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ESTABLISHING A SUSTAINABLE PRODUCTION SYSTEM OF  
RATTAN PRODUCTS IN CAMBODIA, LAOS, AND VIETNAM

## RESEARCH AND CASE STUDIES

June 2010

THE POTENTIALS AND UNSUSTAINABILITY OF RATTAN SECTOR IN  
VIETNAM

**Establishing a Sustainable Production System for Rattan Products in Cambodia, Laos and Vietnam**

## **REPORT ON THE POTENTIALS AND UNSUSTAINABILITY OF RATTAN SECTOR IN VIETNAM**

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## PART 1. OVERVIEW OF RATTAN SECTOR IN VIETNAM

### 1.1 Situation of rattan sector

Rattan is the most important group in forest products, after wood, especially in Asia. Rattan has been used by human to make end's meet that has been recorded in history through many decades. Although rattan is mostly in Asia, it can be found in many other places, like Ancient Egypt, Europe during the Renaissance, and France under the reign of King Louis XIII and Louis XV. Up to now, rattan is the most important non-timber forest product in global market. Although this kind of tree receives a lot of attraction from people, none of them is really enthusiastic. On the world, there are more than 700 million people run business or use rattan with different purposes, such as beautiful furniture whose materials are widely known. According to Food and Agriculture Organization (FAO, 2003), global trading, livelihood value of rattan and its products are estimated to be more than USD 7.000 million/year. Obviously, furniture is the most popular rattan product. Other products include carpet-beating stick, propping stick, drumstick, sport tool, hat, rope, birdcage, mat, basket, plank wood, wood hoop, wood box, and others. Obviously, rattan with ground spreading foliage and straight root plays an important part in preventing soil corrosion. Rattan is an essential part of tropical forests due to its growth characteristics: penniform leaf, 7m or more in height, heavy rain prevention. Ecology benefits as well as other economic benefits of rattan have helped to increase forest value.

According to FAO's research in 2003, Vietnam is the country that produces and exports rattan the most, including *Calamus poilanei*, *Calamus platyacanthus* and *Calamus palustris*. However, the current supply ability can not meet the requirements for export. Natural resources are degraded seriously, and drop distribution in sustainable samples. A large amount of wild rattan can be exploited simply from Cambodia and Laos at low price [1].

**Table 1.** Rattan products from 1995 to 2005

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ton of rattan	28,500	25,975	25,639	80,097	65,700	53,891	44,204	36,259	29,741	24,396	20,011

**Source:** MARD, National project for protecting and developing non-timber forest products in the period of 2006-2020

\* Data in 2000-2005 is calculated by consultants

Uncontrollable rattan exploitation has lead to the distinction of rattan source in Vietnam. To support the immerging handicraft in Vietnam, the Government is encouraging rattan planting in related objects. In Thai Binh, Hai Duong, Ha Tinh, and Nam Ha, rattan has been grown in garden for some decades to serve for many different purposes. Every year, cultivating rattan productivity can be up to about 1500 to 2000 tons from households. At present, rattan market has been independently growing and being operated by private businesses, preliminary processing companies, State-owned export brands and companies. In Vietnam, secondary processing is to serve for internal demands only and almost all of export products are just preliminary processed. Secondary processing to produce furniture and household goods is mainly in import companies. Every year, there are about 20,000 to 40,000 people involve in

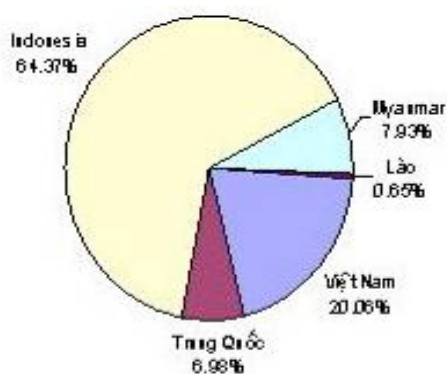


the exploitation and processing of rattan, and this is an important resource. Most important kinds of rattan are: *Calamus tetradactylus* Hance (small diameter) in the North; *Calamus tonkinensis* Becc (small diameter) *Calamus rudentum* Warb (small diameter) widely; *Calamus platyacanthus* Warb (small diameter) in the North and *Calamus poilanei* Lour (large diameter) in the South. These kinds of *Calamus tetradactylus* Hance, *Calamus tonkinensis* Becc and *Calamus amarus* Roxb have being grown in gardens.

### Export quantity and value of rattan in Vietnam

Rattan is an important product in non-timber forest products and plays an important role in handicraft export in recent years. In the period of 1999-2005, export turnover of timber industry increases 2.3 times, in which the value of rattan increases 4 times, raising the total export value of these products from USD 48,21 million in 1999 to more than USD 211 million in 2007. This figure of 6 first months of 2008 is USD 110,9 million in which rattan occupies a great part and has the tendency to increase in recent years: from 61,60% in 1999 to 97,79% in 2005. According to many researches, if domestic consumption is calculated, total value of rattan can be up to USD 250 million (MPDF, 2005). Survey's results in provinces also show the importance of handicraft in the development of non-agriculture through the ratio in small industry: Ha Tay - 47%; Northwest - 17% and Cuu Long River Delta - 10%.

In recent years, Vietnam rattan products have accessed many fastidious markets like USA, EU and Japan. In the past, key markets in the years of 80s were Soviet Union and former Eastern Europe (traditional market, market region I) but now potential markets are developed countries. Up to now, rattan products of Vietnam are in more than 90 countries, regions and will be widened. Key export markets are: Japan, German, Taiwan, France, USA... Japan and Taiwan are stable markets of high demands: From USD 13 million in 2000 to USD 27,6 million in 2005. USA is a new but highly grown and potential market. Export turnover to USA in 2000 is of low level, less than USD 2 million, but that figure of 2005 grew up to USD 22 million, 10 times higher and rank the 2<sup>nd</sup> position right after Japan. Some markets of high market share like Germany, France, and Spain remain high positions in the list of 10 large markets of Vietnam rattan.

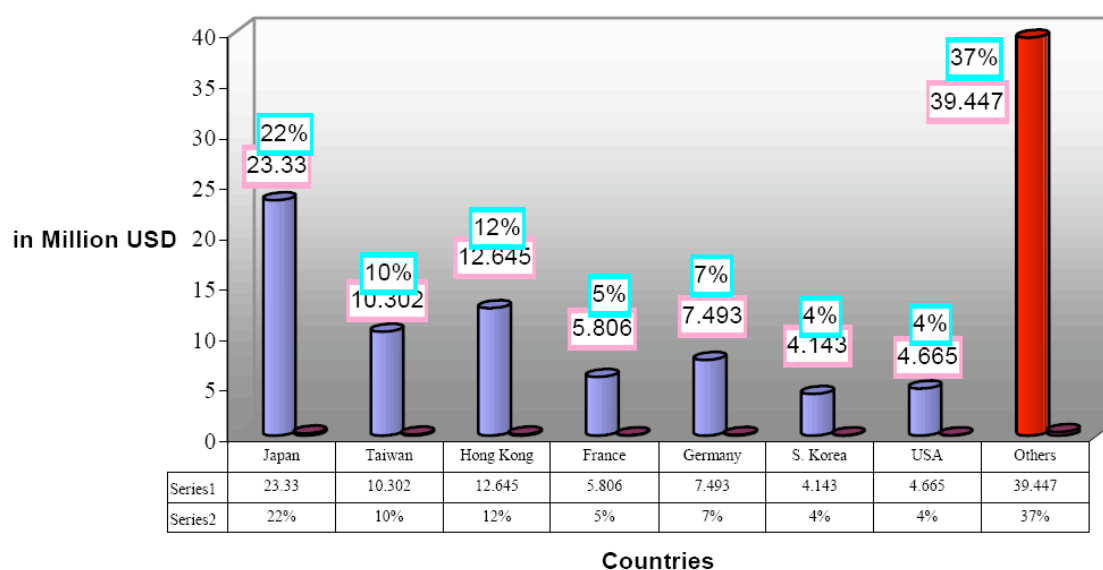


**Figure 1.** Chart of rattan export value of countries in the world

Source: [www.inbar.int](http://www.inbar.int)

In the decade of 1970 and 1980, almost rattan in Vietnam was exported in products to former Soviet Union. With the collapse of Eastern Europe, this market is lost and the potentials

changes to export crude products to neighboring countries, like Thailand, Taiwan, Hong Kong, China, and Japan. Since 1993 to 1995, the export of raw rattan decreased due to the Decree number 90 of Government about forbidding export of raw rattan and semi-processed rattan products to improve domestic processing. The decision was declared in 1992, but that sales still remained until 1995. After the banning law, rattan sector in Vietnam copes with many problems, resulting from the lack of technique and skillful workers. However, since 1996, rattan processing in Vietnam has been upgraded; rattan product export has been increased, partly due to economic innovation in Vietnam. So, the immerging markets like Germany and USA are becoming more important [1].



**Figure 2.** Export quantity of rattan in 2004  
*Source: Viettrade 2004 – Ministry of Trade*

**Table 2.** Rattan Export Products in Vietnam in the period of 2001-2003

Phase	Trade flow	Goods value	Percentage in key countries
2001	Export	\$2,124,000	Total (50%) including: Spain (24.9%); Singapore (12.5%); China (6.2%); Italy (3.1%); Hong Kong (1.4%); Philippines (0.8%); Thailand (0.8%); Japan (0.3%);
2002	Export	\$2,562,000	Total (50%) including: Spain (13.8%); Singapore (11.7%); Philippines (8.3%); China (7.2%); Japan (2.7%) Laos (1.1%); Germany (0.9%); France (0.9%); Switzerland (0.9%); Denmark (0.4%); Hungary (0.4%) Korea (0.3%); Portugal (0.3%); Malta (0.2%); Australia (0.2%); Other Asian countries NES (0.2%); Russia (0.2%); Hong Kong (0.2%) UAE (0.1%); UK (0.1%)

2003	Export	\$1,790,000	Total (50%) including: Spain (18%); Philippines (2.8%); Singapore (12%); China (9.2%); Italy (6.5%); Thailand (0.6%); Japan (0.4%); Hong Kong (0.4%)
<b>Total rattan export in Vietnam = \$6,476,000 in the period of 2001 - 2003</b>			

Source: COMTRADE data, UN statistics

According to the statistics, export turnover of rattan, bamboo, leaf, lacquer, carpets of Vietnam in 2008 was USD 224,7 million, increasing 3% in comparison with 2007. Export market for these above products are German (USD 37 million), USA (USD 32,3 million), Japan (USD 31,1 million), France (USD 12,8 million), Spain (USD 10,8 million), Taiwan (USD 10,4 million)... The statistics of export turnover of rattan products and lacquer, carpets in Vietnam in 2008 are as follow:

**Table 3.** Market and export turnover for rattan products in Vietnam

Market	Turnover (USD)	Market	Turnover (USD)
Argentina	824.782	Italy	9.140.859
Ireland	784.795	Latvia	650.779
India	1.774.345	Malaysia	1.254.793
England	7.217.452	Norway	294.213
Austria	1.048.427	South Africa	691.351
Poland	5.055.921	New Zealand	786.996
Belgium	6.531.063	Russia	4.624.370
Portugal	1.020.675	Japan	31.157.018
Brazil	1.742.717	Australia	6.007.055
United Arab Emirates	47.708	Poland	917.577
Cambodia	242.583	France	12.828.232
Canada	3.211.696	Czech	900.388
Taiwan	10.377.733	Singapore	901.161
Denmark	2.695.676	Slovenia	216.545
Germany	37.033.081	Spain	10.788.806
Estonia	217.694	Thailand	600.619
Netherlands	7.657.752	Portugal	1.166.816
Korea	5.769.681	Sweden	3.234.707
USA	32.331.654	Switzerland	1.228.173
Hong Kong	673.572	China	1.217.948
Hungary	846.634	Ukraine	492.305
Greek	868.874		

In the key export rattan, bamboo, leaf, carpet, lacquer in 2008, export turnover of bamboo and leaf occupied the most, with USD 55,6 million, increasing 17,5% in comparison with the same period of 2007 and occupies 24,8% total export turnover of rattan, bamboo, leaf, carpet, and lacquer of the whole country while this figure of 2007 was 21,6%. Following is rattan products, in 2008, rattan export turnover of Vietnam is USD 33,1 million, decreasing 17,9% in comparison with the same period of 2007 occupied 14,7% total export turnover of rattan,

bamboo, leaf, carpet, and lacquer of the whole country while this figure of 2007 was 18,4%. In all export rattan products in 2008, the turnover of rattan chair and table was the highest with USD 15,3 million, decreasing 9,5% in comparison with the same period of 2007 and occupied 46,2% total export turnover of rattan products in the nation wide. Other export products of high turnover are: rattan tray, rattan basket, rattan box, rattan cask, rattan bowl and disk, rattan shelf... Key markets for rattan export of Vietnam in 2008 were German, USA, Japan, France, Spain, Italy, Sweden, England, Poland, Netherlands, and Belgium... According to the information given by International Network of Bamboo and Rattan (INBAR), consumption capacity of rattan in the global market is USD 4 billion/year. Meanwhile, the total production value of rattan sector is no more than USD 1,5 billion/year. Therefore, the market share of rattan products in Vietnam (USD 33.1 million) just occupies no more than 1% of rattan market in the world and Vietnam still get the opportunities to increase market share. The problem is just whether our product design and quality can meet global demand or not.

### Material import

Vietnam is importing rattan from some countries in the region like Laos, Philippine, Indonesia.. According to the statistics of UN, import turnover of rattan in Vietnam in 2004 is USD 1.34 million, that figure of 2005, 2006 and 2007 is 1.66 million, 1.43 million and USD 0,65 million.

**Table 4.** Material import turnover

2004			2005		
Country	Commercial value	Net Weight (kg)	Country	Commercial value	Net weight (kg)
Total	\$1,343,345	613,491	Total	\$1,666,942	761,274
Laos	\$602,359	275,091	Philippines	\$796,888	363,930
Philippines	\$535,107	244,377	Laos	\$750,734	342,852
Indonesia	\$131,907	60,240	Singapore	\$119,320	54,492
Singapore	\$69,228	31,616			
Japan	\$2,440	1,114			
France	\$2,304	1,052			
2006			2007		
Country	Commercial value	Net Weight (kg)	Country	Commercial value	Net Weight (kg)
Total	\$1,429,420	652,800	Total	\$646,075	295,093
Philippines	\$669,662	305,827	Indonesia	\$359,727	164,304
Indonesia	\$313,863	143,338	Philippines	\$176,186	80,472
Laos	\$282,750	129,129	Laos	\$82,850	37,841
Cambodia	\$93,887	42,877	Cambodia	\$23,712	10,830
Singapore	\$35,290	16,117	Other Asian countries	\$3,600	1,644
Malaysia	\$31,368	14,325			
China	\$2,600	1,187			



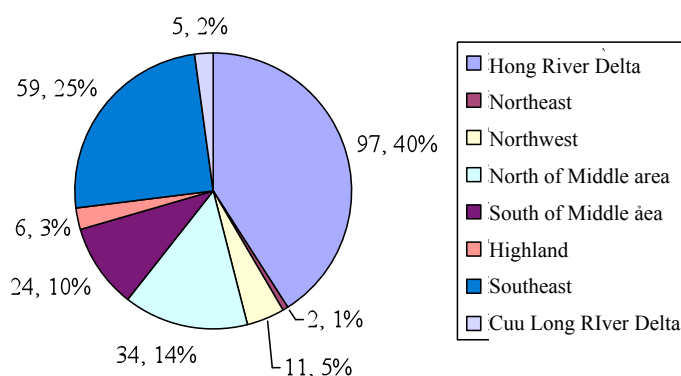
Rattan import can be explained by two reasons – The first may be due to the price of rattan in Vietnam is higher in comparison with other countries, however, this reason can be denied as in fact, the average price of imported rattan is USD 2,19/kg – much higher than that of Vietnam (VND 25-28.000/kg). Therefore, the second may be more reasonable that rattan import in Vietnam is due to material shortage and enterprises have to import rattan at higher price to ensure production. Therefore, creating new source of material is absolutely necessary at this moment. The problem now is only whether the capacity and quality of rattan in different locals are qualified enough or not.

Rattan import is becoming more difficult due to export “sewing” policy of many countries. Since 1990s, almost all of countries (Indonesia, Malaysia, Laos...) has banned raw material export and issued exploitation, export quota for processed materials. Indonesia is the country whose rattan capacity is greatest in the world (70% of world’s capacity) but the annual exploitation quota is about 250 thousands of ton in which 165 thousands are for domestic demand and the rest are for exporting preliminary processed materials. But in fact, the annual demand of rattan for handicraft manufacture is about 450-500 thousands of ton and the illegal exploitation is unavoidable.

Through these above analysis, improving rattan material within the country is very necessary and urgent to develop rattan sector, as well as create incomes for rattan labor, especially the poor in mountainous area.

### **Vietnam rattan enterprises**

According to the survey in December, 2009, at present there are about 238 enterprises working in different processes of rattan sector (exploitation, processing, exporting), in which most are in Hong river delta. (97 enterprises, 40%), Southeast (59 enterprises, 25%), North of middle area (34 enterprises, 14%). Many enterprises are responsible for both processing and exporting, according to the functions, there are 25 processing enterprises, 161 manufacture ones, and 184 business ones, and 130 exporting ones.



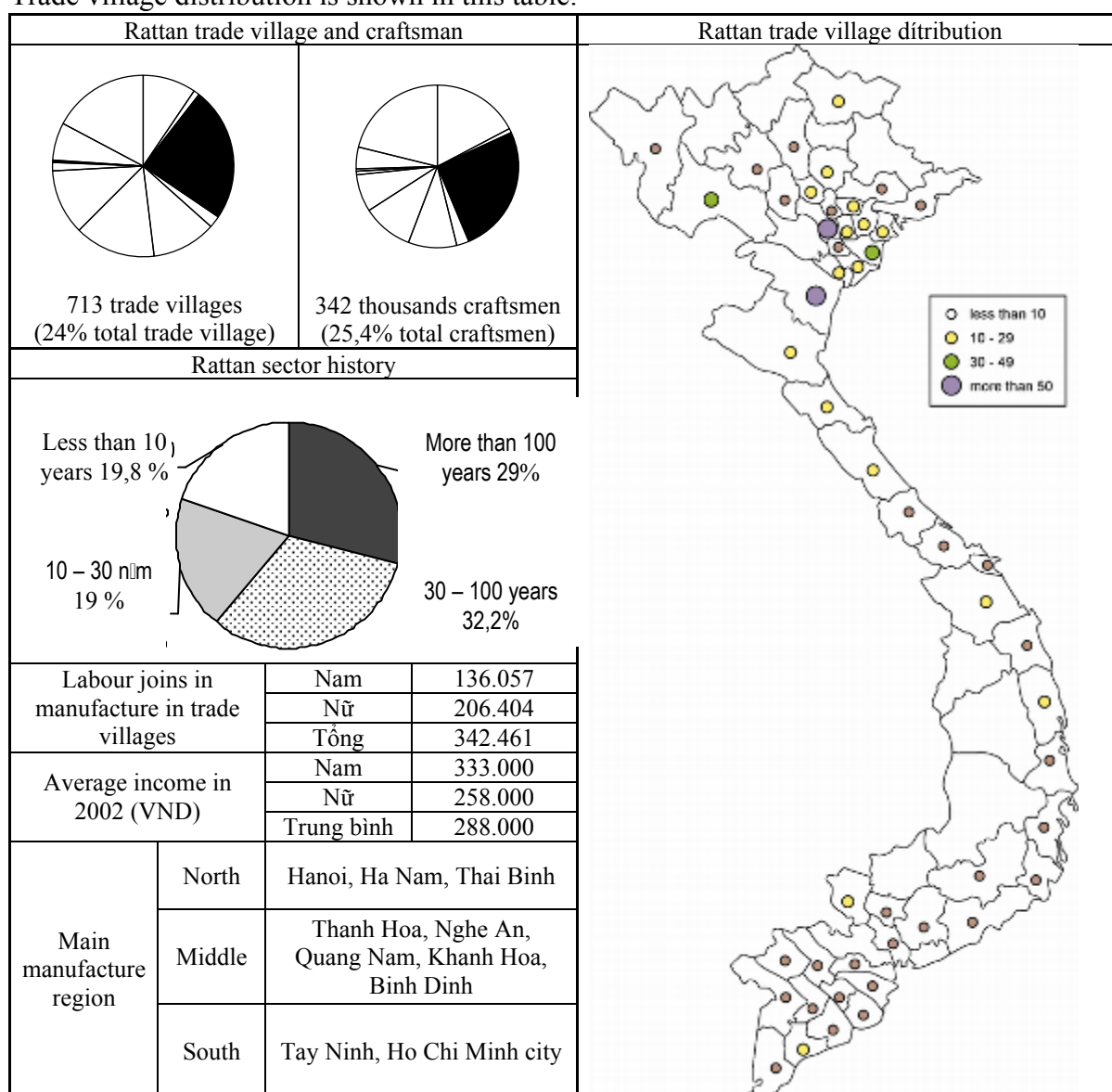
According to the survey, there are 713 rattan trade villages which occupy for 24% total handicraft trade villages in Vietnam and have the greatest source of labour - 342 thousands of labour. Rattan trade villages distributed all over the country, half of them are in Hong River Delta. Vietnamese, in all regions, have been making daily products, like tray, basket, chair and table...

**Table 5.** Rattan trade village distribution

Region	Hong River Delta	Northeast	Northwest	North of Middle area	South of Middle area	Highland	Southeast	Cuu Long River Delta
Number of rattan trade village	337	77	45	121	34	0	26	73
%	47,3%	10,8%	6,3%	17%	4,8%	0	3,6%	10,2%

Source: JICA – MARD 2002

Trade village distribution is shown in this table:



Rattan products can be classified into 2 main products: Rattan knitting products; interior and exterior products. The distribution of these trade villages is as followed:

Products	North	Middle	South
Rattan knitting products	Hanoi Thai Binh Ha Nam Hung Yen (later develop)	Quang Nam	Almost no trade village, but small groups in Dong Nai
Interior and exterior products	Hà Nội Hà Nam Thái Bình Hưng Yên	Khanh Hoa, Quang Nam, Đà Nang	Almost no trade village, but small groups in Dong Nai, Ho Chi Minh City, Binh Duong

The development of rattan source in Vietnam depends on consumption market of rattan products, especially the role of export market which consumes about 95% rattan products from Vietnam.

Although there is no individual statistics of export turnover of rattan in individual, just that of rattan, bamboo and leaf in genera, which is called natural fibers (code HS4601.20/ 4602.10/ 4602.90/ 6504.00 / 9401.50 and 9403.80). However, the annual growth of natural fibers can represent for that of rattan products.

**Table 6.** Export growth

Year	Used rattan and bamboo (ton)	Rattan and bamboo product export revenue (thousand USD)	Growth speed (%)
1999	6,523	48,216	
2000	5,068	65,932	37%
2001	4,626	73,216	11%
2002	7,621	88,747	21%
2003	8,830	99,737	12%
2004	9,911	138,218	39%
2005	9,000	140,000	27%
2007	n/a	219,000	25%
2008	n/a	224,700	3%

*Source: MARD, National project on conservation and development non-timber forest products in the period of 2006-2020 in combination with statistics of Information Centre, Ministry of Trade*

### **Role of rattan manufacture trade village**

Rattan manufacture trade villages play an important role in creating jobs and incomes in rural area, reduce the migration flow to big cities that creates instability in national socioeconomic. In addition to the creation of jobs for more than 342.000 labour, in term of income in 2008, the income of households in the sectors of pottery, fine art wood and lacquer is the highest (VND 2,5 – 3 million/month), following is household in the sectors of rattan and bamboo;

and silk textile (VND 2,3 million/month). Compared to agriculture households in the same local, the income of rattan labor is 2.3 times higher.

**Table 7.** Income of households in surveyed sectors in 2008

Group		Rattan and bamboo	Sedge, water hyacinth	Pottery	Handicraft wood	Lacquer	Silk, flax	Other sector
Total of household		143.042	68.681	64.907	67.892	11.907	43.418	6.926
Average household/commune		2.201	1.962	4.327	2.425	2.977	2.412	1.385
Average income VND/month	Agriculture household	1.023.554	1.037.503	1.386.333	743.258	2.050.000	1.173.796	756.000
	Non-agriculture household	2.339.730	1.748.478	3.090.000	2.509.097	2.937.500	2.272.894	1.303.000
		2,3	1,7	2,2	3,4	1,4	1,9	1,7
Both 2 group		2.108.897	1.880.954	2.743.800	2.377.805	2.975.000	2.715.012	1.700.000

Source: HRPC, 2009

Average income of craftsmen in 2007 increased from 30% to 103% in comparison with 2001, in which the increase of rattan and bamboo sector was 43%. One notable thing is that the income is not very different between female and male craftsmen in rattan sector, except for the job that requires strength and high working intensity like handicraft wood. Usually, the income of female craftsman is only 1.1 times lower than that of a male. IN all cases, handicraft contributes much to the economic development in the rural areas as the average income of both male and female craftsmen is higher than the average level in the country.

**Table 8.** Income of labor in surveyed sectors

*Unit: thousand VND*

Group		Rattan and bamboo	Sedge, water hyacinth	Pottery	Handicraft wood	Lacquer	Silk, flax	Other sector
2001	Craftsman	584	453	816	861	600	543	350
	Agriculture man	269	223	507	223	410	328	573
	Difference	2,2	2,0	1,6	3,9	1,5	1,7	0,6
	Male craftsman	588	455	823	1.110	600	571	350
	Female craftsman	534	455	782	676	600	527	275
	Difference	1,1	1,0	1,1	1,6	1,0	1,1	1,3
2007	Craftsman	836	677	1.197	1.639	1.217	708	590
	Agriculture man	412	391	668	340	817	454	750
	Difference	2,0	1,7	1,8	4,8	1,5	1,6	0,8
	Male craftsman	868	672	1.233	1.561	1.417	750	590
	Female craftsman	815	678	1.167	1.034	1.317	693	590
	Difference	1,1	1,0	1,1	1,5	1,1	1,1	1,0
The increase in average craftsman income from 2001-		43%	49%	47%	90%	103%	30%	69%



2007							
The increase in average agriculture man income from 2001-2007	53%	75%	32%	52%	99%	39%	31%

Source: HRPC

Therefore, trade village plays a very important role in creating income for labour as well as transferring economy in many regions. However, there are still many opportunities to increase the income of labour by improving resource efficiency, generating suitable processes (reducing input cost), verifying products in which high value ones are concentrated (increasing sales value), improving marketing... These are the factors contributing to the high and sustainable income for craftsman.

## 1.2 Relating legal policies and documents

Up to now, there is no individual system of policies about rattan and non-timber forest products (NTFP). Rattan and NTFP are mentioned scattered in some legal policies, but just in one chapter, or article.

### 1.2.1 Material planning

According to current laws, NTFP resource area can be created on the planned land or forest for the purpose of manufacture and protective forests. The State encourages improving replanting forests and adding NTFP in protective and manufacture forests, considering it as an important option to recover forests in which there is NTFP. The decision 100/2007/QĐ-TTg on July 06<sup>th</sup> 2007 modified and added some articles in the decision 661/QĐ-TTg on July 29<sup>th</sup> 1998 about targets, responsibilities, policies, and organization of the project to newly plant 5 million acre of forest as well as widen the article of developing NTFP even in special forests “*Planning area is special forest without forest, if recovery forest is needed, cultivating and replant forest should be considered as the key methods; especially, NTFP should be developed to create income for the local people in the area of special forest (outside serious protective)*”.

### 1.2.2. Land and forest resources policy

The State transfers the right of using land and forest land to organizations, households, individuals for stable and long forestry purposes; the regulation that allows the users to change and transfer land and forest usage; and even rent land has encouraged the concentration of land and forest to form NTFP resources.

### 1.2.3. Rattan source policy

Decision No. 26/2007/QĐ-BNN on April 09 2007 of Ministry of Agriculture and Rural Development about Issuing additional checklist of forestry plants that can be manufactured for business indicates “Calamus tetradactylus is the plant that can be manufactured for business, however, the source must be selected carefully or the mother plants need to be approved”

#### 1.2.4. Investment policy

Legal documents about investment defines general forest planting, including NTFP planting, forest process, traditional handicraft sector (rattan, bamboo...) to have support policies, such as reducing money for land using, and land renting. The projects of planting NTFP materials, processing NTFP, manufacturing rattan products, handicraft can receive preferential rate; in addition, households that produce rattan products, handicraft, processing NTFP can be given loans from banks with commercial rate.

#### 1.2.5. Taxes that relates to NTFP material trading

Tax for using NTFP planting land is 4% of exploited product value. From 2003 to 2010, organizations, individuals who invest on developing NTFP materials can be exempt or reduced tax for using land; resource tax for exploiting bamboo, neohouzeaua, Bambusa procera A. Chev... from natural forests is 10%, for rattan is 5% of exploited product value; VAT is 5% for rattan, bamboo, neohouzeaua, from natural forests that have not been processed.; products are made of jute, sedge, bamboo, neohouzeaua, rattan.

In recent years, some legal documents are issued for the exploitation of NTFP in production forests which are natural ones, in protective forests which are natural ones, policies of benefits, transportation, and consumption of NTFP, in detail:

*Decision no. 59/2005/QĐ-BNN on October 10<sup>th</sup> 2005 of Minister of Agriculture and Rural Development about issuing Regulations on checking and controlling forest products and Decision no. 40 /2005/QĐ-BNN on July 07<sup>th</sup> 2005 of MARD*

- Forest products are not exploited in special forests (national forest, natural reservation zone...)
- Auxiliary forest products are allowed to be exploited (except for precious products that are banned to be exploited by the Government) in protective forests without affecting the protectibility of the forests. The exploitation is decided by forest owners (for the forest that are managed by Commune People Committee, exploitation license is issued by Commune People Committee)
- NTFP (such as rattan) are allow to be exploited in production forests which are natural ones without affecting the growth and development of each category. The exploitation is decided by forest owners (for the forest that are managed by Commune People Committee, exploitation license is issued by Commune People Committee). Products are free to be distributed.

#### 1.2.6 Action plan for presercation and development of NTFP in the period of 2007-2010

**(Issued with the Decision no. 2242 on August 07<sup>th</sup> 2007 by MARD)**

##### **a. Program for NTFP production**

Target	Priority actions
Supplying more than 50% demand of NTFP for processing and exporting;	1. Basic investigation, database development of NTFP 2 Development of basic NTFP types

**Specific actions and targets:**

Investigating, assessing the situation of planting, developing, exploiting, processing materials, handicraft (rattan, *Phyllostachys pubescens*): At the end of 2008, 01 national report on the situation of planting material and handicraft plants must be finished; management software is completed (lead by Department of Forestry and Department of processing Agriculture, Forestry and Salt)

## b. Program on NTFP conservation

Target	Priority actions
1. Improving the organization, planning, management, and development of NTFP conservation.	1. Conserving NTFP in national gardens, natural conservation zones, and protective forests
	2. Developing model for NTFP conservation basing on local experiences
2. Improving social awareness of NTFP conservation.	3. Improving the awareness of people, management of all levels, all sector and the whole society to conserve NTFP
	4. Piloting the model of combining community management and NTFP conservation

**Specific actions and targets:**

- 28 national gardens bring the content of Insitu and Exsitu NTFP conservation into action plan.
- 30 natural conservation zones take Insitu NTFP conservation.
- 20 protective forest take extu and inxtu NTFP conservation.
- 05 regional models of NTFP conservation are developed basing on application and development of available knowledge (Northeast, Northwest, Middle are, Highland, salt-water area.
- Communication programs on NTFP conservation are developed and operated.
- Subject information about NTFP conservation is published.
- 10 pilot models that combine community management and NTFP conservation are establish and represented for Northeast, moutainous North, Middle area and Highland

## c. Programs on processing and trading NTFP

Target	Priority actions
1. Improving the contribution of NTFP process in national economy and competitiveness of NTFP process.	3. Planning trade villages near the resource areas
2. Establishing and developing NTFP market for specific products	4. Developing trade villages near the resource areas
	5. Supporting enterprises, trade villages to apply new technology in improving product quality for some kinds of NTFP that have the potentials of becoming goods

	6. Establishing market information system for NTFP 7. Organizing NTFP fairs
<b><u>Specific actions and targets:</u></b> <ul style="list-style-type: none"> <li>▪ Planning plan is approved by MARD at the end of 2008</li> <li>▪ 50 NTFP trade villages are supported</li> <li>▪ 20 trade villages and 10 small and medium-sized enterprises are supported to develop quality management system ISO 9001: 2000; ISO 14000 ...</li> <li>▪ 10 enterprises are supported to renovate technology of processing materials and end-product finishing</li> <li>▪ The market information system of NTFP is operated and operated</li> <li>▪ Bulletin about NTFP is composed every quarter; information about NTFP market is frequently established and updated in website</li> <li>▪ 01 NTFP fair is organized</li> </ul>	

d. Program on research, training and encouraging forestry

Target	Priority actions
Developing and applying scientific technology scientific technology in breeding, planting, conserving and processing NTFP to directly serve for conservation and development of NTFP in Vietnam.	<ul style="list-style-type: none"> <li>▪ Researching and completing the technology of breeding, exploiting, conserving, and processing some basic types of NTFP</li> <li>▪ Researching market forecast for some basic potential NTFP</li> </ul>
Establishing human resources for developing and conserving NTFP	<ul style="list-style-type: none"> <li>▪ Developing and applying training program about NTFP for training and vocational units of forestry</li> </ul>
Quickly adapting technology advancement into manufacture and guiding farmers towards NTFP sustainable development.	<ul style="list-style-type: none"> <li>▪ Developing and operating the national program of encouraging forestry about NTFP</li> </ul>
<b><u>Specific actions and actions:</u></b> <ul style="list-style-type: none"> <li>▪ Researching, completing technology of breeding, planting, exploiting, processing and conserving <i>Phyllostachys pubescens</i>, <i>C. tetradactylus</i> Hance, and <i>C. platyacanthus</i> Warb...)</li> <li>▪ Researching, selecting suitable equipments and technologies that have been approved by the science committee for processing and conserving bamboo, rattan and some other multifunctional plants with small and medium size (concentrating on material and bamboo and rattan product finishing). Processing methods of bamboo and rattan are issued and applied into practice.</li> <li>▪ Report on actual situation of NTFP market is prepared (NTFP market forecast to 2010, proposing market policies for NTFP in Vietnam)</li> <li>▪ The framework of training program about NTFP in intermediate and vocational schools must be finished and used</li> </ul>	



- The framework of training program about encouraging forestry at provincial and district level must be finished and used

e. Program on NTFP mechanism and policy

Target	Priority actions
1. Forming advantageous legal lobby to encourage organizations, individuals and economic sectors to participate in the sustainable development of NTFP resources towards market economy and international economy integration	Developing encouragement policies for conservation and development of NTFP that are suitable for international economic integration
	Modifying and adding some policies that relate to NTFP
2. Improving management capacity of NTFP	Consolidating State management of NTFP
	Supporting the establishment of associations of conservation and development NTFP
<b><u>Specific actions and actions:</u></b> <ul style="list-style-type: none"> <li>▪ Developing support policy for forming sourcing area connecting with processing area</li> <li>▪ Issuing new decision of MARD for exploiting forest products; checking and controlling forest products.</li> <li>▪ Forming department or assigning staff responsible for controlling, supervising NTFP at all levels</li> <li>▪ Establishing NTFP association</li> </ul>	

1.2.7. Development strategy of Forestry in Vietnam in the period of 2006-2020

**Has been approved by Prime Minister in the Decision no. 18/2007/QĐ-TTg on February 5<sup>th</sup> 2007**

Building and developing some timber and non timber sourcing areas that connect with processing area to create forest product processing industrial zones in the locals that have potentials and market. Improving processing of wood equipments and developing trade villages in rural areas, paying attention to NTFP processing (pine resin, bamboo and rattan...)

**Important policies relating to developing trade village, industry encouragement and trade promotion.**

(Including: Decree 66/66/2006/NĐ-CP on July 07<sup>th</sup> 2006 of Government; Circular 116/2006/QĐ-BNN on December 18<sup>th</sup> 2006 of MARD; Circular 113//2006/TT-BTC on December 28<sup>th</sup> 2006 of Ministry of Finance; Decree 134//2004/NĐ-CP of Government, decision 136/2007/QĐ-TTg on August 20<sup>th</sup> 2007 of Prime Minister, Decision 279/2005 QĐ-TTg of Prime Minister and Decision 80/2009/QĐ-TTg on May 21<sup>st</sup> 2009 of Government about modifying and adding some articles in Decision 279/2005/QĐ-TTg). Some specific support mechanisms are:

**Manufacture:** The State supports the investment on trade village infrastructure and rural sectors. Rural sectors that are invested and have efficient outcome can be: (a) Support in transferring or renting land; and issuing land usage license according to laws on land (b) the

units of rural sector that move from residential area to planned area are supported in usage fee and taxes as well as moving fee.

**Investment, credit:** Provincial budget supports partly the investment capital in building infrastructure and environment treatment for trade villages, rural sectors group. With the provinces that have difficulties in budget sourcing, central budget can support partly in annual estimate. Efficient business projects are supported (a) investment preference according to laws on investment (b) post-investment rate according to current regulations (c) loans from occupational funds according to current regulations (d) development investment and export credit according to State regulations (e) guaranty from credit guaranty funds to ask for loan from credit organization for small and medium-sized enterprises.

**Trade promotion:** The State encourages and supports rural sectors to promote trading according to the current regulations of National Trading Promotion Program (support 50% fee to attend domestic fair and 100% to attend foreign fair, 50-70% training fee...). The enterprises are also supported in developing brand.

**Scientific technology:** (1) Rural sector units receive preference, and support financial policies when they do technology transfer, technology innovation, or technology accession from organizations and individuals both at home and abroad. (2) Rural sector units receive partly financial support from the budget for science and technology of the State when they compose research on new technology, complete research products that can be commercialized in rural sectors.

**Human resource training:** Projects on the training units for rural sectors receive policies of investment credit of the State to prepare a human resource for the sectors that are planned to develop. The craftsmen of rural sectors that do training to the others can collect fee basing on negotiation; can receive perk from training units; can receive tax support in training. Rural labor can receive support in training fee according to the support policy for short-term vocational training for rural labor of the State; can ask for loan from national program on work solutions.

## PART 2. ANALYSIS AND ASSESSMENT ON UNSUSTAINABLE ISSUES IN RATTAN SECTOR IN VIETNAM

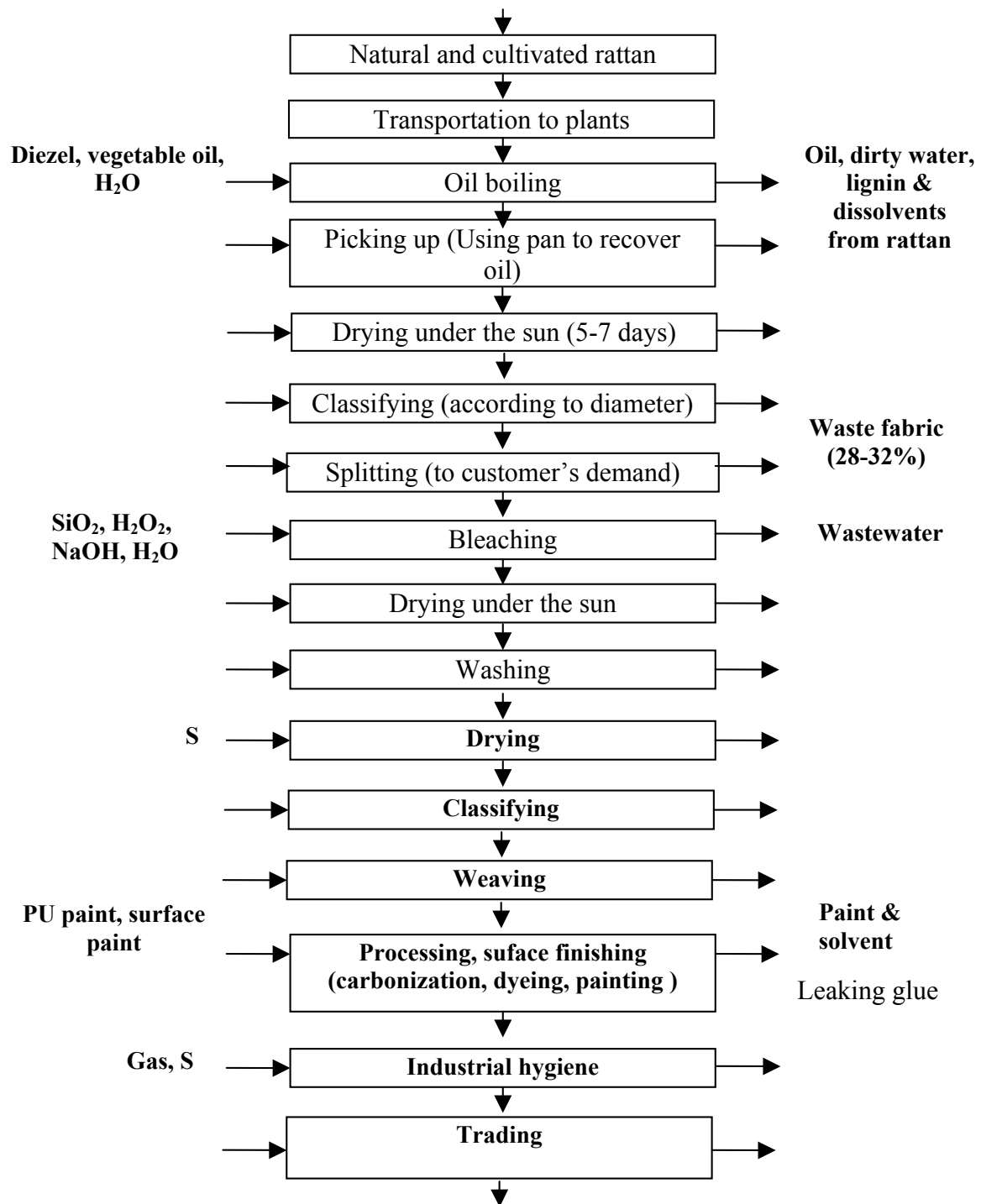
### 2.1. Raw materials

Up to now, there is no quantitative data published and no research composed on rattan in Vietnam. In fact, it is also very difficult to define the detail quantity of rattan *due to the character of living together with many different plants in forests*.

There are 30 rattan species, belong to 6 branches locating in different biological area. In these species, there are 10 of high commercial value that are widely used in handicraft production. The area that has greatest rattan amount in Vietnam is middle area seacoast (201.076 ha/381.936 ha total of rattan forest in Vietnam – according to MARD). Natural rattan allocates mainly in the forests of mountainous area. Garden rattan has recently been cultivated rather widely in many provinces, especially in some northern (Thai Binh, former Ha Tay, Tuyen Quang...) and middle provinces (Nghe An, Ha Tinh, Quang Ngai...). These two species play an important part in increasing local people's income, not only for the ethnic minorities, but also for rural people. Rattan is harvested and processed all time in a year in order to ensure the food buying for families. Individually in the north of middle area, collecting natural rattan in forests and processing rattan create about 1,6 million USD/year for 4000 involving people.

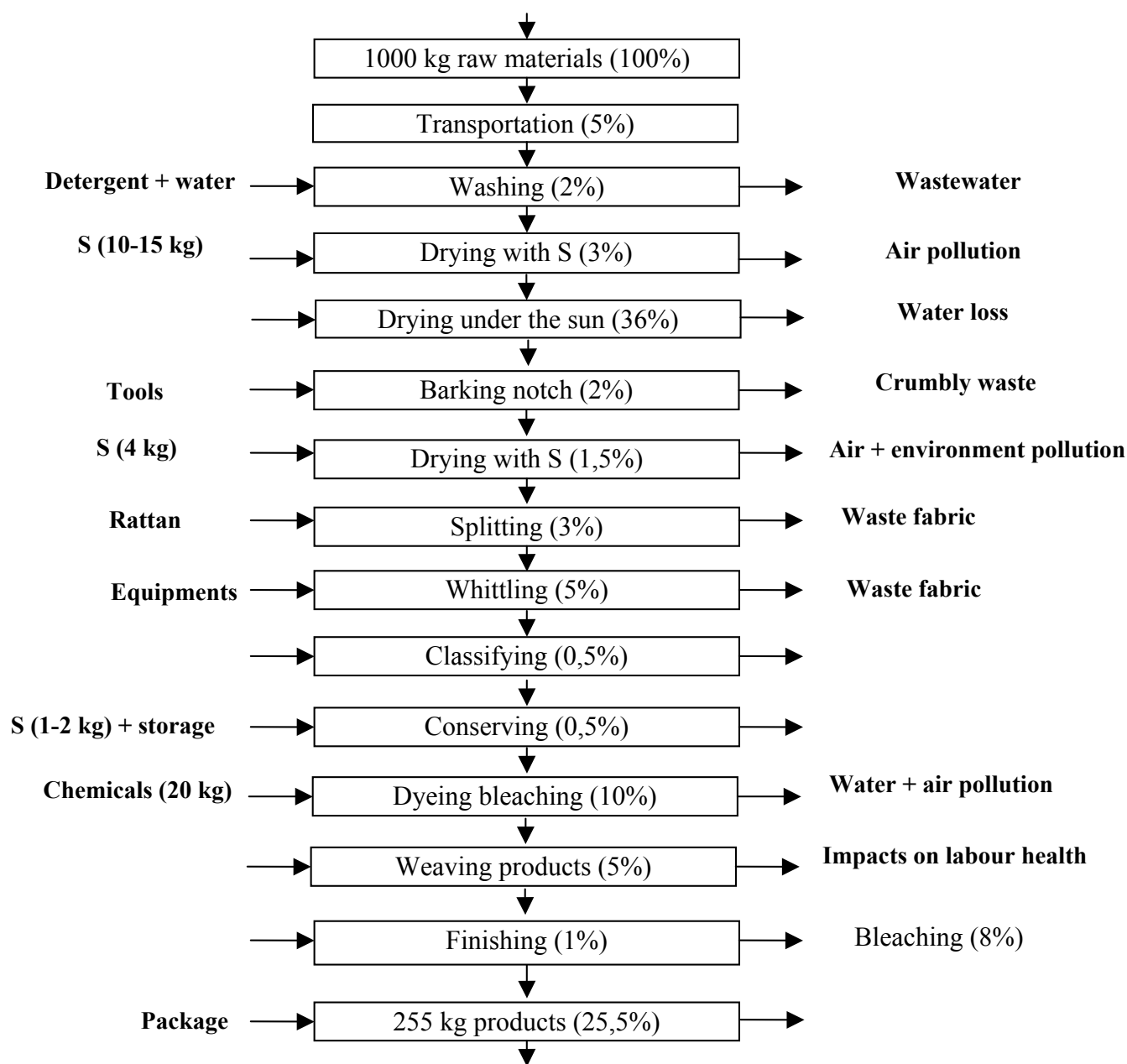
**.10 rattan species that have high economical value in Vietnam** (Source: institute of forest investigating and planning)

No.	Species	Vietnamese/local name	Main locating area
1	<i>C. tetradactylus</i> Hance	Mây Nếp, Tắt, Ruột Gà	Northern middle area and northern area
2	<i>Calamus armarus</i> Lour	Mái, mây Nước	Middle area, northern middle area and northern area
3	<i>D.pierreanus</i>	Mây nước Pie	Middle area, northern middle area and northern area
4	<i>Calamus tokinensis</i> Becc	Mây Đẳng, Mái	Middle area, northern middle area and eastern northern area
5	<i>C. bousinggonii</i> Pierre	Chèo Đồi, mây Lá Rộng	Southern middle area, Central highland, and southern area
6	<i>Calamus palustris</i> Griff	Mây Tàu	Eastern southern area, middle area and northern middle area
7	<i>C. platyacanthus</i> Warb	Song mật	Nghe An province northward
8	<i>C. poilanei</i> Conrard	Song Bột, Trèo Đồi, Poóng	From Thua Thien – Hue northward
9	<i>Calamus rudentum</i> Lour	Song Đá, song Đen	Almost all provinces in north, middle and south area
10	<i>C. pseudoscutellaris</i> Conrard	Cây Hèo	Middle area and north area

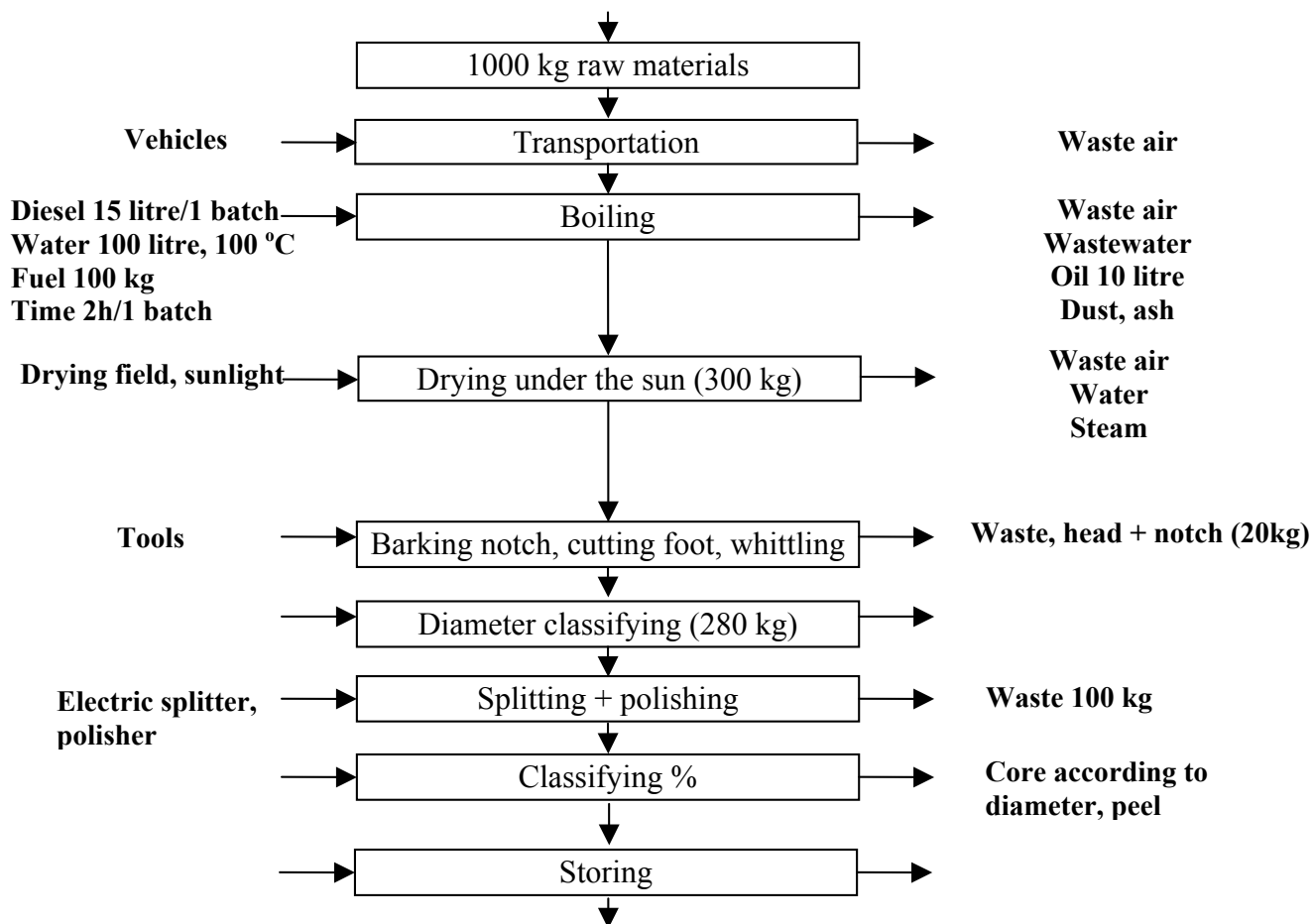


**Value flowchart in rattan sector**

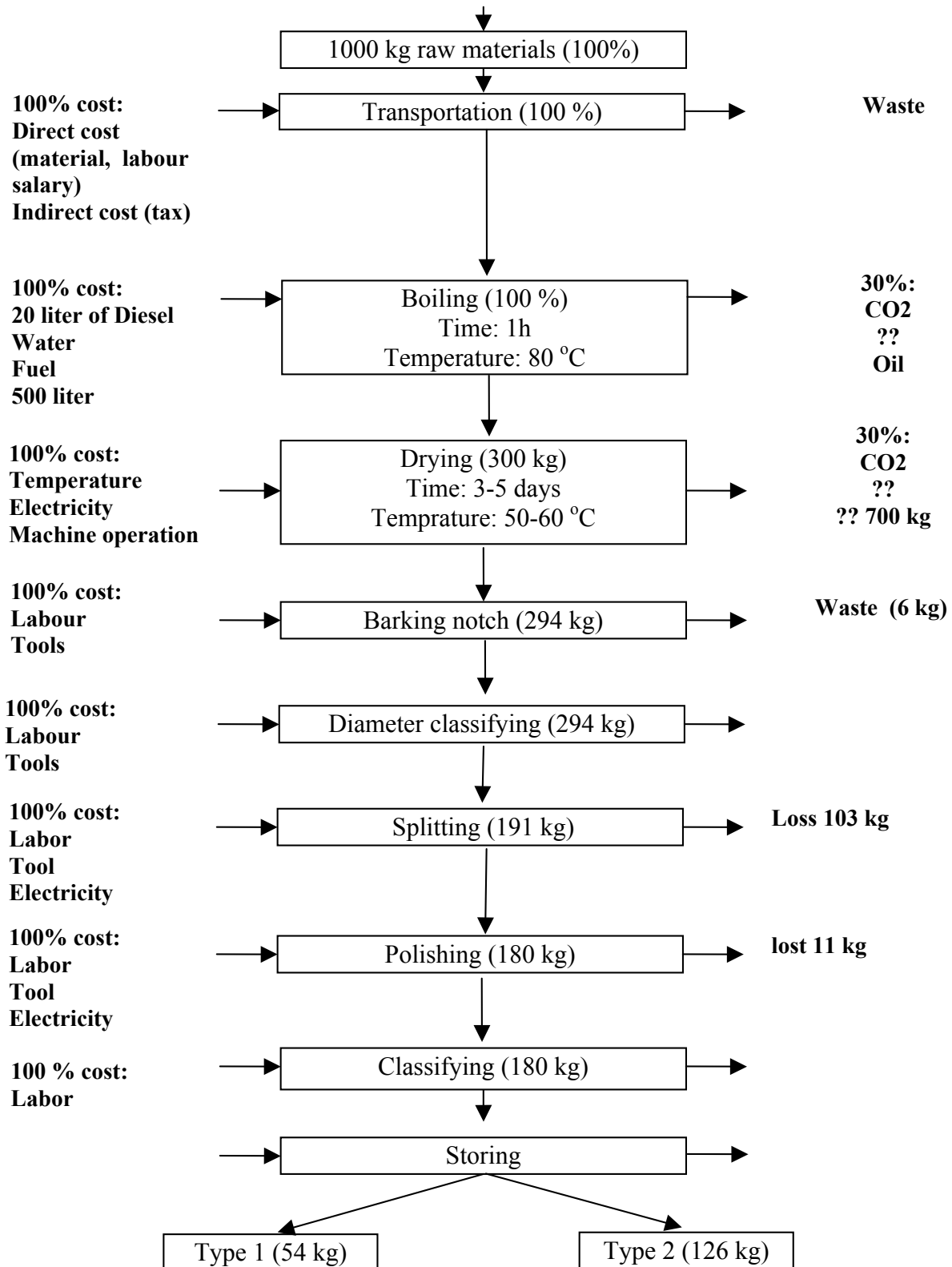




**Detail flowchart of *C. tetradactylus* Hance**



**Detail flowchart of Calamus armarus Lour 1**



**Detail flowchart of Calamus armarus Lour 2**



(a)



(b)

**Figure 1.** Natural rattan: garden rattan (a), forest rattan (b)

According to the quantitative data about the areas that have potentials of rattan exploitation, the rattan amount of Vietnam was 381.936 ha in 2005 (source: Ministry of Agriculture and Rural Development), in which the sea-coast of northern middle area, including Thua Thien – Hue, Quang Tri, Quang Binh, Ha Tinh, Nghe An, and Thanh Hoa is of greatest amount with the area of 180.270 ha. The above figure shows that the potential rattan amount to be exploited is about 36,510 tons nationwide with two dominated species of *C. tetradactylus* Hance and *Calamus armarus* Lour while the demand of rattan is more than 100 thousands of tons

*Unit: ha*

	North West	North East	Sea-coast of Northern middle area	Central Highland	Sea-coast of southern middle area	Total
Natural rattan			201.076		180.000	381.076
Grown rattan	40	550			270	860
<b>Total</b>	<b>40</b>	<b>550</b>	<b>201.076</b>		<b>180.270</b>	<b>381.936</b>

*Source: MARD, provincial statistics – May 2005*

MARD has approved NTFP (non-timber forest product) preservation and development Plan to the year 2010, in which the area of cultivating and developing rattan to the year 2010 is 740.000 ha (double the current area) with five main cultivating areas are: North-west, North-east, sea-coast of Northern middle area, sea-coast of Southern middle area, and Central highland (to the decision 2242 /QD-BNN-LN on August 7<sup>th</sup> 2007). However, in recent years,

the area of rattan newly cultivating and protecting is not much, the increasing amount can not compensate the exploited one. It can be concluded that the current rattan amount is less than the one in 2005 – the year that MARD approved that plan. On the other hand, the demand for rattan increases 8-12% annually.

The area of rattan traditional resource is gradually exhausting. Natural rattan species of high commercial value are mostly of extinction or of high price (if existing). *C. poilanei* Conrard and *Calamus rudentum* Lour are scarce and have prices of 30-40 VND/kg (August 2009). The main rattan resource is imported from Laos. However, at this moment, Laos Government has forbidden exporting materials and issued quota for exploiting as well as restricted harvesting time according to seasons, therefore companies have to preliminarily process, cut into demanded dimensions and export. Due to these above difficulties, the amount of imported is rather limited. Naturally, white rattan species has degraded, so the mostly used is *Calamus armarus* Lour (red rattan) exploited from middle area. These species have high water content that raises transportation cost and high grey matter content that requires a lot of treating chemicals. However, *Calamus armarus* Lour has high growing speed, can be concentrated grown or delineated in a natural forest to cultivate. *Calamus armarus* Lour has gradually replaced *C. tetradactylus* Hance in the applications that do not require much flexibility due to its 50% lower price. In this context, the problem is the remaining situation of illicit rattan export, creating difficulties for the supply for processing companies and raising the speed of natural rattan exploitation

The scarce and price raising of materials has created the potential for cultivated rattan market, which *C. tetradactylus* Hance and *Calamus armarus* Lour are popular. *C. tetradactylus* Hance is often white and is cultivated successfully in Thai Binh, Yen Bai, Ha Tinh and Thanh Hoa. *C. tetradactylus* Hance K83 that is now very popular, with standardized cultivating and caring technique, is a good choice for rattan producers. In some places in middle area, local people begin to grow concentratedly *Calamus armarus* Lour. Intensive rattan cultivation with different models is of many farmers and locals' attention

Among cultivable rattan species, breed choosing and caring techniques are just finished with K83. However, there still remain many different professional ideas about cultivating density which varies from 20.000 - 50.000 trees/ha. With other rattan species, breed choosing and caring techniques are just in the first steps.

Monoculture or polyculture model applied with Garden – Pond – Cage or Garden – Pond – Cage – Forest model is a potential which needs more investigation, calculation and standardization before advising the farmer to grow on a large scale. On CP view, we recommend the model of Garden – Pond – Cage or Garden – Pond – Cage – Forest because the emission amount of CO<sub>2</sub> and CH<sub>4</sub> is low. Even if the process is properly done, there is no emission of these green house gases, as well as the chemical fertilizers used for other agriculture applications is decreased. In addition, the products that are produced along with rattan, like fishes, cattle, poultry, and food or medicine plants are also a considerable source of income. Mr. Tran Quang Ngo in Cam My, Cam Xuyen, Ha Tinh informed that in 2008, for 1 ha of GPCF, he got 120 million VND profit and created jobs for 10 labour with the

salary of about 1.2 million VND/month. However, before duplicating this model, there needs to be the survey about rattan adaptation, choosing breed and plants to grow with, as well as domestic animals in farm.



**Figure 2:** (a) Rattan core that has commercial value

(b) Biomass from the correlative rattan peels and leaves

(b) Biomass from the correlative rattan peels and leaves

Great amount of biomass after rattan core collecting and in the caring process is wasted. Great amount of biomass after rattan core collecting and in the caring process is wasted. According to our research, the ratio between rattan core that has commercial value and the remaining biomass ranges from 1:6 to 1:8, depending on the species and regions. This left biomass can be used to manufacture compost. However, only the model applied in Mr. Ngo's farm can successfully manufacture compost that fertilizes back rattan and other agricultural plants. In Thai Binh, local people mix rattan leaves with lime to make fertilizer. However, this method is improperly done and is of low efficiency. According to our calculating, the wasted biomass (83-88% total amount of received biomass) can create the amount of fertilizer not only sufficiently served for rattan but also for many other purposes. In environmental point of view, heaping up rattan leaves in winter as in Thai Binh can emit  $\text{CH}_4$  that causes green house effect 21 times higher than  $\text{CO}_2$ . Drying and then burning rattan like what local people in Thanh Hoa often do can cause  $\text{CO}_2$ .

All rattan models have demonstrated their economic as well as social effects. Cultivating rattan is also environment-friendly, with much lower amount of chemical fertilizer used in comparison with other agricultural plants and can be replaced by compost. The amount of pesticide used is also low and just put down the germinated ones. With these above benefits, growing rattan to compensate the exhausting forest rattan should be encouraged. During our investigation, many locals as well as companies express their desire to invest in this plan.





**Figure 3.** Mr. Ngo's farm

As having mentioned above, optimization and standardization of these models are very important. Some problems need to be solved right away, including:

(1) – Utilizing the wasting biomass: even in Mr. Ngo's model, there is a lot of rattan being wasted. The measure of usable biomass is being experimented. Compost manufacture technique also needs to be improved to reduce the usage of cattle manure (200-250 kg/ton of manure). There need to be some researches on the ability of combining rattan leaves and straw, stubble, husk or agricultural waste.



**Figure 4.** Utilizing biomass to make compost



(2)- Interpolating, cultivating medium, and kinds of cattle, poultry, maritime breed that can be combined with rattan: Plants and animals which are of high commercial values and suitable with soil and weather should be chosen. However, this is out of the project, so other projects or organizations need to be found to support the farmers. At present, Vietnam Rattan Network has been established and got some impressive initial activities. This may be a reliable source of experience and expertise. It is expected that the problem will not just end at “what to be cultivated and what to be reared” as in this preparation report.



**Figure 5.** Cultivating plant and breeding farm, fish pond

(3)- Rattan species: there needs to be more researches and development of consultancy services for the farmers about variety of rattan species. Presently, there are only *C. tetradactylus* Hance (mainly K83) and *Calamus armarus* Lour being grown on large scale. *C. tetradactylus* Hance is very environment-friendly as it is naturally white and flexible that needs no more boiling or bleaching. *C. tetradactylus* Hance also owns a high commercial value as well as high compatibility with different precipitation in Red River Delta and northern middle area. Cambodian market also has a high demand for *C. tetradactylus* Hance sheets to cover chairs. Meanwhile, *Calamus armarus* Lour brings high productivity, and it has grey colour and lower flexibility. Therefore, they must be boiled and sometimes be bleached. These processes cause impacts on environment and harm to human health. These problems can be solved by developing products with natural colour that needs no bleaching. On the

other hand, *C. tetradactylus* Hance can grow well in floody area and can be immersed in water up to 3 months. This characteristic is very suitable for riverain or inshore area to eliminate the rain's damage.

4)- Harvest: Harvesting technique for cultivated rattan, which occupies  $\frac{1}{4}$  selling price (1.700-2.000 VND/kg) also needs to be completed. With high density (20.000-50.000 plants/ha) and thorny characteristic, the exploitation is rather difficult and low efficient. The tools and techniques used are not entirely the same. In some places (Thai Binh), fully grown plants are massly cut and pulled out of the bush to be peeled while in other places, they cut the foot of these trees and wait for 1 week when rattan is withered, rattan arms do not hang tight to the cultivating plants to pull out of the bush. Advancing the cutting and peeling tools can improve considerably efficiency as well as working environment. The unstandardisation of rattan age to be exploited also affects quality, durability of products, recapture ratio of semi-products (post-splitting, sizing) and the chemical consumption in boiling and bleaching processes



**a**



**b**



**c**

**Figure 6.** Tools for harvesting rattan a, b - harvesting cultivated rattan in Thai Binh  
c - Harvesting natural rattan in Thanh Hoa

Delineate area to cultivate rattan is necessary due to the increasing demand and the decreasing source. Nulgar bamboo has been used instead of rattan in some products. Many companies in Ho Chi Minh City have changed rattan materials into combined materials, like rattan – bamboo, rattan – water-fern or even replaced rattan. The pity is that growing time of this species is long (at least 9 years) so not many people dare to grow on large scale, but just in experiment.

With forest rattan, there is no technical guideline for harvesting, as well as no technical standard for the materials being purchased and sold in market. Consequences are: harvest of immature rattan, mixing species of different commercial values, even the most critically, exhaustion. This degrades forest, reduces the ratio using in products as well as quality and value of next processes. Never have we found out any documents guiding farmers in harvesting rattan from forests or gardens.

## 2.2. Transportation



Figure 7. Preparing rattan for transportation

Water content (moisture) in rattan materials to be transported is very high, which is about 65%. Therefore, from 1 kg raw materials, only 280g dried thread is collected. This increases costs of transportation and waste treatment and at the same time, decreases quality of materials due to mould and wood eater.

Basically, 2 main means of transportation are road route and water way. Only rattan from headwater is transported by waterway which is of low cost. However, rattan will be dirtied by



alluvium and grey matters, which would cause an increase in the cost of labour and water consumption after boiling process. The more popular transportation is road route.

To reduce transportation cost, rattan should be processed right after harvesting: boiled, spitted, sized, dried, and then transported according to orders. This can also reduce waste, overhaverst as well as increase profit for the whole sector. However, due to weak information exchange and purchasing-selling relation, weak technological and financial capacity of haversters/growers, dispersedly material sources, preliminary processes are done by collecting companies.

A transaction system based on the rattan's length rather than weight can be a basic solution to this problem. On the market point of view, customers just pay for the products regardless of the weight. On the manufacture point of view, cost identification basing on rattan's length is the most suitable. This calculation is towards the transaction basing on quality and quantitative rather than weight and qualitative.

Unfortunately, when exporting, most (if not to say all) companies use the intercom of FOB (Free of Bank) - but not CIF (Cost-Insurance-Freight), so their attention can not be over the "port". All expenses relating ship renting, insurance, packaging tax are responsible by importing partners. However, the importing partners can make use of this reason to put impressions of ship, packaging time and standards that cause increase in cost for companies. If the intercom is changed into CIF, the companies can benefits from considerably increased profit as well as improved negotiation position

### 2.3. Oil boiling



Figure 8. Oil boiling

Materials can be boiled in diesel, vegetable oil in which palm oil is the most popular. Diesel boiling affects badly on the environment as well as labour and local communities. Some

companies do not use chemicals, just only water. After wholesaling, the customers, like from China will reprocess. Au Co Company has succeeded in boiling with the mixture of vegetable oil and salt instead of diesel. However, there is no information about from which tree is the oil extracted.

Best time for boiling is when rattan is still raw due to its high quality. However, the boiling time is longer and chemical consumption is higher. Therefore, it is best to boil material at source. As having mentioned in 2.1.2 sector, raw materials raise the weight 3 times higher. In the companies that run business on materials, due to long transportation distance and hot weather, rattan can not always be boiled timely.

Diesel ratio varies from 0% to 50%, depending on the usage purposes: with commercial purpose, low ratio of diesel can be economical and eliminate the quality loss while high ratio with longer boiling time can achieve higher flexibility and ability of anti-mould and anti-wood eater.

There is also no standard for boiling equipments. The best tool observed in the survey is in Nam Phuoc with cylinder bottom, roof, water circulation and extracted palm oil. However, this equipment can be further advanced as the oil stuck to the material after boiling is not recovered, the roof is improper so rain can easily attacked and firewood needs to be additionally used. In many companies, stainless steel boiling equipment is uneconomical because the oil itself is stain-proof.

There needs to be a standard process with specific requires and technical parameters: temperature, boiling time, chemicals, ratio, ways of mixing and pouring into boiler – changing remedy when there is a change of materials, measures, standard drawings of boiling and auxiliary equipments, material moisture, worker's posture...

Vietnam Cleaner Production Centre has corporated with Polymer centre of Hanoi University of Technology to experiment the boiling method combining soy-bean oil and salt. This experiment is successful in the laboratory and is ready for industrial piloting. The experiment can be executed with existing equipments in the companies. Proper and standardized boiling equipment system will be designed, experimented and transferred during the CP assessment. This technique and equipment allows boiling rattan circulatedly without creating waste water as well as oil waste. Therefore, there is no need for waste treatment system.

#### **2.4. Preservation/storage:**

Almost all of stores in the companies are dark and hot. Nam Phuoc and Ngoc Dong, 2 leading companies in the centre of middle and northern area, seem to be the best. Because rattan is easy to get moldy at high moisture, companies often use sulfur to conserve that causes choke and harm to worker's health. There are other techniques to prevent mould and wood-eater but none is cheaper than using sulfur. In the context of price competitiveness, small and medium-sized enterprises must carry out the economic solution, regardless of health affect. All of companies being surveyed in the north and middle area need to use sulfur with different ratio.

There is no shelf as well as the capacity of drying that can remain moisture is low, the quality of materials and products is often reduced and lost.



**Figure 9.** Proper lighting design

Natural lighting and ventilation is very necessary. However, it must be carried in the right way in order to avoid heating the store too much. Some companies place lighting sheets incorrectly and have to cover or paint the sheets to avoid heat and direct sunshine. Light-getting sheets should be placed on the corners of the stores with the direction to avoid direct sunshine (north and south direction), dust (placed straightly or with high slope) and at the place suitable for cleaning process. Smart lighting sheets that can filter ultraviolet rays are the best choice if possible. Lifting doors for lightning and ventilation can avoid raindrops is also a very good solution (see the picture). Combining well natural lighting and ventilation can not only reduce lighting cost but also maintain the moisture, which is good for preservation.

Rattan cane needs to be leaned in the stores and avoid direct contact with the roof while rattan is hung in the shelves of 60cm above the roof.



**Figure 10.** Rattan preservation/ storage in Laos



## 2.5. Drying

This process is often done after boiling and bleaching. Companies often use natural drying. Drying is often used when natural one can not be applied due to dissimulates in weather and field. Presently, rattan splitting and sizing companies have an abundant amount of crushed rattan that brings available fuel resources. However if these resources are used in processing new products, there would be a short of materials in the companies.

Main problems of this process is designing drying field and suitable working tools to improve the efficiency of natural drying as well as reduce working intensity and spilled materials. This is important to the north and northern middle area where the time of drizzling rain and humidity is long.

The amount of waste rattan thread, crushed bamboo or wood used as fuel can be most effectively used with a boiler of suitable capacity. Steam can be used for bending, carbonization while waste heat can be utilized for drying or other applications that need low moisture like in the painting room and stores.

The most sustainable solution is drying by solar energy in drying fields that have covering roof making use of green house effect. There needs more experiments to get standard design in order to avoid investment risk for companies. At present, the project is implementing this design and experiment.



**Figure 11.** Natural drying (a), drying chamber using secondary solar radiation (b), drying room (c)

## 2.6. Splitting and sizing



(a)



(b)



(c)

**Figure 12.** Prepare rattan for splitting (a), splitting (b), sizing (c)

This is the most important process to increase the value for rattan sector. According to the data collected from companies, the usability ratio of *Calamus armarus* Lour (dry semi-products) from 100% raw materials is 10% rattan outer layer; 12% rattan core; 8% waste thread; crushed rattan because of being too old or too young; 70% lost quantity is evaporating water and spilled materials. With *C. tetradactylus* Hance, the relative ratio for rattan outer layer is 8-12%, rattan core is 10-15%, and crushed thread is 5%. The crushed thread from splitting and sizing can be used to produce other products. Moreover, they are now very suitable for natural dyeing which is very popular in developed countries. The



problem is that our companies mainly process according to the customers' orders and have no initiative in developing and consuming new products.



(a)

(b)

**Figure 13.** Rattan splitter (a), sizer (b)

With some special products or for the households that can not afford new equipment, splitting and sizing may be often done manually. The ratio of recovering manual splitted materials is very low, only 50% while the efficiency of the machine can be 10 times greater.

The outer layer of *Calamus armarus* Lour is hard, polished and does not have so high value as the core and is seldom used as materials. The problem is thought to be product design. For example, IKEA Company has developed a chair design from rattan's outer layer.



**Figure 14.** IKEA's rattan chair



**Figure 15.** Broom made of rattan's core discharged after sizing

Survey shows two main problems:

- 1- Splitting and sizing cutters: materials and technique for manufacture these cutters have not been studied. Domestic manufacturing companies just base on the Taiwan design. Comparison in Cambodia shows that Vietnamese cutter is the cheapest and most abundant one, however its durability is lowest and polish of the surface of rattan semi-products is also lowest. It is easy to understand because they are made from automobile lab axis steel, which is just ginned but have not been forged with rather different chemicals in different axis. Forging steel before shaping (lathing and cooling) can prolong the cutter's age and reduce splitting and sizing cost.



(a)

(b)

**Figure 16.** Splitting cutter: new cutter (a), spoiled cutters (b)

- 2- When weaving, the thread needs to have an even section, therefore, sizing is necessary. A lot of crushed rattan is produced in this process. In addition to using this crushed to produce new products, can be used to create rattan thread for weaving. Of course, there needs to build the market for this kind of rattan thread. Presently, the similar products made by rattan core, sedge, forest ropes or hemp rope are very popular.

## 2.7. White and grey bleaching

In fact, the survey of some companies shows that there is no need to bleach. The reason for white and grey bleaching is creating additional flexibility, steady color or white color depending on the requirements of customers (primarily client companies). Another reason for bleaching may be in the previous boiling stage, rattans do not reach enough flexibility for weaving.

One company in the North has following ratio of bleaching chemicals:

Snow whitening process (whitening):

$\text{NaOH}/\text{H}_2\text{O}_2/\text{silica}/\text{H}_2\text{O}/\text{rattan} = 6\text{kg}/22\text{kg}/11\text{kg}/200\text{ litre}/150\text{kg material}.$

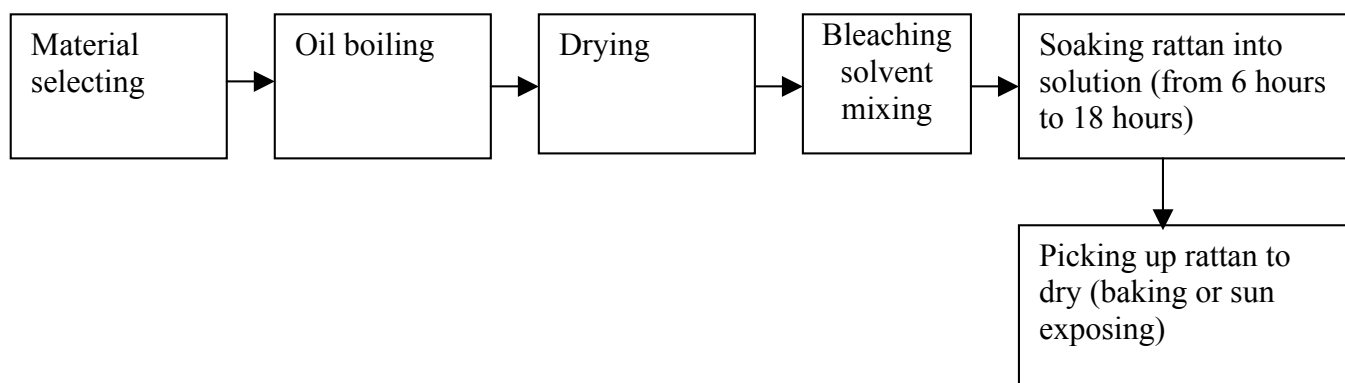
Immersing time from 12 hours to 24 hours

Ivory-whitening (grey bleaching):

$\text{NaOH}/\text{H}_2\text{O}_2/\text{silica}/\text{H}_2\text{O}/\text{rattan} = 4\text{kg}/15\text{kg}/6\text{kg}/200\text{litre}/150\text{kg material}.$

Immersing time from 12 hours to 24 hours

The diagram of whitening rattan is described as follow:





There is no standard formula for the amount of used chemicals ( $\text{SiO}_2$ ,  $\text{NaOH}$ ,  $\text{H}_2\text{O}_2$ ), how to prepare or to pour into bleaching tank. And there's no standard design for bleaching tank, operation process or technology. Most companies said that it was the result of learning from each others and self-study to have current techniques, equipments and experiences.



**Figure 17. Bleaching**

Main impacts of this phase is using too much water, after whitening and washing, wastewater consisting of alkaline and liquid glass is mainly discharged to the environment. As having mentioned, only some big companies have wastewater treatment system while the rest (the major) do not.

The main problem caused from atomic oxygen, which is a strong corrosive. Workers in this phase often expose directly to the gases from whitening tank, even to the hands' skin during whitening.

There was some units applied whitening technique using a chemical named "oxcilic". However, this technique is gradually lost in oblivion, and this chemical can not be found on the market.

The best solution for whitening is properly processing materials right from boiling phase to ensure the flexibility, toughness, and avoid grey cleaning. Moreover, the awareness of manufacturers and consumers need to be changed towards the products that use less chemicals and more environment-friendly.

## **2.8. Washing**

After bleaching, rattan is washed in ponds, rivers or by nozzles. The best ways are using cascading pools and high pressure nozzles, but none of enterprises has applied them. These can save a lot of water.



**Figure 18.** Washing rattan by nozzles, waste water

Another reason for washing materials is due to contaminants during river transportation. Notable point is that rattan is often washed after being boiled. Almost no enterprise has a wastewater treatment system. In many households, the washing water can spill, even suck into well.

## **2.9. Preservation using sulfur:**

Sulfur is used for treating insect, fungi, mould, and wood eater. A small amount of sulfur being burned in a closed room is very effective for material preservation, especially in the humid environment. This is a simple and cheap solution, so it is the choice of many small and medium-sized enterprises, applying for all phases from materials to finished products. When combining with the moisture in materials,  $\text{SO}_2$  is believed to become an acid that can whiten and make the rattan more flexible. However,  $\text{SO}_2$  is very harmful and unpleasant which can affect the health of exposed people. Many households make canvas to execute sulfur drying right in the house's lean-to and rattan remaining sulfur smell is brought into home. Due to livelihood and lack of knowledge, people regard this harm. The amount of sulfur changed according to weather condition and companies, from 4-30kg/ton of rattan. Note that sulfur is also used for conserving bamboo, water-fern and even Chinese traditional medicine.

Survey in some leading companies shows that it is not necessary to use sulfur for preservation. The new boiling technique (in 2.1.3 section) allows good rattan preservation as boiling with diesel. Through some experiments, as long as the humidity is under 15%, there is no fungi and mould. However, the dry materials need to be immersed in water before weaving to gain necessary flexibility, and this is also one of the reasons why sulfur is used.

Drying by biomass fuel (waste rattan, bamboo, crushed woos), utilizing waste heat from boiler, or using solar energy are the alternatives for using sulfur. Note that sulfur is in the blacklist of forbidden chemicals in Europe and America



**Figure 19.** Preservation using sulfur





**Figure 20.** Burning sulfur in store

## **2.10. Processing (bending, frame making, weaving, finishing)**



**Figure 21.** Processing

In this stage, the main interests are training workers, normalizing processes, quality control, 5S, safety, ventilation, thermal isolation and lighting. Labor productivity and quality depend a lot on skills of workers, working position, working conditions (lighting, temperature, air). Using fixture, frame can improve considerably working efficiency and product quality. In addition to improving working efficiency and product quality, other main potentials for CP in this phase are improving working environment; avoiding occupational diseases; and minimizing material, gas, glue damage and spillage... Its weak point is high transportation cost, if the management is not good, the re-processing cost will increase.

Many enterprises apply the models of renting trade villages at home; suppliers for rattan materials, frame (tables and chairs); quality control; design provision; and training support. The advantages of this model are no need for big workshop, protective clothes; reducing training cost, insurance cost (a serious pressure for industrial enterprises). Disadvantages are much transportation, and high treatment cost due to bad quality control.

### 2.11. Surface finishing (painting, carbonization, dyeing)



**Figure 22.** Burning fabrics



There are 3 types of surface finishing (painting, carbonizing, and dyeing), then it could be painted with colorless PU to preserve the internal dyeing layer.

a- Carbonization: Carbonizing is the most economical method; the product surface with good aroma will have brown natural color which is very durable. The nature of this process is the transformation of pentose (burned), which wipe out the insect species, and the insect eggs when in rattan body have no food to live. The products are put into a hermetic sealed device with steam pressure at 3 atmospheres in 45 - 60 min. This method is friendly for environment and safe for the packers as well as users. According to the data provided by companies, the products finished by carbonization occupy 30-60% total products.

The weak point of this method is high investment cost, about more than 1 billion VND. Recently, Vietnam National Institute for Mechanical Engineering (NARIME) has proposed the mini system of boiler and carbonization chamber with the cost of just 25% of current systems in use. However, this new system needs more time to design, manufacture and experiment.



**Figure 23.** Carbonization, painting, dyeing

Strong point of carbonization is no usage of chemicals and the utilization of waste rattan, bamboo or crushed wood. This technology is very suitable for processing food containers.

b- Painting or lacquering: is the surface finishing by some normal paints. This phase produces much waste solvent, dye-stuffs and affects to the workers' health. The companies do not have proper equipments to absorb extra paint in the air. Few of companies equip painting system with water filter, however, the maintenance and continual operation of this system is not reliable. The environmental weak point of this stage is that the paint used for the product is less than the paint discharged and in the long term, wastewater treatment needs to be invested. Beside, customers in developed countries do not like painting other than natural processing. According to us, only some water-based paints that create transparent layers and being allowed to use for exporting should be applied.

c-Dyeing: Dyeing by water-based solvent combined with pigments occurs at high temperature, dipping in about 5 minutes can make many different colors. Chemicals used are mostly Chinese textile dyes. Some units (the information is from Ngoc Dong) use pigments from Thailand, which are considered to have natural origin. This technology is cheap, fast,

high productive, creates the variety of color, but it's not color-fast with rattan outer layer (peel) difficult to stick. The rate of dyed product in the enterprise's product basket is small.

Natural dyeing can be a priority in developing new products towards high-class markets. Vietnam cleaner production Centre (VNCPC) and Vietnam Glimpse Co-operative has successfully experimented 10 natural pigments from available vegetables. However, to meet the requirements of capacity, colour uniform, and colour remaining, there needs to be more time applying and experimenting.

HRPC (Vietnam Handicraft Research and Promotion Center) and Vietcraft (Vietnam Handicraft Exporters Association) import 34 different surface finishing techniques. Many companies want to learn and to transfer these technologies. However, there's still not clear the environment impacts, investment requirements and the market for the above techniques. The detail information and some transfer tests selected according to the enterprises needs can be a reasonable start.

## **2.12. Packaging**

Small-diameter rattan is a natural material with good mechanical properties, able to bear the physical impacts, light and not unhealthy. Wastes in rattan product transportation for the export markets mainly are the unused spaces of all containers and trucks, taxes on packaging materials: paper, plastic-nylon. There are some products designed for packaging and transportation: can be put closed to each other or can be folded. These products are not only long-lasting (not easy to get fractures, scratches), but also reduce the cost of transportation and packaging.



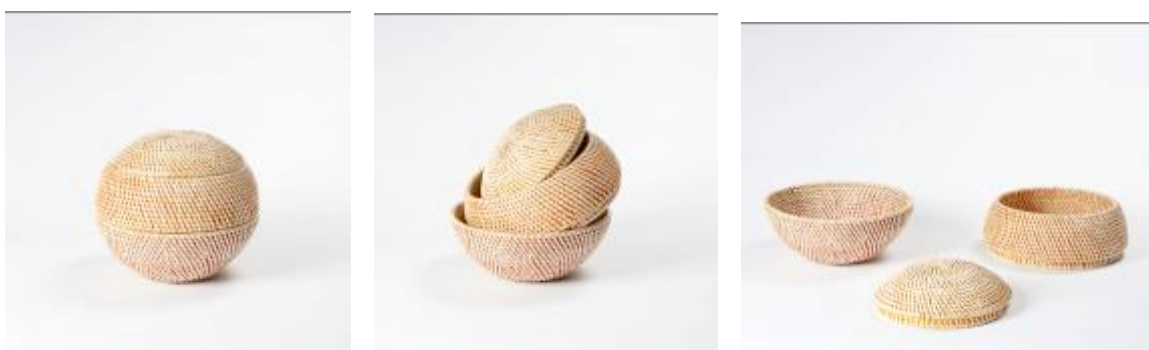


**Figure 24.** Ways to save transportation room in packaging

Vietnam has a variety of available plant material (straw, rice stubble...) that can be used as packing which decreases impact in packaging. However, these materials are not approved by foreign inspectors as we have not got the technology of mold and insects treatment. This is a potential for future applications, but because of the time and the resources of the project it is difficult to become a reality in the framework of the project.

### **2.13. Designing and developing products**

It can be said that this stage is the most potential one. According to Vietnamese Rattan Network (VRN), the cost of Vietnamese rattan products only equals to 40-50% of the cost of the same product in the Philippines. The reason is that we only process orders; design stage and product development have been neglected for too long due to no investment in personnel training. In the Philippines, each company has a product-designing department, while even our biggest companies do not have an acceptable one. Even the knowledge and vision of the enterprises on this issue are still limited. In fact, this is the problem of not only rattan industry, but also the whole society in general.



The major weak point in this system needs a lot of time to be solved. First of all, the heads of enterprises that are satisfied with handling need to change their way of thinking. Next, the must be personnel training infrastructure of a designing industry. Many skills are gradually lost in oblivion with the pass away of old craftsmen while the youth does not pay much

attention to handicraft in general and rattan sector in detail. The reason comes from low income and the concept that handicraft is out of date and just for the old and women. If price is still competed, the income as well as living standards of craftsmen remains difficult.

Making use of the design and marketing of the project and collaborating with the SPIN project begun in 2010 might be a good start.

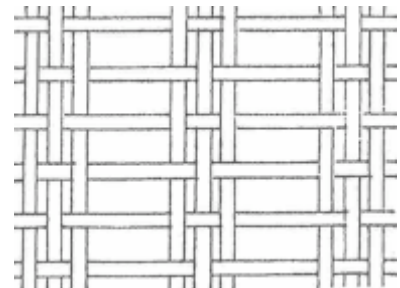
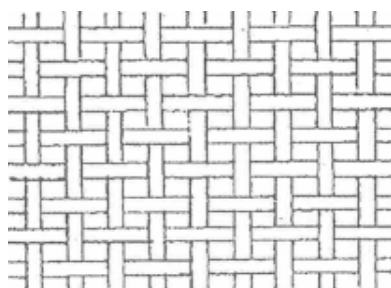


An urgent problem is to develop products using rattan cuttings spun and products using rattan outer layer (may cat). At present, core rattan commodity value is the highest; outer layer rattan only considered to be an ancillary material. To take an example, Nam Phuoc took the initiative in balancing the rate of orders for rattan cores and outer layers, while Ngoc Dong couldn't manage to do that and still has outer layer rattans remainders.

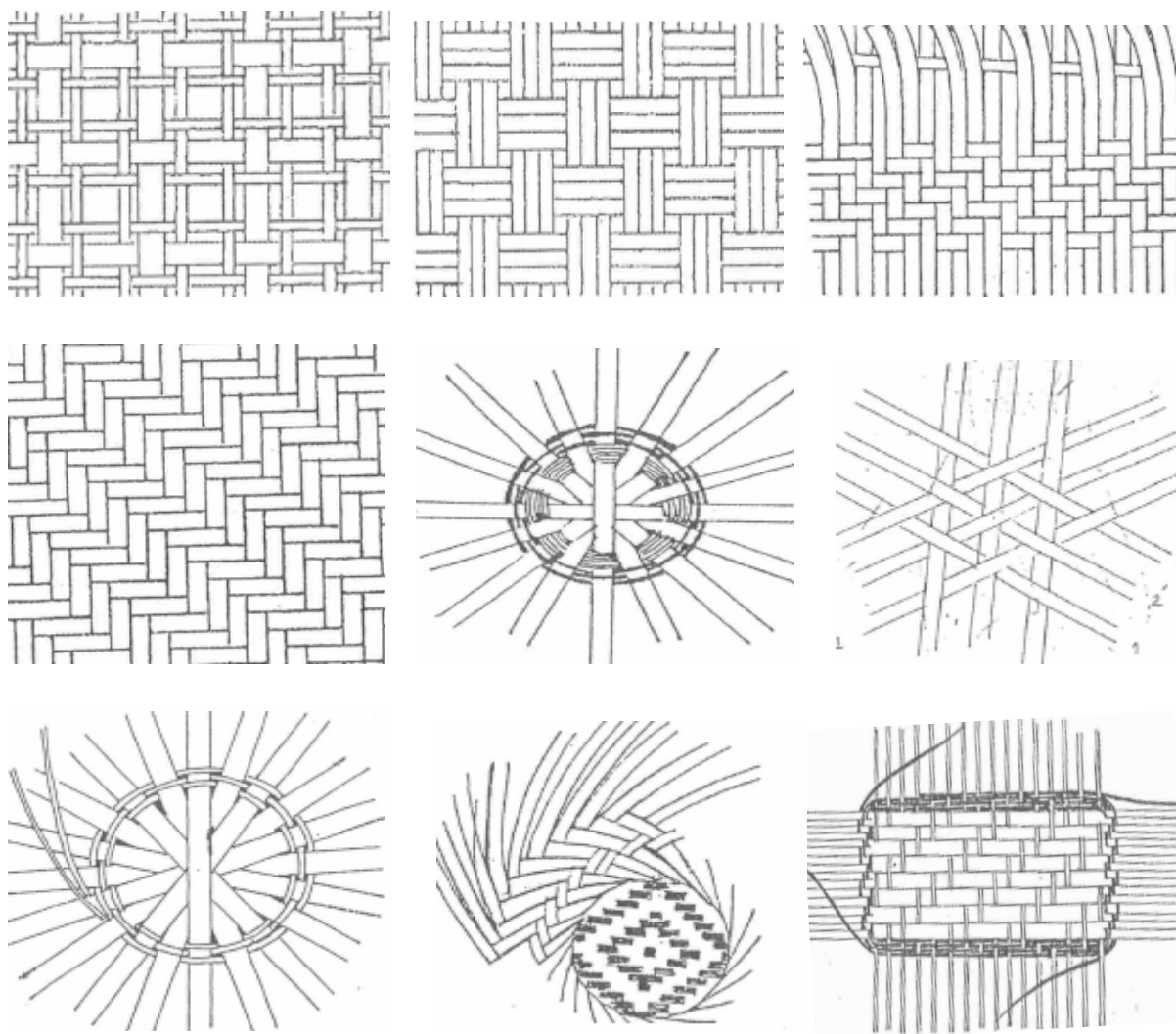
Another solution is to combine all kinds of different materials, including rattans, in new products. Companies in the south are the leading in this direction: their strong points are the products made of water-fern – rattan, forest liana – rattan.

Weaving rattan is one of Vietnamese strength due to the long tradition that has been developed through many generations in Vietnam. In different regions, there are different weaving techniques. There are even some techniques that are speciality of some regions, for examples spitting weaving which is rather popular in Hanoi (Chuong My) and Ha Nam (Duy Tien); double cant, triple cant weaving in Hanoi (Chuong My, Thuong Tin, Phu Xuyen...) or Thai Binh (Kien Xuong, Thai Thuy); trellis weaving; rosetty weaving; diamond-shaped weaving; whirling weaving... are also popular in almost all of trade villages.

### **Rattan weaving styles**







These techniques must use processed rattan (splitted), however, the whole rattan tree can be used to produce many natural products recently with the same techniques.



Weaving using the whole rattan tree – a recent trend

At regional level, there are 9 countries that are manufacturing rattan products with different scales including China, Thailand, Indonesia, Philippine, Myanmar, Malaysia, Laos and Cambodia. According to the researches and observations by many experts, there is no difference in weaving techniques among countries. To be accurate, there is no weaving style that is found in other countries but not in Vietnam. Up to now, Vietnam is the country of

highest productivity of rattan products although Indonesia is the country of the biggest scale of household rattan products (tables, chairs...) following are China and Thailand...

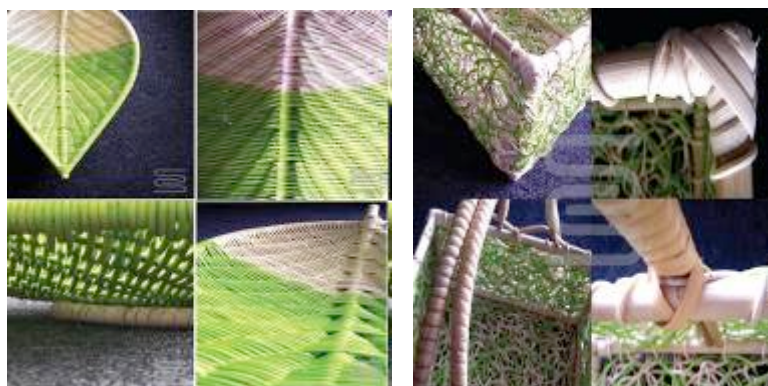
Ranking	Product group	
	Medium and low standard rattan products	High quality rattan products
1	Vietnam	Myanmar
2	China	Philippine
3	Thailand	Thailand
4	Indonesia	Vietnam
5	Philippine	Malaysia
6	Myanmar	Indonesia
7	Malaysia	Laos
8	Laos	Cambodia
9	Cambodia	

However, in term of quality, products from Myanmar are of highest while the Philippine is the most creative in design that many new and strange products are generated with harmonious colour



Myanmar products

Even the tangled weaving that is considered to be the initiative of Philippine like in this Otto chair is not strange in Vietnam as it can be found in Thai Thuy district and Thai Binh city in Thai Binh province



Philippine products

Weaving styles in other countries are all applied and used by Vietnamese craftsmen, but not all Vietnamese styles are found in others. For instance, spitting weaving did not exist, however, through some ways, spitting weaving has become popular in Kwangtung, China in these 3 years with larger scale.

Therefore, difference of design in weaving styles and principles can entirely applied in Vietnam as the craftsmen can easily adapt to new techniques. The problems for Vietnam at present are only design and combination of different weaving styles as there is often not enough market information for Vietnamese craftsmen.

To define the competitiveness of Vietnamese rattan products, some following questions need to be answered:

- Should Vietnam remain to be the country that exports rattan products of lowest quality as present? Should Vietnamese enterprises continue to produce the products of lowest quality?
- Whether Vietnam should follow the trend of Myanmar to pay attention to quality or the trend of Philippine to pay attention on design to produce creative products? Should enterprises follow that direction?

The answers depend much on the decision of each enterprise, and their resources (labor, equipments, technology...) in detail. In the first case, the enterprises will endure great competitiveness from Chinese products that are massly manufactured and other alternative products. In this case, a lot of resources are used (mass production) but the profit value per product unit is not high. In the second case, as the enterprises can create special products with oriented customers are of middle and high class, less competitiveness is inserted on enterprises. The resources are optimized (the product price includes intelligence, creativity...) Some Vietnamese enterprises have invested in Myanmar to corporate with enterprises in this countries to manufacture high quality products and export to countries in Europe, America... some other Vietnamese enterprises recruit Philippine designers to increase the value of products.

Therefore, to innovate/ develop products towards cleaner production basing on new weaving styles, some following things have to be done:

1. Defining and generating shapes for products towards material savings or rattan utilization (for instance, the rattan inside part utilization)
2. Using environment friendly colorant and surface finishing substances (water-origin, natural colorants) to verify products
3. Combining different weaving styles in one product (not to abuse too many styles to make products too complicated and apply "less is more" principle).
4. Praising/ improving the value of weaving styles by using an individual style as an end product/ a furniture decorating things (experiences of Oita district, Fukuoka, Japan). Pictures formed by waste ends, short rattan show not only aesthetic value but also material usage rate.

#### **2.14. Auxiliary system and equipment:**

\* Steam boiler - coal storage - insulation - burning technique - fuel: it can easily be seen that operation and management of these equipments remain many potentials of improvement.



Pilot CP assessment in Ngoc Dong company shows that if all system is optimized: boiler insulation, fuel utilization, burning technique improvement, heat distributing consolidation, waste heat utilization for drying, covering roof building for coal; the fuel can be reduced up to 60%. This is the common situation of all small and medium-sized enterprises in Vietnam, not only in rattan sector.



\* Electricity systems and engines: the potential of saving energy is high by improving grid, replacing too old engines that have been tied for many times.



\* Boiling equipments: section, dimension, water circulation and kind of oil used; design standardization are the problems that need t be solved.





\* Splitter, sizer and cutter: completing operation technique and managing parameters of moisture, rattan age, boiling models can improve much efficiency and quality of rattan semi-products.



\* Carbonizing equipment: product tanker should make full use of volume, insulation, adjust optimal pressure, and time according to different kinds of products. Beside, the mini carbonization system is the long-term and the most sustainable solution for the finishing phase.



\* Drying equipment: design improvement, waste heat utilization, solar energy usage.



\* Waste water and gases treatment: there is wastewater treatment system in some medium and big-sized enterprises. This is a happy signal which shows the companies' environmental commitment. The number of companies that equipped with waste gases and dust collecting system to ensure the working environment is greater. However, treatments of waste water or

gases, like other environmental treatment is not a CP approach in nature. Waste treatment systems require high investment cost, as well as costs of labour, operation and maintenance. Companies have to pay tax for their discharged waste water.

The highest target of the project is a rattan sector without waste water and no need for recovering and processing system, therefore the direct and indirect cost of this phase can be saved. To achieve this goal, diesel, sulfur or other conservatives, toxic cleaning chemicals and paints should be minimized. These are all feasible, but it requires the innovation of the whole system.

### **2.15. Manufacture management:**

Manufacture management in rattan sector is relatively out-of-date. Except for some leading companies that have professional management system, the others, especially small and medium-sized ones seem to be weak. Some companies and households even do not have professional data record, just a notebook recording expenses, receipts, input and output. The use of computer can support unlimited data collecting, recording, storage, and processing. This restriction does not only reduce business efficiency and profit but also increase bad effect on environment

### **2.16. Other CP issues:**

*\* Fixture, working posture*



*\* Glue collecting and catching equipment:*



## **PART 3. ANALYZING THE OPPORTUNITIES AND CHALLENGES OF VIETNAMESE ENTERPRISES IN RATTAN SECTOR**

### **3.1. Analyzing strengths, weaknesses, opportunities and threats of rattan sector**

#### **Strengths**

1. There are enough natural conditions to develop rattan materials in many regions. In addition, Vietnam is the country that has greatest area of rattan in the world; therefore, long-term development strategy can be developed.
2. Price of some kinds of rattan is lower than in Indonesia (*C. tetradactylus* Hance,...). Development of rattan resources is supported by all local governments.
3. Labour resources that are skillful and creative are able to quickly adapt to new technology. Labour cost is cheaper in comparison with other countries in the same region (strength of labour should not be considered as a long term one).
4. There are a lot of trade villages all over the country with abundant labour resource that are always ready for great and long term orders.
5. Many international importers have come to Vietnam to search for products and in fact many agencies and collecting units have been established in Vietnam.
6. Handicraft market is stable and strongly supported by the Government with many different policies. Administration procedures are simplified to encourage import. The accession of Vietnam into WTO has increased Vietnamese position in international market.

#### **Weaknesses**

1. National rattan database is incomplete (lack of resource information) and so are conservation and sustainable development methods.
2. Rattan exploitation and management are very limited. Exploiters are not equipped with enough sustainable management. Strategic resource areas of the country have not been established.
3. Technology and process of growing rattan as well as replanting and protection methods have not been standardized. The best model to optimize the economic effect for rattan planters has not been defined (for example, the encouragement for crop rotations, combination between agriculture and forestry).
4. Rattan breed is lacked, especially the potential ones, like *C. poilanei* Conrard...
5. Land and forest transfer to organizations, households, individuals have not completed in many locals that affects on the planting, protection and breeding of rattan.
6. Forestry encouragement activities are not really deep enough while the technology staff is not enough at local level to support the development of units. .
7. Standards for classifying rattan on the national scale that can be the base for standardization rattan process and management have not been established.
8. Unofficial costs during exploitation and transportation increase cost of rattan material.
9. Labour are not enough for exploitation and harvest according to market demand.
10. Rattan process are not unified, standardized, composed into document and widely spread to meet the demand of quality and economic effects.

11. Factors in the rattan value chain lack of knowledge and information about cleaner production (material utilization, environment friendly techniques...) to improve competitiveness.
12. Information about technology of manufacture, process, and finishing rattan products in the world is lacked.
13. Auxiliary industries (painting, cloth, glue...) are under developed that creates difficulties in verifying products and improving competitiveness.
14. Lack of market information and weak ability of marketing have created difficulties in stabilizing labour (insufficient and abundant due to period) as well as economic benefits of enterprises to maintain sustainable development.
15. The ability of design in enterprises is limited – without effective support from Government as well as from service suppliers in rattan sector. Most of rattan enterprises concentrate on the low and medium-level market with high productivity, high material consumption but low benefit.
16. Management competence of process and export enterprises is limited. Not many Vietnamese enterprises can meet all the requirements of international audit in international retail groups.
17. Cost of international sea transportation in Vietnam is higher than many other countries in the region, especially many times higher than China.
18. Although the connection among factors in value chain has being improved (Vietnam rattan network has been established), there are still many limits, especially the connection between research units and manufacturers to give out the most suitable technology options.
19. A State synchronous management unit at Central and local level in rattan sector in particular and rural sectors in general. National statistics shows that there are 25 provinces have assigned trade village development to Department of Trade and Industry and 38 provinces have assigned to Department of Agriculture and Rural Development.

### **Opportunities**

1. Overall planning for all rattan trade villages in the country to connect with resource area. This is one of the best conditions to ensure sustainability in rattan sector in Vietnam.
2. Locating in Indochina region, the opportunity of Vietnam to corporate with Laos and Cambodia in exploiting and processing rattan is very fruitful. However, at present, many countries, like Thailand and China... has made use of this opportunity, so if we do not have in time and enough policies, the opportunity for Vietnam would be lost.
3. Vietnam is famous as a leading supplier of “clean” handicraft for international market.
4. Demand for natural and environment friendly products is increasing, especially in the great awareness of global warming.
5. Support policies from the State are very good opportunities for Vietnam to develop rattan sector.

### **Threats**

1. In comparison with other countries, Vietnam depends on more big international customers. This is really a threat in global competitiveness. Enterprises have to endure the global competitiveness while Vietnamese competence, like auxiliary industries, business

administration is limited... Therefore, business profit is low, many enterprises even in the danger of bankrupt.

2. Natural resources are exhausting if exploiting plans are not suitably organized. At present, some high value kinds of rattan, like *C. poilanei* Conrard, *Calamus armarus* Lour has decreased at great scale. *C. poilanei* Conrard seems to nearly exhaust in Vietnam.
3. Industrialization and urbanization are so fast that the labour force in handicraft sectors decreases and raises the labour cost.

According to the Report of Policy and Development Strategy Institute of Agriculture and Rural development, after the survey of situation of rattan sector, one of the rather big problems for enterprises is capital. When the enterprises sign a contract, they are just given a part of capital while they have to disburse an amount of money in advance for workers, so the mobile capital is a problem. Almost all of capital is short-term. Although this is suitable for the current status of rattan sector in Vietnam (processing contract according to the customer's order), in term of sustainability, it is very difficult to create sustainable products and markets. The ratio of enterprises that receive loans is also not the highest with long-term capital, only under 5% asked enterprises [2].

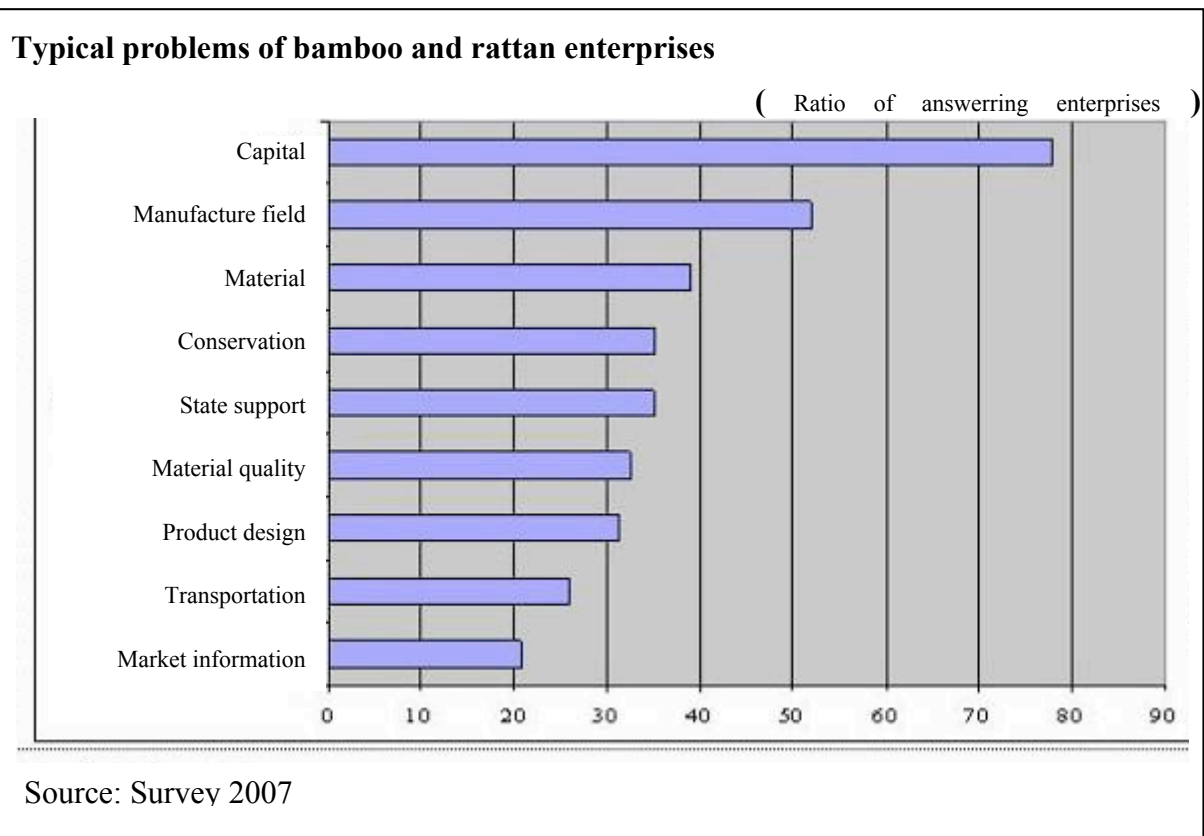
**Table 9.** Credit accessibility of enterprises

Kind of credit	Household			Enterprise		
	Number	Ratio (%)	Loan (million of VND)	Number	Ratio (%)	Loan (million of VND)
Short-term (less than 12 months)	22	40.7%	159.0	11	47.8%	1288.6
Middle-term (1-3 years)	7	13.0%	59.3	1	4.3%	7000.0
Long-term (more than 3 years)	2	3.7%	215.0	1	4.3%	200.0
<i>Source: Survey 2007</i>						

Material shortage is one of the most difficult problems with rattan enterprises in our countries. Approximately 90% of current rattan material in former Ha Tay province depends on the provision from other provinces that the transportation and negative costs are high, resulting in high material cost.

The ability of market explore, brand development, trading promotion of enterprises are weak. At present, most of Vietnamese enterprises copy the foreign designs or process for foreign groups, so the price is squeezed. The participation of enterprises in fairs and exhibitions both at home and abroad is limited as the financial support is not high [2].





**Figure 29.** Concerning problems of enterprises

### 3.2. Options to improve operation efficiency of rattan enterprises in Vietnam

Through the analysis of development status of rattan sector and its factors, especially small and medium-sized enterprises, some following options are generated:

- Surface planning of rattan enterprises:

Firstly, land planning (if any) must be reviewed and adjusted; otherwise, new land plan must be developed; methods to change land usage purposes must be approved by authority level. Only by good planning adjustment can the land for rural industrial development in general and for rattan sector in individual be defined. Basing on that, plan for using land and detail methods of land clearance can be drawn out. Policy that supports for surface planning for rattan sector must be equal to that for industrial zones. For the focal rattan zones that includes many rattan enterprises, there needs to be the support from districts and provinces to build some basic infrastructure such as traffic system; electricity, water supply system. Construction and development of rural industrial zones must mobilize the community strength and apply the joint stock model in investment and exploitation. Local government and enterprises can discuss to find out methods of effective investment and usage, avoiding losses of national and social resources. With the locals whose fund is limited, enterprises must be supported to build a professional product treatment area that ensure the hygienic and trade village environment.

- Improving vocational training and developing a craftsmen force for trade villages:

To avoid the labour competitiveness between rattan trade villages/enterprises and other sectors, training for labour should be prioritized and improved. Enterprises must be aware

that training labour is a frequent activity, not just some sample trainings like what they have done. Only skillful labour can be responsible for big and valuable orders. Trade villages and enterprises should review and evaluate accurately the quality of confidential labour force to develop long-term training plan for labour force. First of all, a force of crowded and skillful labours should be established. Craftsmen force is responsible for designing as well as training for next generations. In the coming time, authority offices should consider and recognize the artist title for qualified labours. In fact, the State has issued decrees and guidelines to recognize trade villages and artist, but the implementation in local is still very slow with little support and investment. Provincial support budget should be combined with that of communes, districts, and enterprises to increase the investment for training the labour that are going to work long term in this sector.

- Supporting enterprises to build material areas:

Government of province and district level create the best conditions and supports for the enterprises to cooperate to build up material areas (stable and long-term forestry land transfer, participation in forest planting projects). Material areas in locals should be established through the planning of land for growing rattan, bamboo, neohauzeaua; technical, and investment support for units, and household that plant rattan material in forestry potential regions. In addition, product design should be developed using available materials in locals.

- Facilitating rattan enterprises to access credit fund from banks:

Purchase contract that are approved are the one with high value mortgage asset in credit loans. Renting land of the enterprises is considered and used as a high value mortgage asset in credit loan. Members of handcraft associations are guaranteed by the associations for loans. In the future, there may be some capital support channels for enterprises through the development programmes of sector associations or rattan processing unions.

- Supporting enterprises to develop markets:

Necessary financial support should be provided for the enterprises to take part in the exhibitions and fair both at home and abroad. Through the fund of industrial encouragement, enterprises managers and artists are supported to learn experiences, search for new markets and develop current markets in foreign countries. Sector associations and organizations should be given financial supports to develop system of market information, product development program as well as information dissemination to rattan manufacture and enterprises.

- Encourage the corporation among enterprises to improve competitiveness:

Common competitiveness and tax payment should be established through assessing, classifying enterprises, registering for the unregistered enterprises. Local government should facilitate for the small industrial cooperatives, groups, and support the surface, credit investment, tax preference... for newly established units. National rattan investment programs should be developed through sector associations and organization in order to improve national competitiveness, such as: supporting newly established units, awarding titles, widen social services including business and laws... Environment hygienic investigation should be improved to ensure the common benefit of the enterprise community. .... The units that cause environment pollution must be seriously punished... [2].

### **3.3. Petitions and suggestions**

Although rattan sector has developed recently, it is not paid enough attention to ensure sustainable development. To get over this situation, these following petitions and suggestions should be considered:

1. National rattan database and specialized office for conserving and developing rattan sources must be established. Rattan source planning needs to be nationally strategic.
2. Awareness of the importance of rattan sources, training for planting, conserving, and exploiting natural rattan should be improved. Exploiters are now in short of sustainable management.
3. Techniques/process of planting, replanting, conserving at different locals/regions should be standardized – the best model to optimize the economic benefit should be establish for rattan planters.
4. Standard nursery gardens should be supported, giving the priorities for the kinds of rattan that have much market potentials, like *C. poilanei* Conrard.
5. Technician staff at local level should be trained to support the development of rattan material sources.
6. Land, forest transfer should be completed for economic sectors, social organizations, households to ensure the true ownership and the conservation and development of material sources.
7. Standards to classify rattan in the national scale should be established to be the pre-conditions for the completion of standardization for processing and managing resources.
8. Processing rattan materials should be standardized to ensure the requirements of both quality and economic benefits.
9. Models of producing/processing/finishing applying clean technologies to create the real difference for Vietnamese rattan sector in comparison with other countries. Training materials should be standardized to multiply later.
10. Sector associations and Vietnam rattan networks should be supported to improve the ability of supplying market information, cooperation to solve the problems that relates to labour and market...
11. Support should be created for design training, especially the long term design for skillful craftsmen in trade village, and this should be considered as the key to increase the sector value in the future.
12. Enterprises should be supported to connect with market (including material and export markets)

## **REFERENCE**

- [1]. Ha, Thai Thanh. Report on the rattan value chain in Quang Nam province. Project GTZ. 2005
- [2]. Report on “Situation of rattan enterprises and options to develop” by Policy and Strategy Institute of Agriculture and Rural Development. 2008
- [3]. Vietnam Handicraft Research and Promotion Center. Consultancy report for Vietnam Rattan sector. 2009



## ANNEXES

### Rattan projects in Vietnam

No.	Project	Leader	Time	Capital source	Place
1	Vietnam rattan network	Vietnam Handicraft Research and Promotion Center	2009-2011	Ford Foundation	Nation-wide
2	Investigation for classifying rattan in Vietnam	Forest Investigation and Planning Institute	2007 - 2010	New York Arboretum	Nation-wide
3	Establishing a sustainable production system for rattan products in Indochina region	WWF	2009 - 2011	EU	Quang Nam, Thua Thien Hue
4	Green production and trade to create incomes for the poor	VIETCRAFT / VIETRADE	2010-2012	MDG-F (Spain)	Thanh Hoa, Nghe An, Hoa Binh, Phu Tho
5	Applying technology advancements to develop rattan in Quang Nam	Center of Research and Application of Science Transfer, Department of Science and technology of Quang Nam	2007 - 2010 -:	Ministry of Science and Technology	Nam Tra My, Bac Tra My, Tien Phuoc, Hiep Duc, Nam Giang, Phuoc Son, and Dong Giang District
6	Developing rattan, acacia, casava to support the poor	SNV	2009-2010	Ford Foundation	Thua Thien Hue, Quang Binh
7	Planting rattan under the forestry plants	Farmer Association of Vinh Phuc Province	2008 – 2009	Vinh Phuc province	8 communes: Bac Binh, Ngoc My, Lien Son, Xuan Hoa, Van Truc, Quang Yen, Lang

					Cong, and Dong Que in Lap Thach District
8	Planting rattan for trade villages	Hanoi Center of Agriculture encouragement	2008 – 2009	National centre of agriculture and fishery encouragement	Chuong my and Thach That
9	Implementing the model of planting rattan in the forest	Dien Bien Center of Agriculture encouragement	2008 - 2009	Dien Bien Department of Agriculture	Thanh Hung, Thanh Yen, Thanh Nua, Noong Luong (Dien Bien District) Lay Nua, Muong Lay town
10	Developing garden rattan in households	Ba To station of Agriculture encouragement	2007- 2009	Quang Ngai Department of Agriculture	Communes of Ba Vinh, Ba Thanh, Ba Dong, Ba Trang, Ba Kham, and Ba Vi (Ba To district)
11	Planting rattan in forests	Quang Ngai Branch of Cooperative and Rural development	2007 – 2008	Branch of Cooperative and Rural development, Ministry of Agriculture and Rural Development	Son Thanh commune, Son Ha district
12	Support the development of rattan value chain in Quang Nam	Quang Nam Corporative coalition, Quang Nam Department of Industry and Trade	2006- 2008	GTZ	Tra Mi, Nam Giang, Phuoc Son, Dong Giang...
13	Rattan intensity planting	Cam Xuyen People Community	2004 – 2006	Project of NTFP	Cam Son, Cam My, Cam Quan of Cam Xuyen District
14	Developing 2 models of	Quang Tri Branch of forest	2007- 2008	Birdlife international	2 communes of Huc Nghi, ba

	planting in the forest	management			Long – Dakrong District
15	Applying science and technology to develop the model for planting rattan material	Huong Khe center of applying science and technology transfer	2009 - 2010	Department of Science and Technology	Phuc Trach Commune, Huong Khe District
16	Pilot project of planting rattan in the forest	People Committee of Loc Lam Commune	2006 - 2009	Lam Dong association of Science and technology	Loc Lam, Lam Dong
17	Investigation of developing rattan in Khanh Hoa	Khanh Hoa Factory of agriculture and forestry design	02/2005 - 05/2007	Khanh hoa committee of science and technology	Khanh Vinh, Khanh Son and Khanh Lam districts
18	Project to support rattan and handicraft sector	People Committee of Quan Hoa	2005- 2010	GRET	4 communes: Luong Ngoai, Thiet Ke, Xuan Phu and Hoi Xuan in 2 districts Quan Hoa and Ba Thuoc
19	Supporting the development of C. tetradactylus Hance in Can Loc district, Ha Tinh province	Center for developing for the poor	2009- 2011	The Ford Foundation	2 communes Thuong Loc, and Nga Lo (5 communes of Tra Son)
20	Evaluating potential market for rattan	Vietnam Handicraft Research and Promotion Center	2009	Oxfarm Hong Kong	Con Cuong, Tuong Duong, Ky Son districts of Nghe An province
21	Developing the model of planting rattan in rice field	Dung Tan Rattan Company	2005- 2006	Thai Binh Department of Agriculture and Rural Development	Kien Xuong and Kien Thuy District, Thai Binh province

## Units, organizations and offices that play key roles in rattan sector

No.	Organisations	Activities relating to rattan sector
1	Ministry of Agriculture and Rural Development (State management office)	<ul style="list-style-type: none"> <li>Planning and developing material area (Forestry Department)</li> <li>Approving seeds, researching and supporting planting technique</li> <li>Supporting agriculture and forestry encouragement</li> <li>Supporting the technique of processing, trade promotion (Department of commercial processing agriculture, forestry, fishery and salt sector)</li> <li>Implementing action plan of processing and trading NTFP</li> <li>Issuing other policies</li> </ul>
2	Management board of Forestry projects	<ul style="list-style-type: none"> <li>An underlying unit of MARD that is responsible for managing directly all the forestry projects. At present, the management board is managing projects of World Bank, ADB, KfW, JICA... It is the focal point of rattan development programs.</li> </ul>
3	Support programmes for forestry and partners	<ul style="list-style-type: none"> <li>In addition to the partnership with some partners in forestry projects in Vietnam, Support programs for forestry and partners are the management organization of TFF – this is a capital source that Vietnam rattan sector can access.</li> </ul>
4	Ministry of Industry and Trade (State management office)	<ul style="list-style-type: none"> <li>Supporting the technique of processing, technology transfer; training through national program on industry encouragement (local department of Industry).</li> <li>Supporting technique of safety and environment protection</li> <li>Supporting trade promotion</li> <li>Issuing other policies</li> </ul>
5	Ministry of Science and Technology	<ul style="list-style-type: none"> <li>Supporting technology transfer that relate to breeding, planting, proceeding and developing products.</li> </ul>
6	Forestry Science Institute of Vietnam (FSIV)	<ul style="list-style-type: none"> <li>Research on the kinds of rattan that are suitable for each region and meet the requirement for processing (research centre of forest plants underlying the Institute has the breeding laboratory, biology technology department and breeding testing station)</li> <li>Techniques of exploiting and processing (bleaching) and conserving rattan.</li> </ul>
7	Forest Investigation and Planning Institute	<ul style="list-style-type: none"> <li>Investigating and classifying rattan in Vietnam</li> </ul>
8	Xuan Mai Forestry University, Thu	<ul style="list-style-type: none"> <li>Research on the kinds of rattan that are suitable for each region and meet the requirement for processing</li> </ul>

	Duc Agriculture and Forestry University	<ul style="list-style-type: none"> <li>▪ Research on the techniques of exploiting, processing and conserving rattan.</li> </ul>
9	National center for Agriculture and Fishery encouragement	<ul style="list-style-type: none"> <li>▪ Supporting activities of agriculture encouragement in planting rattan materials</li> </ul>
10	Provincial departments of Industry and Trade	<ul style="list-style-type: none"> <li>▪ Supporting policies and finance to develop rattan sources and processing (Industry and agriculture encouragement programs)</li> <li>▪ Supporting domestic trade promotion</li> </ul>
11	VIETCRAFT	<ul style="list-style-type: none"> <li>▪ Supporting activities in order to improve competence and trade promotion, especially searching for export market.</li> </ul>
12	HRPC	<ul style="list-style-type: none"> <li>▪ Supporting activities to improve competence, basic investigation and research, techniques of planting and processing rattan, trade promotion, especially searching for export market</li> </ul>
13	Vietnam rattan network (HRPC – VIETCRAFT).	<ul style="list-style-type: none"> <li>▪ Connecting factors in national rattan value chain</li> <li>▪ Supporting the technique of planting, processing, consuming products</li> <li>▪ Supporting the development of mechanisms for rattan sector</li> </ul>
14	IUCN	<ul style="list-style-type: none"> <li>▪ Participating in the activities which aim at conserving biological diversity, livelihood improvement, and contributing to the national development targets.</li> </ul>
15	SNV	<ul style="list-style-type: none"> <li>▪ Supporting the development of rattan material areas in the North of Middle area (Thua Thien Hue, Quang Tri, Quang Binh...)</li> </ul>
16	FAO	<ul style="list-style-type: none"> <li>▪ Participating in basic research, supporting planting technique.</li> </ul>
17	WWF	<ul style="list-style-type: none"> <li>▪ Supporting the development of sustainable rattan production in Indochina</li> <li>▪ Participating in activities that aim at conserve the biological diversification</li> </ul>
18	Ford Foundation	<ul style="list-style-type: none"> <li>▪ Supporting finance for rattan development in regions. At present, it is supporting Vietnam rattan network, <i>C. tetradactylus</i> Hance development in Ha Tinh...</li> </ul>
19	GTZ	<ul style="list-style-type: none"> <li>▪ Supporting finance and technique for the rattan value chain in Quang Nam</li> </ul>
20	ADB, World Bank, KfW	<ul style="list-style-type: none"> <li>▪ At present, it is supporting forestry projects and is a potential partner to develop material area through combination programmes</li> </ul>
21	INGOs	<ul style="list-style-type: none"> <li>▪ Many international Non-governmental Organizations (INGO) are working in collecting, developing and</li> </ul>



		conserving natural resources, such as Oxfam, BirdLife... Their attention is livelihood improvement, including developing material areas, processing and consuming rattan products.
22	Rattan export companies	<ul style="list-style-type: none"> <li>▪ They play important role in developing market, encouraging domestic manufacture and process.</li> <li>▪ They also play important roles in training, transferring manufacture technique, supporting capital...</li> </ul>
23	Local sector associations	<ul style="list-style-type: none"> <li>▪ Vietnam Trade village association</li> <li>▪ Hanoi association of handicraft and trade village</li> <li>▪ Ho Chi Minh City association of Wood and Handicraft</li> <li>▪ Ha Tay rattan Association</li> <li>▪ Quang Nam association of Rattan, bamboo and leaves</li> </ul>
24	Other units	<ul style="list-style-type: none"> <li>▪ Institute of research on ecology, resource and environment/Institute of tropical living things (well-equipped to define accurately kinds of rattan)</li> <li>▪ Units that supply Testing and Appraisal, such as Vinacontrol, SGS, OMIC, Bureau Veritas...</li> <li>▪ Units that supply other services: chemical suppliers (Inchem, Becker...), equipment supplier (Lidovit...), training service (VCCIL..).</li> </ul>



**Why we are here.**

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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