

THE SIGNIFICANCE OF BAMBOO TOWARDS SUSTAINABLE DEVELOPMENT IN INDONESIA

By :

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Abstract

Indonesia has been endowed with natural resources of non-wood forest products, particularly bamboo, and also been acknowledged that several hundreds of millions of people worldwide depend partly on bamboo for human livelihoods. However, there is a notion that the bamboo sector is still part of the informal and backward rural economy and seemingly unable to grab the large potential as it has already been proven by the Chinese bamboo industry which contributes \$ 700 million of foreign exchange earned from annual export.

Bamboo in Indonesia is mostly traditionally used as the handicrafts, furniture, construction materials for housing and fruit basketry, etc. In addition, bamboo also contributes to the broader environmental goals of erosion control at the riverbanks and watershed management.

In line with the current policy of the government of Indonesia which is now attempting to promote Non-Wood Forest Products of bamboo in order among other things to combat the poverty alleviation and to improve the livelihoods of poor people who depend on forest resources.

Keywords : bamboo, constraints, policy, sustainable development

I. INTRODUCTION

Indonesia is rich in natural biological resources and is well endowed with valuable goods and services. The natural environment of the country comprises many diverse ecosystems, which house numerous Non-Wood Forest Products (NWFPs), such as bamboo. Bamboo is one of the important non-wood forest products in Indonesia and also in other tropical countries. Bamboo has economical worth in which its uses have widely been used, either as daily utensils or as other products to be traded.

NWFPs in broad sense play a critical and central roles in meeting the daily needs of forest-bound communities in the form of food, material for shelter, medicine, and other a source of income generation, etc and with that regard, it is important to examine the potential of bamboo to support of not only the subsistence needs of those people but also to offer commercial opportunities which will provide the communities with reliable sources of income. Likewise, it is also essential that the needs, resources and constraints of forest products collection be identified to further improve their efficiency and productivity.

Bamboo has provided useful and important products for the local people and also to the local government budget, at lesser extent to the country in terms of significant economic contribution. However, its is acknowledged that the complete information on bamboo stock in the country is not precisely known at national level, and the only data available are derived from survey studies on supply and demand.

Even though bamboo plays an important role in Indonesian life as earlier described, its cultivation on a large-scale has yet done seriously. Thus, the supply of bamboo to meet the existing demands is still relying solely upon the yard-garden and its uses are also very traditional in nature. The worth of bamboo as paper material, for instance, has already developed, but in the future there should be some possibilities to increase its uses of functions as the pulp-making material, chop-stick, particleboard, or construction wall layers.

II. PRESENT STATUS OF BAMBOO PLANTATION IN INDONESIA

In the past decades, the government has generally paid little attention to the management of bamboo. In contrast, many local people living in and near forests have developed slightly traditional, but effective management systems (e.g. Tana Toraja of South Sulawesi, Balinese). However, a number of research works have provided a list of important bamboo species and its distribution areas in Indonesia as illustrated in Appendix 1.

Based on a study done by Agricultural Census 2003 in cooperation with Centre for Forestry Inventory and Statistics (Ministry of Forestry), it showed that Indonesia had 4.71 million households who managed bamboo plantations with 38.07 million clumps or on average 8.08 clumps per household. Out of 38.07 million clumps of bamboo, 27.95 million clumps or 73.42 % are ready to be harvested (see Table 1).

As Table 1 indicates that Java dominates bamboo plantation, which accounts for 29.19 million clumps or 76.38 % of total bamboo plantation in the country, while the remaining 8.88 million clumps (23.32 %) were scattered in Outer Java. Bamboo plantation is dominantly found in West Java (28.24 %), Central Java (21.42 %) and East Java (19.30 %), while South Sulawesi (3.62 %).

Table 1. Population of Bamboo Plantation Managed by Households

No.	Description	Forestry Household			Bamboo Household		
		Number of Household	Number of existing clumps	Number of harvestable clumps	Number of household	Number of clumps	Number of harvestable clumps
1	2	3	4	5	6	7	8
I	Java						
	a. Absolute	3,569,160	29,191,143	21,189,701	389,525	18,057,447	12,663,611
	b. %-age	75.73	76.68	75.81	74.64	78.44	76.90
II	Outer Java						
	a. Absolute	1,144,013	8,875,360	6,759,810	132,367	4,963,827	3,803,857
	b. %-age	24.27	23.32	24.19	25.36	21.56	23.10
III	INDONESIA						
	a. Absolute	4,713,173	38,066,503	27,949,311	521,892	23,021,274	16,467,468
	b. %-age	100.00	100.00	100.00	100.00	100.00	100.00

Source : Pusat Inventarisasi Kehutanan and Central Bureau of Statistics, 2004.

Furthermore FAO (1998) elaborates that whether relationships of dependency-oriented or management-oriented, there are 3 (three) main types of people and forests which cover the following spectrum of livelihood benefits, viz. :

- ◆ *People who live inside forests* : often surviving as hunter-gatherers or shifting cultivators, and who are heavily dependent on forests for their livelihoods;
- ◆ *People who live outside but near forests* : farmers generally practicing their agriculture outside the forests, who regularly use forest products in their agricultural land activities for subsistence or for income generation; and
- ◆ *People engaged in forest-based commercial activities* : trapping, collecting minerals or employed in forest industries, such as logging, as income is often derived from forest-dependent labour.

If applicable, to this list must added by :

Urban dwellers : people who need forests or trees for amenity or recreation and physical consumption, depending on income stratum.

The future outlook of bamboo in Indonesia is variable, depending on the product involved and the circumstances of utilization. Key trends include increasing commercialization of bamboo (sustainable only if resource management and/or domestication accompanies the demand growths), declining importance of bamboo for subsistence use, disintegration of traditional systems depending on bamboo, including resource management systems, and devolution for community-based management.

III. CONSTRAINTS FOR DEVELOPMENT

The prospective developments in bamboo business in Indonesia are always encountering a number of constraints, such as :

1. Human resource, of which on one hand, middle and upper class communities are still having the notions that bamboo be considered as “low-class” goods, while on the other hand, to low-class community, the utilization of bamboo as building materials and household utensils is less competitive as compared to that of other products, e.g. rattan;
2. Design development is not working well as expected, simply due to the appreciation of intellectual property right. Even though there are many graduates from various vocational schools and universities (faculty of fine arts) whom from the beginning they have performed the career in designs and have also performed the art works, but to the intellectual property right they are now reluctant to perform art works any longer.
3. Market accesses, the difficulty in seeking the potential buyers is also one of the constraints in developing bamboo plantations at large scale, while the processing industries offered by the investors which are exhausting or depleting the raw materials;
4. Institutional setting, of which the contributions of government agencies, including universities, to the management and conservation efforts of bamboo resources are still low.
5. As a labor-intensive industry, the overall bamboo sector is facing various constraints, i.e. minimal capital investment, a low-skilled labor force, a low technological level used in processing, poor quality control and lack of marketing skills.
6. Bamboo-based products produced tend to have lower quality standards and fail in the competition field with the products from other countries.

IV. POLICIES TO BE IMPLEMENTED

On the occasion of CGI Meeting on 19 January 2005, the Minister of Forestry of Republic of Indonesia has briefed the meeting that the condition of forest resources in Indonesia has deteriorated very significantly due to illegal logging, encroachment and overlapping use of forest lands. To date, more than 43 million hectares of Indonesian forests have been degraded with an average annual deforestation rate of 2.83 million hectares from 1998 to 2002.

To rebuild these conditions, the Ministry of Forestry within the context of the National Development Program of the Cabinet of United Indonesia has 5 (five) priority programs for 2005 – 2009, viz. (i) combating illegal logging inside the state forests and illegal timber trade; (ii) revitalization of the forestry sector, especially the forestry industry; (iii) rehabilitation and conservation of forest resources; *(iv) economic empowerment of people living within and around the forest areas*; and (v) stabilization of the forest area and forest fire prevention.

With regard to natural resources utilization under program # (iv) as earlier mentioned, the forestry sector has a role to play in reducing the *community poverty*. A community poverty alleviation program is being carried out by providing generous access to the natural resources through social forestry without giving property rights in terms of forest land ownership. Social forestry activities within non-conservation forests are implemented in various forms, including Community-based Forest Management (CBFM). In addition, a capacity building program for communities is necessary to support income generation and to increase their appreciation to forest resources.

In order to meet the goals of sustainable development (from both the economic and environmental perspectives), the bamboo-based development is principally implemented through the public investment, while the government has only the duties to regulate, supervise, encourage, assist, monitor and to control, which are now known by the terms of facilitation, regulation and supervision. This should be realized by establishing both physical and social (community institutions) infrastructures as the basis of public investment continuation.

The following are policies which should be taken by the government concerning the development of bamboo, such as :

- a. Bamboo development should be placed as part of the national sustainable forest management system;
- b. Bamboo development should empower the local communities;

- c. Bamboo development should directed at the production forest, estates, community-owned lands, unproductive areas, logged-over areas, etc.;
- d. Bamboo development should properly be managed with the strong institutional, appropriate technology application supports;

While the developmental strategies which should be taken are as follows :

a. Farmers' Group Empowerment

This strategy should be carried out through ever-ended education process by applying "self-help" principle with income-generating capacity reliance, so that they are capable of accessing to the resources, capital, technology, and market;

b. Partnership Development

This strategy is combining the natural resources of land owned by the farmers with the technological assets, business skills, marketing owned by the capital owners. This principle should be mutual benefits in practicing the business.

c. Competitiveness

This strategy is encouraged in order to obtain the efficiency and to avoid the failures in marketing the abundant products coupled with the economic resource exhaustion so as to the products produced can compete with the similar products from other countries.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

1. It has been acknowledged that several hundreds of millions of people worldwide depend partly on bamboo for their livelihoods, even though resources, production and particularly trade statistics on bamboo at national level are still incomplete;
2. Evaluation and monitoring of bamboo resources is important to estimate the actual and potential socio-economic and ecological value at the national level;

3. To evaluate the socio-economic importance of bamboo, quantitative data on resources, product consumption (for subsistence or commerce), and trade are required, for instance, figures should indicate quantity (tons, etc), product status (dried, graded, semi-processed, etc) and value (US \$) for a given period (year);
4. Conservation efforts, particularly on specific species which are mostly used, such as pattung (*Dendrocalamus asper*), parring (*Gigantochloa atter*), tallang (*Schizostachyum brachycladum*), Ao' (*Bambusa vulgaris*) and bulo (*S. lima*). These conservation efforts are aimed at maintaining the specific bamboo species from the extinction;
5. The bamboo-based business opportunities for further development in the future are still widely open in line with the increasing tastes for aesthetical products of the end consumers

5.2. Recommendations

1. The Government should carry out an intensive, comprehensive and reliable studies and/or inventory works at the national level in order to ensure the precise bamboo potential within the framework of anticipating the ever-increasing bamboo demands in the future for construction materials in housing development
2. The Government should provide the accurate data concerning bamboo stocks at the national level in order to encourage the development of greater productivity in bamboo utilization;
3. There should be complete and reliable information on the production-to-consumption system of bamboo as the basis for the Government policy-making in improving and developing its utilization in the future
4. Market opportunities should be created by promoting bamboo-based products having the arts- and aesthetical-worth into the new interior design field of area, and also bamboo-laminating industries, which are specifically intended to the middle and upper class communities.
5. Research works on bamboo covering the silviculture, ecology and processing aspects in Indonesia are still restricted and if any, they are dispersed and spread over various uncoordinatedly government agencies, and should be compiled into an orchestrated and integrated programme at the national level.

Appendix 1. Bamboo Species and Its Distribution Areas in Indonesia

No.	Latin Name	Local Names	Distribution Areas
1	2	3	4
1.	<i>B. atra</i> Lindley	Loleba Nena	Maluku Sulawesi
2.	<i>B. amahussana</i> Lindley	Nitu	Ambon
3.	<i>B. bambos</i> (L) Voss	B. duri Pring ori	Indonesia Java
4.	<i>B. blumeana</i> J.A. & J.H.	B. duri Haur cucuk Piring gesing	Indonesia Sunda Java
5.	<i>B. forbesi</i> (Ridley) Holtum	Sasa, akoya, warire	Irian Jaya
6.	<i>B. multiplex</i> (Lour) Raeusch ex J.A. & J.H. Schultes	B. krisik hijau, Krisik putih, b. pagar, b, cina Aor selat	Indonesia West Kalimantan
7.	<i>B. tukdoides</i> Munro	B. blenduk	Indonesia
8.	<i>B. vulgaris</i> Schrader	Ampel hijau tua B. ampel hijau muda Pring gading Pring tutul	Indonesia
9.	<i>D. asper</i> Back	B. petung Petung coklat Petung hijau Petung hitam	Indonesia Bengkulu Lampung
10.	<i>D. giganteus</i> Wallich ex Munro	B. sembilang	Indonesia
11.	<i>D. latiflorus</i>	B. taiwan	Indonesia
12.	<i>G. achmadii</i>	Buluh apo	West Sumatera
13.	<i>G. apus</i> Kurz	B. tali	Indonesia
14.	<i>G. atroviolacea</i> ex Widjaya	B. hitam Piring wulung Awi hideung	Indonesia Java Sunda
15.	<i>G. atter</i> (Hassk) Kurz	B. ater Pring jawa Awi temen Air sentong	Indonesia Java Sunda Sumbawa
16.	<i>G. balui</i> KM Wong	Buluh abe	Kalimantan
17.	<i>G. hasskarliana</i> (Kueze)	Awi lengka tali Bulok busi Buluh sorik	Sunda Dayak Tapanuli

1	2	3	4
18.	<i>G. levis</i> (Blanco)	Pring peting Buluh suluk	Banyuwangi South Kalimantan
19.	<i>G. manggong</i> Widjaya	Pring manggong	Banyuwangi
20.	<i>G. nigroiliata</i> Kurz	Awi lengka	Sunda
21.	<i>G. pruriens</i> Widjaya	Buluh belengke Buluh regen Buluh yakyak	Karo Karo Gayo
22.	<i>G. pseudoarundinaca</i> (Steudel) Widjaya	Awi andong besar Andong kaas Andong batu Pring gombong Pring surat	Sunda Sunda Sunda Java Java
23.	<i>G. ridley</i> Holtum	Tiying kaas Tiying aya	Bali Bali
24.	<i>G. robusta</i> Kurz	Awi mayan Pring serit	Sunda Java
25.	<i>G. scortechinii</i> Gamble	Buluh kapal	Bengkulu
26.	<i>G. wrayi</i> Gamble	Bukuh dabo	Sumatera
27.	<i>S. blumei</i> Ness	Awi tamiyang	Sunda
28.	<i>S. brachyladum</i> Kurz	Bambu lemang kuning Lemang hijau Buluh tolang Buluh sero Pring lampar	Indonesia Maluku Maluku Maluku Banyuwangi
29.	<i>S. caudatum</i> Backer	Buluh Bangkok Buluh batu	South Sumatera South Sumatera
30.	<i>S. gracile</i>	Buluh alor	Bintan
31.	<i>S. grandle</i> Ridley	Bulung lemeng	Sumatera
32.	<i>S. iraten</i> Steudel	Awi bunar Pring wukuh	Sunda Java
33.	<i>S. latifolium</i> Gamble	Buluh suling	North Sumatera
34.	<i>S. lima</i> Blanco	Buluh toi	Maluku
35.	<i>S. zollingeri</i> Steudel	?	
36.	<i>Dinochloa scadens</i> OK	Cangkoreh	Sunda
37.	<i>Nastus elegantissimus</i>	Awi eul-eul	Sunda
38.	<i>Phyllostachys aurea</i> Carr ex A & C Riviere	Pring cendani Awi uncue	Java Sunda
39.	<i>Thyrsastachys siamansis</i> Gamble	Baumbu siam Bambu jepang	- -

Source : Sutiyono (2001)