Promote and disseminate the environmental dividend generated by establishing bamboo plantation on degraded land | • Degraded land mapping and mapping service providers are locally available  
• Planning information is available to the MRBEA, the government, investors and donors | • MRBEA  
• Local consultancies operating in agriculture, rural development and environment  
• Staff, managers and consultants previously involved in the Myanmar state-owned paper and pulp industry  
• Businesses supported as part of BIF intervention B1 and B2 |
| • Lack of systematic, detailed and accurate information on the extent, location and quality of bamboo resource, as investors do not have the resources for large-scale research | • Impact responsible investors see bamboo as a way to positive contribute to the social and environmental development of Myanmar  
• Mapping of bamboo in areas surrounding existing or planned bamboo investment (plantation or processing plant) by businesses support by BIF through intervention B2 in Bago Yoma, Dawei area and Shan  
• Promote and disseminate the comparative advantage of Myanmar in bamboo | • Planning information is available to the MRBEA, the government, investors and donors  
• Bamboo resource mapping service locally available | | • MRBEA  
• Businesses supported as part of BIF intervention B1 and B2  
• Local consultancies operating in agriculture, rural development and environment  
• Forest Research Institute |
| • Lack of bamboo market intelligence, training and business service providers | • Support the emergence of bamboo specialist businesses services in support to planning and investment  
• Funding/partial funding of services for research, mapping, businesses planning and feasibility services for the MRBEA, existing business and new business entrants  
• Develop the demand for market information and consultancy service in bamboo | • Market information service providers available locally  
• Business planning and advisory services locally available | | • MRBEA  
• Businesses supported as part of BIF intervention B1 and B2  
• Local consultancies operating in agriculture, rural development and environment  
• Local consultancies that could provide market information service |

**Assumptions and considerations:**

BIF assumes that those consultants and consultancy organisations that have worked on bamboo and timber will show interest in working with BIF and support the inclusive and responsible growth of the sector. It is also assumed that support to several information and consultancy service providers will stimulate the competition amongst them and will drive the quality of the market up. It is assumed that business will value the support of these services providers and will be willing to pay for their services after BIF subsidies. This intervention is likely to require support beyond the lifespan of BIF hence it will be important to design a clear exist strategy with those who will take a keen interest on the development of the bamboo sector. Longer-term support to these businesses may eventually lead to an internationally recognised expertise of Myanmar information and consultancy expertise in value-added bamboo processing.
6.4 Intervention B1

**Intervention summary:** Through piloting, demonstrate the economic benefits of sustainable management techniques of bamboo resource and innovation. Pilot-support to traders-aggregators and Community Forest User Groups to build their business skills, and the cutters capacity on the importance of sustainable management of natural stocks and Community Forest plantations for commercial and industrial purpose as well as innovation.

Adoption and scale-up will happen through the Myanmar Rattan and Bamboo Entrepreneurs Association and consultancies companies (intervention A) who will provide market-driven and demand-led dissemination of experience and advisory services to other traders-aggregators in support to the development of a sustainable, inclusive and responsible supply chain for existing businesses, new business entrants and responsible investors (intervention B2).

**Market underperformance:** Poor management of bamboo resource leads to overharvesting and low productivity of bamboo forests, which, in turn, negatively impact the income of bamboo forest-dependents (cutters of poles and collectors of shoots), as well as the sustainability of their income. Bamboo natural forest provides a direct source of income for those who don't own land or have a regular source of income. It also provides an activity for casual workers during the off-farming season in rain-fed agriculture areas. The overharvesting and exploitation of natural bamboo coupled with shifting cultivation leads to erosion, reduction of the biomass and changes to local climate patterns. Degradation of land and biomass resource affects the 'ecosystem service' by affecting river basin, soil fertility and biodiversity dynamics. This, in turn, increases vulnerability of cutters and collectors and more generally rural populations. Cutters and collectors have to go further every year to harvest good bamboo therefore decreasing their productivity. Decrease in productivity, accessibility and availability of bamboo resource have a negative impact on poor’s income since their wages are based on a piece rate paid for poles or per viss/kg in the case of bamboo edible shoots.

Furthermore, the increase demand for bamboo poles for construction in the past years has meant that more are getting involved in the business triggering more competition and even more pressure on the resource. Traders-aggregators interviewed by BIF in Bago and Tanintharyi were definite on the increased cost of bamboo compare to 10 years ago although they could not give us an order of magnitude. But, increase in market prices do not necessarily translate into a better price for the cutters and collectors. Increased cost of bamboo is driven by demand, wages, and most importantly a rarefaction of the resource. Cutters, collectors, Community Forest User Groups and traders-aggregators play a key role in the management of bamboo; however, they have limited knowledge and access to training on sustainable management of bamboo forest, and have not had any incentive and rights to develop commercial plantation of bamboo to sustain both the resource and their income. Traders-aggregators and Community Forest User Groups have limited business skills and limited incentive to promote sustainable management of bamboo despite the dependence of their business on the resource. Their strategy is based on extending the reach of cutters into new bamboo stocks rather than managing existing stocks. Finally, Forest Officers have not had any incentive to promote sustainable management of Community Forest User Groups in general and bamboo Community Forest user groups in particular (see intervention C for further information on policies and legislation).

**Market change:** The market system change sought through this intervention is the development of a sustainable, inclusive and responsible supply chain by incentivising traders-aggregators, and through them cutters and collectors, and Community Forest User Groups to manage bamboo stocks and where relevant establish bamboo plantation on degraded land. This will enable the traders-aggregators to respond to the demand of the construction and bamboo-food market and/or supply value-added processing businesses. This market system change aims to protect the jobs and incomes of those involved in the bamboo supply chain, and create new job opportunities, while trying to preserve the remaining stocks of bamboo. By the end of this intervention BIF would have supported the establishment of a sustainable, market-led and demand-driven supply chain for bamboo that could be replicated by other traders and Community Forest User Groups across the country. The MRBEA, and BIF will have an important role to play in the dissemination of this business model.
Overview of intervention: This intervention will aim to support a limited number of traders and Community Forest User Groups to create a reliable, effective and sustainable source of bamboo supply for industrial processing. This support will primarily be targeted to large traders that can support the industry growth. The incentive for the traders-aggregators and Community Forest User Groups is to ensure a reliable and sustainable supply of good quality bamboo at the right price point for the market, while ensuring the sustainability of their business.

Possible BIF activities include:

- Establish out grower scheme for traders-aggregators willing to supply companies producing value-added produce and exploring based on the principle of a sustainable inclusive and sustainable supply chain;

- Support traders-aggregators to analyse their business strength, weakness, opportunity and threat (SWOT), forecast, as well as the risks, and to identify solutions to sustain their businesses in the long run. Technical Advisory support will be provided by local consultancies, or consultants supported by international TA as and when necessary. Business analysis and skills transfer will emphasise the importance of the resource and will aim to define whether this resource could sustain the business in the long run and if not what could be the solution. The business analysis will also explore innovation to minimise the waste of bamboo and sustainable harvesting of bamboo, as well as bamboo plantation;

- Work through traders, CSO and other projects to identify potential Community Forest User Groups that could be involved in the emergence of a high value added bamboo market supply chain and medium value processing through innovation;

- Training of traders’ staff/supervisors and leaders of Community Forest User Groups to train cutters and collectors on best practices for extracting resource from natural forest. For example of large majority of cutters harvest the pole 50 cm to 1 m above the ground level leaving a significant amount of wood on the culms. Harvesting the poles nearer to the root provides a better utilisation of the resource and increases the amount of waste that could be processed. Another example is the harvesting of young poles. Oldest poles providing the best timber are located at the centre of the culm are hardly accessible if the new shoots and poles have not been harvested so that cutters can access to the oldest and strongest poles. These harvesting techniques give healthy and strong timber while leaving the youngest poles enough time to grow. Cutters and workers with knowledge and know-how on sustainable management of natural stocks (managed forest), propagation, maintenance and care of new plantation while supporting traders and CF to diversify their income through waste minimisation is an important to achieve a bamboo market system change at scale;

- Introduction of innovations for bamboo waste management and increased productivity of land. It is important to note that BIF will neither support nor promote increased productivity of workers, but rather productivity of land. Indeed, promoting an increase productivity of labour could result in further degradation of the resource, for examples if chain saw were to be introduced. Productivity of land will be promoted through improved management of resource, and waste minimisation, for example through conservation of fresh shoots, or processing and packaging of shoots, or though the production of charcoal or compost. The versatility of bamboo provides a number of opportunities to test and innovate new produces affordable by rural population. Bamboo farmers in Australia, INBAR, or RECOFCTC working with local consultancy that have an interest in bamboo and have previous experience in agriculture, rural development or the environment could provide these services to the traders and CF (insofar as CF are allowed to enter into this type of ‘commercial’ activities). Technical assistance to equip the traders with bamboo resource and plantation management training skills to be passed onto cutters and collectors they contract will therefore be provided;

- Support to aggregators and processors of bamboo edible shoots in support to effective processing of the by-product of existing bamboo resource and opportunities provided by bamboo commercial and Community Forest plantations to provide a reliable source of high
quality raw material while providing poles for the construction market or processing plants. The principle of waste minimisation would still be a cornerstone to any TA support provided by BIF; and

- Introduction of health and safety equipment (e.g. helmets, gloves, boots) in bamboo forest and plantations, as well as at the aggregation points, may also be developed to protect the workers. Similarly first aid life-saving skills and kits, and fire and safety equipment could also be promoted at aggregation and extraction points. Embedding these practices into the traders’ day-to-day operations could help prevent serious injuries to workers, supervisors and managers alike. For example head cutters and loading-unloading supervisors at the extraction and aggregation points respective should be trained in first aid. The Myanmar Red Cross provides first aid training to business for a reasonable fee that could be borne by the traders.

**Fundamental constraint being addressed:** There are two fundamental constraints areas that will be addressed through this intervention: (i) the poor management of the bamboo resource by cutters, collectors, and Community Forest; and (ii) the reliance of poor cutters and collectors on natural forest contributing to the degradation of the bamboo resource.
<table>
<thead>
<tr>
<th>Root causes</th>
<th>Change required</th>
<th>Potential Activities</th>
<th>Potential Results</th>
</tr>
</thead>
</table>
| Cutters, collectors, and Community Forest have limited access to information, technical skills, business skills and knowledge on how to manage the bamboo resources in an efficient and sustainable way. | • Cutters and collectors understand the benefits of better management of bamboo stocks and Community Forest plantation as a way to increase land productivity leading to an increased productivity of cutters (cutters achieve the same or more income in less time by having easier access to bamboo poles and reducing travel time to the extraction site) | • Through local consultancy, provide TA to traders-aggregators, CF and possibly Forest Officers to design an improved supply chain through sensitisation and training of cutters and harvesters on bamboo resource sustainable management principles.  
• Work with governance organisation/projects to structure CF working with traders-aggregators supported by BIF | • Traders-aggregators businesses are safeguarded through improved business performance and reliance on a sustainable supply chain  
• Community Forest User Groups are integrated into the high value supply chain and benefit from medium value addition innovation and opportunities  
• Cutters and collectors are aware of and convinced by the benefits of managing bamboo resource sustainably  
• Cutters and collectors are equipped with the skills and knowledge for sustainable management of bamboo resources. |
| Traders’ aggregators and Community Forest User Groups (CFUG) have limited technical skills, business skills and knowledge about economic benefits and innovation in management of bamboo, and limited support to implement such business models. | • Establish out grower scheme for traders-aggregators willing to supply companies producing value-added produce and exploring based on the principle of a sustainable inclusive and sustainable supply chain  
• Build traders-aggregators and Community Forest User Groups technical skills, business skills and innovation capacity by linking them to the association | • In collaboration with value-added bamboo-processing companies work with traders-aggregators to establish an outgrower scheme to create a sustainable, inclusive and supply chain of bamboo.  
• Provide TA to traders-aggregators for them to increase their revenue through better management of resource and in support to the creation of a market-led and demand driven supply chain for value-added processing.  
• Provide TA to traders-aggregators to pilot innovation such as processing of waste into charcoal or other products to increase revenue from waste.  
• Provide TA to the organisation working with Community Forest Users Groups to support community forest enterprise | • Traders-aggregators understand the potential of value-added processing and the role they could play in this value chain and become suppliers of bamboo processing businesses  
• Traders-aggregators and Community Forest User Groups adopt innovations such as health and safety at the work place and waste management of bamboo  
• Community Forest User Groups are integrated into the high value supply chain and benefit from medium value addition innovation and opportunities |
Assumptions and considerations: The key assumption of this intervention is the demonstration and acceptance by traders-aggregators and cutters-workers that better manage existing bamboo stocks leads to direct and sustainable financial benefits. A second assumption is the Forestry Department agreement for BIF to support traders working with CF on commercially oriented project. The FD is piloting a CF bamboo plantation in Bago Yoma. Even if BIF does not provide direct support to CF we need to consider whether this will need to be included in the Memorandum of Understanding and Letter of Agreement BIF will need to have with MOECFAF and the FD. BIF also needs to consider whether these agreements need to be signed at the outset of the market intervention or if it is wiser to wait until the new government takes office.
6.5 Intervention B2

**Intervention summary:** Pilot support to emerging bamboo plantation and processing businesses to ensure commercial viability, create/safeguard jobs, and increase rural income through facilitating a sector-wide, sustainable, inclusive, and responsible market-led and demand-driven value chain model for value-added industrial processing of bamboo.

**Market underperformance:** This intervention will address the lack of market intelligence and business planning in support to company growth and as a pre-requisite condition to project-risk finance. This intervention will also support company led R&D and, where appropriate, to incentivise the Government research institute to scientifically support innovation.

**Market change:** The market change sought through this intervention is the development of a performing group of businesses pioneering the emergence of a sustainable, inclusive and responsible vertically integrated and demand led bamboo value chain that can attract impact investment and trigger a wider interest from the business community for bamboo. Progress achieved so far by these companies should be catalysed and supported to facilitate a market-system change at scale that will see Myanmar emerging as a reputable and responsible sourcing destination of value-added bamboo.

**Overview of intervention:** This intervention will aim to support emerging companies producing and processing value-added bamboo to establish and achieve the right business model and plan. This intervention will aim to provide businesses and investors with tool kits and options to achieve the right supply source model in line with their target market and products. For example companies should consider the type of land on which they plan to establish plantations (degraded or existing bamboo forest), the customary use and ownership of land etc.

This intervention will aim to catalyse a bamboo sector in which businesses develop, sustain and promote inclusive and sustainable supply chains, effective planning, waste minimisation and a market-driven approach as the key principles of the business model. Waste minimisation is absolutely critical to achieve high efficiency of resource utilisation and can create jobs for men and women in rural areas. For example, the management of bamboo culms requires the removal of young shoots every year providing an opportunity for companies, cottage industries and Community Forest User Groups to process, package and sale edible shoots on the local market, in supermarkets or for export. Bamboo edible shoots also provide an opportunity to build the companies' cash flow before the pole can be harvested as well as promote the gustative and nutritive quality of Myanmar bamboo shoots locally, regionally and internationally. Similarly the upper and lower part of bamboo that are not used for the production of furniture, flooring and other high value-added product can be used to produce chop-sticks, or flower sticks. Other parts of bamboo that cannot be used for processing can be used as a source or energy or for composting (leaves).

Producing the right product at the right price point and to test these products out on the local market while building a better understanding of the requirements and demand of the export market is also key to sustain the value chain. Support to pioneers will aim to create more inclusive business model and plans, provide technical know-how, explore certification, and contribute to testing the market(s) while building the foundation of a responsible and sustainable multiple source (i.e. plantation and Community Forestry through traders) supply chain for the industry that can attract social impact investors. This intervention, and intervention B1, therefore, could contribute to the creation of a multiple input supply chain model based on small-medium commercial plantation established on degraded land and Community Forest supply may be through an outgrower scheme managed by traders-aggregators.

As part of this intervention design it is important to note that are more significant barriers to entry for product areas that require higher levels of processing and this indicates that caution be applied in entering new markets that require significant capital expenditure. Beyond traditional and cottage industry products, the edible shoots and poles markets face lower risks. Opportunities in the canning sector for edible shoots should be explored especially as this is the first product that can be harvested in the second year after a plantation has been established. Another product with a both domestic and
export market potential is bamboo housing and is one that a number of countries have explored. The housing market has a strong pro-poor impact potential for the most vulnerable in Myanmar.

This intervention could also be an opportunity to establish carbon balances of different projects piloted and better understand environmental and social impact to provide further recommendations for the development of the industry. Environmental and climate change impact of different system and basin development scenarios will also need to be considered. Input and services for these interventions could be supplied by organisations active in this area such as Fauna and Flora International, WWF or Wildlife Conservation.

Companies identified by BIF in 2015 have already invested in nurseries, plantation, processing, training and study tours. This investment should be catalysed and most investors would benefit from project/risk financing given the innovative nature of the sector, the nature of the investment required and the potential benefit on poverty and the environment on the best business models for the industry. To attract further investments, businesses need to improve their investment readiness. For example, a clear and transparent Governance structure and business plan are often required by investors to build a relationship with the business, understand the financial requirements and most importantly the potential impact and risks. This activity should enable companies to access loans and equity finances. BIF can support those companies requiring such support to become investment ready and link them up to potential investors but the ultimate decision will be made by the company and the investor. TA provided to individual companies will obviously be tailored to the business’ plans.

A key activity for BIF to catalyse a wider market system change at scale will be to help the association document the actual and future economic transformation bamboo could bring by analysing the business models supported by the Facility through this intervention in comparison to other commodities for which Myanmar may also have a competitive advantage for example timber, rubber or palm oil. Dissemination of this learning should be done by the MRBEA, with BIF support if required, to attract followers and build a critical mass for the sector to develop.

**Fundamental constraint being addressed:** The key fundamental constraints addressed through this intervention is the lack of value chain for value-added bamboo. A number of bamboo-based ventures have been set up and operated in Myanmar but none of them was able to sustain its operations and grow for various reasons including, amongst others, the absence of a reliable supply chain.
<table>
<thead>
<tr>
<th>Root causes</th>
<th>Change required</th>
<th>Potential Activities</th>
<th>Potential Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>No examples of commercially successful value-added processing based on a</td>
<td>• Plan and establish commercially successful vertically integrated bamboo value</td>
<td>• Catalyse companies plans to establish a sustainable supply chain; market driven</td>
<td>• Supported companies to established a sustainable, inclusive and responsible</td>
</tr>
<tr>
<td>sustainable supply of bamboo from responsibly managed plantations using a</td>
<td>chain based on responsible, inclusive, sustainable principles</td>
<td>demand-led value chain for value-added processing</td>
<td>supply chain, record and sustain commercial activities</td>
</tr>
<tr>
<td>multiple input supply model (e.g. commercial plantation, traders and</td>
<td></td>
<td>• Promote business successes and demonstrate the impact of bamboo</td>
<td>• Businesses have a better understanding of the technical and commercial</td>
</tr>
<tr>
<td>community forest)</td>
<td></td>
<td>• Study tour to China to gain knowledge from the bamboo market leader</td>
<td>requirements to grow their business after having talked to Chinese bamboo</td>
</tr>
<tr>
<td>Potential responsible investors are not aware of the material and its use</td>
<td>• Promote Myanmar’s competitive advantage in the sector to attract responsible</td>
<td>• Improve investment readiness of supported companies</td>
<td>businesses</td>
</tr>
<tr>
<td>for value-added processing and do not know what the returns will be from</td>
<td>investments to showcase and ensure the success of bamboo pioneer companies</td>
<td>• Attract further demand from responsible investors to support bamboo</td>
<td></td>
</tr>
<tr>
<td>setting up factories and what is the best business model</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Assumptions and considerations:**

The key assumption of this intervention is the capacity of businesses to attract further investment based on advice and support provided by BIF. The Facility can prepare and facilitate business investment readiness and introduction to potential investors and financial organisations but the final decision and outcome of this activity will be based on the businesses’ capacity to convince potential investors. BIF could also look into various mechanisms for reducing investors’ risks.
6.6 Intervention C

Intervention summary: Building on information, analysis and lessons from interventions A and B, develop evidence for the association to make strategy and policy recommendations on how to support the bamboo sector and attract investment. This intervention could also aim for bamboo opportunities to be clearly presented in the National Export Strategy on forest products, and/or to create an out-grower scheme policy for non-wood forest products.

Market underperformance: The intervention will address the under representation of bamboo in government priorities as a valuable wood-substitute in terms of a sector that can be economically very useful for Myanmar. It will also address the lack of clarity in zoning and other regulatory issues pertaining to both existing bamboo and land where bamboo plantations can be established.

Market change: The market change sought through this intervention is an improvement of the rules and regulations that underpin the development of a responsible value-added and inclusive bamboo sector that is recognised at the national level for its potential to contribute to the NES and the economic transformation of the forestry sector.

Overview of intervention: This intervention will aim to capitalise, documents and disseminate the work done in support to the MRBEA, traders-aggregators and businesses to inform policy and decision makers on the actual process for due diligence as well as the economic, financial and environmental potential of the bamboo value-added sectors, and the regulatory environment required to achieve this potential.

BIF’s overall objective is to support a responsible, inclusive and sustainable industry whose practices over access to land and due diligence will depart from those practices that have prevailed and still persist in some sectors in Myanmar.

BIF has started to establish a dialogue on this process and have made it a condition for providing support to companies. This activity is linked to intervention B2 which will conduct due diligence for the companies that are being selected for support. Work on intervention C will aim to bring about a voluntary market system change at the industry level by supporting the introduction of guidelines and principles of good practices. This will apply to companies supported by BIF, and new entrants whether there are companies or investors. More detail on BIF approach to land investment risks and mitigations is presented in Annex D.

To mitigate this risk efficiently, existing tools and databases will be considered in order to establish land rights and potential areas of conflict. In particular, the Interlaken Group’s Guide for Companies and the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests should be carefully considered as they represent one the latest private-public partnership innovation in terms of responsible land-investment.

This intervention may also aim to facilitate the design and implementation of special measures to be granted on an ad hoc basis in support to the competitiveness of companies in the sector. For example by providing tax relief on import of low emission glue from Japan to produce bamboo flooring in line with the specification demanded by the Japanese market.

Furthermore, this intervention will support knowledge base and dissemination of experiences acquired from other countries, through the association who will be the main channel for bringing about change to the regulatory environment. A possible activity could be to support the association to build up data from its members and maybe have working groups around specific issues that would become advocacy points for the government.

While the goal of this intervention is clearly defined it will be important for BIF to remain adaptive to the evolving political landscape and facilitate changes to the supporting rules as and when opportunities arise. For example BIF was recently informed that the National League for Democracy have requested the MRBEA to draw plans for the development of bamboo in four states. Is this is
confirmed BIF could support the MRBEA in developing these plans and recommend changes to the regulatory function. A better articulation of the potential of bamboo in the NES should definitely contribute to a greater attention for the sector.

**Fundamental constraint being addressed**: The fundamental constraint addressed by this intervention is the absence of a strategic and conducive forestry and Non-Wood-Forest-Products business environment in support to the growth of a sustainable bamboo industry.
<table>
<thead>
<tr>
<th>Root causes</th>
<th>Change required</th>
<th>Potential Activities</th>
<th>Potential Results</th>
</tr>
</thead>
</table>
| Land tenure, land use and commercial rights over bamboo resources are neither clear nor secure | - Transparent, accountable mechanism for attribution of land, rights land dispute resolution  
- Provide evidence for the review of the Community Forest Instruction to ensure Community Forest commercial rights to manage and trade the resource on which they depend, to work in decent conditions and raise their income or access job opportunities | - Through the provision of bamboo specific information support relevant organisation advocating for the creation of responsible investment and the importance of securing clear land tenure and land rights for business and communities  
- Garner evidence on the potential discrepancies between the current policies and legislations applicable to bamboo and the reality of what is actually happening to contribute to the review of the Community Forest Instruction or any relevant policy legislation, and most importantly promote the operationalization of these policies | - Community Forestry Instruction revised                                             |
| Government has focused on teak and hardwood and has not supported bamboo production and high value-added bamboo | - Greater emphasis on bamboo in the NES  
- Government support provided through subsidies and better business environment for bamboo | - Participate to working groups with the government, market players and third parties to influence the adoption of a strategic and conducive environment for the bamboo sector.  
- Participate to working groups and or providing/seconding an expert for the redaction of a section on bamboo in the NES on forestry products | - Bamboo becomes a component of the NES on forestry products  
- Rules and regulations are amended to improve the competitiveness of bamboo enterprises |

**Assumptions and considerations:**

It is assumed that the next government will take a keen interest on bamboo as a potential source of responsible, inclusive and sustainable growth. The timing and content of this intervention will therefore depend on how quickly we make progress with other interventions, as well as eagerness and reactivity of the new government on this topic. This intervention will be driven by opportunities and could be timetabled based on the existing working groups working on forestry and land; request from the government and the association to support reform; and when the association hand BIF have built sufficient evidence, through intervention A and B, to present a business case to decision-makers and specialist within the government.
Table 14: Summary of risks associated with BIF interventions in the bamboo sector

<table>
<thead>
<tr>
<th>Risk theme</th>
<th>Risk</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Inherent risk</th>
<th>Mitigating action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>Bamboo plantation companies grabbing local land for bamboo plantation without consultation and involvement of the local communities</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>Develop and promote Bamboo Transparency Initiative, ensure robust due diligence prior to supporting companies and promote multiple input supply source (commercial plantation and Community Forest)</td>
</tr>
<tr>
<td>Delivery</td>
<td>Dispute over land leads to local conflicts or disenfranchisement of communities</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>Ensure consultation between businesses and communities and a conflict sensitive approach as part of the principles for a responsible bamboo value chain</td>
</tr>
<tr>
<td>Delivery</td>
<td>Value-added bamboo products factories supported by BIF employ underage workers or do not provide decent working conditions</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>Support businesses to develop CSR policies and make BIF support conditional to the respect of the law and basic health, fire and safety requirements</td>
</tr>
<tr>
<td>Delivery</td>
<td>BIF is unable to find suitable partners to implement intervention B, invest and crowd in</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>Work with MRBEA to promote intervention B, prove the economic and financial benefits, help identify potential investors and explore innovative ways of facilitating investments</td>
</tr>
<tr>
<td>Delivery</td>
<td>New information provided through MRBEA is not relevant to the needs of investors.</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>Ensure regular communication between responsible investor and companies</td>
</tr>
<tr>
<td>Delivery</td>
<td>MRBEA does not have the interest or capacity to take on new market functions</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>Identify other market player to take new market functions forward</td>
</tr>
<tr>
<td>Delivery</td>
<td>Government does not show sufficient interest in bamboo to include in National Export Strategy.</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>Support MBREA to advocate for bamboo to be given more importance in the NES</td>
</tr>
<tr>
<td>Delivery</td>
<td>New value-added bamboo processing does not create significant amount of jobs for the poor.</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>Ensure the development of an inclusive supply chain</td>
</tr>
<tr>
<td>Risk theme</td>
<td>Risk</td>
<td>Likelihood</td>
<td>Impact</td>
<td>Inherent risk</td>
<td>Mitigating action</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td>------------</td>
<td>--------</td>
<td>---------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Reputational</td>
<td>BIF supports bamboo plantation company or value-added company with link with cronies</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>Undertake thorough due diligence before agreeing to provide support to companies</td>
</tr>
<tr>
<td>Environmental</td>
<td>Over harvesting of natural forest bamboo lead to deforestation and land degradation</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>BIF to support interventions that promote the preservation of stock that have not been exploited, improve the management of depleted stocks and commercial plantation for the development of a bamboo value-added sector</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Develop of large bamboo monoculture on existing forest leads to a loss of biodiversity</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>Promote and support the establishment of commercial plantation on degraded land to create an environmental dividend and ensure different species are planted</td>
</tr>
<tr>
<td>Coordination</td>
<td>Duplication with other programmes in the sector</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>Activities will be closely coordinated with other programmes in the sector.</td>
</tr>
</tbody>
</table>
6.7 Market Results Chain

A market results chain has been generated (Figure 6) to detail how BIF interventions in the bamboo sector will deliver pro-poor impacts. At this stage the results chain covers the initial interventions BIF will target. If other interventions are identified as viable then the results chain will be revised to incorporate these.

The market results chain diagram is split into three sections that describe different routes through which BIF’s interventions are expected to reach the poor. For example for intervention B:

1) **Direct effects**: BIF will support the creation and safeguarding of jobs through support to traders-aggregators and businesses. Direct effects will also aim to support CSR policies for supported businesses and facilitate the adoption of health, fire and safety procedure at the workplace. Direct effects through first movers will be scaled up by leveraging responsible impact investment and replication of the business model by followers.

2) **Indirect effects**: The indirect effect of this intervention will be a better accessibility and availability of bamboo leading to increase income opportunities for the poor and a reduced depletion of ecosystem services. This intervention will also lead to better access to innovation for traders-aggregators and consumers to benefit from improved products and produces such as housing or high-quality fresh bamboo shoots.
Figure 7: Bamboo market results chain

Poverty reduction

Intermediate impact

Market System Change

Systemic intervention

Constraint

Jobs created

Better income for local people

Local people have more opportunity in bamboo business

Investors startup or support commercial processing or production of bamboo

Increase in productivity of bamboo resource/land

Cutters, collectors, and Community Forest improve management of bamboo resources

Government establishes National Export Strategy and responsible investment policy for bamboo

Government increase their awareness on importance of pro-poor bamboo sector growth

MREDA makes available up to date and accurate bamboo resources related information to investors

Potential investors access and use this information

More examples of commercially successful value-added processing based on a sustainable supply of bamboo from responsibly managed plantations

Cutters, collectors, and Community Forest increase access to information on how to manage bamboo resource sustainably.

Intervention C: Development evidence to make strategy and policy recommendation to support bamboo sector and attract investment

Intervention A1: Support MREDA for generating and disseminating information that helps market players

Intervention A2: Support information and consultancy services to commercialise demand-driven market intelligence, mapping and business planning services

Intervention B2: Pilot support to emerging bamboo plantations and processing businesses

Intervention B1: Support trackers’ aggregators to build skills of community forests, cutters, and collectors to sustainable manage natural stocks

The enabling environment is not conducive to the growth of sustainable bamboo industry

Rural population experience few opportunities to benefit from bamboo production and industrial processing

Low productivity of bamboo natural forests - leading to low income of bamboo forest dependents
Figure 8: Bamboo causality tree

- **FC1**: Low productivity of natural forest bamboo
  - **UC1**: Poor management of bamboo resources by cutter, collectors and community forestry
  - **UC2**: Reliance of poor cutters and collectors on natural forest contributes to the degradation of bamboo resource
  - **RC1**: Cutters, collectors, and Community Forest have limited access to information and technical skill on how to manage bamboo resource sustainably
  - **RC2**: Traders and aggregators have limited business skills and knowledge about economic benefits and innovation on sustainable management of bamboo and limited support to implement such business models
  - **RC3**: Lack of systematic, detailed and accurate information on the extent and location of degraded land as investors do not have the resources for large-scale research
  - **RC4**: Lack of systematic, detailed and accurate information on the extent, location and quality of bamboo resource as investors do not have the resources for large-scale research
  - **RC5**: Lack of reliable and open-source information and market intelligence on bamboo global market outlook to inform socio-economic feasibility studies and business plans
  - **RC6**: Lack of bamboo market intelligence, training and business service providers
  - **RC7**: No examples of commercially successful value-added processing based on a sustainable supply of bamboo from responsibly managed plantations
  - **RC8**: Potential responsible investors are not aware of the material and its use for value-added processing and do not know what the returns will be from setting up factories and what is the best business models
  - **RC9**: National land use policy still at drafting stage and no clear policy on commercial use of forestry products by communities
  - **RC10**: Lack of transparent process on land acquisition, land rights and commercial rights
  - **RC11**: Government has not had the evidence on which to prioritize industrialised and value-added bamboo

- **FC2**: Rural population experience few opportunity to benefit from bamboo production and industrial processing
  - **UC3**: Commercial potential of bamboo production and industrial processing has been neglected
  - **RC3**: Lack of reliable and open-source information on the extent, location and quality of bamboo resource as investors do not have the resources for large-scale research
  - **RC4**: No examples of commercially successful value-added processing based on a sustainable supply of bamboo from responsibly managed plantations
  - **RC5**: Potential responsible investors are not aware of the material and its use for value-added processing and do not know what the returns will be from setting up factories and what is the best business models

- **FC3**: The enabling environment is not conducive to the growth of a sustainable bamboo industry
  - **UC4**: Lack of value chain for value-added bamboo
  - **UC5**: Land tenure, land use and commercial rights over resource is insecure
  - **UC6**: Government has not supported bamboo production and value-added bamboo
  - **RC6**: Lack of bamboo market intelligence, training and business service providers
  - **RC7**: No examples of commercially successful value-added processing based on a sustainable supply of bamboo from responsibly managed plantations
  - **RC8**: National land use policy still at drafting stage and no clear policy on commercial use of forestry products by communities
  - **RC9**: Lack of transparent process on land acquisition, land rights and commercial rights
  - **RC10**: Government has not had the evidence on which to prioritize industrialised and value-added bamboo
Annex A: Carbon market systems by BIF

A.1 Compliance markets

Compliance markets originate from the 1997 Kyoto Protocol, in which a number of developed countries (“Annex 1 Parties”) committed to reducing their greenhouse gas emissions. To achieve this, carbon markets were established for countries and companies to trade excess emissions with counterparties. The Kyoto Protocol provides a number of “Flexibility Mechanisms” to lower the overall costs of achieving emission reduction targets.

One of these is the Clean Development Mechanism (CDM). It allows developed world countries to achieve their emissions reductions targets by investing in emissions reductions projects in the developing world.

Other compliance markets have sprung up since, such as the Californian carbon market (which isn’t linked to the CDM) and the European Emissions Trading Scheme, which is linked to the CDM.

A.2 The Clean Development Mechanism

Currently, only one global carbon market exists – the Clean Development Mechanism (CDM), which originated from the 1998 Kyoto Protocol. CDM projects which are set up in the developing world can produce saleable certified emissions reductions (CERs). As of 2015, more than 7,500 CDM projects have been registered, ranging from wind power projects in India to methane capture projects in Chile to reforestation in China. They have issued a total of 1.6 billion CERs (equivalent to 1.6 billion tonnes of CO₂). However, while this might sound like an impressive number, the CDM is currently seen as being at the brink of collapse. This is due to the fact that the prices for CERs have fallen dramatically from $20 per tonne to less than $3 per tonne, indicating a vast oversupply.

In December, Parties agreed in Paris to a global climate change deal, which establishes a new carbon trading mechanism (without however mentioning the words “carbon” or “trading”). However, the details of this mechanism have yet to be hammered out. As the Paris deal is very ambitious in its mitigation goals, this new mechanism may indeed see a market increase in carbon prices eventually.

The CDM currently has one forest carbon project category, the Afforestation/Reforestation (A/R) category. In this category, carbon credits can be earned when turning non-forested land into forested land. The CDM board decided that “palm and bamboos are equivalent to trees in the context of afforestation and reforestation”, meaning that like trees they can be included in reforestation or afforestation projects and thus into the scheme.70

However, the credits which can be generated in this category are only temporary credits due to the risk of reversal (i.e. deforestation once the project is over), and expire at the end of a project’s lifetime. In addition, the European Emissions Trading Scheme (EU ETS) which is the biggest market for CDM credits, currently excludes forestry (see below).

A.3 European Emissions Trading Scheme (EU ETS)

The EU ETS is the biggest greenhouse gas emissions trading scheme worldwide and was established in 2005. All EU member states plus Iceland, Liechtenstein and Norway are taking part in the scheme. The EU ETS is linked to the CDM, meaning that companies can use CDM credits within the EU ETS to reach their emissions targets. However, the EU only accepts CDM credits if they were issued in least developed countries.

The EU ETS is the biggest market for the CDM, but, as mentioned above, it excludes forestry projects, mostly because it was deemed extremely difficult to monitor and verify these emissions reductions. However, a growing coalition of NGOs, policy makers and business leaders is lobbying to have these emissions included, as they make up around 15% of global emissions.

A.4 California

California’s emissions trading scheme was launched in 2013 and is the second biggest after the EU ETS. However, it is not linked to the CDM. Unlike the EU ETS, the Californian scheme does accept forestry projects. In fact, it is set to accept REDD+ (Reducing Emissions from Deforestation and Degradation) projects for the generation of carbon credits from 2018 (see more on REDD+ below). The state of California has signed Memoranda of Understanding with the state of Acre in Brazil and the state of Chiapas in Mexico with a view to develop frameworks for REDD+.

This market could potentially become interesting for Myanmar in the future, however, a number of conditions would have to be met:

- California currently works with “jurisdictional” (read: regional) REDD programmes. Individual states within Myanmar would have to negotiate with California which would have to negotiate with California.
- The states would have to meet a number of conditions, in particular with regards to proving so-called “non-carbon benefits” are provided and social and environmental safeguards are in place. Both of these are elaborated on in more detail below.
- It is currently unclear whether bamboo forests would be acceptable as REDD programmes, and more work would need to be done in this area.

A.5 China

China is the first country that is sanctioning the issuance of bamboo carbon credits. A methodology for bamboo carbon credits was developed by INBAR, Zhejiang A&F University and the China Green Carbon Foundation. More than 50,000 tonnes of CO₂e certificates have been issued so far in voluntary markets, and with China establishing the potentially biggest carbon market globally in 2017, this number is likely to increase.

Thus far, the Chinese scheme only accepts credits which are generated in China. Myanmar would probably need to set up a carbon scheme of its own and link it to the Chinese one in order for its bamboo certificates to be tradeable in China.

However, it is important for the bamboo industry that China now has a methodology which is applicable to it. A few pillars which are important include:

- The land on which the bamboo is planted needs to have been non-forested land since 2005 or off-forest land;
- Clear and stable tenure rights need to exist;
- Land should be expected to remain in original state or continue land degradation trends, with a carbon stock at a stable low level, in the absence of the project’s afforestation activities;
- The project should improve the quality of life and living conditions for farmers; and

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71 Yiping, Lou et al.: Introduction to the Methodology for Carbon Accounting of Bamboo Plantation Projects.
• The project will not result in displacement of households or villages.  

A.6 Voluntary Markets

Voluntary markets can be tapped into by organisations, individuals and governments who want to offset their carbon emissions outside of compliance markets. Voluntary markets avoided around 90 million tonnes of greenhouse gas emissions in 2014.

Most forestry projects currently fall within the voluntary markets. These projects usually either adhere to the REDD+ methodology and/or are aligned with the Verified Carbon Standard (VCS)

A.7 REDD+

REDD+ is a structure that puts a value on the carbon stored in forests, and through that places a value on the forests themselves, reducing the incentive for governments to allow deforestation or degradation. REDD projects are required to fulfill certain criteria with regards to conservation, sustainable management of forests and enhancement of forest carbon stocks. In addition, projects developers need to prove that their projects have certain safeguards in place, such as respect for the rights of Indigenous Peoples and the full and effective participation of all stakeholders. Projects are often expected to include a number of “non-carbon benefits”, such as the improvement of gender equity or the improvement of local livelihoods. REDD+, like the CDM, is specifically aimed at developing-world countries.

Both governments (through bilateral and multilateral initiatives) and the private sector invest in REDD+ projects.

Bamboo is currently somewhat overlooked when it comes to REDD+. Negotiation documents on REDD+ fail to reference bamboo. This is partly due to the fact that there is ambiguity whether bamboo should be classified as a non-timber forest product or as a timber. Due to this ambiguity, currently many bamboo species are classified as a non-timber forest product, and thus not eligible to be used for REDD+ credits. In fact, no bamboo projects are currently included in REDD+.

However, in fact, the UNFCCC’s Warsaw Framework leaves it up to countries to set their own definition of a tree. Thus, if Myanmar were to define bamboo as a tree, it should be eligible for REDD+. Publicly available information seem to indicate that Myanmar defines bamboo as a non-wood forest product. If this is indeed the case, then Myanmar’s bamboo would not qualify for REDD+ schemes. However, if the government was willing to change this and if REDD+ schemes were to become more open for bamboo projects, there might be a future market here.

Another angle would be to develop a project where bamboo is used as a “buffer” around a natural forest. Projects like this one aren’t uncommon, and basically mix income through REDD credits with income through an agricultural or forestry activity. The bamboo itself would not be eligible for credit, but the protected natural forest would.

A.8 Verified Carbon Standard

Companies whom go through the voluntary carbon markets will adhere to assurance standards; the most prominent of these being the Verified Carbon Standard (VCS). The VCS registers greenhouse gas reductions programmes including forestry projects and REDD+ that have been validated and verified to its standard by independent verification bodies.

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72 Yiping, Lou et al.: Introduction to the Methodology for Carbon Accounting of Bamboo Plantation Projects.
There are currently two bamboo projects accredited to Agriculture, Forestry and Land Use (AFOLU) standard of the VCS, one in Nicaragua and one in South Africa. Both were accredited in 2012 and the project in Nicaragua has thus far issued around 34,000 credits, while the other hasn’t issued any.\textsuperscript{74} The very small number of both issued credits and projects accredited shows that the market for bamboo emissions credits isn’t well-functioning yet.

However, projects in Myanmar could apply to the VCS to get their bamboo forests accredited. However, as seen in the South Africa project, accreditation doesn’t equal issuance or sale. Indeed, while REDD+ doesn’t fully include bamboo, these kind of projects will likely remain outliers.

**A.9 Private sector**

There are currently only a handful of private sector actors who invest in forestry projects.

The majority of companies that buy REDD+ credits do so for CSR reasons. This is mainly due to the fact that, as mentioned above, REDD+ is not currently part of the wider carbon market, and the incentive to use REDD+ to offset emissions is not strong. On the private market, in 2014, REDD+ credits earned the seller an average of $4.3 per tonne, depending on volume sold.\textsuperscript{75} Demand for REDD credits reached an all-time high in 2014. However, the volume of supply still far outstrips demand, and project developers continue to look at governments as a source of demand (see below).

**A.10 Bilateral and multilateral initiatives**

A number of donor governments are investing in REDD+, for example through the Forest Carbon Partnership Facility (FCPF), a fund which is set to disburse $500 million for REDD+ credits in the developing world, at a price of $5 per tonne of CO₂. Developing world governments have to apply to access these credits. Myanmar is not currently part of the FCPF, the biggest REDD+ funding scheme. The FCPF currently is working with 47 developing countries, but isn’t looking to add more in the near future.

Myanmar is part of the UN-REDD Programme. The UN-REDD Programme supports developing countries with “REDD readiness”, which essentially means helping them to get the structures and policies in place to be in a position to issue REDD credits. The programme doesn’t offer credits itself.

In addition, a number of countries are involved in bilateral REDD+ initiatives. As such, the government of Norway works with, among others, Guyana, Brazil and Indonesia. The German REDD Early Movers Programme is working with individual states in Brazil. Myanmar is not currently involved in bilateral initiatives.

Finally, the newly established Green Climate Fund (GCF) is set to include REDD projects in its funding rounds soon. Developing world governments can apply for climate finance in the form of loans and grants for projects under the GCF, and Myanmar would be eligible for this as well. A summary of the root causes that is believed BIF can feasibly address have been listed in Error! Reference source not found. below, and grouped by suggested intervention areas

\textsuperscript{74} VCS Project Database: http://www.vcsprojectdatabase.org/

Annex B: Conflict sensitivity consideration for bamboo sector development

B.1 National-level conflict risk considerations for bamboo development

A prerequisite is that the development of the bamboo sector should Do No Harm wherever it is operating. This means that where possible, actors should attempt to ensure that their business does not reinforce existing conflict dynamics, nor create or exacerbate differences and inequalities between groups that can create or deepen conflict. Where possible, and in line with conflict sensitive principles, any interventions should also reinforce the positive possibility for peace.

One of the structural causes of conflict in Myanmar is the grievance held by ethnic groups in the periphery, who perceive they have not had the same level of opportunity to participate in the political, social and economic development of the country as those ‘at the centre’. At the macro-level this suggests that economic development should be conducted in a way that not only avoids reinforcing the centre-periphery divide, but also contributes to addressing this root cause. If economic and business opportunities are only benefitting the majority ethnicity and not accruing to those in the periphery, then they are still inadvertently contributing to consolidation of the divide and enabling it to be maintained. This would make the idea of supporting the bamboo sector in areas governed by EAO worth considering.

On the other hand, BIF has to recognise that the realities of starting up and developing a business in EAO areas is likely to be harder. Table 15 below outlines some of the pros and cons associated with the conflict sensitive, development and economic issues involved in such approaches.

Table 15: Potential costs and benefits of supporting bamboo production in contested areas

<table>
<thead>
<tr>
<th>Potential costs</th>
<th>Potential benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Greater investments of resources required from the business in negotiating and developing relationships with more stakeholders</td>
<td>• There may be higher quality natural reserves of bamboo to start with.</td>
</tr>
<tr>
<td>• Greater investments of resources in fulfilling bureaucratic requirements from more than one administrative system</td>
<td>• Locations may be strategically placed in some cases to international borders that could facilitate access to large established markets (Thailand and China)</td>
</tr>
<tr>
<td>• Potentially greater costs associated with relatively poorer infrastructure and transport systems - including possible international supply chains (depends on location)</td>
<td>• Similarly, strategic locations could be identified that will take advantage of planned infrastructure such as the East-West Asia Highway for long term development and growth</td>
</tr>
<tr>
<td>• Potentially higher risks of instability and at worst, possible outbreaks of conflict putting investments at risk</td>
<td>• From a development perspective, engagement with EAOs may allow opportunities for positive influence and capacity building with respect to policy, good business practice, improved economic and resource governance and management</td>
</tr>
<tr>
<td>• Potentially higher informal overhead costs due to double payments of ‘taxes’ to dual (or more) administrations that may reduce profit margins76</td>
<td>• Addresses directly a root cause of conflict in Myanmar</td>
</tr>
</tbody>
</table>

Importantly, engagement with EAOs assumes that it is likely to increase the chance of long-term stability and economic growth in the peripheries and greater equality of opportunity to develop; and provide an opportunity to leverage policy and practice reform in some of these areas. The assumption may not always turn out to be the case in reality.

76 This could be considerable depending on the area that one is operating in. On the one hand the business may avoid costs associated with the government if solely operating in an EAO administered area close to the border, but there may also be multiple groups such as those in the Border Guards
However, there are likely to be opportunities to engage with some EAOs, who in certain cases have the appetite and political will to change behaviour while simultaneously facilitating benefits to the people living in their areas. For instance, in a discussion with a senior member of the KNU, he acknowledged that they have ‘sold all the forest to fight the war’ and are in need of new sources of income to maintain themselves. This led to them inviting in poorly-behaving agribusinesses, such as rubber and palm oil, with negative social and environmental consequences.

B.2 Regional and local conflict risk considerations for bamboo development

Beneath this macro-level conflict picture, BIF also needs to consider who is potentially benefitting from the bamboo business, how they may respond to changes in the sector, and whether this could also contribute to conflict. There are two major risks involved at this level.

Firstly, there is the potential for established economic and political elites capturing resources and opportunities at the expense of others. As the opportunities for relatively fast and ‘easy’ profits in the forestry sector diminish with the majority of hard wood reserves having been exploited, then there may be a possible shift in focus towards the newly developing bamboo sector. The particular concern is that unscrupulous ‘cronies’ will spot and take advantage of the opportunity, which unwittingly provides a driver for further land grabbing. However, while there were those who felt that ‘cronies’ were increasingly looking to diversify their economic portfolios77 others felt that the profit margins and degree of work necessary to enter the market would not make it attractive to this group, who are more interested in more lucrative industries such as mining.

It is also important to consider local level elites who may seek to benefit at the expense of others78. There is a degree of inevitability to this, as it is the elites that have the money for investment in business, but it is important to ensure that interventions do not exacerbate and polarize societies without providing opportunities for a broader section of society to participate. As ever in Myanmar, this should also be considered along ethnic lines.

At the community level, the issues may be as simple as who receives the opportunities to participate in the business and earn a living. While it is a clear fundamental principle of good business to employ local people from around the location of the new business, the term ‘local’ can be loaded. It may be those who are living locally (but from a ‘non-local’ or different ethnicity), or those who are indigenous to that region. In some localities this becomes even more complex due to the impacts of conflict, where there may have been displacements and complex migration flows, as well as potential political alignments associated with particular ethnicities (or perceived to be associated). A sensible option would be to ensure that employment and training opportunities are spread across a wide range of recipients.

B.3 Access to land – conflict risk considerations

As ever at the local level access to land is a crucial issue and a potential driver of conflict. It is important that investment in the bamboo sector does not encourage the disenfranchisement of people from their land, as has been seen in other large natural resource activity in Myanmar. The 30-year Master Plan for the Agriculture Sector (2000) hopes to convert wasteland (now reclassified under VFV law) into private agribusiness (Chao, 2013), of which a proportion could be taken up by the bamboo

77 Examples were found in the Community Forestry sector for hard woods (Tint, Springate-Baginski, Ko Ko Gyi, 2011) and the site visited where key informants noted that those in control of the operation were not strictly speaking local community but business men who had organised the community to meet the requirements of the forestry department. While this did not appear to have created conflict, nevertheless the principle of broader community ownership was not fulfilled. This was later also confirmed in discussions with ECCDI who suggested that the example visited was a pilot for bamboo Community Forest but not yet the ‘ideal model’
sector. The precedent in Myanmar has been that such shifts in land ownership are achieved through illegal means or by the use of force at the extreme (‘land-grabbing’), or more often through an unclear legal process that permits abuse.

The broader trend on land grabbing appears to be one of decline according to an unpublished DFID and FCO paper cited by Henley (2014). This perception was also agreed by respondents in the land sector, who put the decline down to increased media attention and transparency around cases, civil society advocacy and improved knowledge by citizens. The concern for the bamboo sector going forward is less overt ‘land-grabbing’, but more likely unclear ‘legal’ processes, such as the allocation of land that appears to be virgin, vacant or fallow for plantations but which is in fact occupied or used by communities. Similarly competing claims or disputed demarcation of boundaries on the different categories of land may encroach on community livelihoods. The potential for conflict driven by land grievances connected to the sector is real, and BIF should ensure it has the right due diligence processes in place.

B.4 Conflict risk considerations for different scales of production

It is also important to consider the conflict risks connected to different scales of bamboo production, to support BIF’s decision making on which model of production to support. Table 6 gives an overview of the three most significant modes of production – Large Scale, Small Scale and Community Forestry – the nature and severity of potential conflict issues connected to them, and potential mitigation approaches for BIF to consider.

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79 Note that this is then NOT under the jurisdiction of the Forestry Department
81 One example that the author came across was close to Kutkai where an attempted grab of 60,000 hectares was prevented through a large community advocacy effort
Table 16: Potential conflict risks for bamboo production systems

<table>
<thead>
<tr>
<th>Scale of Production</th>
<th>Primary potential conflict stakeholders</th>
<th>Possible Land Category</th>
<th>Conflict Issue</th>
<th>Level of Risk for Bamboo</th>
<th>Mitigating approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large scale bamboo plantation</td>
<td>Community Vs. Corporate Corporate Vs. EAG Military Vs. Corporate Vs Community</td>
<td>RFL PFL VFVL</td>
<td>Displacement</td>
<td>High (Land is rarely ‘empty’)</td>
<td>Due Diligence on whether land is ‘empty’, or registered, has customary status is under use. Simply because it is categorised by Forestry Department does not mean that this is what is happening on the ground Ensure tri-partite consultation – government, business and communities Set up process oriented ‘serious’ long-term development CSR opportunities Consider Cultural and livelihood impacts Undertake an Environmental &amp; Social Impact Assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Destruction of land under cultivation or traditional use Clashes with Customary Tenure Border demarcations ‘Inaccurate’ or clashes between classification of land and actual land use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small scale plantation</td>
<td>Community- Corporate Community- Community</td>
<td>RFL PFL VFVL FL</td>
<td>Displacement of communities; formal or informal Destruction of land under cultivation or traditional use (may be fallow as well), e.g. graveyard and ancestral land Clearing of forest in use by community Granting of concession to plantation on area overlapping with Community Forest Exclusion or marginalisation of poor or other minority participants (e.g. women, ethnicities etc.) Capture of benefits by elites</td>
<td>Medium (Due to land use on the ground differing from categorization)</td>
<td>Due Diligence on whether land is ‘empty’, or registered, has customary status is under use. Simply because it is categorised by Forestry Department does not mean that this is what is happening on the ground Ensure that Conflict Sensitivity principles are employed when recruiting staff or workers Consider Cultural and livelihood impacts</td>
</tr>
<tr>
<td>Community Forestry</td>
<td>Community – Community</td>
<td>RFL PFL VFVL FL</td>
<td>Capture of benefits by elites Exclusion or marginalisation of poor or other minority participants (e.g. women, ethnicities etc.)</td>
<td>Medium (Communities are rarely harmonious or homogeneous)</td>
<td>Ensure that Conflict Sensitivity principles are employed when setting up the governance and working mechanisms on who is participating Ensure also that there are conflict management mechanisms built in to the governance mechanisms</td>
</tr>
</tbody>
</table>

Note that government authorities that may be involved if it is Vacant and Fallow Land include: MOAI, CCVFV, SLRD, GAD

Note that government authorities that may be involved if it is Farmland Vacant and Fallow Land include: MOAI, CCVFV, SLRD, GAD, FAB
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