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GREEN PRODUCTION AND TRADE  
**MDG F**  
MDG ACHIEVEMENT FUND



**J**OINT PROGRAMME ON GREEN PRODUCTION AND TRADE  
TO INCREASE INCOME AND EMPLOYMENT OPPORTUNITIES FOR THE RURAL POOR

# REPORT

## ASSESSMENT OF CLEANER PRODUCTION AND DESIGN FOR SUSTAINABILITY



**Vietnam Cleaner Production Centre**  
4<sup>th</sup> floor, Building C10  
University of Technology, Hanoi  
Dai Co Viet street, Hanoi, Vietnam  
Tel: (84.4) 3 8 684 849  
Tel/Fax: (84.4) 3 8 681 618  
Email: [vncpc@vncpc.org](mailto:vncpc@vncpc.org)  
Web: <http://www.vncpc.org>

**Hanoi, August 2011**

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## I. NGHE AN PROVINCE

### 1. Duc Phong Co.Ltd.

#### a. Company description:

Name of SME: Duc Phong Company limited

Address: 15th block, small industries zone, Nghi Phu ward, Vinh city, Nghe An province

Tel: (038)3 518459

Fax: (038) 3518448

Email: ducphongcom@hn.vnn.vn Website: www.ducphong.com.vn

Name of Director: Mr. Thai Ba Phong

Year of establishment: 1993

Number of workers: 66 Male: 23 Female: 43

Number of operation day/year: 350

Annual Turnovers: 18 bills.VND

Products: hanging, table, floor...

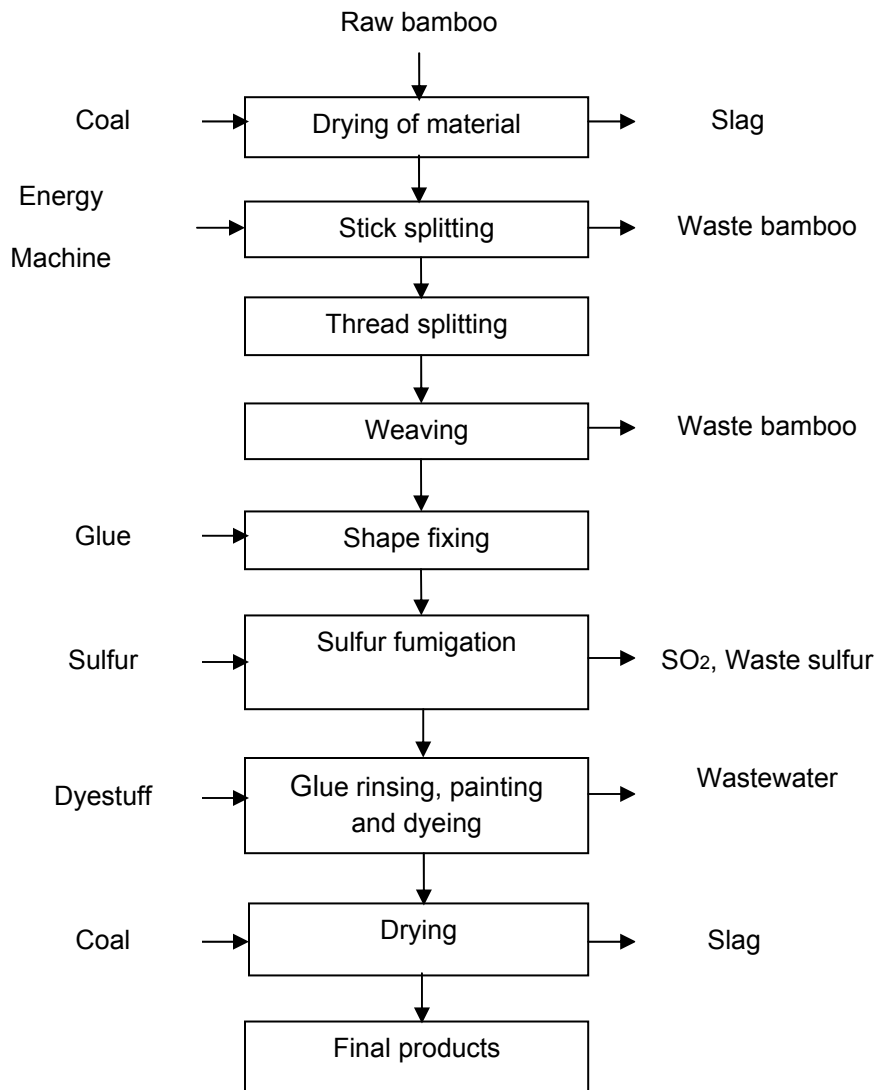
#### b. Production description:



**Pic 1:** Front of Company.



**Pic 2:** Sign board of company



**Figure 1:** Production flowchart

**Table 1.** Actual production

	<b>Product</b>	<b>Unit</b>	<b>2009</b>	<b>2010</b>
1	Hanging bamboo lantern	piece	110.000	165.000
2	Table bamboo lantern	piece	165.000	275.000
3	Floor bamboo lantern	piece	88.000	165.000
4	Other products	piece	80.000	90.000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009
1	Bamboo	Tons	3.197.840
2	Electricity (for production)	KWh	19.367
3	Chemical		
	- All kinds of paints	Litter	2.928
	- Sulfur	Kg	901
	- Color powder	Kg	901
	- Water based glue	Kg	811
4	Water (for rinsing)	M <sup>3</sup>	1.500
5	Coal (if using)	ton	11.485

**c. Waste**

**Air emissions:**

- Smoke from burning waste of bamboo for drying and sulfur smoking.



**Effluents:**

- Waste water from PVA fixing, dyeing, painting.

**Solid wastes:**

- Solid wastes from splitting, weaving
- Broken products.

**d. Observation and recommendation**

Observation	Recommendation
- Using a big volume of sulfur to treat and prevent the material from fungi and insects	- Replace sulfur fumigation by boiling to treat the bamboo, and well preservation to prevent fungi attached
- Workers do not wear protective equipments	- Strictly require worker to wear protective equipments






- The furniture of workshop is bad arrangement



- Rearrange workshop to enhance capacity and protect worker better.
- Use painting line to separate working area for better management of chemicals and equipment.



	
<ul style="list-style-type: none"> <li>- No insulation for too old heat pipe. All of valves and linking point are rusted, causing unsafe.</li> </ul>  	<ul style="list-style-type: none"> <li>- Install insulation and maintain machinery and conduit.</li> </ul>
<ul style="list-style-type: none"> <li>- The combustion is not efficient</li> </ul>	<ul style="list-style-type: none"> <li>- Check the furnace and repair to improve combustion efficiency.</li> </ul>



Fire extinguishers have been equipped for too long, the ability and function are not qualified.



Chemical management is not good.

- Check and replace if necessary.

- Apply better chemical management options: 0
- Define exactly the necessary amount of chemical to avoid excess and waste.
- After each time using, clean the storing area to avoid accident and improve working environment.



Wastewater from dyeing is not treated.



- Use settling tank, combining with flocculation by alum to treat wastewater

## 2. Duc Quyen Co. Ltd.

### a. Company description:

Name of SME: Duc Quyen Company limited

Address: hamlet 4 – Dien Truong commune - Dien Chau district - Nghe An province

Tel:+ 84 038 3629477

Fax:

Email:chumanhquyen78@gmail.com Website:

Name of Director: Chu Manh Quyen

Year of establishment: 2007

Number of workers: 16 Male: 4 Female: 12

Number of operation day/year: 1 billion VNĐ

Annual Turnovers: 300 days

Products: basket, utensils, tray, casket....

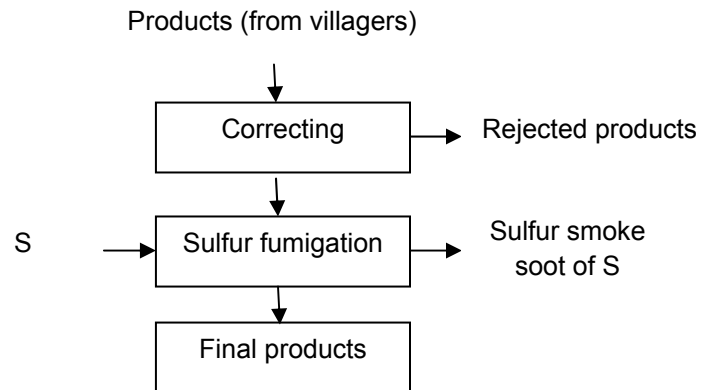
### b. Production description:



Pic 1: sign of company.



Pic 2: Director's Father of company.



Pic 3: Production flowchart.

**Table 1.** Actual production

	<b>Product</b>	<b>Unit</b>	<b>Weigh (kg/each)</b>	<b>2009</b>
1	Casket	piece		5000
2	Basket	A pack- 3 pieces		6000-7000
3	Lamp cap	piece		Over 1000
4	Casket (2 layers)	Piece		700

**Table 2.** Raw materials and resources consumption

<b>No</b>	<b>Input</b>	<b>Unit</b>	<b>2009</b>
1	Rattan	Meter	100.000
3	Chemical - Glue (PVA) - Sulfur	Litter kg	100 200-300

**c. Waste****Air emissions:**

- Smoke from fumigation.

**Solid wastes:**

- Unqualified materials due to the very short length or bad preservation
- Soot of sulfur from fumigation
- Broken products

**d. Observation and recommendation**

Currently, company has built a new workshop; hence, the processing of company has been stopped. As a collector satellite of Ngoc Dong Enterprise in Ha Nam, Duc Quyen collect products from villagers, households and then treat by sulfur fumigation.

Difficult of company are workshop that is too narrow, and has no drying facilities, thus they have to use too much sulfur for persevering materials and products.

### 3. Hai Van Brocade Cooperative

#### a. Company description:

Name of SME: Hai Van Brocade Cooperative.

Address: Chi Khe commune, Con Cuong district, Nghe An province.

Tel: 0989 065 798

Fax:

Email: thocamhaivan@yahoo.com

Website:

Name of Director: Mrs. Ha Thi Phuong Van.

Year of establishment: 2008

Number of workers: 200 Male:

Female:

Number of operation day/year:

Annual Turnovers: 500 mill VNĐ

Product: handbag, clothes, towel.

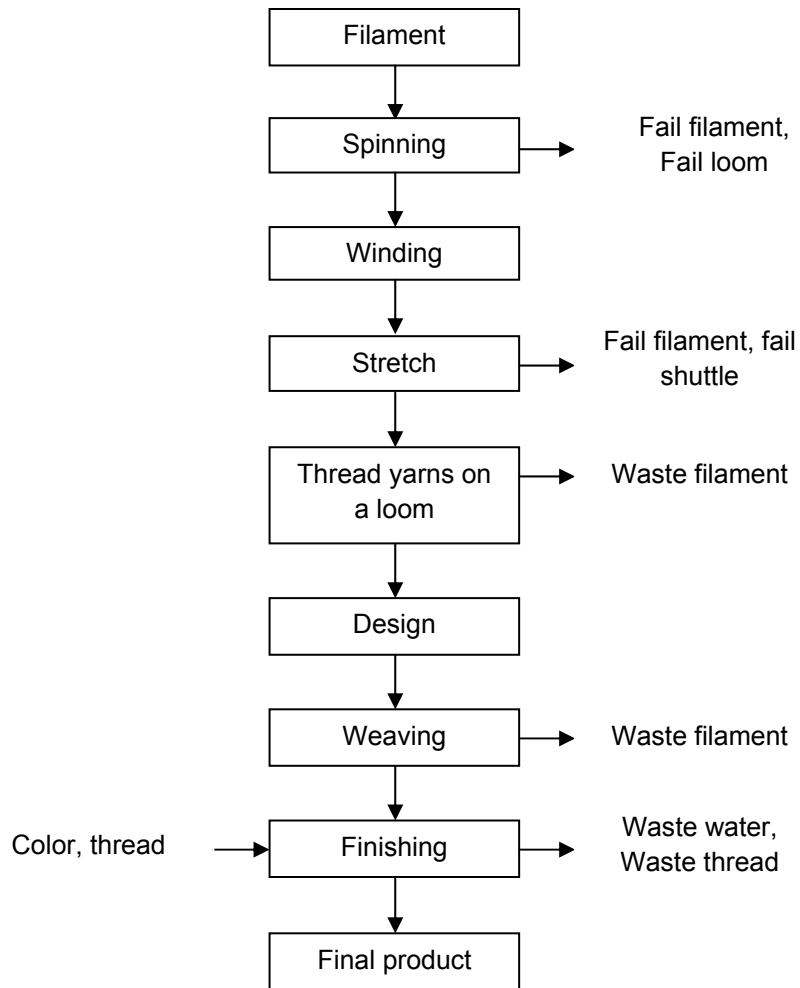
#### b. Production description:



**Pic 1:** Front of company.



**Pic 2:** Workshop of company.



**Pic 3:** Production flowchart.

The company is temporarily stopped running due to legal proceedings.

**c. Waste**

**Air emissions:**

- Dust from spinning, winding, stretch and weaving. But mount of dust are very small and that do not make bad for health of workers.



**Effluents:**

- Waste water from finishing (dyeing if need be).

**Solid wastes:**

- Thread from spinning, stretch, thread yarn on a bloom and weaving.
- Fail bloom from spinning and fail shuttle (small mount).
- Thread from finishing.

**d. Observation and recommendation:**

Observation	Recommendation
<p>- Cooperative have installed sewing machine (made in China). But technology for use machines has not transferred so those machine have not used yet.</p>  	<p>- Training for worker on operating machine and maintenance</p>
<p>- Technique of dyeing is not good and wasting a lots of dyestuffs and water.</p>	<p>- Improve cooperative technology for dyeing in order to save dyestuffs and water.</p>



#### 4. Dinh Trieu Bamboo and Rattan Co.Ltd.

##### a. Company description

Name of SME: Dinh Trieu Enterprise.

Address: 21 hamlet – Nghi Phong commune – Nghia Loc district – Nghe An province.

Tel: (038)3 616404

Fax

Email: dinhtrieumaytredan@yahoo.com.vn

Website:

Name of Director: Mr. Nguyen Dinh Trieu

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Rattan  Bamboo  Others:

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;

Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 30 Male: 14 Female: 16

Number of operation day/year: 350

Annual Turnovers: 12 bills.VND

Products: Bowl, cup, tray, bucket...

##### b. Production description



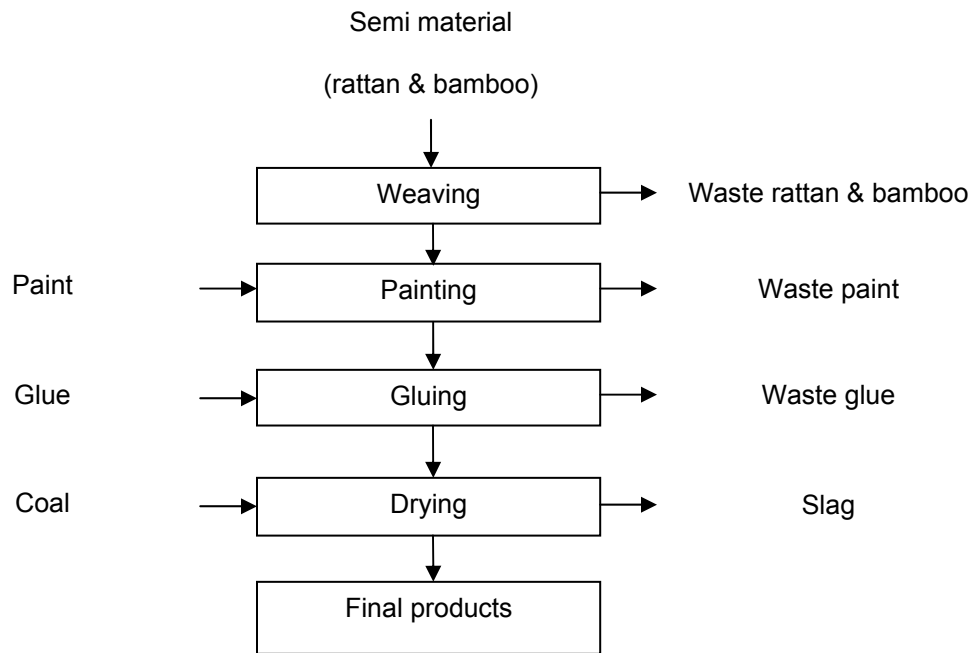
**Pic 1: Front of Company.**

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Basket (3 pieces/set)	set	0.5	12.000
2				
3				

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009
1	Rattan	Tons	30
2	Bamboo	Tons	500
3	Electricity (for production)	VND	2.000.000
4	Chemical		
	- Glue	Litter	2.000
	- Paint	VND	50.000.000
	- Petrol	Litter	12.000
5	Coal (if using)	Tons	4,8
6	Gas	Kg	1.008



Production flowchart

**c. Waste**

**Air emissions:**

- Smoke from burn coal.


**Effluents:**

- Waste water from Painting, Gluing.

**Solid wastes:**

- Solid wastes from Weaving.
- Slag from burn coal.

**d. Observation and recommendation**

Observation	Recommendation
<p>Materials are not stored carefully and are arranged in bad order, causing loss and damage.</p> 	<p>Rearrange the storage and develop the mechanism of conservation and apply FIFO methodology (first in first out) for higher efficiency.</p>
<p>Chemical management is not good</p>	<p>Develop a safer chemical conservation, management and usage.</p>



- The furnace is not efficient

- Check the furnace and repair to improve combustion efficiency.



Wastewater from painting is not treated.

- Use settling tank, combining with flocculation by alum to pre-treat wastewater from painting.

The storage is not equipped with transparent panel to make use of natural light and solar energy to reduce product's moisture.



- Install transparent panels to make use of natural light and solar energy to reduce product's moisture.

Some pictures at company:



## 5. Lam Giang Sericulture Co

### a. Company description:

Name of SME: Lam Giang mulberry and Silkworm Company.

Address: Thanh Giang – Thanh Chuong – Nghe An.

Tel: 0383 833 378

Fax: 0383 833 378.

Email: [dautamlamgiang@gmail.com](mailto:dautamlamgiang@gmail.com)

Website: [lamgiangsilks.com.vn](http://lamgiangsilks.com.vn)

Name of Director: Mr. Nguyen Kim Lung

Year of establishment: 2006

Number of workers:                      Male:                      Female:

Number of operation day/year:

Annual Turnovers:

Products: silks

### b. Production description:



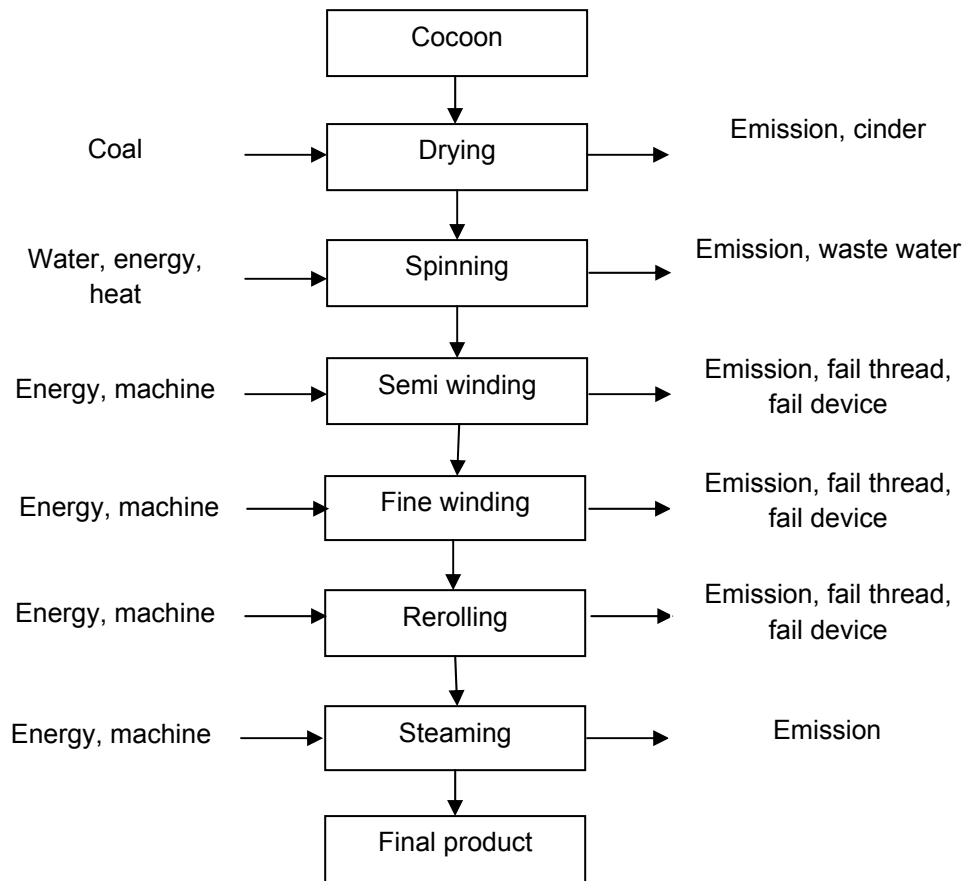
**Pic 1:** Gate of company.



**Pic 2:** Director of company.



**Pic 3:** Product.



**Pic 4:** Production flowchart.

**Table 1:** Actual production

	<b>Product</b>	<b>Unit</b>	<b>2010</b>
1	Silk	Tons/year	6

It is not the time to harvest cocoon, so company has not operated. The company has installed new machine and the production is not frequent so company has no data record system.

**c. Waste**

**Air emissions:**

- CO<sub>2</sub> from burning coal make heat at boiler (Heat has made in order to use in all of steps on process).
- Organic matters have steam by heat from: drying and spinning.

**Effluents:**

- Waste water from spinning.

**Solid wastes:**

- Cinder from burning coal at boiler.
- Waste thread from semi winding, fine winding and rerolling.
- Fail device from machines (a little mount).

**d. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
- Waste water after using is discharged directly in pond behind of company. After that, company reuse the water at pond for process produce but the water has just pass a tank to filter sand. That can cause make lower quality of company's silk.	- Review about using water wells for produce. - Redesign water treatment system to pretreatment waste water before discharge income environment.



## 6. Ngoc Canh Co.Ltd.

### a. Company description:

Name of SME: Ngoc Canh Company limited

Address: Gia My Hamlet – Do Thanh commune – Yen Thanh district – Nghe An province.

Tel: (038)3 3681444

Fax

Email:

Website:

Name of Director: Mr. Vo Van Canh

Year of establishment: 2006

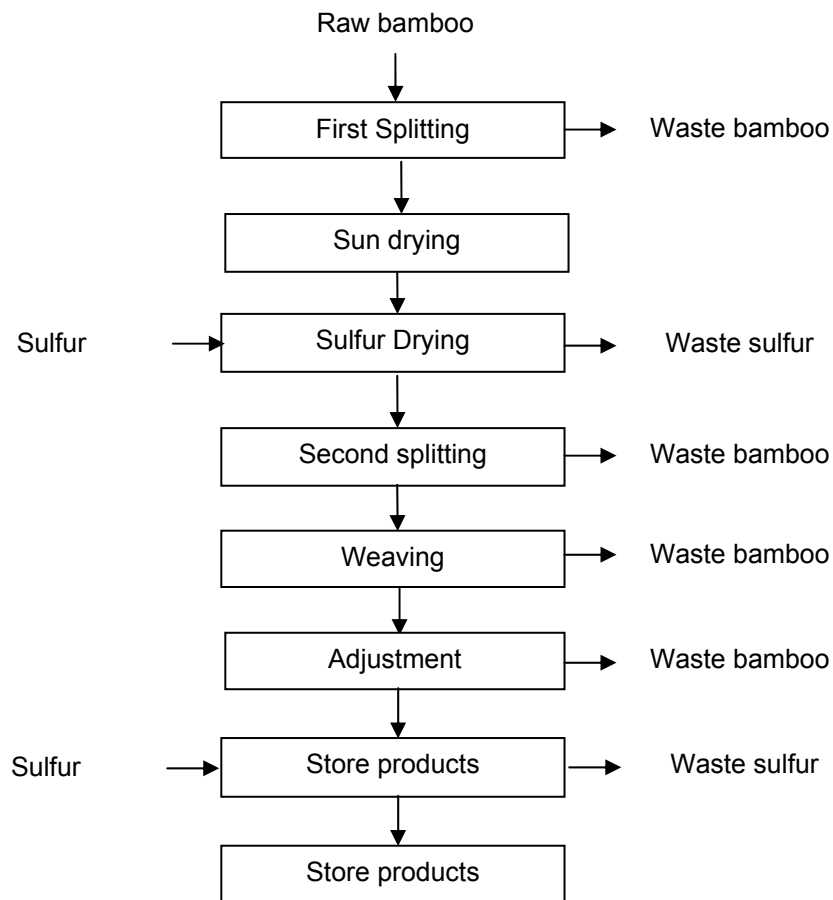
Number of workers: 6      Male: 2      Female: 4

Number of operation day/year: 350

Annual Turnovers: 1, 4 bills.VND

Products: hanging, table, floor...

### b. Production description:



Pic 1: production flowchart.



**Pic 2:** Front of Company.



**Pic 3:** Sign of company

**Table 1.** Actual production

	Product	Unit	Norm (kg/pieces)	2009		2010		Aug/2011
				Ps	Kg	Ps	Kg	Piece
1	Q: 35x45	Ps	0,6	6110	36,660	8816	5.289,6	4376
2	J: 18	Ps	0,4	4109	1.607,6	6121	2.448,4	5115
3	Q: 28	Ps	0,45	3331	1.499	7333	3.299,9	2100
4	J: 42	Ps	0,46	1311	603,1	6112	2.811,5	3710
	<b>Total</b>			<b>1.4861</b>	<b>40.370,5</b>	<b>21.049</b>	<b>13.849,4</b>	<b>15.301</b>

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009
1	Rattan	Tons	10,5
2	Rattan with big diameter	Tons	0,8
3	Bamboo (kind of species)	Tons	100
3	Chemical - Sulfur	Tons	1,5

\*: Because, cargo certificate is not frequent so company has no record data system.

**c. Waste**



**Air emissions:**

- Smoke of sulfur from sulfur drying, sulfur re-drying and sulfur curing.

**Solid wastes:**

- Solid wastes from splitting, Weaving and adjustment.
- Waste sulfur from sulfur drying, sulfur drying again and sulfur curing.

**d. Observation and recommendation**

Observation	Recommendation
<ul style="list-style-type: none"> <li>- Workers do not wear the protective equipment.</li> </ul> 	<ul style="list-style-type: none"> <li>- Strictly require worker to wear the protective equipment.</li> </ul>
<ul style="list-style-type: none"> <li>- Company uses much sulfur, affecting worker's health.</li> </ul>	<ul style="list-style-type: none"> <li>- Used drying chamber instead of sulfur fumigation.</li> </ul>
<ul style="list-style-type: none"> <li>- Rattan cores are not recycled</li> </ul>	<ul style="list-style-type: none"> <li>- Recycle the waste to weave a new product.</li> </ul>
<ul style="list-style-type: none"> <li>- Storage of bamboo is insufficient causing a fungi and mold.</li> </ul> 	<ul style="list-style-type: none"> <li>- Redesign store to enhance capability.</li> <li>- Redesign the storage for better conservation and make use of solar energy for material drying.</li> </ul>

## 7. Phuong Anh Co. Ltd.

### a. Company description:

Name of SME: Phuong Anh Company limited

Address: Km 399+700, QL1A, Quynh Thanh commune, Quynh Luu district, Nghe An province.

Tel: 0382 247 189

Fax

Email: [maytredan@phuonganhco.com](mailto:maytredan@phuonganhco.com)

Website: <http://www.phuonganhco.com>

Name of Director: Mr. Tran Quoc An.

Year of establishment: 2005

Number of workers: 20      Male: 5      Female: 15

Number of operation day/year: 330

Annual Turnovers: 3,5 bills.VND (2008)      2 bills VND (2009).

Products: lampshades, house ware, box, basket.

### b. Production description:



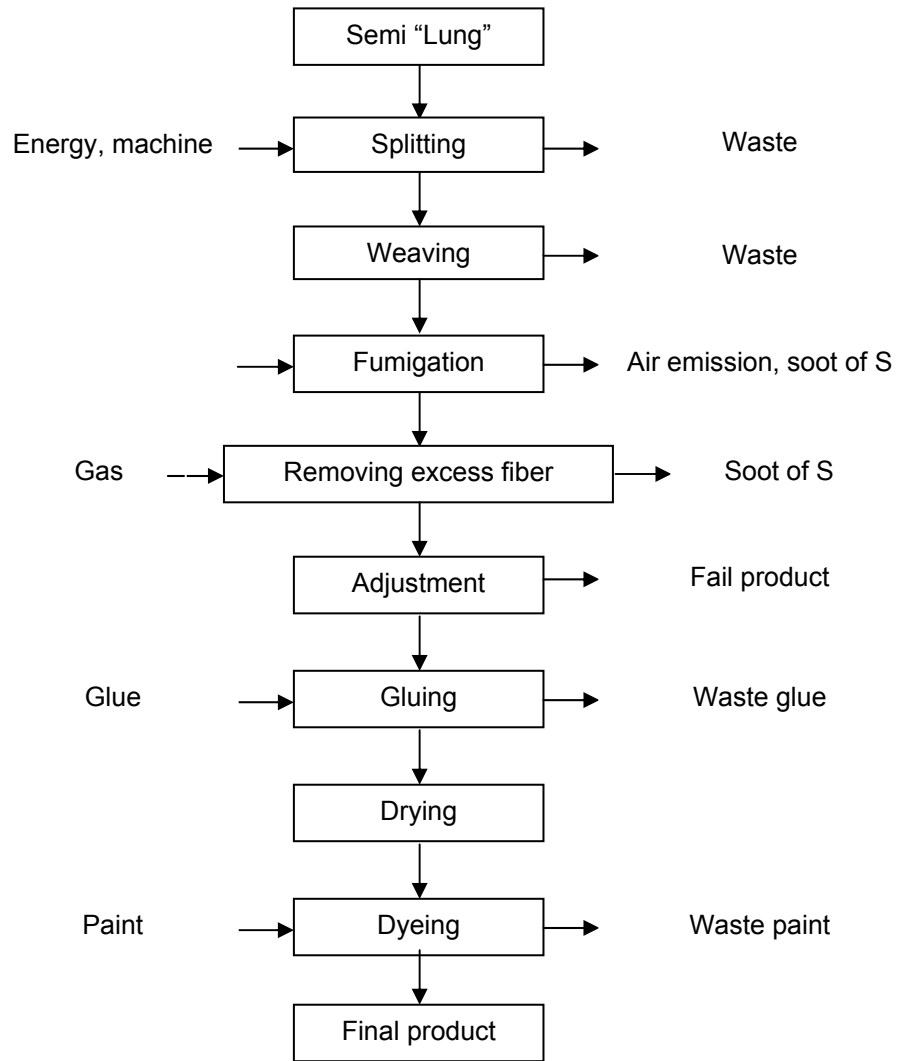
Pic 1: Sign of company.



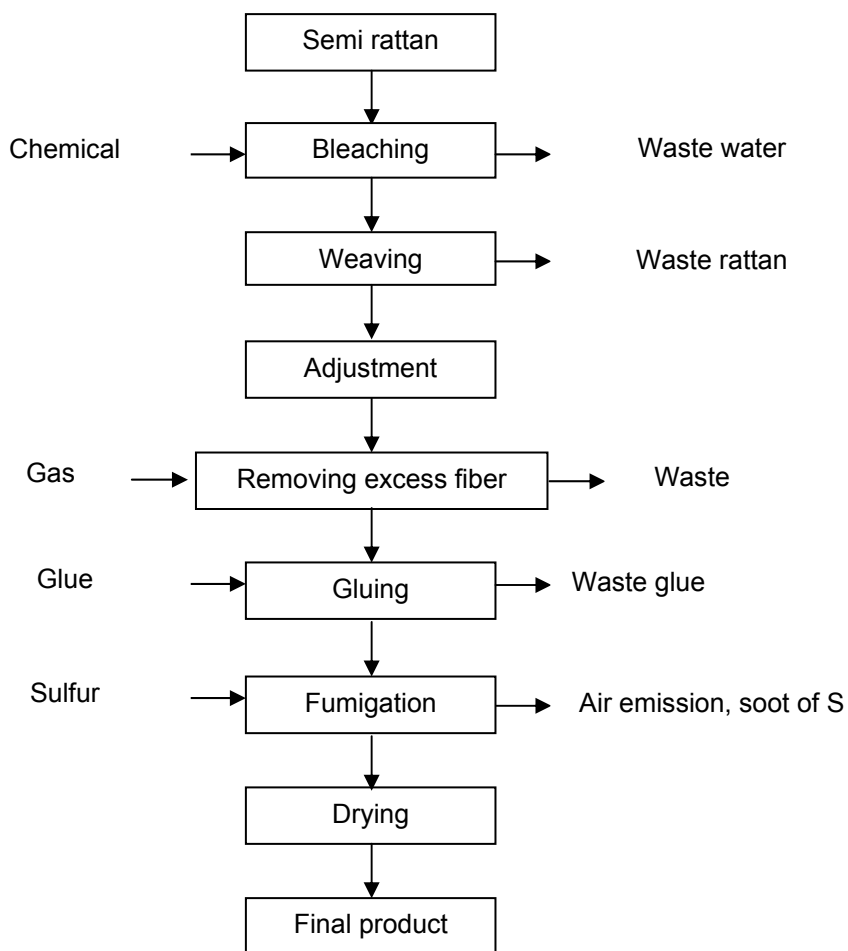
Pic 2: Workshop of company.



Pic 3. Product



**Pic 4:** Production flowchart product from "Lung".



**Pic 5:** Production flowchart product from rattan.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Box	1 set (3 piece)		180.000
2	Total	Piece		725.000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	2010
1	Material ("Lung" + rattan)	Tons	86	30
2	Water for production			NA
3	Electricity	kWh		24.000
4	Chemical			
	- Sulfur	Tons		0,1
	- Glue	Tons		60

5	Gas	Kg		432
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**c. Waste**

**Air emission:**

- Air emission has Sulfur from fumigation.



**Waste water:**

- Waste water from bleaching.
- Waste paint from Dyeing.

**Solid waste:**

- Waste “Lung” from splitting and weaving.
- Soot from removing excess fiber and soot of Sulfur from fumigation.
- Fail product from bad maintain.

**d. Observation and recommendation**

Observation	Recommendation
<ul style="list-style-type: none"> <li>- Waste material due to bad preservation.</li> </ul> 	<ul style="list-style-type: none"> <li>- Storage and preservation in properly method to keep away from moisture.</li> </ul>
<ul style="list-style-type: none"> <li>- A high volume of product was returned because quality of that product is not good.</li> </ul> 	<ul style="list-style-type: none"> <li>- Re-training workers to improve the skill.</li> <li>- Check product carefully before exporting</li> </ul>
<ul style="list-style-type: none"> <li>- Company just collects product from household and other satellites and finishing at their workshop then it uses little sulfur for fumigation.</li> </ul>	

## 8. Yarn-Silk production, JSC.

### a. Company description:

Name of SME: Yarn Silk Joint Stock Company.

Address: Tay Ho 2 block, Quang Tien precinct, Thai Hoa town, Nghe An province.

Tel: 0382 699 045

Fax:

Email: [nguyentoanhang@yarnsilk.vn](mailto:nguyentoanhang@yarnsilk.vn)

Website: [www.yarn-silk.vn](http://www.yarn-silk.vn)

Name of Director: Mr. Nguyen Toan Thang.

Year of establishment: 2009

Number of workers: 18 Male:

Female:

Number of operation day/year: 330

Annual Turnovers:

Product: silk.

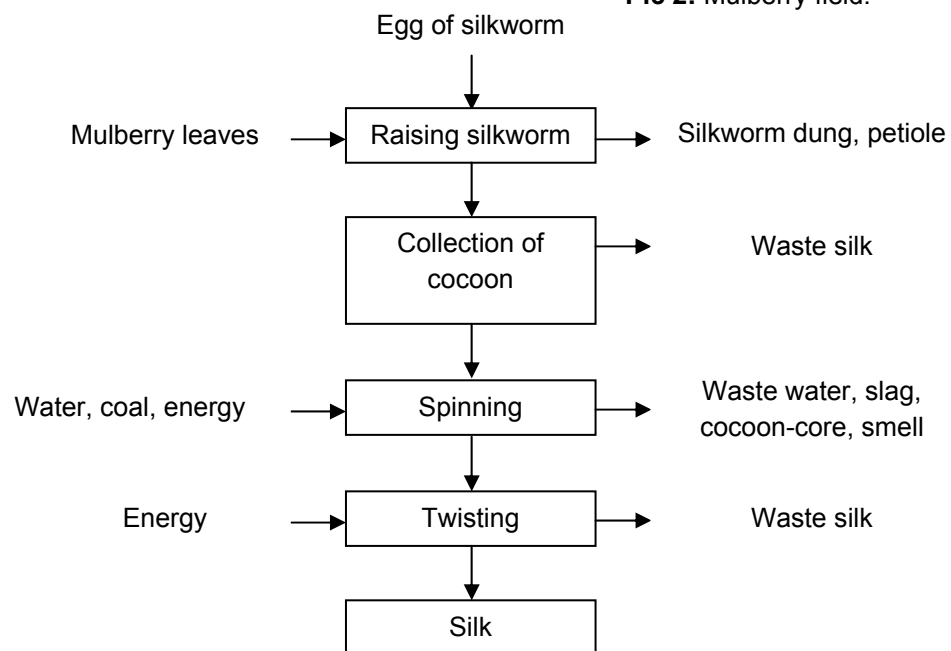
### b. Production description:



Pic 1: Front of company.



Pic 2: Mulberry field.





**Pic 2:** Production flowchart.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Silk	Kg		NA

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Egg of silkworm Mulberry leaves		NA
2	Water		NA
3	Energy		NA
4	Wood		NA

\*: Now, It is not time to harvest cocoon, so company has not active. Because company's production is not frequent so company does not have a system data record.

**c. Waste**

**Air emissions:**

- Smell from spinning.

**Effluents:**

- Waste water from spinning.



**Solid wastes:**

- Silkworm dung and petiole from raising silkworm.
- Silk has been stick on frame and waste frame from collection of cocoons.
- Cocoon-core from spinning.
- Waste silk from winding.
- Slag from burning coal at boiler.

**d. Observation and recommendation**

- Mulberry nursery and silkworm has low quality because it selling in the market without strictly inspection.
- Now, the planting mulberry and feeding silkworm has base on their experiment. Therefore, the company wants to have support on mulberry cultivation and silkworm feeding for famer.

Observation	Recommendation
- The lighting system of workshop is not good. Many places have not enough lighting condition for worker.	- Lower the high of lighting system. - Replace the old lamp by the T8 lamp which is saving energy

	<ul style="list-style-type: none"> <li>- Install the transperence panel to collect sun light.</li> </ul>
<ul style="list-style-type: none"> <li>- Company has raised the silkworm at workshop where produce product. Within the inappropriate workshop in term of environment it can effect to quantity and quality of cocoon.</li> </ul>	<ul style="list-style-type: none"> <li>- Re-arrange area for feed silkworm. Company has to remove area for feed silkworm far from area for production or near to the source of mulberry in order to enhance quality of cocoon.</li> </ul>
<ul style="list-style-type: none"> <li>- No insulation for the steam pipeline.</li> <li>- Water supply to boiler is underground water. And it is not pre-treatment before used.</li> </ul> 	<ul style="list-style-type: none"> <li>- Set up insulation for boiler and steam pipeline.</li> <li>- Pre-treatment underground water before used in boiler especially to avoid the hard water which is causing a scaling inside boiler</li> <li>- Wood using for burning boiler should be well protected to avoid the moisture</li> <li>- Recycle the condensate water</li> </ul>
<ul style="list-style-type: none"> <li>- Lay the equipment in workshop is disorder which can be affected to the productivity and quality.</li> </ul>	<ul style="list-style-type: none"> <li>- Re-arrange the layout workshop to avoid the overlapping of material and product flow.</li> </ul>



## II. THANH HOA PROVINCE

### 1. Thanh Duc Co.Ltd.

#### a. Company description

Name of SME: Thanh Duc Company limited

Address: hamlet 7, Thieu Do commune, Thieu Hoa district, Thanh Hoa province

Tel: 0982829426 Fax:

Email: Website:

Name of Director: Hoang Viet Duc

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business: Actual is a household under the form of Company limited

Registered household/unit;  Cooperative;  Limited company;  Joint-stock

company;  Joint-venture company;  Foreign-invested company;  Others:

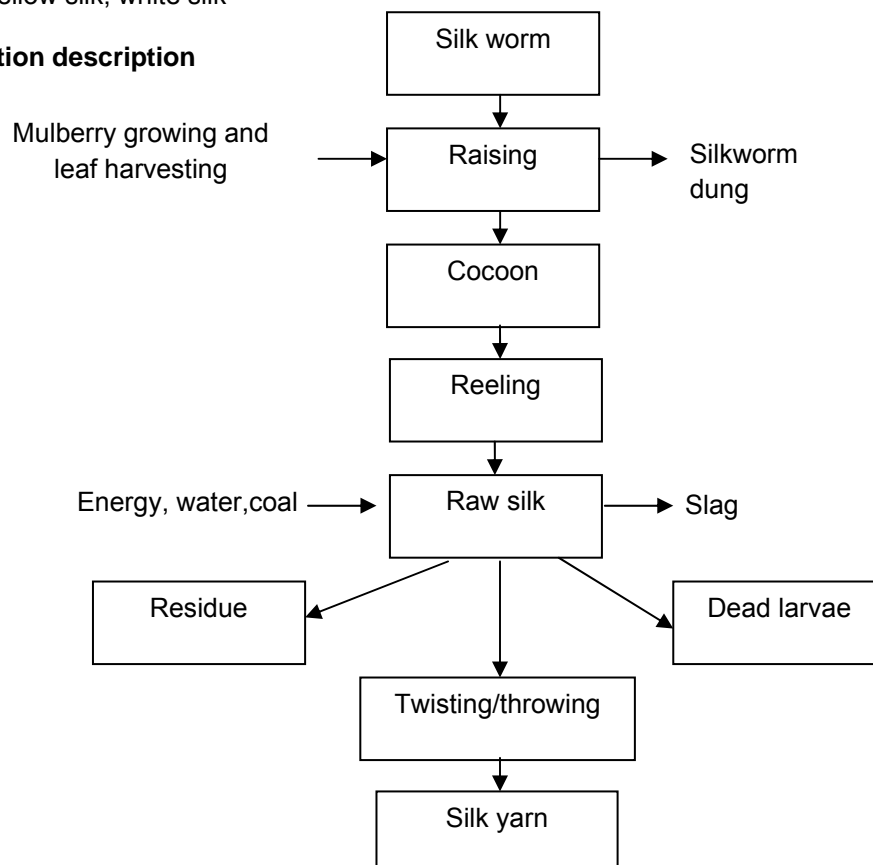
Number of workers: 10 Male: Female: 10

Number of operation day/year: 270

Annual Turnovers: VNĐ10 billion

Products: yellow silk, white silk

#### b. Production description



**Table 1. Actual production**

	Product	Unit	Weight (kg/each)	2010
1	Yarn silk		Ton	10

**Table 2. Raw materials and resources consumption**

No	Input	Unit	2010
1	Silk worm	Tons	N/A
2	Electricity (for production)	Kwh	4500
3	Chemical - Ant and white aunt pesticide	kg	N/A
4	Water (for rinsing)	M <sup>3</sup>	1350
5	Coal (if using)	ton	67.5

**c. Waste**

**Air emissions:**

- From the water burning oven for reeling process

**Effluents:**

- After reeling, wastewater contains high COD, BOD

**Solid wastes:**

- Slag from stove

**d. Observation and recommendation**

Observation	Recommendation
<p>Last layer of cocoon which can not be salvaged is sold to China</p> 	<p>Entirely collect silk by investing on machine (imported from China) to increase productivity</p>

Product pupa is not preserved



There is no cool storage to preserve pupa, so company has to sell pupa in day and is squeezed the price by buyers

Growing mulberry in an old way



The area for growing silkworm must be far away from living area to ensure silk quality as well as the existence ratio of worm

Using coal stove and aluminum basin without insulation for boiling the cocoon will loss energy quickly and smoke will effect to the workers



Use automatic silk reeling system in combination with a boiler to distribute steam and control heat to each reeling pot, avoiding coal and water loss.

Obsolete machines which are self-made

Invest on new machines which are upgraded to





suit work and regularly maintain machines to avoid low efficiency and high electricity consumption.

Manual fiber twisting



Design and install one motor in the central axis to form semi-manual machine to improve efficiency.

Other pictures in company





## 2. Hoang Long Co. Ltd.

### a. Company description:

Name of SME: Hoang Long Import & Export JSC.

Address: Handicraft industrial area, Nga Son Town, Nga Son District, Thanh Hoa province.

Tel: 0373 627 503 . Fax: 0373 628 555.

Email:hoanglong1994@vnn.vn Website: hoanglongimex.com.vn

Name of Director: Mr. Duong Van Tuan.

Year of establishment: 1994

Number of workers: 45 Male: Female:

About 200 household have been worked for company.

Number of operation day/year: 330

Annual Turnovers: 2,3 mill USD.

Products: Household goods, tray, basket, table & chair, mattress.

### b. Production description:



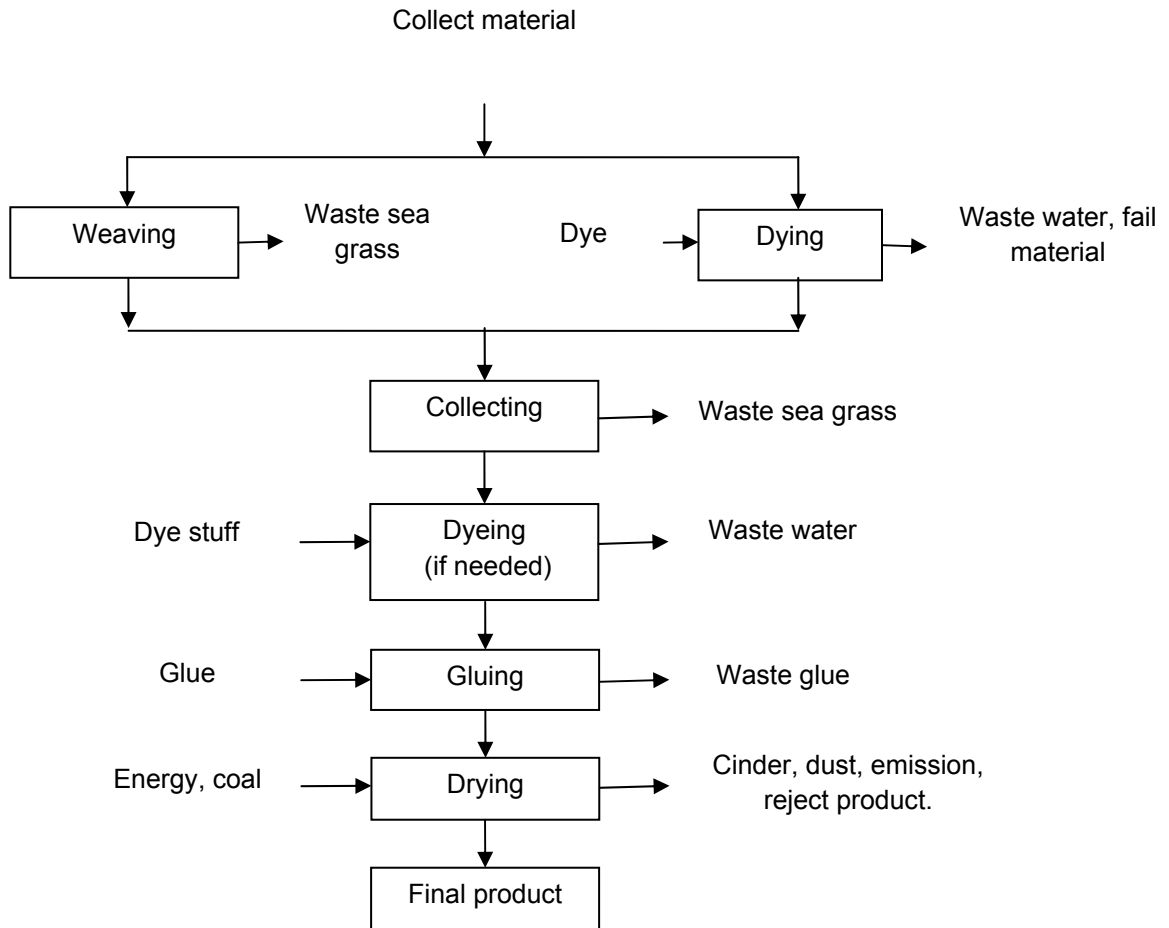
**Pic 1:** Front of workshop in company.



**Pic 2:** showroom of company.



**Pic 3:** Products



**Pic 4:** Production flowchart.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Household good	Container		40
2	Total	container		100

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Sea grass	Tons/year	5000
2	Electricity (for production)	KWh	72.000
3	Chemical		
	- Dye	Tons	0,8
	- Glue	Tons	6
4	Water (for rinsing)	m <sup>3</sup>	NA

5	Coal (if using)	Tons	28
6	Gas	Kg	432

**c. Waste (from where, how?)**

**Air emissions:**

- Emission from drying.


**Effluents:**

- Waste water from dyeing.
- Waste glue from gluing.

**Solid wastes:**

- Waste seagrass from weaving, collecting.
- Reject material from dying and preservation.
- Reject product from preservation.
- Slag and dust from drying.

**d. Observation and recommendation**

Observation	Recommendation
<p>- Illumination system of workshop is not good. Many place still so dark and no enough light for working.</p> 	<p>- Redesign illumination system and install the transperance panel to collect sun light.</p>
<p>- Lack of fire extinguishing equipment.</p>	<p>- Install fire extinguishing equipment in workshop.</p>
<p>- Workshop is too disorder that make reduce efficient working of workers and overlapping</p>	<p>- Redesign the layout of workshop to increase</p>

the material and product flow.



the productivity

- Drying oven is not good.



- Redesign and repair the drying oven to enhance efficient in preserve material and dry product.



- Storage is too wet and dark. This environment is good condition for mould development.



- Redesign storage utilize sun light and good ventilation for preservation material and product.

### 3. My Quang Co.Ltd.

#### a. Company description:

Name of SME: My Quang company limited.

Address: Thieu Long comune, Thieu Hoa district, Thanh Hoa Province.

Tel: +84 037 3816668/ 0978379767

Fax:

Email:

Website:

Name of director: Mrs. Pham Thi My.

Year of establishment: 2006

Number of workers: 17

Male:

1

Memale:

16

Number of operation day/year: 330

Annual Turnovers: 1 bills VNĐ

Product: Box, tray, dish.

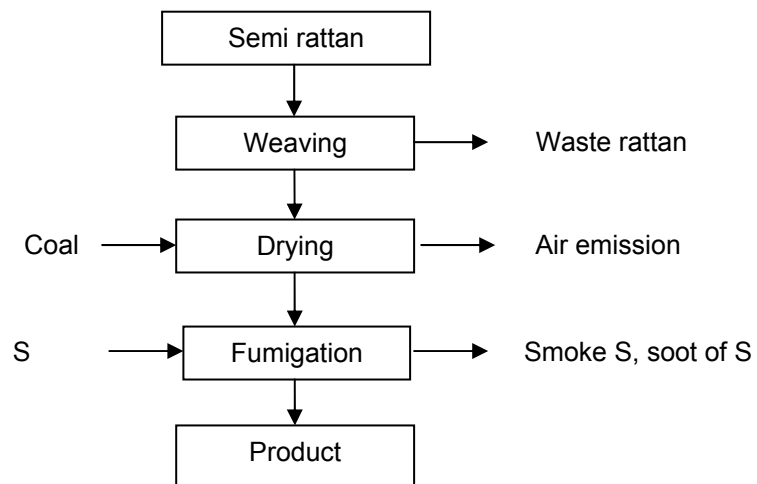
#### b. Production description:



**Pic 1:** Front of director company's house.



**Pic 2:** Sitting room of director's house



**Pic 3:** Production flowchart.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009
1	Box	Piece	0.5	5400
2	Dish	Piece	0.8	14000
3	Tray	Piece	0.15	24000

**Table 2.** Raw materials and resources consumption.

No	Input	Unit	2009	2010
1	Rattan	m	35.000	
2	Electricity	Kwh		
3	Chemical - S	kg		25

**c. Waste**

**Air emissions:**


- Smoke S from fumigation.
- Smoke from Drying.

**Waste waters:**

**Solid wastes:**

- Reject product from bad maintain.

**d. Observation and recommendation**

Observation	Recommendation
<p>- Material and product has bad preserved.</p> 	<p>- Rebuild store maintain material and product to avoid the reject material and product.</p>





- Dry oven is too basic and used coal for direct drying. It does not vouch for quality of product.



- Company has done fumigation in room make by canvas. This room is too basic and not tight so that can make air pollution.



- Rebuild room for drying and used sun light and combine with method indirect drying to vouch for quality of product.

- Rebuild fumigation room that is tight. And if the drying is good then company can stop to use Sulfur for preservation.





#### 4. Nam Duong Co.Ltd.

##### 1. Company description

Name of SME: Nam Duong Co., Ltd.

Address: Ben Sung town, Nhu Thanh district, Thanh Hoa province.

Tel: 0373848294

Email:lephutien@yahoo.com.vn Website:

Name of Director: Mr. Le Phu Tien

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Rattan  Bamboo  Others: Rattan plantation

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;

Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 36 Male: 24 Female: 12

Number of operation day/year: 350

Annual Turnovers: 200 million VND

Products: Bowl, cup, tray, basket...

Nam Duong was used to be a rattan handicraft producer, wild/forest rattan processor but in the recent years, Nam Duong focuses more on the plantation of rattan material to supply for handicraft producers in Thanh Hoa and other provinces. The company has already built its strong human resource and it started producing rattan seedlings to supply for rattan growers in the area. Presently, Nam Duong has an open area of 10 ha – previously this is the place for sugar-cane and pineapple production but because of its low economic value, Nam Duong has decided to replace with rattan intensive plantation. The goal that Nam Duong pursues is to be the biggest supplier of rattan material in Thanh Hoa by 2015.



## 5. Ninh Huyen Thong Co.

### a. Company description:

Name of SME: Ninh Huyen Thong Company.

Address: 3<sup>rd</sup> hamlet, Nga Thanh commune, Nga Son district, Thanh Hoa province.

Tel: 037 3653 171

Fax:.....

Email:.....

Website:.....

Year of establishment: 2006

Name of Director: Mrs. Tran Thi Kim Thong.

Number of workers: 100 Male: 20 Female: 80

Number of operation day/year: 330

Annual Turnovers: 16 billion VNĐ

Products: mat.

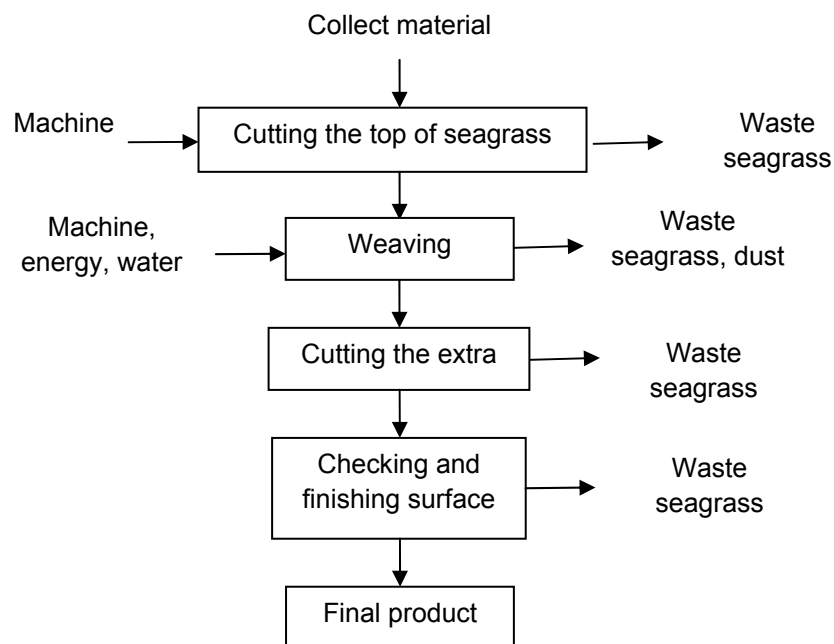
### b. Production description:



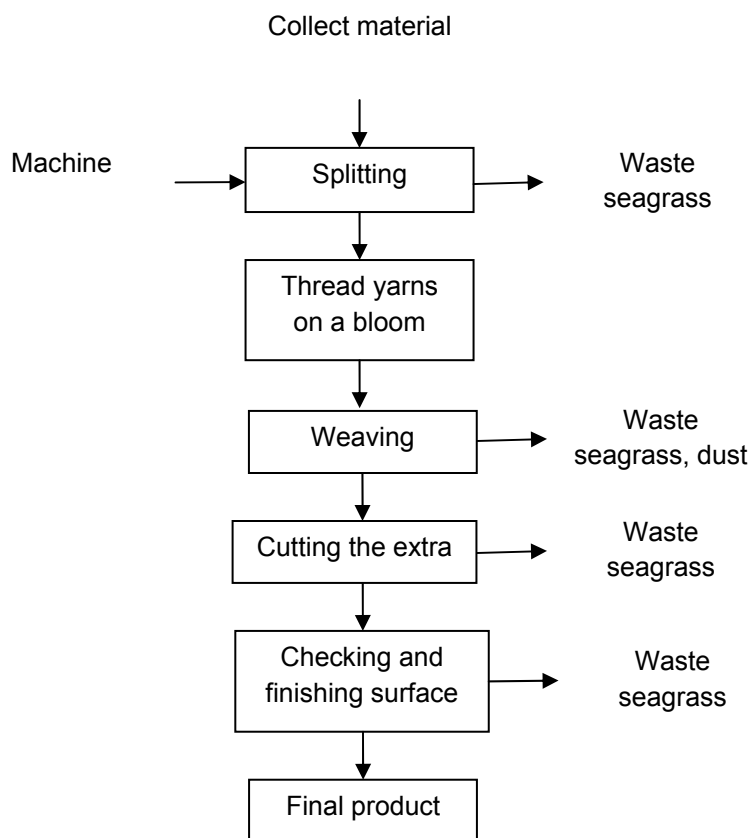
Pic 1: Gate of company.



Pic 2: Workers are weaving mat.



Pic 3: Production flowchart mat by machine.



**Pic 4:** Production flowchart mat by hand.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Mat (by machine)	Piece	2	163.000
2	Mat (by hand)	Piece	2	400.000
3	Twisted seagrass fibers	Knot		NA (*)

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Seagrass	Tons	720
2	Electricity (for production)	Kwh	NA

**c. Waste**

**Air emissions:**



- Dust from weaving.

**Effluents:**

**Solid wastes:**

- Waste seagrass from cutting the head of seagrass thread, weaving, cutting the extra, checking and finishing surface.
- Reject mat from bad storage and preservation.

**d. Observation and recommendation**

Observation	Recommendation
<p>- The lighting is not good. That will effect to the productivity as well as consuming high electricity during the bad weather.</p>  	<p>- Redesign system light to improve working condition for worker. Collect the natural light by installing the transparence panel in the roof</p>
<p>- The material preservation is not good. - Company is considering installing the boiler for drying and preservation material and product.</p>	<p>- At company, mount of waste seagrass and scrap of seagrass are big volume. And the drying seagrass is requires low temperature to keep the natural color, so company can use waste seagrass and scrap to burn the boiler.</p>



	
<p>- Company has not fire extinguishing equipment.</p>	<p>- Install fire extinguishing equipment.</p>
<p>- Workshop has arranged disorder causing a untidy and overlap the production flow</p>	<p>- Replant workshop to manage better and make good condition for worker.</p>

At the moment, company has low various types of products then the yield is low. Company should be design more style of mat and product with seagrass (in those products use waste seagrass and scrap of seagrass) in order to improve style of product and get much income from waste material that company has discharged.

## 6. Quoc Dai Co. Ltd.

### a. Company description:

Name of SME: Quoc Dai bamboo, rattan Ltd Co.,

Address: Hamlet 7, Hoang Thinh commune, Hoang Hoa district, Thanh Hoa province.

Tel: 0373 640 126

Fax:

Email: quocbieu147@gmail.com;

Website:

Name of Director: Mr. Nguyen Quoc Bieu

Year of establishment:

Number of workers: 180

Male: 50

Female:

Number of operation day/year: 300

Annual Turnovers: 23 Bill VND

Products: Lamp shade, hand basket, flower basket.

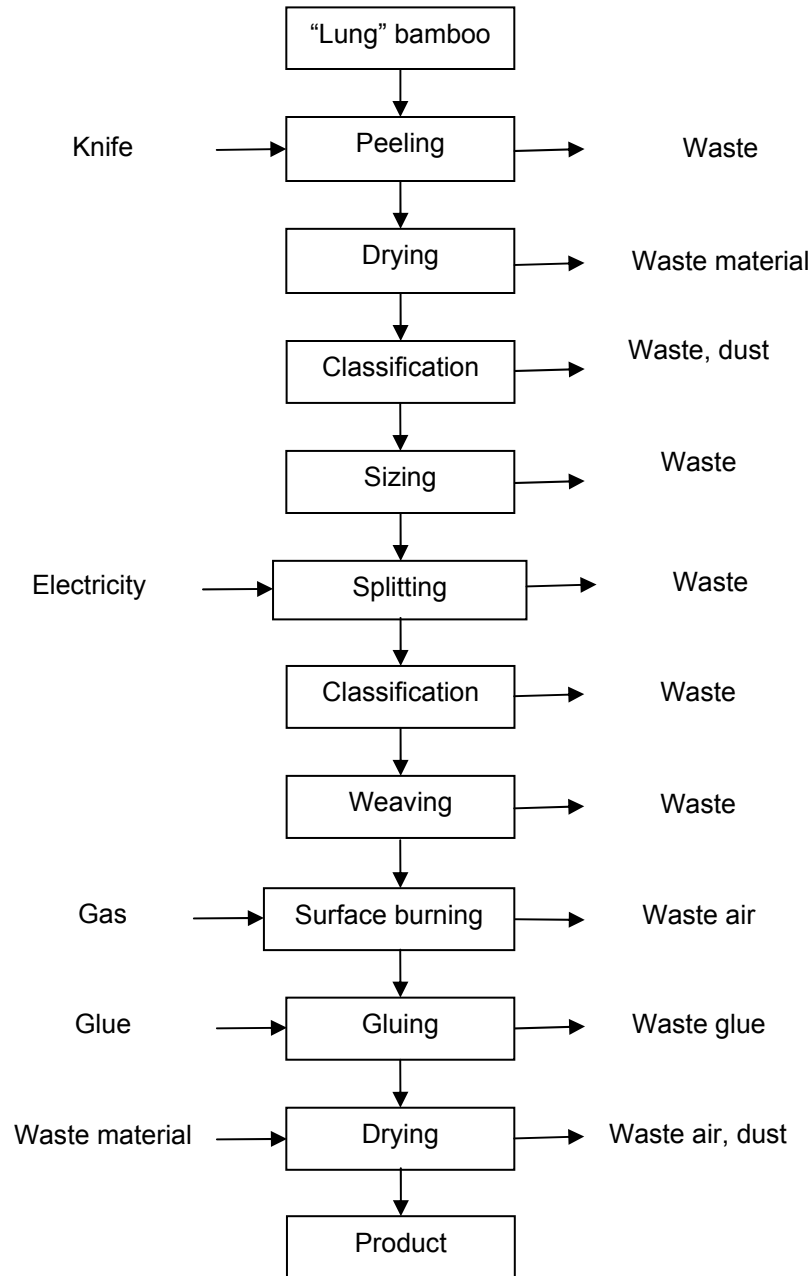
### b. Production description:



**Pic 1:** Front of Company.



**Pic 2:** Products of Company.



**Pic 3:** Production flowchart in company.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Lamp shade	Piece	0.3	120.000
2	Hand basket	Piece	0.3	30.000
3	Flower basket	Piece	0.3	30.000



**Table 2.** Raw materials and resources consumption

No	Input	Unit	May 2010
1	Rattan:	Tons	7
	Lung bamboo:		80
2	Electricity (for production)	Kwh	7000
3	Chemical		
	- Glue	Kg	4500
	- Sulfur	Kg	500
4	Gas	kg	480

**c. Waste**

**Air emissions:**

- Waste air from the burning material for drying.


**Effluents:**





- Waste glue from gluing process.

**Solid wastes:**

- Waste bamboo from peeling, classification, sizing, splitting, weaving.
- Waste material causing from drying process.
- Broken knife from peeling and splitting processes.
- Reject product due to bad preservation.

**d. Observation and recommendation**

Observation	Recommendation
<p>Working area is lacking of fresh air causing a effects to the worker productivity.</p> 	<p>Open window and create the ventilation for workshop.</p>
<p>Lamp was turned all the time of working due to the close room without using the natural light.</p>	<p>Install the transparence panel in the roof to collect the natural light.</p>

	
<p>Peeling skill is not so good then the outer layer of the material was broken causing waste material.</p> 	<p>Design the knife which is suitable for peeling aiming at increasing the peeling productivity and quality.</p>
<p>The transpance panel is dirty causing a low efficiency of natural lighting.</p> 	<p>Clean the panel to increase the natural lighting.</p>
<p>Working area is disorder than may effects to the material and product flows.</p> 	<p>Rearrange the working area to increase productivity and preserve the material.</p>
<p>Sawdust from the toothpick production are collect and recycle causing a environmental pollution in the company</p>	<p>Using the press machine to produce a fuel pallet for burning</p>

**7. Son Phu Co. Ltd.**

**e. Company description:**

Name of SME: Son Phu Co., Ltd

Address: Hamlet 5, Nga Thai commune, Nga Son district, Thanh Hoa province

Tel: 091 698 2171.

Fax:.....

Email:.....

Website:.....

Name of Director: Mr. Do Xuan Phu

Year of establishment: 2008

Number of workers: 14      Male:            8            Female:            6

Number of operation day/year: 300

Products: mat, raw material.

**f. Production description:**



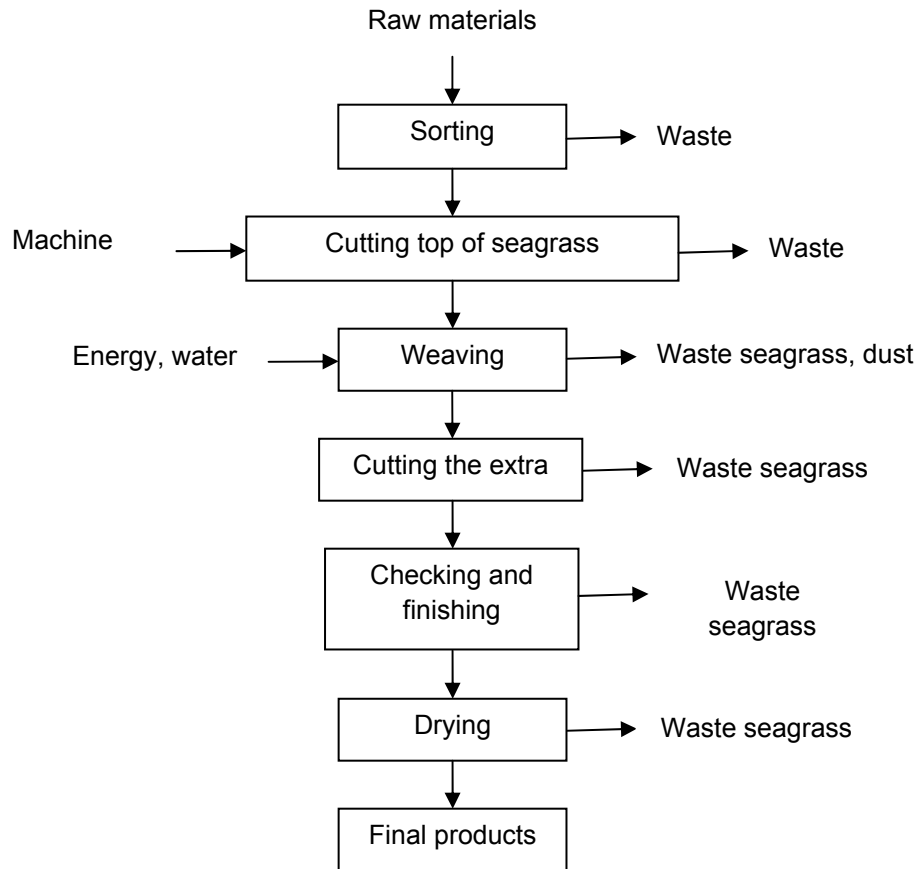
**Pic 1:** Front of company.



**Pic 2:** workshop of company.



**Pic 3:** workers are collecting seagrass



**Pic 4:** Production flowchart mat at company.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Raw material	Tons		500
2	Mat	Piece		NA(*)

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Sea grass	Tons	480
2	Electricity (for production)	Millions VNĐ	18
3	Thread	Kg/ mat	0.25

**g. Waste**

**Air emissions:**



- Dust from weaving.

**Solid wastes:**

- Waste seagrass from: sorting, cutting the top of seagrass, drying, weaving, cutting the extra, checking and finishing.

- Broken product because of bad preservation.

**h. Observation and recommendation**

Observation	Recommendation
<p>- The lighting system is not good so company has to turn the light on all day.</p> 	<p>- Redesign the lighting system to use natural light for energy saving.</p>
<p>- The preservation is not good so mat has attached by mould.</p> 	<p>- The volume of waste seagrass and rejected products are very high. Thus, company can reuse waste seagrass and rejected products for drying.</p>
<p>- The arrangement material and product of company is not good.</p>	<p>- Review and re-arrange material and product with FIFO method in order to preserve better.</p>
<p>- Lack of fire extinguishing equipment.</p>	<p>- Set up the fire extinguishing equipment.</p>
<p>- The storage workshop is not well designed causing a mold, fungi during storage.</p>	<p>- Redesign the storage to get enough light, air and temperature</p>

**8. Tan Tho Cooperative**

**a. Company description**

Name of SME: Tan Tho cooperative

Address: Tan Tho commune, Nong Cong district, Thanh Hoa province.

Tel: 0949357521 Fax:

Email: Website:

Name of Director: Ms. Nguyen Thi Tham (extend contact Nguyen Thi Binh)

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 300 Male: 20 Female: 280

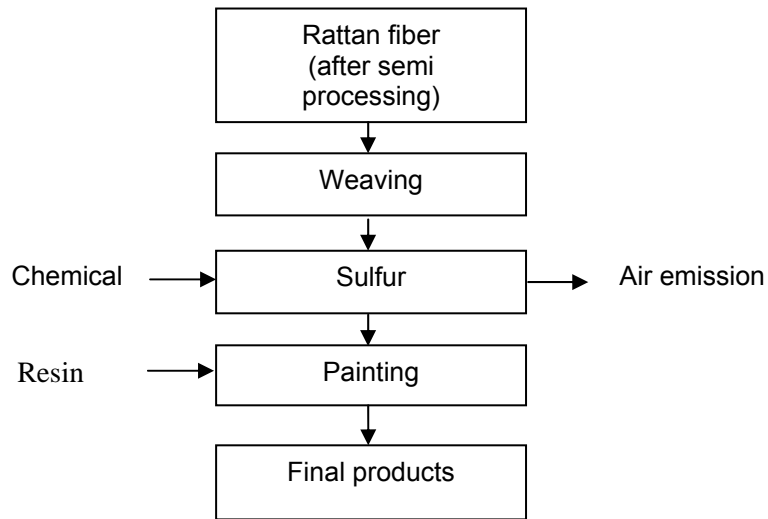
Number of operation day/year: 270

Annual Turnovers: VNĐ 2 billion

Products: tray, basket, bamboo screen...



**b. Production description**



**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009	May 2010
1	All products			N/A	

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Raw rattan with each kind of species - Rattan - A kind of bamboo "giang"	M Piece ( 2,5 x 60 cm)	1.800.000 20.000
2	Electricity (for production)	Kwh	
3	Chemical - Petrol - Resin - Sulfur	Litter Kg Kg	270 90 5
4	Others		

**c. Waste**

**Air emissions:**

- Exhaust gas from sulfur drying

**Solid wastes:**

- Defect products



- Defect material

**d. Observation and recommendation**

The cooperative mainly processes according to the buyer's orders. Because materials are supplied by the buyers, there is no data on the material source and the cooperative just sells labor force to get profit. As the skillfulness is not high, cooperative does not dare to process the order which require sophistication although they have up to 185 households as sub-contractors. At present, the cooperative has 4 ha of Calamus tetradactylus which has been grown for 2 years. Rattan can be harvested next year; however, the cooperative lacks of experiences for pre-processing, process and preserve raw rattan. Sulfur is still used for preserving products, except for products which are served for domestic market, as required by the consumers. Another product which is also the cooperative's strength is producing blind from Artemisia Annu L. which is grown in Ha Tinh Province using environmentally friendly technology without any chemicals. However, due to the overexploitation without cultivation, material price is increasing. Trainings on weaving skills and raw rattan processing are recommended to improve villager's skills to harvest 4 ha of rattan in the future.

Observation	Recommendation
<p>Workers do not wear protective equipment</p> 	<p>Equip necessary protective equipment for villagers.</p>





Other pictures in cooperative.





## 9. Viet Linh Co. Ltd.

### a. Company description:

Name of SME: Viet Linh bamboo flooring production ltd Co.,

Address: Lot A2 – Small industrial zone Dan Luc commune – Trieu Son district – Thanh Hoa province.

Tel: 0373 894 688

Fax: 0373 894 689

Email: bambooth@vnn.vn ;

Website:

Name of Director: Mr. Tran Van Duong

Year of establishment:

Number of workers: 80

Male: 5

Female: 75

Number of operation day/year: 300

Annual Turnovers: 6 ÷ 8 bill VND.

Products: Flooring, furniture (table, chair, window)

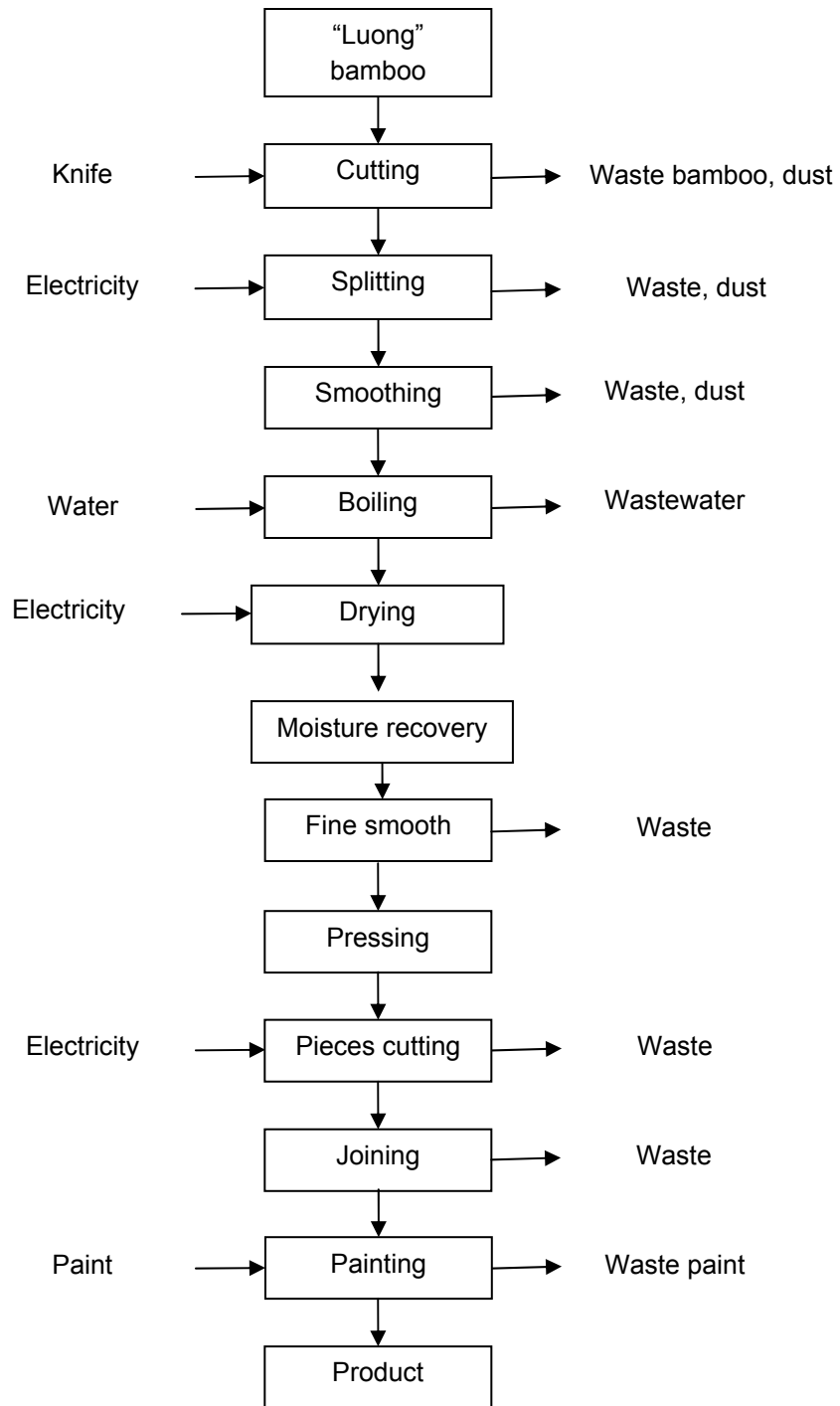
### b. Production description:



**Pic 1.** Font of workshop



**Pic 2.** Products of Company



**Pic 3:** Production flowchart in company.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Flooring board	m <sup>2</sup>		140.000

2	Table	Piece		10.000
3	Chair	Piece		60.000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Fresh “Luong” bamboo	Billion VNĐ	2.4
2	Electricity (for production)	kWh	40.000
3	Chemical - Ca(OH) <sub>2</sub> - Glue	Kg Billion VNĐ	6000 0.4
4	Coal (if using)	Ton	NA

**c. Waste**

**Air emissions:**

- Dust from splitting and smoothing processes.
- Stack gas from boiler burning.


**Effluents:**

- Wastewater from boiling process.
- Waste paint from painting.

**Solid wastes:**

- Solid waste from cutting, splitting, smoothing process.
- Reject product from processing and preservation step.
- Broken auxiliary..

**d. Observation and recommendation**

Observation	Recommendation
<p>- Purchasing material is stored in improperly method causing a loss of material.</p> 	<p>- Design a storage area to store the material to avoid the loss.</p>



- Working area is disorder causing a effect to the production flow and productivity.



- Machines is getting dirty and causing a low efficiency and broken.

- Rearrange the working area.

- Clean and maintenance frequent machines.





- Electricity box is opened.



- Close the box to avoid the dust causing a short circuit.



- The valves, pipe is leakage causing a steam loss.



- Seal the leak and replace the broken valve.
- Replace the pressure meter to control steam better.





- Not good isolation of boiler and auxiliary.



- Boiling tank has no cover which will lose the heat.  
- Wastewater is untreated before discharge.

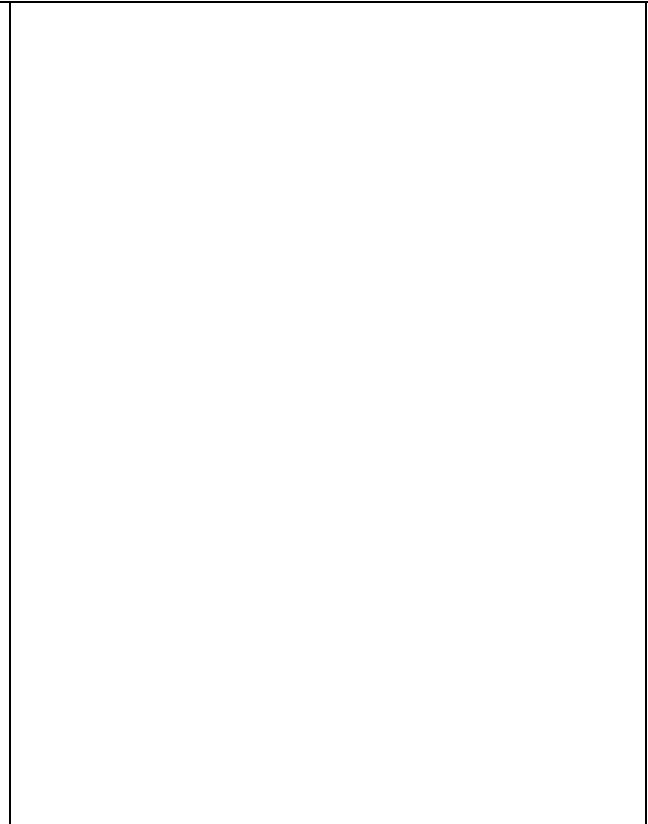
- Good isolation for saving energy.



- Coal storage has no roof.



- Working area is very dirty that will effect to the human health.



- Build the roof for coal storage.



- Clean the working area to make it more tidy to keep the human health better.



- The lamp shade is covered by the dust layer causing an effect of lighting and increasing the energy consumption.
- Lamp capacity using in the company is too high while the lighting efficiency is low.



- Often cleaning and maintenance the lighting system.
- Replace the high capacity lamp by the energy saving lamp.



- Not good management in chemical using.



- Implement the efficient chemical using for safety.

## 10. Viet Anh sedge production export company

### a. Company description:

Name of SME: Viet Anh Sedge Production Export Joint Stock Company.

Address: Hamlet 8 – Commune Nga An – District Nga Son – Thanh Hoa City.

Tel: 0378 636 659

Fax: 0373 652 868.

Email: vietanhimex@vnn.vn - supplier@vietanhseagrass.com.vn

Website: www.vietanhseagrass.com.vn

Name of Director: Mr. Pham Minh Ton

Year of establishment: 1998

Number of workers: 20      Male: 5      Female: 15

Number of operation day/year: 330

Products: tray, carpet, handbag.

### b. Production description:



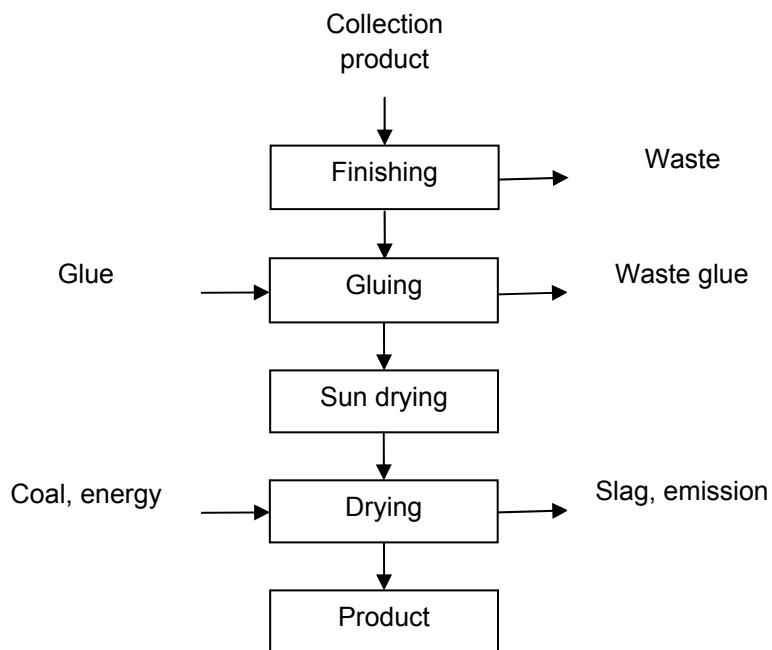
**Pic 1:** Front of company.



**Pic 2:** Workshop in company.



**Pic 3:** Products



**Pic 4:** Production flowchart.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Tray			NA (*)
2	Handbag			NA
3	Carpet			NA

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Seagrass	Tons	NA
2	Electricity (for production)	Kwh	NA
3	Chemical - Glue	Kg	7200
4	Coal (if using)	Tons	60

\*: The company has no data record system.

### c. Waste

#### Air emissions:

- Air emission from drying.

#### Effluents:

- Waste glue from gluing.

#### Solid wastes:

- Waste from finishing.
- Cinder from drying.
- Fail product from bad maintain.

### d. Observation and recommendation

Observation	Recommendation
- The lighting system is not efficiency even in the day time then the lamp was turned on all the time	- Install the switch to easily operation. - Replace the lamp with low capacity to save energy.





- Equipment to recover glue from products after immersing in glue is obsolete and not efficient.

- Install the new recycle glue system



- Boiler that used to drying product, have bad efficiency in use heat and combustible

- Maintenance oven to improve efficient in use heat and combustible.







## 11. Duy Hai Co. Ltd.

### a. Company description:

Name of SME: Duy Hai company limited

Address: Minh Thanh Hamlet – Quang Tien Commune – Sam Son – Thanh Hoa Province.

Tel: 037 350 4050

Fax 037 790 760

Email: duyhaivietnam@gmail.com

Website:

Name of Director: Mr. Le Van Hai

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Rattan  Bamboo  Others:

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;

Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 30 Male: 8 Female: 22

Number of operation day/year: 270

Annual Turnovers: 3 bills.VND

Products: Bowl, bottle, tray...

b. Production description



Pic 1: Front of company



Table 1. Actual production

	Product	Unit	Weigh (kg/each)	2009	2010
1	Bottle	piece			6000
2	Bowl	piece			40.000

Table 2. Raw materials and resources consumption

No	Input	Unit	2009	May 2010
1	Material bamboo	Tons		800
2	Electricity (for production)	VND		1.500.000
3	Chemical			
	- All kinds of paints	Litter		NA
	- Glu	Litter		2000
	- Petrol	Litter		3000
	- Water based glue	Kg		
4	Diesel Oil for boiling	tons		NA
5	Water (for rinsing)	M <sup>3</sup>		
6	Coal (if using)	tons		12
7	Others			

**c. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
<p>Poor of lighting system in the workshop</p> 	<p>Installing the panel to receive natural light</p>
<p>A big volume of solid waste in the workshop</p> 	<ul style="list-style-type: none"><li>- Redesign the drying chamber to use the solid waste</li></ul>



### III. PHU THO PROVINCE

#### 1. Can Lieu Cooperative

##### a. Company description:

Name of SME: Can Lieu Cooperative

Address: Yen Tap commune, Cam Khe district, Phu Tho province, Viet Tri city.

Tel: 0210 363 7277

Fax: (84-43) 944 7162

Email:

Website:

Name of Director: Mrs. Nguyen Thi Lieu.

Year of establishment: 2003

Number of workers: 20

Male:

Female:

Number of operation day/year: 180

Annual Turnovers: 800 mills VNĐ

Product: Material, lamp cap, tray, basket, betel-tray.

##### b. Production description:



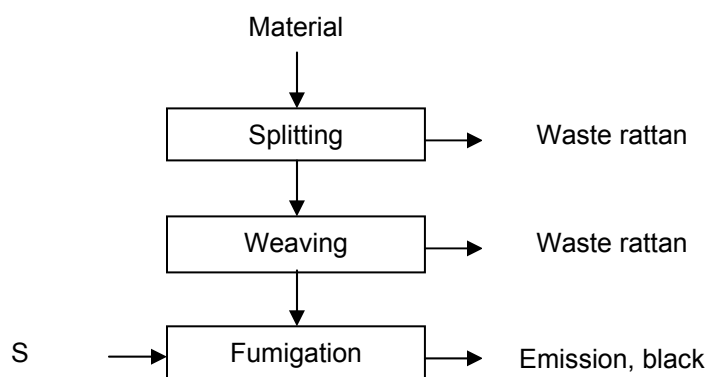
**Pic 1:** Mrs Lieu is introducing company's products



**Pic 2:** One product has made in company.



**Pic 3:** Materials.



**Pic 4:** Production flowchart.

**Table 1.** Actual production

	<b>Product</b>	<b>Unit</b>	<b>Weigh (kg/each)</b>	<b>2010</b>
1	Material			NA(*)
2	Tray	Piece		4.000
3	basket			NA
4	Betel-tray	Piece		2.000

**Table 2.** Raw materials and resources consumption

<b>No</b>	<b>Input</b>	<b>Unit</b>	<b>2010</b>
1	Rattan	Tons	75.000
2	Chemical - Sulfur	Tons	4.8

**c. Waste**

**Air emissions:**

- Smoke sulfur from fumigation.

**Solid wastes:**

- Waste rattan from splitting and weaving.
- Reject material and product from bad preservation.
- Soot of sulfur from fumigation.

**d. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
- Cooperative has no drying oven so material and product has getting mould.	- Install the drying room to dry and preserve material and product.



(Cooperative can use the existing room that currently using for sulphur fumigation to build drying room).

They have a lot of rattan waste as well as much combustibile waste that can burn to supply the heat for drying.



- Cooperative has been cultivating the nursery rattan tree. So, they need to have a support on cultivation technology in order to achieve high capacity.



## 2. Duong Thanh Phu Co. Ltd.

### a. Company description:

Name of SME: Duong Thanh Phu., JSC

Address: lot 4 – Thuy Van industrial park – Viet Tri city, Phu Tho province.

Tel: 0210 395 6686

Fax: 0210 385 7877

Email: [vinabamboo@gmail.com](mailto:vinabamboo@gmail.com)

Website: [www.duongthanhphujsc.com](http://www.duongthanhphujsc.com)

Name of Director: Mr. Duong Minh Uong

Year of establishment: 2006

Number of workers: 60

Male: 25

Female: 35

Number of operation day/year: 330

Annual Turnovers: 10 bill VND

Products: chopstick, broach, rattan powder.

### b. Production description:



**Pic 1:** Director of company.

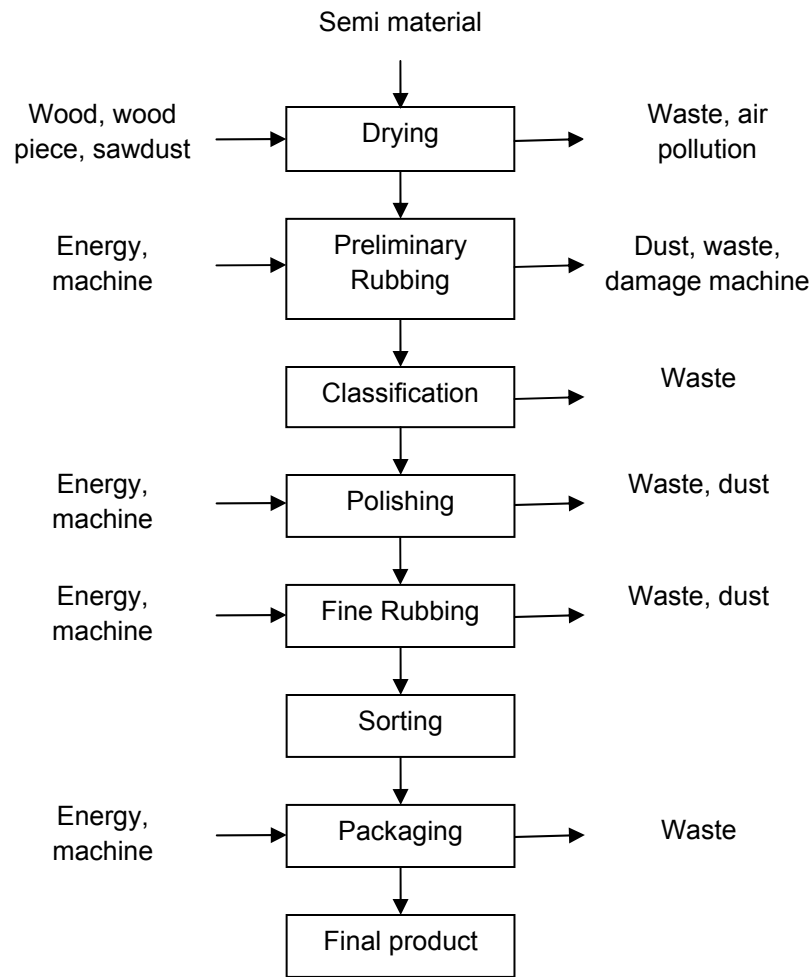


**Pic 2:** workshop of company.

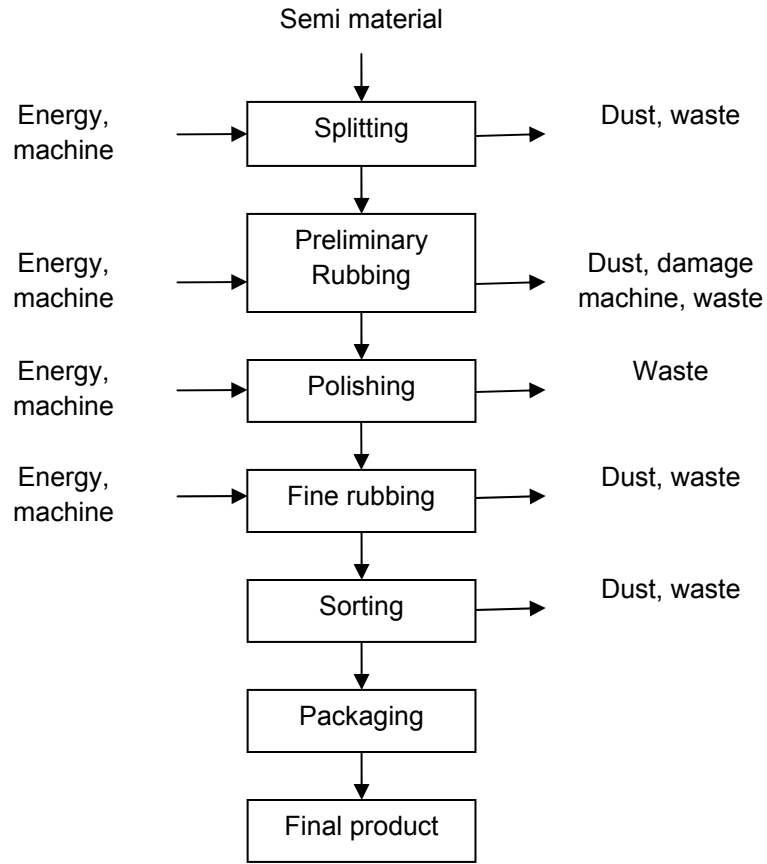


**Pic 3:** products of company





**Pic 4:** Production flowchart bamboo chopstick



**Pic 5:** Production flowchart of bamboo broach.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Chopstick			NA(*)
2	Broach			NA
3	Powder			NA
4	Total	Container		51

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009
1	Bamboo	Ton	12.000
2.	Electricity (for production)	kWh	253.000
3.	Chemical		
	- S	Kg	50
	- Other	L	500

\*: Because, mount of all products are too large, so company has not data record each product but they just manage flowing total product.

### c. Waste


**Air emissions:**

- Dust from splitting, polishing, and rubbing.

**Solid wastes:**

- Waste from all of step in production flowchart.

**d. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
<p>- The dust exhaust system is not working properly then it will effect to the worker health.</p> 	<p>- Isolate the area which causing dust and install the dust exhaust system</p>
<p>- Worker working in the unsafe environment but they do not have to wear any protecting health equipment.</p>	<p>- Equip the protecting health equipment to worker.</p>



- Many places have a collecting dust system but they did not work efficient so it will effect to the environment as well as destroy the electrical equipment.



- Install the collecting dust system to recover the dust for incense making.

- With that environment so machine need maintain more and frequent in order to have a high efficiency.



- Now, wastes of bamboo are too much and use to burn for boiling.



- Save material by cutting properly.  
- Design other product from waste.

### 3. Lv & Oriental Pearl Co.Ltd.

#### a. Company description:

Name of SME: LV & ORIENTAL PEARL COMPANY LIMITED

Address: commune Do Xuyen – District Thanh Ba - Phu Tho province.

Tel: 02103671164

Fax: 043 858 7891

Email: lv-orientalpearl@fpt.vn

Website: <http://www.lv-orientalpearl.com.vn>

Name of Director: Mr. Do Dinh Lang

Year of establishment: 2003

Number of workers: 42

Male: 16

Female: 22

Number of operation day/year: 300

Annual Turnovers: 20 bills VNĐ.

Products: dish, bowl, picture, house ware.

Biggest 3 buyers: Europe, Japan, USA.

#### b. Production description:



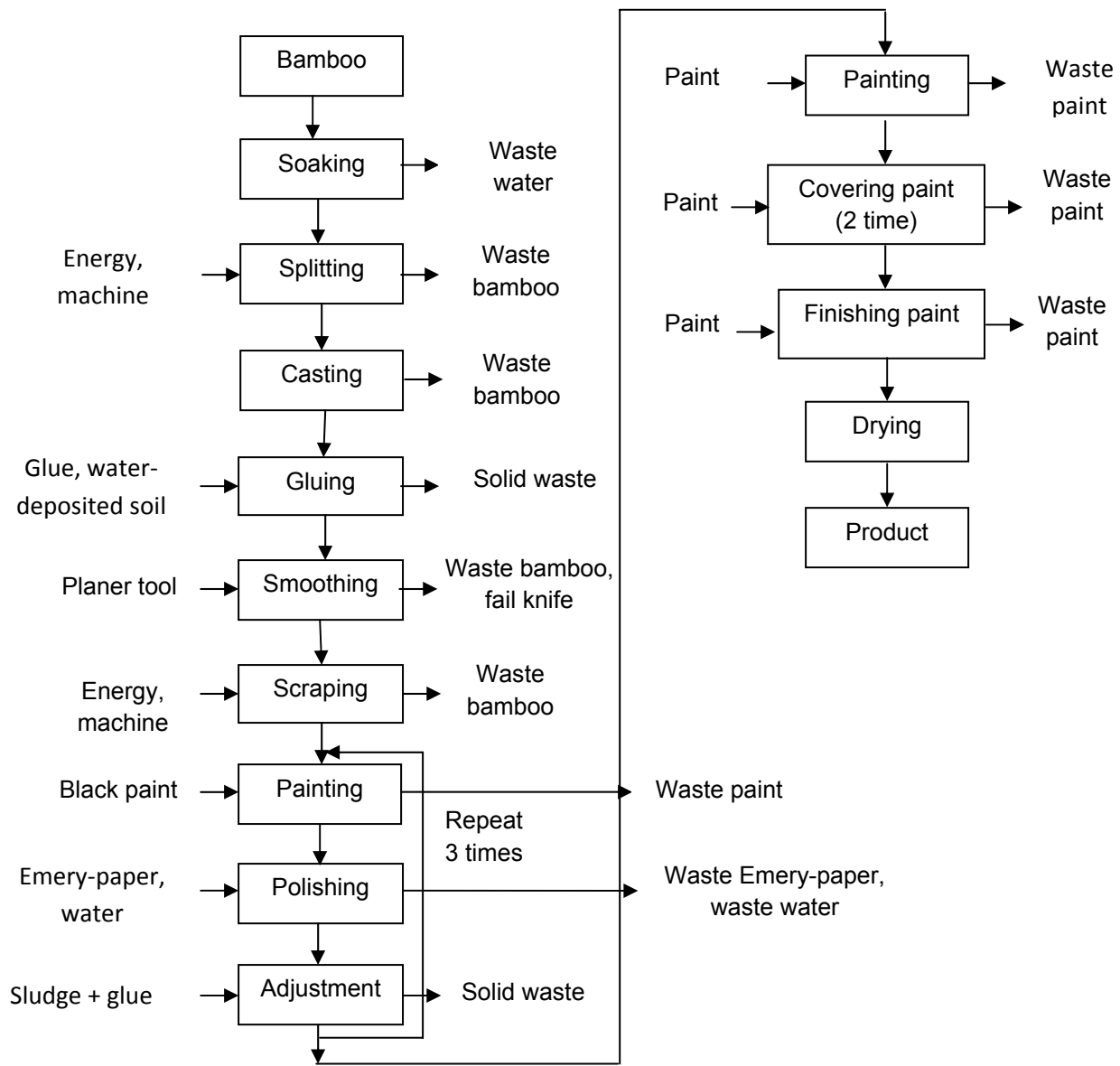
**Pic 1:** Sign of company.



**Pic 2:** Workers are painting the painting frame.



**Pic 3:** Products of company.



**Pic 4:** Production flowchart.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Dish	Piece		30.000 – 40.000
2	Mirror frame	Piece		5.000 – 10.000
3	Total	Piece		100.000

**Table 2.** Raw materials and resources consumption



No	Input	Unit	2010
1	Bamboo	Tons	200
2	Electricity for production	Kwh	NA (*)
3	Chemical		
	- Cashew-nut oil.	Tons	40
	- Lacquer	Tons	10
	- Glue	Tons	2
	- Watermark	Tons	3,2
	- Japan paint	Tons	2
	- Sludge	Tons	2
4	Water		NA

\*: There are some of data is not available.

### c. Waste

#### Air emissions:

- Smell from soaking bamboo.
- Dust from splitting, casting.

#### Effluents:

- Waste water from soaking, polishing.
- Waste paint from: painting, covering paint and finishing paint.

#### Solid wastes:

- Waste bamboo from splitting, casting, smoothing, scraping.
- Solid waste from gluing and adjustment.
- Reject knife from smoothing.
- Waste emery-paper from polishing.
- Reject product in production and from bad preservation.

### d. Observation and recommendation

Observation	Recommendation
- The workshop system is not aerating, so the odor of paint and solution is appear in the all position of the workshops.	- Redesign windows or ventilation system to increase the fresh air to ensure working conditions.



- Protective equipment is not equipped for the workers, so some workers get headache.

- Equip protective equipments to improve productivity.



- Although there are rather many windows in working area, the lighting level is not enough to ensure working conditions for workers.

- Redesign the roof by installing transparent panel to utilize the sunshine.



- Working area is in disorder, causing material loss and damage.

- Rearrange the area to improve working conditions for the workers and ensure better material preservation.



- Material and product are not managed well, causing material loss and product damage.



- Consider the material and product management to reduce material loss and product damage.

	
<p>- Working area is not well allocated.</p> 	<p>- Reconsider the working area allocation to improve productivity.</p>
<p>- Irregular machine maintenance and check, so some have broken down.</p> 	<p>- Regularly maintain and check machine to ensure smooth operation and avoid loss.</p>
<p>- Wastewater is not treated and is directly discharged into the environment.</p>	<p>- Using the new technology of treatment bamboo by boiling at high temperature instead for soaking in the pool aiming at saving the cost as well as protect the environment.</p> <p>- Design wastewater treatment system to reduce environment pollution caused by wastewater.</p>



- At present, the product drying process is not efficient, the enterprise wants to invest on new product drying chamber.



- Design simple incinerator to utilize the waste bamboo to dry products.





#### 4. Phu Cat Curtain Weaving Cooperative.

##### a. Company description

Name of SME: Phu Cat textile export cooperative

Address: 827 Hung Vuong avenue, Viet Tri city, Phu Tho province

Tel: (84) 210 3910425/ 3862739 Fax: (84) 210 3910426

Email: Website:

Name of Director: Nguyen Ngoc Quynh

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 160 Male: Female:

Number of operation day/year: 250

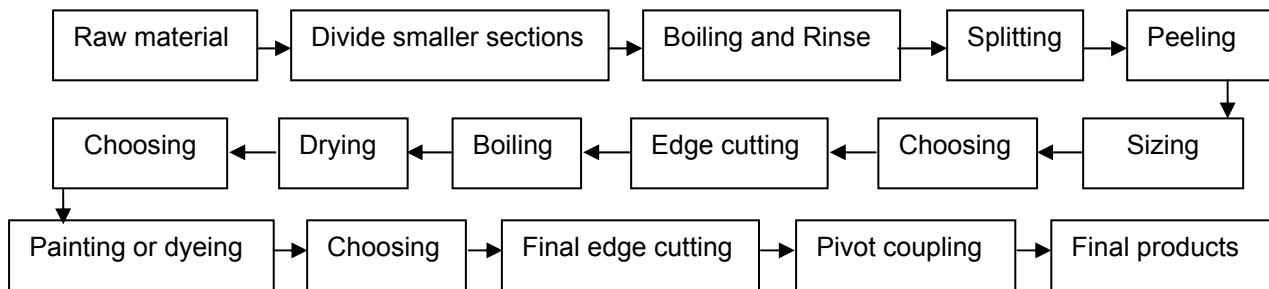
Annual Turnovers: no data recorded

Products: bamboo screen, lamp cap....



Pic 1: Company's a workshop

**b. Production description**



**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009	2010
1	Bamboo screen	m <sup>2</sup>		over 200.000	
2	Other products				

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	2010
1	Raw bamboo with each kind of species	Tons		200
2	Electricity (for production)	Kwh		3500
3	Chemical - H <sub>2</sub> O <sub>2</sub> - NaOH (or soap) - Na <sub>2</sub> SiO <sub>3</sub> - Others	kg		N/A
4	Coal (if using)	ton		0.4
5	Others			

**c. Waste**

**Air emissions:**

- Exhausted gas with dust from boiler

**Effluents:**

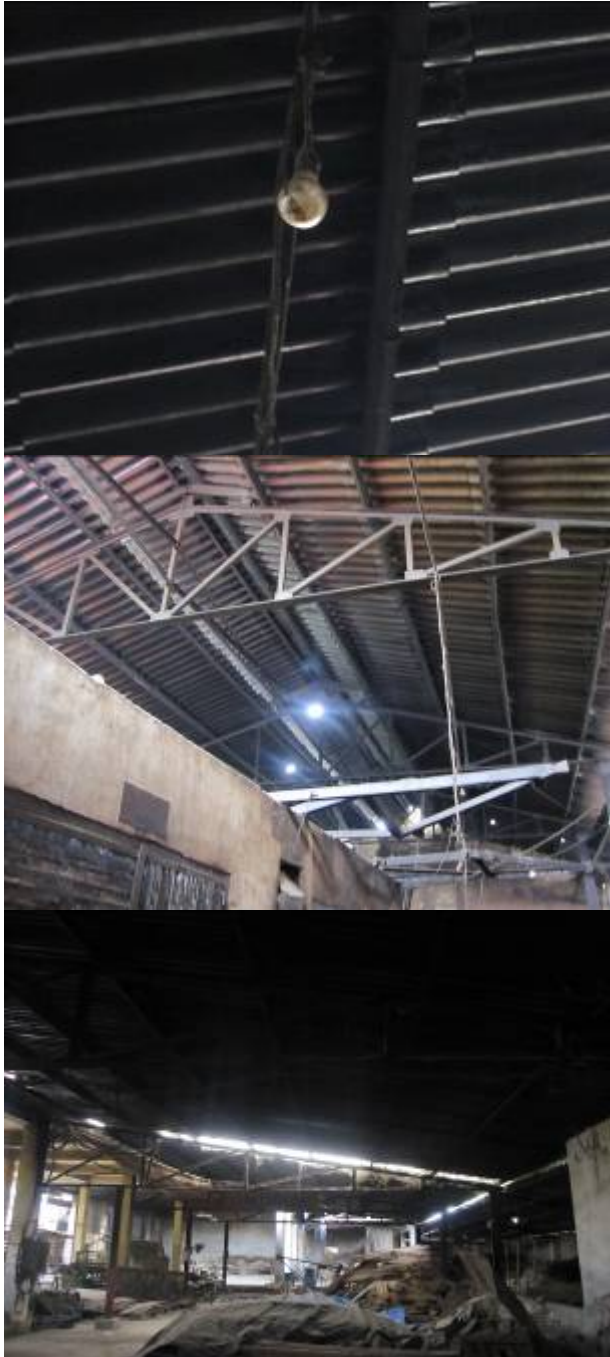
- Wastewater with chemical from boiling process

**Solid wastes:**

- Residue, dust, excess material and broken products from splitting, peeling, sizing, divide smaller sections, edge cutting process



**d. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
<p>Filament bubble lamp s and tole roof are used for a long time.</p>  <p>The top photograph shows a close-up of a single filament bubble lamp hanging from a dark, corrugated metal ceiling. The middle photograph shows a wider view of the interior, with several similar lamps and a complex network of metal trusses supporting the roof. The bottom photograph shows a long, dimly lit aisle in a large, cluttered space, with rows of filament lamps providing the only light source.</p>	<p>Replace with new energy efficient compact lamps and transparent panel roof to utilize sunshine to save electricity and increase the lighting efficiency.</p>



Manual drying furnace consumes a lot of fuel and is not insulated



Upgrade new furnace to utilize heat, improve burning efficiency and install insulation at necessary places.



Rattan fiber which is not properly preserved in the storage which many cause damage and mould.



Boiling pot system is not frequently used and easily gets dirty.



Installing storage for materials which is not or has not been used.

Clean the boiling pot system and putting in the dry place, avoiding the rain and sunshine which may damage equipment.



Equipment is broken and not maintained.



Maintain equipment, remove equipment which can not be used and rearrange equipment which can be used

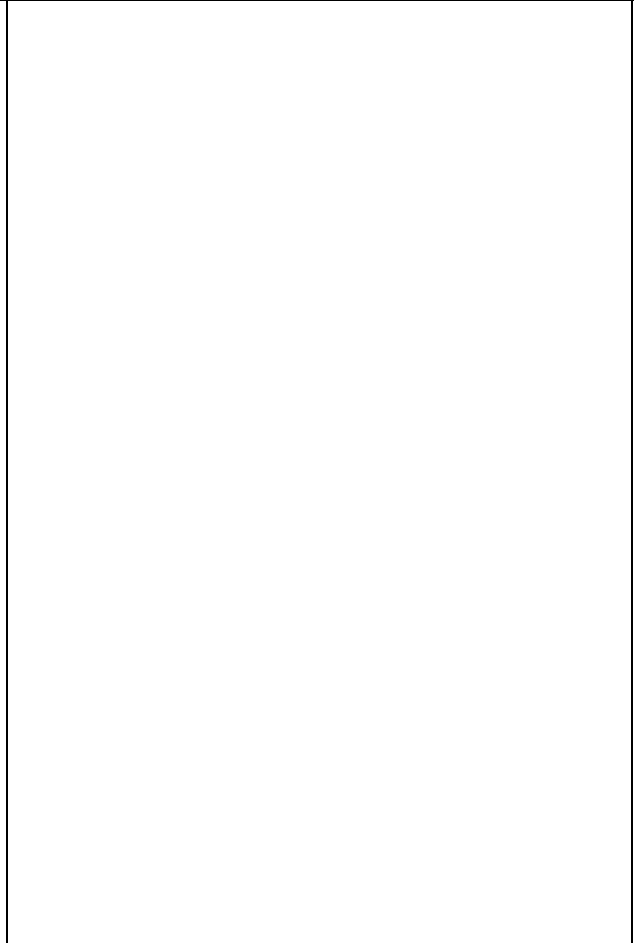


Workshop is in bad and unscientific order



Remove unnecessary equipment and rearrange workshop to utilize the area.





Other pictures in company







## 5. Phu Tho Lacquer Coop.

### a. Company description:

Name of SME: Phu Tho Lacquer Cooperative.

Address: Gia Cam Precinct, Viet Tri town, Phu Tho province.

Tel: 02103859348

Fax:.....

Email:.....

Website:.....

Name of Director: Mr. Vi Son Minh

Year of establishment:

Number of workers: 8      Male:              8      Female:

Number of operation day/year: 330

Annual Turnovers: 1 billion VNĐ (2009).

Products: lacquer ware, embroidery.

### b. Production description:



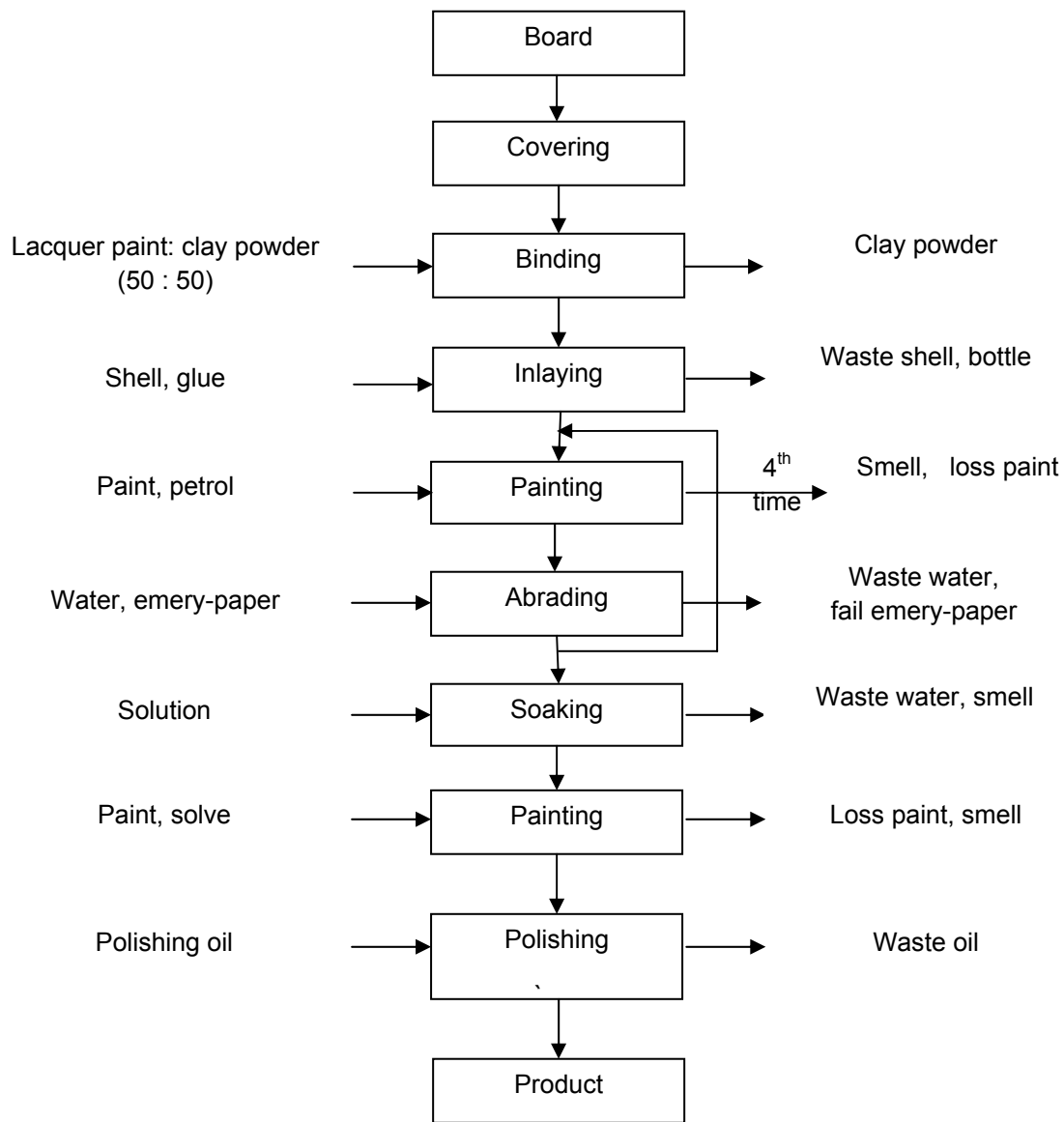
**Pic 1:** Front of company's showroom.



**Pic 2:** Showroom of Company.



**Pic 3:** Products of Company.



**Pic 4:** Production flowchart at company.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009	2010
1	Lacquer ware	m <sup>2</sup>			1000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	2010
1	Cashew-nut oil	Tons/year		2

2	Electricity (for production)	Kwh		NA
3	Chemical			NA
4	Shuck	Tons/year		0,45

**c. Waste**

**Air emissions:**

- Smell from inlaying, painting and glazing.

**Effluents:**

- Waste water from abrading and soaking.

**Solid wastes:**

- Lacquer paint with clay powder (or cashew-nut oil with clay powder) from binding.
- Shell from inlaying.
- Emery-paper from abrading.
- Paint from painting and oil from polishing.
- Fail product from production and maintain.
- Bottles has contained glue is dump after using.

**d. Observation and recommendation**

The quick CPA has done at store of cooperative. So consultant group just collect some data about process from the head of cooperative. However, cooperative have used a little lacquer paint in production because of dry ability of lacquer ware is very slow than cashew-nut oil's product.

## 6. Tam Son Lacquer Co.Ltd.

### a. Company description:

Name of SME: Tam Son Lacquer Co., Ltd

Address: Lane 2 - Tho Van commune, Tam Nong district, Phu Tho province

Tel: 0917758954

Fax:.....

Email:.....

Website:.....

Name of Director: Mr. Nguyen Ngoc Xuan.

Year of establishment: 2006

Number of workers: 10    Male:            8            Female:            2

Number of operation day/year: 330

Annual Turnovers: 1 billion VNĐ

Products: lacquer wares.

### b. Production description:



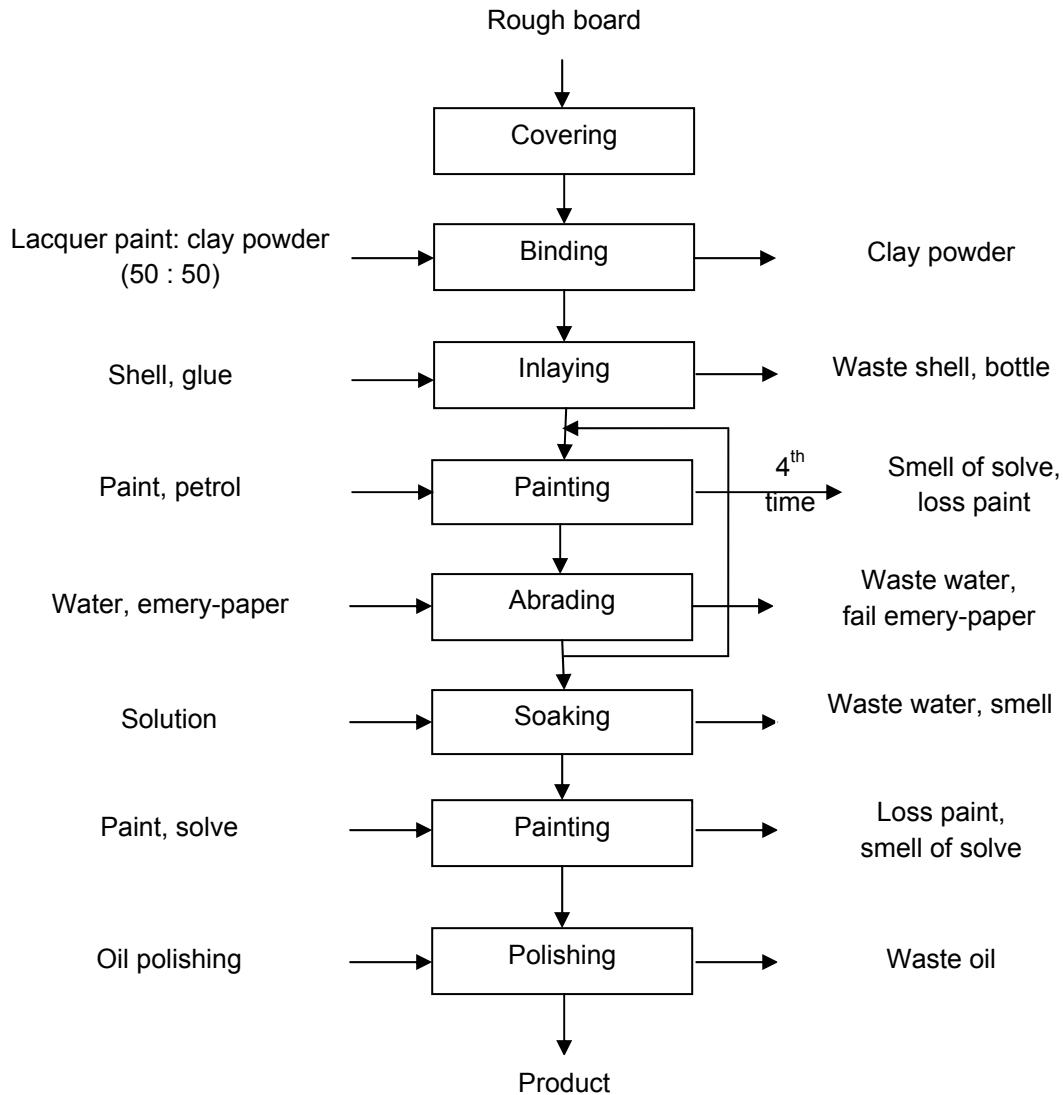
**Pic 1:** Front of company.



**Pic 2:** workers are painting picture.



**Pic 3:** Product of company.



**Pic 2:** Production flowchart lacquer wares.

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009	2010
1	Lacquer ware	m <sup>2</sup>			2.500

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	2010
1	Cashew-nut oil	L		1.200
2	Electricity (for production)	Kwh		NA

3	Chemical - Paint - Glue	Kg Kg		5 32
4	Shell	Tons		0,35

**c. Waste**

**Air emissions:**

- Smell of solve from inlaying, painting and polishing.


**Effluents:**




- Waste water from abrading and soaking.

**Solid wastes:**

- Clay powder from binding.
- Shuck from inlaying.
- Emery-paper from abrading.
- Paint from painting and oil from polishing.
- Fail product from production and maintain.
- Bottles has contained glue is dump after using.

**d. Observation and recommendation**

Observation	Recommendation
<p>- Workers are not wearing protected equipment.</p> 	<p>- Strictly require worker wearing the protected equipment.</p>
<p>- The management of chemical in company is not good.</p>	<p>- Company should have system data record to manage chemical and use chemical efficient.</p>

	
<p>- Waste water and rubbish discharge into environment without treatment causing pollution.</p>  	<p>- With waste water: design basic water treatment system to basic treatment before discharge into environment.</p> <p>- With rubbish: Collection and bring to the landfill.</p>
<p>- The shell stick at the picture in lacquer wares is not matching then after drawing at the final stage they has to reprocessing causing loss of material.</p> <p>- Lack of frame template to sticking the shell in picture.</p>	<p>- To avoid the loss due to the in-correction position when sticking the shell, the company should use the laser technology to draw the outer layer then sticking the shell</p>





#### IV. HOA BINH PROVINCE

##### 1.San Da Co.Ltd.

###### a. Company description

Name of SME: San Da Company Limited

Address: Trung Minh commune, Hoa Binh city, Hoa Binh province.

Tel: +84 021 83841345 / 0913517871 Fax:

Email:

Website:

Name of Director: Nguyen Thi Thu

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;

Joint-venture company;  Foreign-invested company;  Others:

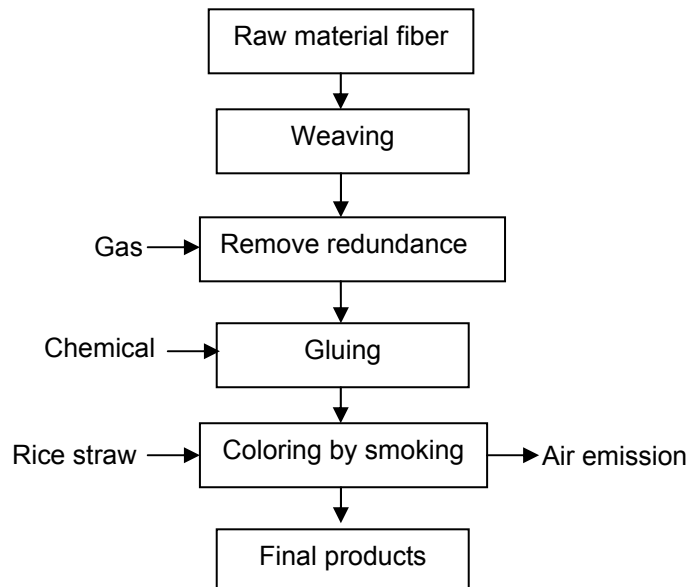
Number of workers: 15 Male: 13 Female: 2

Number of operation day/year:

Annual Turnovers: no data recorded

Products: "chit" broom, utensil, tray, basket....

###### b. Production description



**Table 1.** Actual production

	<b>Product</b>	<b>Unit</b>	<b>Weigh (kg/each)</b>	<b>2009</b>	<b>May 2010</b>
1	Trays			N/A	N/A
2	Basket			N/A	N/A

(\*) N/A: no data recorded

**c. Waste**

**Air emissions:**

- From smoking process

**d. Observation and recommendation**

Now, San Da has not being produced rattan ones for 2 years instead of planting and harvesting "chit" plant to make the exported broom. Besides, with other supporting, this company planted rattan 3 hectare in hill-top. According to the expectation the plant will be harvested from 4 to 5 years later.

Other pictures of company





## 2. Handmade paper production group

### a. Company description

Name of SME: Hand made paper production group

Address: Hop Hoa commune, Luong Son district, Hoa Binh province

Tel: + 84 0218 221 6782

Fax:

Email:

Website:

Name of Director: Nguyen Van Chuc

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 15 Male: 1 Female: 14

Number of operation day/year: 330

Annual Turnovers: VND 22 million

Products: Special types of handmade paper called "do"

### b. Production description

**Table 1.** Actual production

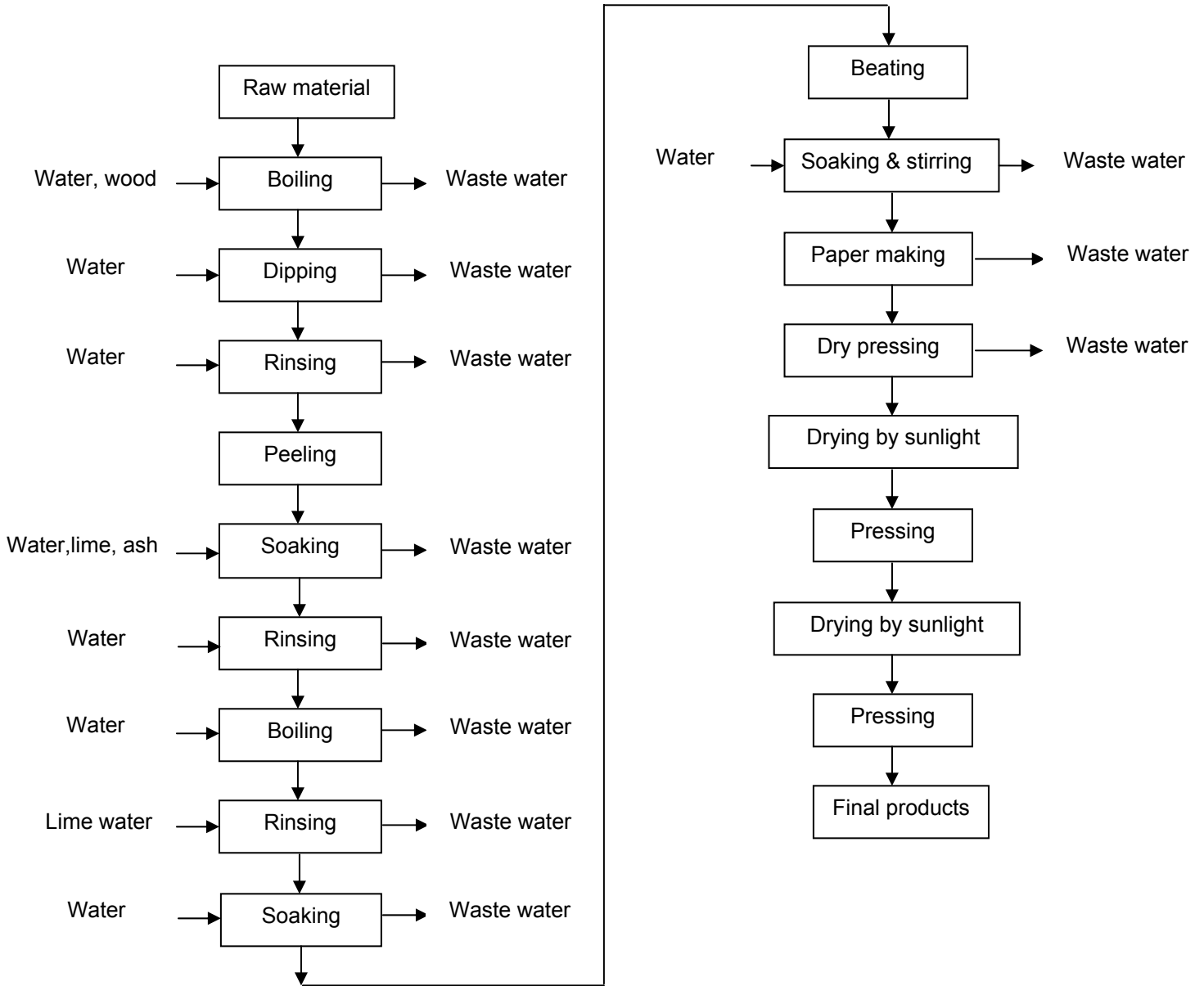
	Product	Unit	Weigh (kg/each)	2009	May 2010
1	Kinds of "do" paper			N/A	N/A

N/A: no data recorded

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	2010
1	Raw material	Tons	2	2
2	Electricity (for production)	Kwh		
3	Chemical - CaCO <sub>3</sub> (lime)	kg	50	50
4	Diesel Oil for boiling	ton		
5	Water (for rinsing)	M <sup>3</sup>		

6	Wood	ton	1	1
7	Gas	kg		
8	Others			



**c. Waste**

**Air emissions:**

- Smoke from burning wood for boiling processing

**Effluents:**

- Wastewater contain chlorine causing by bleaching process



**Solid wastes:**

- Residue of pulp after A part of dry cores after peeling processing and slag from boiling processing

**d. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
<p>Rinsing tank after boiling or beaching tank is not good protected causing a external dust attach to the pulp paper</p> 	<p>Tank should be clean before process the next batch and it should be protected well.</p>
<p>Beating tool</p> 	<p>Replacing beating tool by machine with high capacity and better control the quality.</p>
<p>Raw outer layer material is store improperly method</p>	<p>Store in the close house to avoid the moisture, mould causing a loss of material.</p>





Bleaching tank made by of cement

Tank should be covered one composite layer to against the erosion and leakage.



Boiling tank is very simple and consume a lot of fuel



Design a suitable boiling tank which can be easily control the temperature and well-isolated to save energy.

Other pictures of company



### 3. Tu Dinh Brocade Co.Ltd.

#### a. Company description

Name of SME: Tu Dinh brocade company limited

Address: #38, group 4, Huu Nghi road, Vu Ban town, Lac Son district, Hoa Binh province

Tel: +84 0218 2861531

Fax:

Email:

Website:

Name of Director: Ms. Bui Thi Dinh

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:



Number of workers: 3      Male: 1      Female: 2

Number of operation day/year: 330

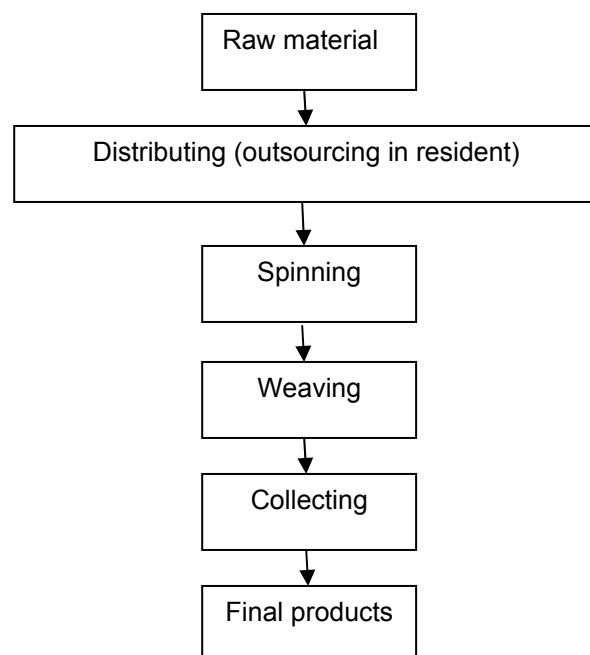
Annual Turnovers:

Products: hem of skirt, scarf, and other traditional cloths



### b. Production description

Introduction of production with flow chart



**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009	2010
1	Hem of skirt	Piece		3500	
2	“Pha”	m		2500	
3	Part of trouser	m		1000	
4	Other products			(*)	

(\*) No data recorded

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	2010
1	Raw material with each kind of species - Thread of Thai minority - Industrial thread - Wool fiber - Silk fiber - Cotton-wool fiber	kg	(*)	700 700 200 30 1000
2	Electricity (for production)	Kwh		
3	Chemical	kg		
4	Diesel Oil for boiling	ton		
5	Water (for rinsing)	M <sup>3</sup>		
6	Coal (if using)	ton		
7	Gas	kg		
8	Others			

(\*) No data recorded

**c. Waste**

**Solid wastes:** just a little redundant of raw material in weaving process when

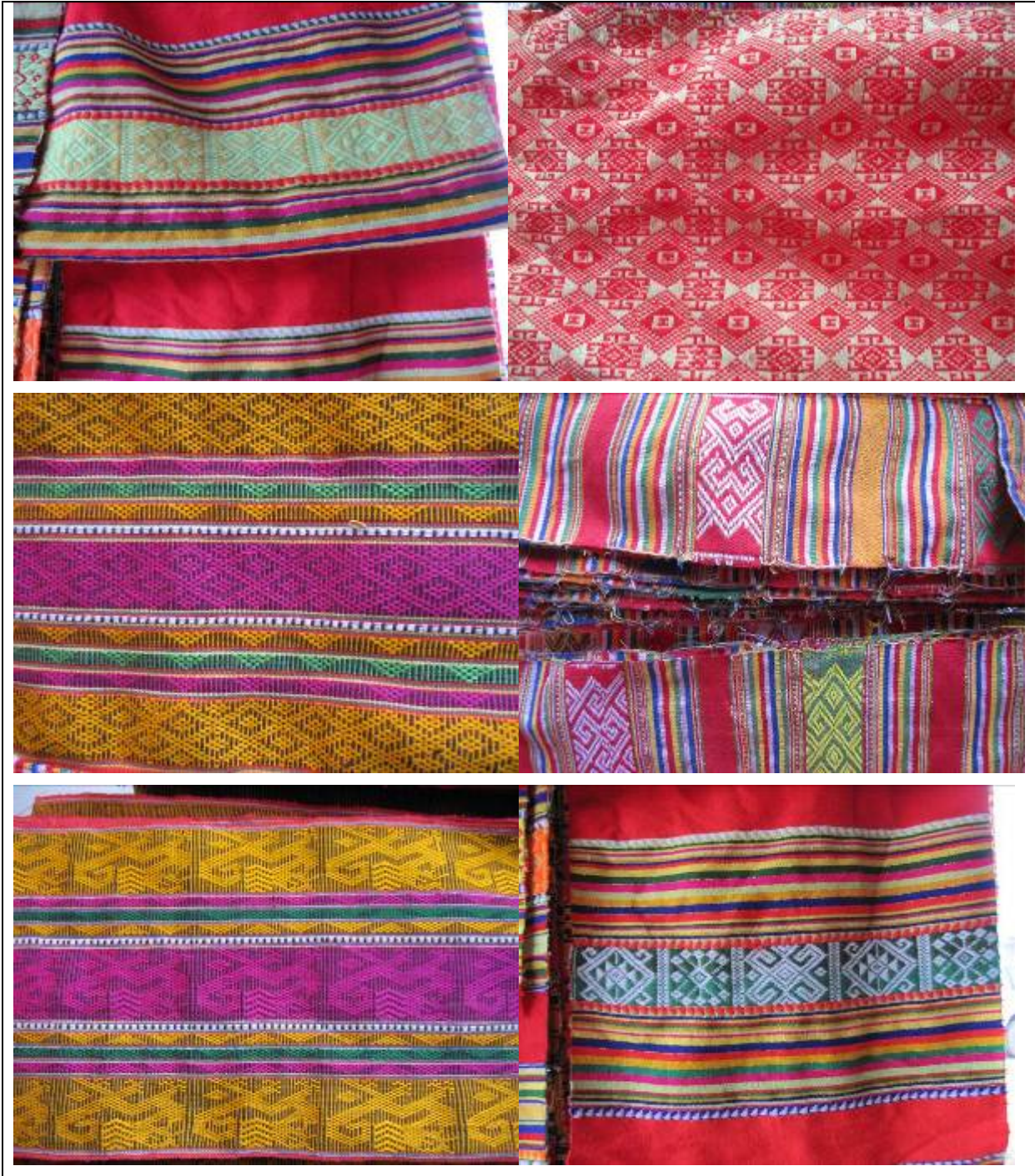
**d. Observation and recommendation**

Remaining difficulties: Lack of capital, storage, high material price, low capacity because of manual weaving machine. Presently, this region has a lot of ethnic minority people is weaving by wood loom, and there are only 35 looms in the group. However, there has not only still lack of loom and they can not buy the new ones due to the poor and it is very difficult for the local people to increase their income in the future.

Observation
Other picture about products in company







## 4. Vong Ngan Cooperative

### a. Company description

Name of SME: Vong Ngan cooperative

Address: Man Duc commune, Tan Lac district, Hoa Binh province

Tel: 0982063888 Fax:

Email: Website:

Name of Director: Mr. Dinh Cong San

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

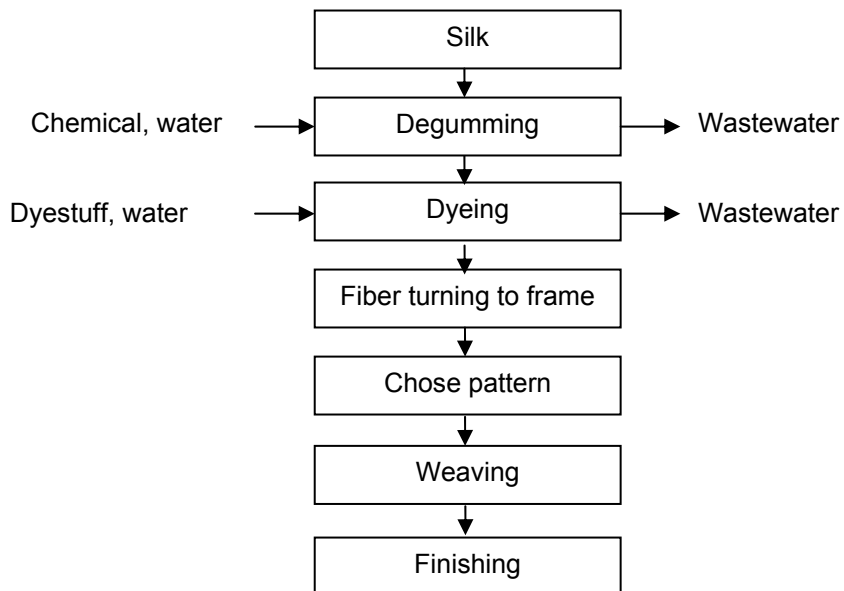
Number of workers: 113 Male: Female: 113

Number of operation day/year: 340

Annual Turnovers: VND 960 million

Products: dress hem, bench cloth...

### b. Production description



**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Rim skirt	Piece		8000-10000
2	Body skirt	Piece		8000-10000
3	“Phà”	M		15000
4	Tablecloth	Piece		500
5	Ethnic brocade	M		10000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2010
1	Raw materials with each kind of species - Silk - Cotton thread - Wool	Tons	
3	Chemical	kg	(*)
5	Water (for rinsing)	M <sup>3</sup>	(*)
6	Wood (if using)	ton	
8	Others		

**c. Waste**


**Effluents:** mainly from dyeing and bleaching process

**d. Observation and recommendation**

Presently, the cooperative has about more than 100 members of Muong Minority group. Profit from silk products is low, so villagers only consider it as a part-time job besides farming. In detail: 1 person can knit 10cm of fabric in 2 hours (in the evening), in one year, he/she can knit 20m fabric of 20-40cm width, making 12-13 dress hems (1,6m/hem) of which the price is 25.000 VND/hem. Thus, income is very low due to manual frame and low price.

Good results can be gained by natural dyeing; however, just indigo color (dark and blue indigo) can be made. For other color, dyeing process is done in Van Phuc silk village in Hanoi. In bleaching process, papaya peel and hog-wash are used in soft bleaching, avoiding environmental impacts.



Observation	Recommendation
<p>Machine with wood frame which costs about 5.000.000 VND/frame</p> 	<p>Recommend to invest more frames to increase capacity</p>
<p>Manual silk twisting</p> 	<p>Install (semi-manual or automatic) machine for twisting silk to improve productivity.</p>



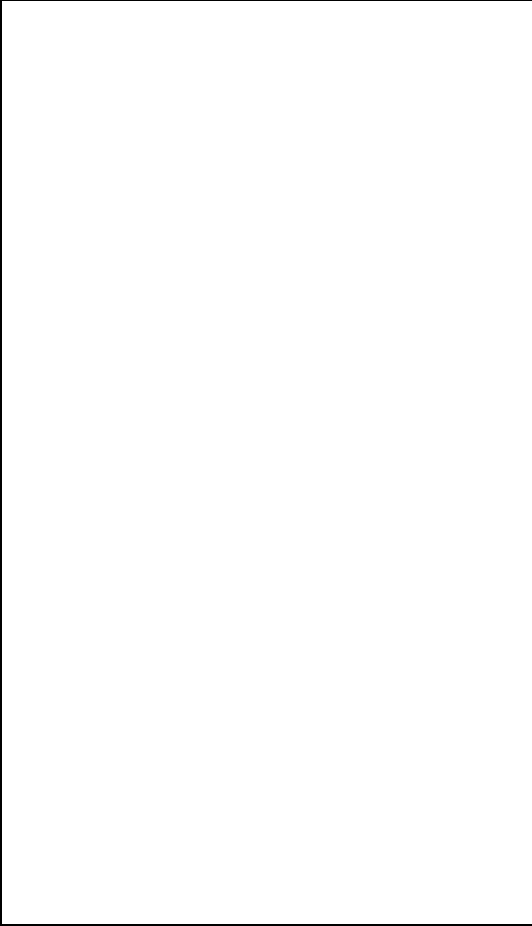
Working place is disorder



Just some people (only 4-6) can make complicated patterns

Rearrange working places to improve lighting system... to improve productivity, quality.

Trainings on skill improvement to develop new patterns. Use a wood self to hang coils to fasten the manipulation as well as to avoid tangle.



Other pictures at the cooperative









## V. HA NOI

### 1. Au Lac Designs Co.

#### a. Company description:

Name of SME: Au Lac designs Co.,Ltd

Address: 8<sup>th</sup> floor, # 609 Lac Long Quan road, Tay Ho district, Hanoi

Tel: +84 (04) 62581474

Fax: +84 (04) 625 81452

Email: info@aulacdesigns.com

Website: aulacdesigns.com

Name of Director: Mr. Purvis David

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 5 Male: 1 Female: 4

Number of operation day/year: 300

Annual Turnovers:

Products: Decorated products, silk scarf, drape, bamboo chair, stone necklace, handbag (made by sea-grass), lamp cap...

#### b. Production description

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2010
1	Handbag			(*)
2	Scarf			(*)
3	Bamboo Chair			(*)
	.....			

(\*) No data record

**c. Observation and recommendation**

Difficulties: The material price is increasingly everyday especially natural silk (original Vietnam), seagrass, bamboo, rattan... then the company decides to work as trader. The company also comments that the bamboo bowl is covered by paint layer and it can not resist the hot meal. Moreover, the seagrass was getting mould quickly without any treatment method.



## 2. CraftLink Co.

### a. Company description

Name of SME: CraftLink Co., Ltd

Address: 43- 51 Van Mieu Street, Dong Da district, Hanoi

Tel: +84 04 37336101

Fax: +84 04 38437926

Email: Craftlink@fpt.vn

Website: www.craftlink.com.vn

Name of Director: Tran Tuyet Lan

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/ Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 33 Male: Female:

Number of operation day/year: 300

Annual Turnovers:

Products: souvenirs, decorations, utensils....

### b. Production description





**Table 1. Actual production**

	<b>Product</b>	<b>Unit</b>	<b>Weigh (kg/each)</b>	<b>2009</b>	<b>May 2010</b>
	No data recorded				

**c. Observation and recommendation**

Existing difficulties of this company base on the Director's point of view is lacquerware's product are still contain Pb residue. Therefore, its product is very difficult to meet the European market. Moreover, the preservation of final rattan, bamboo products is the most important because some of them had been getting mould and they are looking a solution to protect product aiming to avoid the mould.

# Observation







### 3. Dome Co. Ltd.

#### a. Company description

Name of SME: Dome Co.,Ltd

Address: 10 Yen The Street, Ba Dinh district, Hanoi

Tel:+84 04 38436036

Fax: +84 04 38436070

Email: sales@dome.com.vn Website: www.dome.com.vn

Name of Director: Hoang Thi Bach Yen

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers:                      Male:                      Female:  
 Number of operation day/year: 330  
 Annual Turnovers:  
 Products: Decorations, utensils, interior...



Outside's company

**b. Production description**

**Table 1. Actual production**

	Product	Unit	Weigh (kg/each)	2009	2010
	No data recorded				

**Table 2. Raw materials and resources consumption**

No	Input	Unit	2009	2010
1	Raw materials	Tons		
2	Electricity (for production)	Kwh		
3	Chemical - H <sub>2</sub> O <sub>2</sub> - NaOH (or soap) - Na <sub>2</sub> SiO <sub>3</sub> - Others	kg		
4	Diesel Oil for boiling	ton		

5	Water (for rinsing)	M <sup>3</sup>		
6	Coal (if using)	ton		
7	Gas	kg		
8	Others			

**c. Observation and recommendation**

Semi-material source is from Van Phuc village – one of the most famous silk villages in Viet Nam. In addition, one of the difficulty that company has facing with packaging technique and products preservation, especially seagrass ones. Besides, there is problem in dye-stuff fixation and isochroous instability in silk products.

**Observation**

Pictures inside a store



#### 4. Ha Linh rattan & Bamboo Co. Ltd.

##### a. Company description

Name of SME: Ha Linh Bamboo Co Ltd.

Address: Phu Nghia Industrial Zone, Chuong My District, Ha Noi.

Tel: 84-4-33868671 Fax: 84-4-33868670

Email: rattanvina@fpt.vn Website: www.rattanvina.com.vn

Name of Director: Mr. Dang Cong Thang

Main business: Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience: Over 20 years;

Type of business: Limited company

Number of workers: 120 Male: 24 Female: 96

Number of operation day/year: 300 days/year

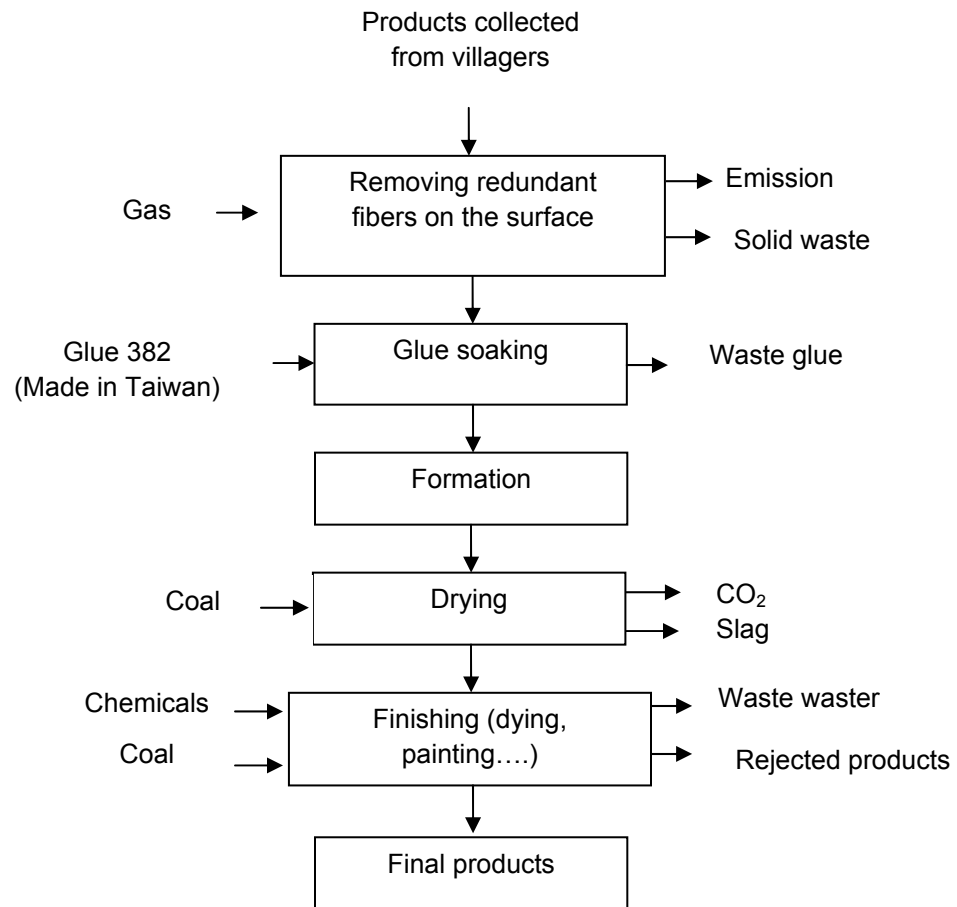
Annual Turnovers: 10 billion VND

Products: basket, decorative objectives, home accessories...export to EU, America, Eastern Europe countries



Outside's company and a workshop

**b. Production description**



Some products in company

**Table 1.** Actual production

	<b>Product</b>	<b>Unit</b>	<b>2009</b>
1	Products (basket, home accessories...)		12.000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	May 2010
1	Splitted rattan	Tons	7	
2	Electricity (for production)	Kwh		400
3	Chemical: - Glue 328 (Taiwan) - Solvent (petrol) - Paint	kg L kg		500 4.000 600
4	Water	M <sup>3</sup>		N/A
5	Coal for drying	ton		3 - 4
6	Gas	kg		250

**c. Waste****Air emissions:**

- Emission from chimney of drying chamber using coal.
- Volatile substance from painting process

**Effluents:**



- Waste water contains chemicals from bleaching stage
- Waste water contains chemicals from dyeing stage
- Waste water from cleaning

**Solid wastes:**

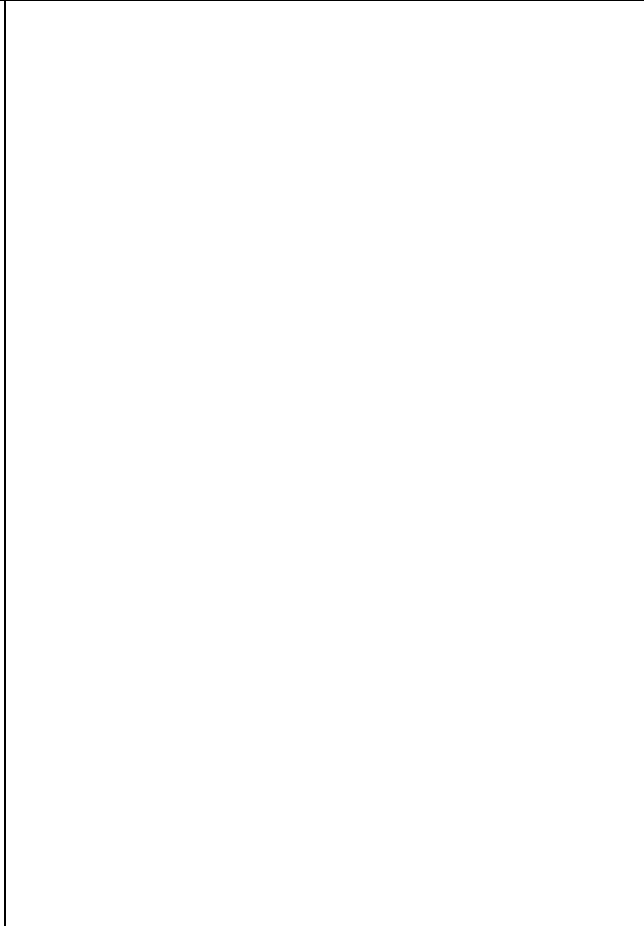
- Slag from coal burning for drying
- Waste rattan from finishing stage
- Broken/unqualified products

**d. Observation and recommendation**



Observation	Recommendation
<p>- Preservation room made by canvas which is not close enough, causing the inefficient in perseveration and loss energy.</p>  	<p>Salvage the solar energy for drying.</p>
<p>Drying chamber was designed improperly, when the hot air comes out with high content of moisture, its sucked back to the room.</p> <p>The preservation room is not close then causing a loss of energy</p>	<ul style="list-style-type: none"> <li>- Repair the out door to avoid the loss energy</li> <li>- The gate to suck the air should be difference with the discharge gate</li> </ul>

	
<p>Painting in open air causing loss of paint and pollute to the environment</p>	<ul style="list-style-type: none"> <li>- Paint product should implement in the close room with ventilation system</li> </ul>
<p>Lack of material storage</p> 	<ul style="list-style-type: none"> <li>- To build a new standard material storage</li> </ul>
<p>Coal storage in the outside door causing loss of energy. Coal size is big and uneven</p>	<ul style="list-style-type: none"> <li>- Store coal in the storage area</li> <li>- Reduce the coal size in smaller and even</li> </ul>



- Other pictures in company







## 5. Han Hanh Co.Ltd.

### a. Company description

Name of SME: Han Hanh Bamboo and Rattan ware Enterprise

Address: Phu Vinh Village, Phu Nghia commune, Chuong My District, Hanoi

Tel: (04) 3 3868345 Fax: (04) 3 3868465

Email: maytredanhoanghanh@gmail.com

Name of Director: Mr. Hoang Van Hanh

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 4 Male: 3 Female: 1

When the company gets order from buyers they will outsource from local villagers.

Number of operation day/year: 300 days

Annual Turnovers: 10 bill. VND

Products: fashion hand bags, lantern, house decoration,

Be developed from a traditional rattan waving family, Hang Do enterprise takes the advantage of having very good waving skills, most of products are exported to Japan as unique ones or selling for tourists.

The owner of household – a craftsman has been invited as a teacher for several vocational training, especially for ethnic groups in Viet Nam and Laos.



#### b. Production description

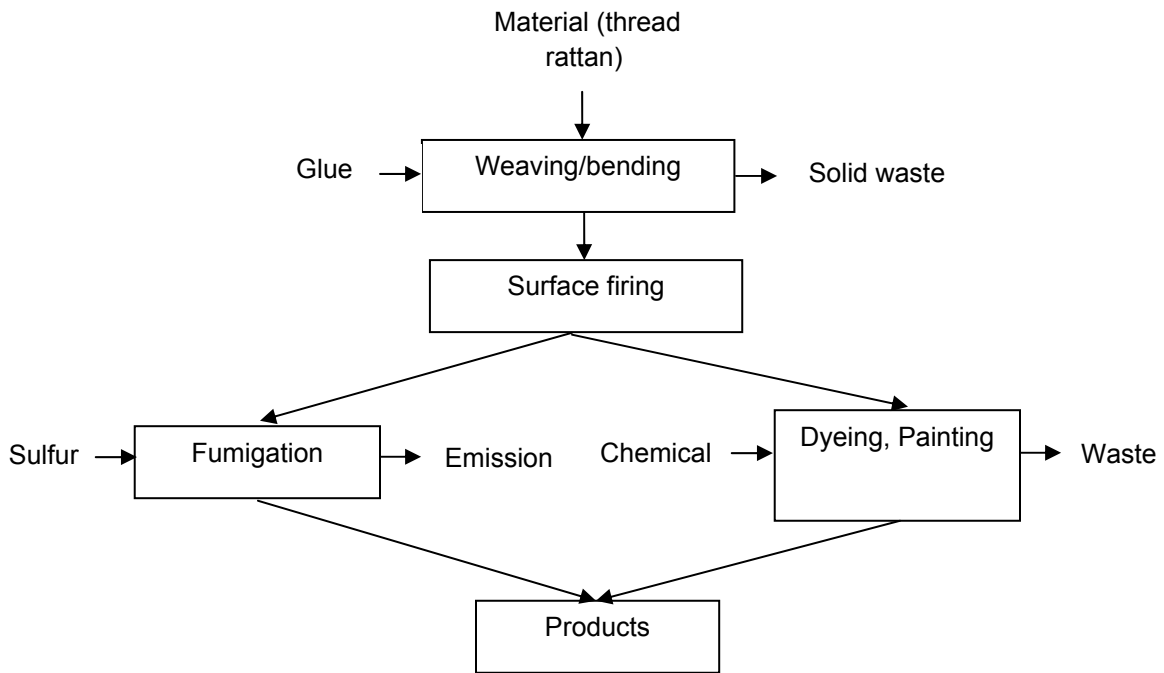
There are no record of the number of products are produced each month. The company just estimate number of products based on annual turnover.

Introduction of production with flow chart:

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009
1.	Chemical		
	- Glue	Kg	600
	- Paint	lit	250
2.	Electricity (for production)	kWh	1000
3.	S	kg	45
4.	Gas	kg	72

(\*): Company has no record data system.



**c. Waste**

**Air emissions:**

- Dust from burning wood for dyeing
- Sulfur smoke from fumigation stage
- Solvent from painting stage

**Effluents:**

- Waste water from dyeing

**Solid wastes:**

- Waste rattan

**d. Observation and recommendation**

Observation	Recommendation
- The workshop is in a mess	- Applying good-house keeping, rearrange the workshop





- Bad storage of materials and semi-products



- Classification materials and storage in the shell.

	
<p>- Lack of labour safety</p>	<p>- Set up labour safety equipment</p>
	

## 6. Kana Co.

### a. Company description

Name of SME: Ka Na company

Address: 41 Hang Trong street, Hoan Kiem district, Hanoi

Tel: +84 04 39286208 Fax:

Email:

Website:

Name of Director: Nguyen Thi Thanh Giang

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;     Cooperative;     Limited company;     Joint-stock company;     Joint-venture company;     Foreign-invested company;     Others:

Number of workers: 10    Male: 1    Female: 9

Number of operation day/year: 364

Annual Turnovers: VNĐ 15 billion

Products: clothes, crafts, handbags....

**b. Production description**

**Table 1. Actual production**

	Product	Unit	Weigh (kg/each)	2009	May 2010
	No data recorded				

**c. Observation and recommendation**

Company's clients are almost domestic consumer and tourist. Company use the silk which original from Korea. Nevertheless, silk is made in Vietnam not suit for consumer as well as producer because of cost, degrading. This enterprise is not directly producing, they only trading and export by foreign retailers.

**Observation**

The show room of company and office is in same place.



**7. Phong Chau Co. Ltd.**

**a. Company description:**

Name of SME: Phong Chau Co.Ltd

Address: 8th floor, Macanimex building, No 4 Vu Ngoc Phan, Dong Da, Ha Noi.

Tel: 043 776 4888

Fax: 043 776 4889

Email:.....

Website: www.phongchau.vn – www.vietshoes.vn

Name of Director: Mr. Nguyen Ngoc Luong

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Number of workers:

Male:

Female:

Number of operation day/year: 300

Annual Turnovers:

Products: lacquer ware, household good.

**b. Production description:**

At the moment, company has been working in the business field. Company's product collected from small production base in order to supply of product.

Biggest 3 Buyers: Europe, North America and Japan.

Because the policy of company is hardly so group consultants have just collected a little information of company.

**8. Sun Co.Ltd.**

**a. Company description:**

Name of SME: Sun Co., Ltd

Address: No 4 – Lane 4 – Yechxanh Street – Hai Ba Trung District – Ha Noi.

Tel: 043 972 4321

Fax: 043 972 4320

Email: [sun&co@fpt.vn](mailto:sun&co@fpt.vn)

Website: www.mo-homevn.com

Name of Director: Mrs. Hoang Thi Thu Hanh.

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Number of workers:

Male:

Female:

Number of operation day/year: 300

Annual Turnovers:

Products: household goods, lacquer wares.

**b. Production description:**



**Pic 1:** Front of company.



**Pic 2:** Showroom of company.



**Pic 3:** Products of company.

**c. Observation and recommendation**

The quick CPA has done at office of company where show company's product. Currently the company is producing a interior and decoration product made from lacquer wares and ceramics.

Market: America, Europe.

Company's difficult:

- Lacquer has slow drying so it very difficult to meet the exporting requirement of order.
- The source of condensate lacquer is very rarely and it does not meet the company requirement.
- Now, company has used much paint from South Korea and North Korea.

**9. Viet Quang Co. Ltd.**

**a. Company description**

Name of SME: Viet Quang Bamboo Rattan Ltd., Co

Address: Go Dau – Phu Vinh Village, Phu Nghia commune, Chuong My District, Hanoi

Tel: (04) 3 3719224

Fax: (04) 3 3719224

Email: maytrevietquang.phuvinh@gmail.com

Website:

Name of Director: Mr. Nguyen Van Tinh

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 10

Male: 7

Female: 3

When the company gets order from customers they can outsource from villager.

Number of operation day/year: 330 day

Annual Turnovers: 2 bill. VND

Products: lamp-shade, basket, disk, package

**b. Production description**

**Table 1.** Actual production

	<b>Product</b>	<b>Unit</b>	<b>Weigh (kg/each)</b>	<b>2009</b>
1	Lamp-shade	piece	0.8	6,000
2	Wall disk	Piece	0.6	18,000
3	Package	Piece	0.55	9,600

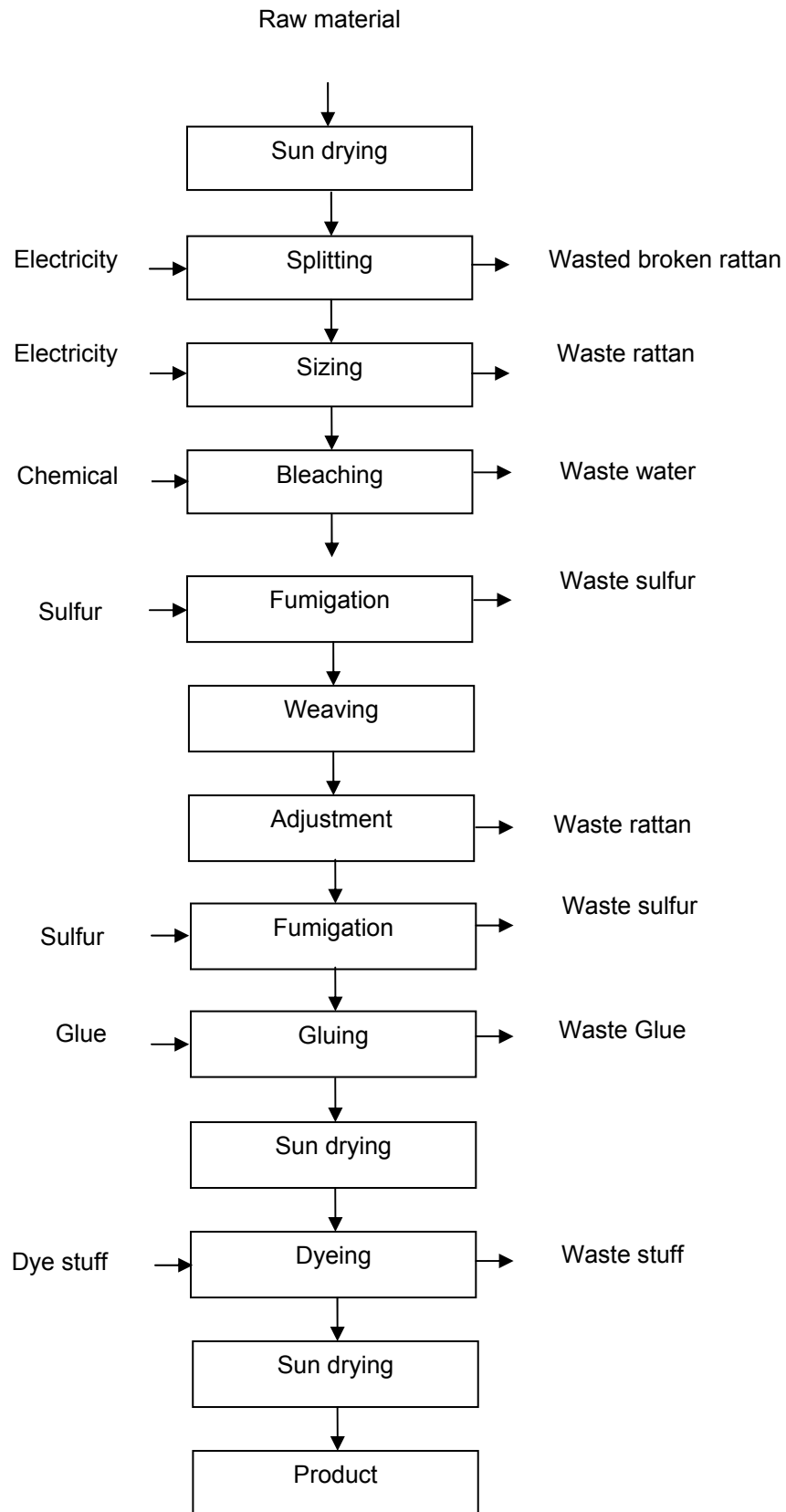
**Table 2.** Raw materials and resources consumption

<b>No</b>	<b>Input</b>	<b>Unit</b>	<b>2009</b>
1.	Thread rattan	kg	20,000
2.	Chemical		
	- H <sub>2</sub> O <sub>2</sub>	Kg	80
	- NaOH	Kg	20
	- Sulfur	Kg	10
5.	Other data		NA (*)

(\*): Company has no record data system.

Introduction of production with flow chart:





Product of company





**c. Waste**

**Air emissions:**

- Sulfur smoke from fumigation process

**Effluents:**

- Waste water from bleaching
- Waste water from dyeing process


**Solid wastes:**

- Waste rattan

**d. Observation and recommendation**

Due to the economic crisis so the company is working with only 20% of capacity compare to 2008

Observation	Recommendation
<ul style="list-style-type: none"> <li>- Sizing by simple tool causing a low quality of rattan thread</li> </ul>	<ul style="list-style-type: none"> <li>- Using sizing machine for better product and saving material</li> </ul>

	
<ul style="list-style-type: none"> <li>- Dyeing stuff is pour out to the floor</li> </ul>	<ul style="list-style-type: none"> <li>- When take the product from dyeing out of the tank, hang product above dyeing tank in some second to collect the dye stuff.</li> </ul>

## 10.VINAEM Co.Ltd.

### a. Company description:

Name of SMEs: Viet Nam Embroidery Company Limited.

Address: No 156A – Lo Duc – Hai Ba Trung - Ha Noi.

Tel: 0985 299 809 / 04 6292 3156 Fax: 043 858 7891

Email: sale@vinaem.vn

Website: www.vinaem.vn / www.qilila.com

Name of director: Mrs. Vu Thi Thuy Duong.

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Annual Turnovers:

Products: blanket, bedspread, pillow, buffer.

### b. Production description:





**Pic 1:** Front of company.



**Pic 2:** showroom of company.



**Pic 3:** Products of company.

**c. Observation and recommendation**

The quick CPA has done at one of the company showroom. Due to the infrequent order then the recording data system is inadequate. At the moment company collect silk and product of silk from Ha Nam.

The company is facing with looking the final sources and finding costumer.

**V. OTHER PLACE**

**1. Hiep Hoa Enterprise**

**a. Company description**

Name of SME: Hiep Hoa Company Ltd

Address: Ly Thai To street, Thai Binh province

Tel: +84 363 732513

Fax: +84 363 730340

Email: mtd\_tb@hn.vnn.vn

Website: www.hiephoarattan.com

Name of Director: Pham Ngoc Hien

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Hand made paper  Sericulture  Bamboo/Rattan

Sea grass  Lacquer ware

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 120 Male: 36 Female: 84

Number of operation day/year: 300

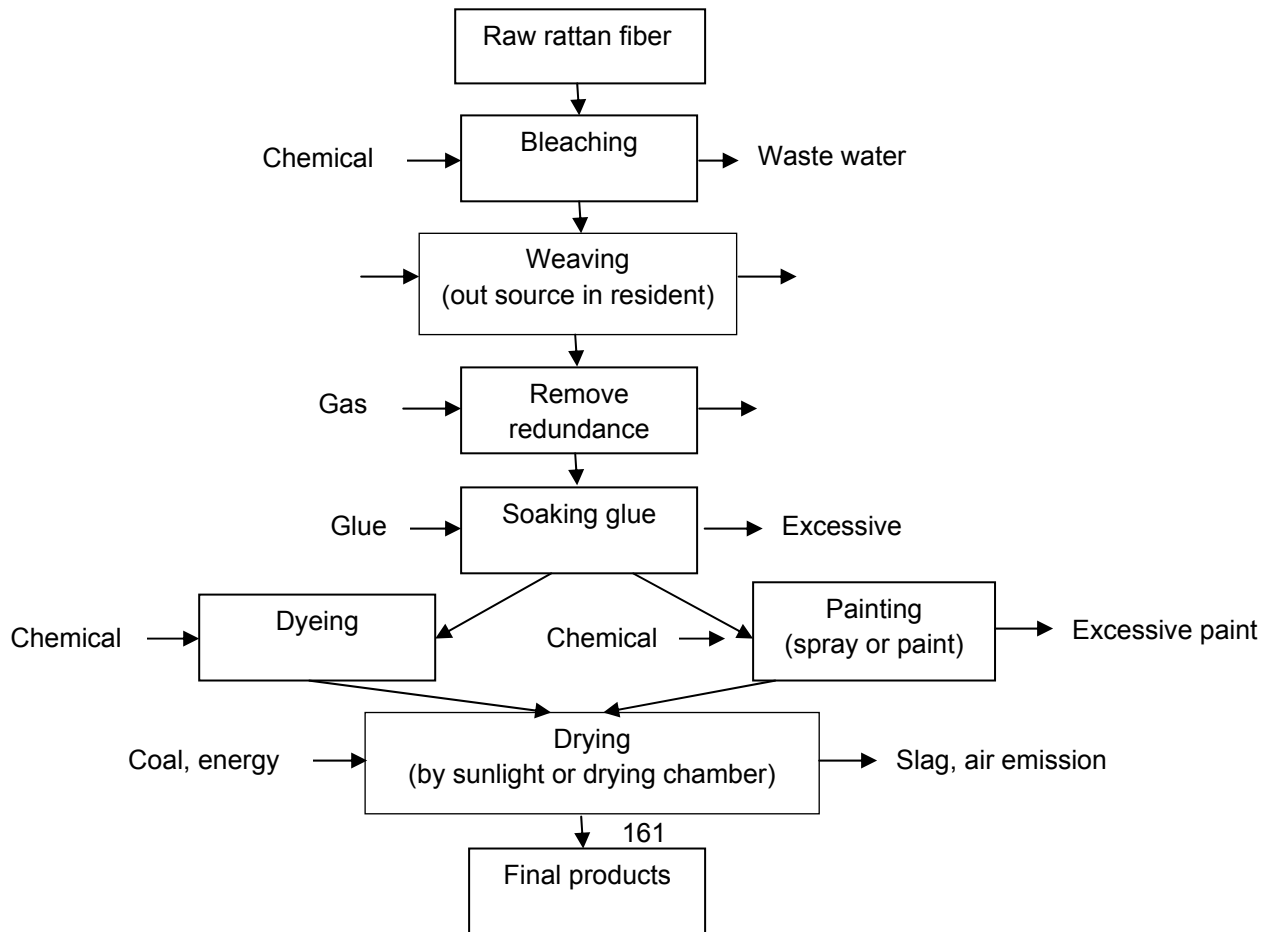
Annual Turnovers: 1.2 mills. USD

Products: basket, flower basket, sofa, basket, casket....



Pic 1: Company's outside

**b. Production description**





**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009	May 2010
1	Casket	Pack			7000-8000
2	Document shelves	Pack			150.000
	Other products			N/A	

N/A: no data recorded

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	May 2010
1	Raw rattan with each kind of species	Tons	280	
2	Electricity (for production)	Kwh	120.000	10.000
3	Chemical - H <sub>2</sub> O <sub>2</sub> - NaOH (or soap) - Na <sub>2</sub> SiO <sub>3</sub> - PU oil - Glue	kg	Chemical - 28.000 - 5.600 - 5.600 - N/A - N/A	
4	Diesel Oil for boiling	ton		
5	Water (for rinsing)	M <sup>3</sup>	3000	300
6	Coal (if using)	ton	10	
7	Gas	kg		120
8	Others			

N/A no data recorded

### c. Waste

#### Air emissions:

- Evaporated solvent from painting process
- Smoke from boiler boiling

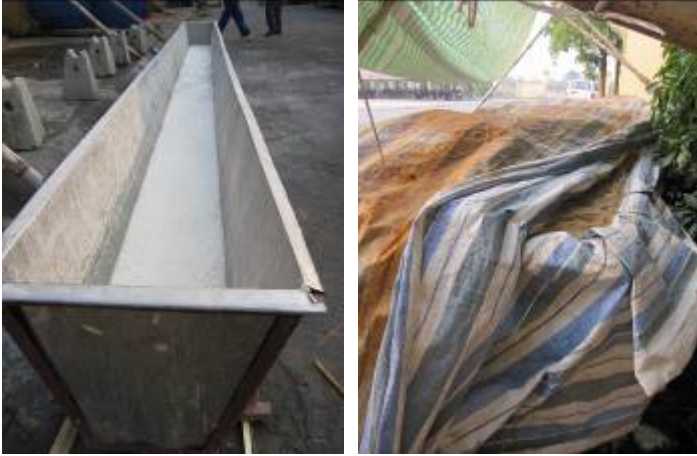

#### Effluents:

- Wastewater from bleaching process

**Solid wastes:**

- Defective products, defective materials
- Coal slag from kiln

**d. Observation and recommendation**

<b>Observation</b>	<b>Recommendation</b>
<p>Using much chemicals on bleaching</p> 	<p>Using bleaching method proposed in project's CP techniques</p>
 <p>Lack of protective equipment</p>	<p>Equip the protective equipment for the workers to ensure labor safety</p>

	<p>Building storage to preserve and control material to avoid loss</p>
	
<p>No preservation storage, causing material loss</p>	
<p>Lack of fire extinguisher in necessary places</p>	<p>Installing fire extinguishers in necessary places</p>
	
<p>Energy waste for lighting</p>	<ul style="list-style-type: none"> <li>- Turning off electricity where there is no worker working</li> <li>- Using the natural light as much as possible</li> </ul>



In painting area, chemicals are in disorder



Rearranging chemicals and cleaning product painting area

Other pictures of enterprise









## 2. Thai Ha Co. Ltd.

### a. Company description

Name of SME: Thai Ha Bamboo and Rattan Ltd., Co

Address: Phu Yen village, Truong Yen commune, Chuong My District, Hanoi

Tel: (04) 3 3910847

Fax: (04) 3 3811169

Email: [thaiharattan@gmail.com](mailto:thaiharattan@gmail.com) Website: [www.thaihabamboo.com](http://www.thaihabamboo.com)

Name of Director: Mr. Nguyen Huu Khoat

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Rattan  Bamboo  Others:.....

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 30

Male: 12

Female: 18

When the company gets order from customers they can outsource from villager.

Number of operation day/year: 260 day

Annual Turnovers: 2 bill. VND

Products: Furniture, household use, package,...

### b. Production description

Introduction of production with flow chart:

**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2008



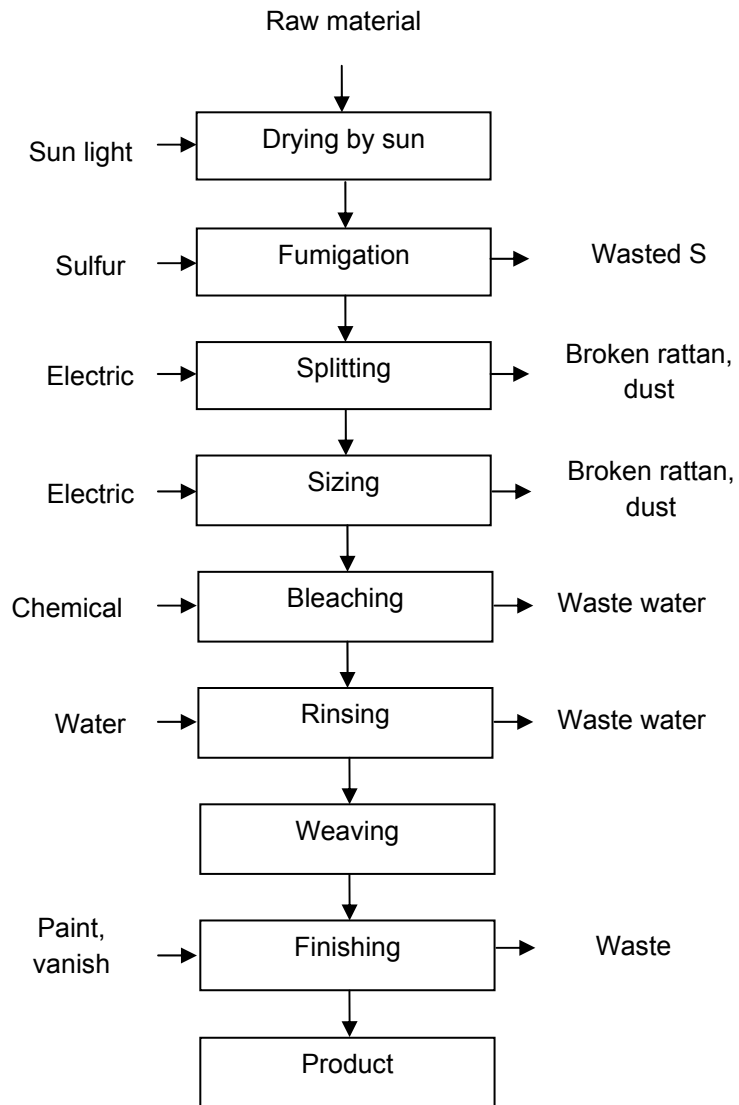
1	Tray	piece	0.2	350,000
2	Book shelf	piece	0.7	500,000
3	Cloth baskets	pair	0.45	120,000

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2008
1.	Rattan thread	kg	20,000
2.	Other data		NA (*)

(\*): - Company has no record data system.

- Some treatment steps was outsourcing at other companies:





**Pic. 1.** Show room of company

**c. Waste**

**Air emissions:**

- Solvent evaporated from painting
- Sulfur smoke from fumigation process

**Effluents:**

- Wastewater included chemical residue from bleaching process
- Wastewater included chemical residue from rinsing after bleaching

**Solid wastes:**

- Waste rattan broken

**d. Observation and recommendation**

Due to the economic crisis so the company is working with only 20% of capacity compare to 2008

Observation	Recommendation
- Workers not wearing the protected equipments	- Strictly require worker wearing the protected equipments



- Using sulfur fumigation for anti fungi and insects



- Bleaching and rinsing

- Painting in outside causing loss of paint and pollute to the environment
- High content of solvent evaporated in the air causing a effect to the human health.

- Using oil boiling and build the solar drying room to protect final product instead of using sulfur.

- Recycle wastewater content high chemical for reusing.

- Paint product should implement in the close room with ventilation system



- Using high electricity for ventilation and lighting



- Build the transparent sheet in the roof of workshop to collect natural light
- Using the sucking fan in the roof to suck the air (natural ventilation) instead of using electricity fan

### 3. Thanh Binh

#### a. Company description

Name of SME: Thanh Binh rattan & bamboo products export corporation

Address: Thai Xuyen commune, Thai Thuy district, Thai Binh province.

Tel: +84 363854018 Fax: +84 363854649

Email: Website: www.maytrethanhbinh.com

Name of Director: Ta Thanh Binh

Main business: Processing  Trading  Harvesting  Processing & Trading

Main sector: Rattan  Bamboo  Others: nửa, cói, đay, móc sợi cotton

Business experience:  Under 5 year;  From 5 -10 years;  From 10 -20 years;  Over 20 years;

Type of business:

Registered household/unit;  Cooperative;  Limited company;  Joint-stock company;  Joint-venture company;  Foreign-invested company;  Others:

Number of workers: 15 Male: 4 Female: 11

Number of operation day/year: 300

Annual Turnovers: VND 29 billion

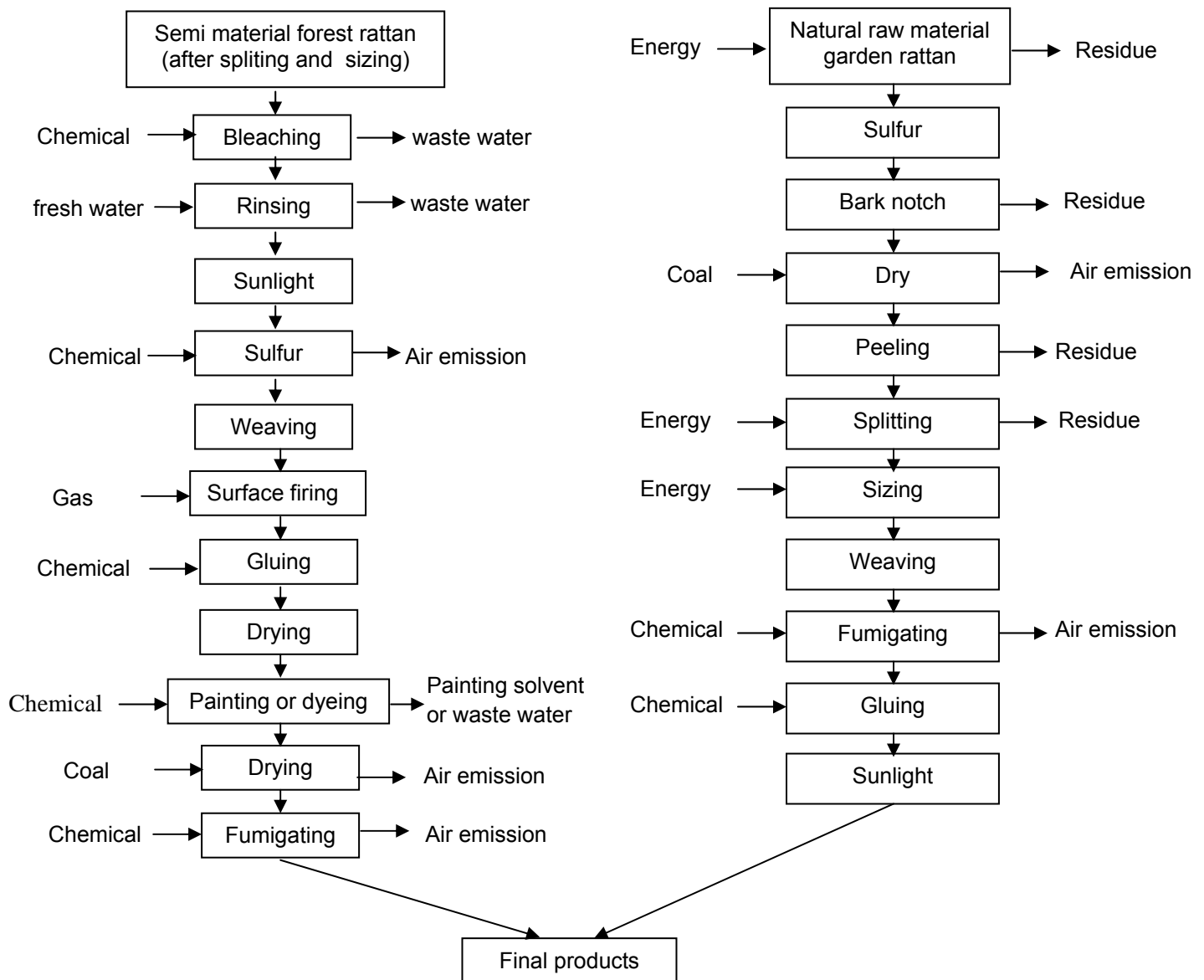
Products: tray, basket, casket vase....



Picture 1: company's outside

#### b. Production description





**Table 1.** Actual production

	Product	Unit	Weigh (kg/each)	2009
1	Tray	Pc		35.0000
2	wood tray	Pc		42.000
3	Other products	pc		N/A

**Table 2.** Raw materials and resources consumption

No	Input	Unit	2009	May 2010
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1	Raw rattan with each kind of species	Tons	270 (forest rattan) 50 (garden rattan)	27 (forest rattan) 5 (garden rattan)
2	Electricity (for production)	Kwh	N/A	2 kwh
3	Chemical - H <sub>2</sub> O <sub>2</sub> - NaOH (or soap) - Na <sub>2</sub> SiO <sub>3</sub> - PVA - Vanish	kg	- 40 - 300 - 300 - 200 - 220	N/A
4	Diesel Oil for boiling	ton		
5	Water (for rinsing)	M <sup>3</sup>	N/A	N/A
6	Coal (if using)	ton	25	
7	Gas	kg	125	12.5
8	Others			

### c. Waste

#### Air emissions:

- Smoke from boiler burning

#### Effluents:

- Wastewater from bleaching process
- Wastewater from washing process
- Wastewater from dyeing process

#### Solid wastes:

- Defect products
- Broken materials
- Slags from boilers

### d. Observation and recommendation

Observation	Recommendation
Bleaching and settling tanks made from cement	Coat composite inside the tanks to longer time, install roof to prevent rain which may dilute chemicals, reducing efficiency.



Chemicals are placed in disorder, sulfur drying chamber is simple



Not use sulfur for preservation and install proper chemical storage, avoiding chemical leakage.



Lighting system includes tube lamps, heat and light from the sun is not efficient

Replace tube lamps with energy efficient compact ones, and utilize sunlight by using transparent panel.



Workers do not use protective equipment

Equip necessary protective equipment for workers



Store material in improperly way



Install storage to well preserve material, avoid wood eater and white ant.



Other pictures in company.

