

State of Bamboo-based Industry Operators in Selected Towns of Rinconada District, Camarines Sur, Philippines

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KEYWORDS Bamboo Craft Production. Agroindustry. Rural Development. Rinconada District

ABSTRACT Bamboo craft trade is a thriving industry in Rinconada District of Camarines Sur, Philippines for more than 30 years. It provides livelihood to local entrepreneurs and employment to residents. This descriptive-survey research looked into the profile of the operators of the local bamboo craft industry, identified issues relative to bamboo supply and provided recommendations based on the findings. Mostly of the bamboo growers are male, in their middle age, married with 4-6 children and 27.45 percent have finished elementary education. Majority (94%) have less than a hectare of plantation that produces 100-500 bamboo poles. For the bamboo craft processors, majority have been in the business for more than 10 years and are into sole proprietorship. Their bamboo craft products are utilitarian in nature. The quality of bamboo raw materials is a very serious issue for them as it affects the quality of the finished bamboo products.

INTRODUCTION

The versatility of bamboo as a raw material for livelihood and construction purposes can be traced to its physical characteristics and ability to grow on diverse climates and habitats. It is hailed a “super grass” because it is the fastest growing plant on earth that can grow three feet in one day (Hickman 2011). According to the World Bamboo Organisation (2009), unlike trees, bamboo produces an annual crop providing regular income for the farmers growing it, as the plant is not killed when it is harvested.

In the Philippines, bamboo is a useful material in construction, furniture and handicraft industries, and hence it is acknowledged as the best substitute for wood for these businesses (PCARRD 2006). It is used as a building material for the construction of houses, restaurants, fences, and as scaffolding materials. In the furniture industry, it is made into living room sets, beds, chairs, tables and cabinets, while it is made into baskets, lampshades, candle holders, fan and many other useful or decorative items in the handicraft industry. Engineered bamboo is also popular for production of parquet and decorative or novelty items. The extensive use of bamboo into a wide array of products is made possible because of its abundance, rapid growth cycle and strength.

The production of various objects from bamboo provides livelihood opportunities to the community, and thus helps in countryside de-

velopment. Bamboo and its related industries have provided income, food and housing to over 2.2 billion people worldwide and in 2000, it contributed USD 3.81 million to the Philippine economy (PCARRD 2006). According to International Network for Bamboo and Rattan (INBAR) the Philippines was among the top exporters of bamboo products and ranked sixth worldwide with a total export value of USD 30 million in 2009 (GMA News Online 2012). In a report by Forest Products Research and Development Institute (FPRDI) in 2015, the Philippines exported USD 424,872 worth of bamboo handicrafts that were exported to Brunei, Italy, Japan, South Korea, Poland, Turkey, United Arab Emirates and United States of America in 2011, and that it intends to maintain its rank as the world's sixth largest exporter of bamboo and rattan products.

In the Bicol Region, bamboo craft trade is a thriving business in the Fifth Congressional District of Camarines Sur, which is popularly known as Rinconada Area. It is evidenced by the numerous displays of bamboo raw materials and products along the stretch of Pan-Philippine Highway within the district. Particularly, the municipalities of Bula and Bato have gained prominence in bamboo craft production. The municipality of Bula is considered the bamboo capital of Camarines Sur and bamboo craft is recognised as its ‘One-Town-One-Product’ (OTOP). Seeing the bright potential to boost rural livelihood, the researcher looked into the status of

the major operators of the local bamboo industry as basis for policy and program directions.

Objectives

This research was designed to answer the following objectives:

1. To know the socio-demographic and farming profile of bamboo growers.
2. To identify the business profile of bamboo craft processors.
3. To determine the trading profile of both industry operators.
4. To know the issues of bamboo craft processors.
5. To suggest strategies for sustainable bamboo pole production and processing.

METHODOLOGY

The study is descriptive-survey in nature that used a structured questionnaire and personal interview to obtain first-hand data. Identification of respondents was based from the record of the Department of Trade and Industry-Camarines Sur (DTI-Cam. Sur) and was validated by the local government units of Bato and Bula, Camarines Sur. The respondents from the bamboo craft processors are members of the Bula Bambusa Cooperative in Bula and the Agos Bamboo Furniture Producers Association in Bato. On the other hand, the respondents from the bamboo growers of the aforementioned municipalities were those identified by bamboo craft processors. Purposive sampling technique was applied in the selection of 60 respondents from the bamboo craft processors while simple random sampling technique was used for the determination of 51 bamboo grower-respondents. The researcher tabulated and evaluated the results using descriptive statistics such as frequency and percentage. Research setting was at Rinconada District, Camarines Sur province, Philippines.

RESULTS AND DISCUSSION

Profile of Bamboo Growers in Rinconada District

Socio-demographic Profile

The profile of the 51 respondents representing the bamboo growers is shown in Table 1.

Bamboo cultivation in Rinconada District is a male-dominated livelihood (76.5%). As to marital status, 48 (94.12%) are married. According to Nicodeme et al. (2017), marital status has a negative influence on the technical efficiency of farmers because the head of the family sometimes has to arbitrate between allocating his income to the purchase of farm inputs and ensuring family responsibilities.

In terms of age, 20 (39.22%) respondents are in the age ranging from 41-50 years old while 18 (35.29%) are in the age ranging from 30-40 years old. Only 13 (25.49 %) are aged 51 and above. Implying from Nicodeme et al. (2017) that old people are less energetic and less receptive to agricultural innovations, and hence develop inefficient production routines and practices, bamboo cultivation in the district seems to have an optimistic prospect with majority of growers being in the productive age.

Table 1: Summary of socio-demographic characteristics of bamboo growers in Rinconada District, Camarines Sur, Philippines

<i>Variable</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Gender</i>		
Male	39	76.5
Female	12	23.5
Total	51	100
<i>Civil Status</i>		
Married	48	94.12
Single	3	5.88
Total	51	100
<i>Age</i>		
30-40	18	35.29
41-50	20	39.22
51 and above	13	25.49
Total	51	100
<i>Number of Children</i>		
0	1	1.96
1-3	7	13.72
4-6	30	58.82
7-10	13	25.49
Total	51	100
<i>Educational Background</i>		
Elementary Level	8	15.69
Elementary Graduate	14	27.45
High School Level	11	21.57
High School Graduate	10	19.61
College Level	4	7.84
College Graduate	4	7.84
Total	51	100

As to number of children, 30 (58.82%) bamboo growers have 4-6 children while 13 (25.49%)

have 7-10 children. Effiong (2005) reported that a relatively large household size enhances the availability of family labour, which reduces constraints on labour cost in agricultural production. Although growing of bamboo requires little attention as reported by Bamboo Information Network (2008), having a large household size would mean more family members getting a hand on the trade because accordingly, farms are complex systems composed of an array of interrelated matters as reported during the 2009 World Bamboo Congress. On the other hand, large family size is also suggestive of large expenditure patterns for basic needs thus affecting allocation for farm inputs.

In terms of educational attainment, 14 (27.45%) have finished elementary level, 11 (21.57%) did not finish high school education while 10 (19.61%) finished their secondary education. The level of education of many bamboo growers where most have basic education is a consideration to look at in terms of technology adoption. The World Bamboo Congress (2009) stated that farmers do not only provide land and labour, they are also involved in the selection, monitoring and evaluation of tested technologies. With the multifaceted role of farmers nowadays, their education is a helpful tool in enhancing sustainable agricultural production. Hence, knowing that bamboo growers in Rinconada District have attained elementary and secondary education suggests that technology adoption may become a challenge unless transfer of farming technologies is complete with capacitation, continuous monitoring and aggressive promotional activities in various modalities.

Farming Profile

As shown in Table 2, ninety-eight percent actually manage their own bamboo plantation. Farm size, however, is very small (< 1 ha). For the cultivation period, ninety-eight percent reported that they cultivate the plant in 3-5 years and only two percent maintain their bamboo clumps within a period of 1-2 years. As to the time of harvesting, almost all bamboo growers harvest during the first half of the year with majority (76.5%) harvesting between the months of February to May. Majority (78.4%) of them produce 100-500 bamboo culms per harvesting cycle while

only 17.6 percent can harvest around 600-1,000 bamboo poles.

Table 2: Farming profile of bamboo growers in Rinconada District, Camarines Sur, Philippines

<i>Variable</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Land Ownership</i>		
Owned	50	98
Rented	1	2
Total	51	100
<i>Hectares with Bamboo Stands</i>		
Less than 1 ha.	48	94
More than 1 ha.	3	6
Total	51	100
<i>Years of Cultivation</i>		
1-2 years	1	2
3-5 years	50	98
Total	51	100
<i>Period of Harvesting</i>		
January-June	11	21.5
February-May	39	76.5
October-January	1	2
Total	51	100
<i>Bamboo Poles Harvested per Hectare</i>		
100-500	40	78.4
501-1000	9	17.6
More than 1000	2	4
Total	51	100

Palijon and Lapis (2009) reported that in Bicol Region, bamboo plantation and development was initiated by private individuals and the government. They were able to document that a certain Mr. Mike Caya of Bula, Camarines Sur established three hectares of bamboo plantation, under the program of the Department of Environment and Natural Resources (DENR). It was reported that ten (10) hectares were established from 1987-1990, but the location was not specified. The initial establishment of bamboo plantations in the region may have introduced bamboo cultivation in this part of the province. The estimated total land area devoted to bamboo cultivation by bamboo growers that participated in this study was 22 hectares. This area for bamboo cultivation may be inadequate if the bamboo craft industry targets expansion of their product lines and broadening their clients.

The 3-5-year cultivation period by the majority of bamboo growers in the district is consistent with the report of Bamboo Information Network (2008) that bamboo cultivated for 2-3 years can be made into boards or laminations while those that have been grown for 3-6 years

are utilised for construction purposes. With the culm acquiring full density and strength in its third year of growth, and as it becomes tougher as it matures (Razal et al. 2013), bamboo craft products made in Rinconada District are not compromised in terms of strength and its life span is optimised. Thus, buyers can be assured of quality bamboo poles as raw materials.

The period of harvesting between the months of February to May is found to be advantageous for most growers. Accordingly, the presumed low starch content along with the lower moisture content of bamboo poles appear to make the summer months the more favourable time to harvest bamboo in the country. Likewise, no new shoots emerge during this time and therefore, shoot damage through harvesting is avoided. Weather conditions are also favourable for cutting and transporting the poles. Conversely, the starch content of bamboo poles is considered to be higher during the rainy season. New shoots also emerge during this period. Thus, culm cutting during the growing or rainy season is avoided since the cutting could actually damage the young shoots and will also retard the growth and development of the residual culms (PCARRD 2009; Razal and Palijon 2009 as cited by Razal et al. 2013).

As for bamboo pole production, majority (78.4%) produce 100-500 bamboo poles per harvesting cycle while only 17.6 percent harvest around 600-1,000 poles. This could be indicative that the cultivation practices of bamboo growers may need technological intervention to maximise pole production. There are already proven bamboo cultivation technologies in the Philippines such as POPEYE or poles per year (America 2015) and branch marcotting technology (ILARRDEC no date) that could be adopted by bamboo growers to increase pole production per hectare.

Business Profile of Bamboo Craft Processors

As disclosed in Table 3, sixty-five percent of bamboo craft processors have stayed in the business for more than 10 years while thirty-five percent existed for less than 10 years. Majority (87%) are into sole proprietorship while thirteen percent have partners in their business. The finished products include living room sets (100%),

single beds (63%), double deck beds (53%), TV stands (23%), dining sets (23%), double beds (20%), dividers (18%), bench/chairs (17%), family sized beds (12%), nipa huts (7%), cabinets (5%) and penny banks (5%). One hundred percent (100%) affirmed that production of bamboo crafts is done on a daily basis. Around 66.67 percent produce a maximum of 10 sets per production cycle while twenty percent can produce 11-20 sets per production cycle.

Table 3: Business profile of bamboo craft processors in Rinconada District, Camarines Sur, Philippines

<i>Variable</i>	<i>Total (n=60)</i>	<i>Percentage</i>
<i>Years in Business</i>		
Less than 10 years	21	35
More than 10 years	39	65
<i>Type of Organisation</i>		
Sole Proprietorship	52	87
Partnership	8	13
<i>Bamboo Craft Products</i>		
Living room set	60	100
Single bed	38	63
Double deck bed	32	53
TV stand	14	23
Dining set	14	23
Double bed	12	20
Divider	11	18
Bench/chair	10	17
Family sized bed	7	12
Nipa hut/Bahay kubo	4	7
Cabinet	3	5
Penny/coin bank	3	5
<i>Frequency of Bamboo Craft Production</i>		
Daily	60	100
Weekly	-	-
<i>Quantity Produced (in sets)</i>		
1-10	40	66.67
11-20	12	20
21-30	4	6.67
31-40	1	1.67
41-50	1	1.67
>50	2	3.33

The existence for more than 10 years of majority of bamboo craft processors in Rinconada District indicates their vast experience in the bamboo processing business. This corroborates the report of Palijon and Lapis (2009) on the establishment of bamboo plantation in the district in the 1990s that could have supplied the needed raw materials for bamboo craft making. However, as there was no definite account on the year of establishment of bamboo plantation by

Mr. Caya in Bula, Cam. Sur, it could be assumed that it came earlier than 1990 since there are two (2) entrepreneurs who are already in the business of bamboo craft production for more than 30 years. The involvement in the bamboo craft production by these entrepreneurs for more than three decades in Rinconada District demonstrates the sustainability of the said industry. If supported with a positive enabling environment from the government and private sectors, there is a higher probability that this local trade can be transformed to a vibrant and global industry contributing to countryside and national development.

Sole proprietorship is the business form adopted by most bamboo craft processors in the Rinconada District. It is a business structure owned by an individual who has full control and authority of its business and owns all the assets, personally accountable to all liabilities or suffers all losses but enjoys all the profits to the exclusion of others (Trade Chakra no date). This is the simplest form of business under which one can operate a business, hence, the choice of the owners (Barandon 2015).

Bamboo craft business in Rinconada District produces 12 different product lines mostly of utilitarian nature like household furniture. All bamboo craft processors create living room sets, some make single and double deck beds and some produce TV stands, dining sets and double bed. Only few sell dividers, bench chairs, family sized beds, nipa huts, cabinets and coin banks. Majority of the processors are still into production of traditional bamboo crafts. In the study by Redzuan and Aref (2011) on the 'Constraints and Potentials of Handicraft Industry in Undeveloped Region of Malaysia', they recognised that products of a utilitarian nature would presumably be higher on the priority list of purchases than ornamental products.

The variety of products that can be made out of bamboo is a showcase of bamboo's versatility as a raw material. However, it appears that this characteristic is not fully exploited to its fullest potential by the bamboo craft processors in the district as most can finish 1-10 sets with a only a few producing 11-20 sets in their assembly line given that their operation is on a daily basis. Barandon (2015) pointed out that they do not produce more than the demand due

to lack of storage space for finished products. Product demand is also dictated by pricing and quality. Nipa huts and cabinets have less demand because the former is expensive while the latter is prone to insect infestation. Lack of storage space and poor quality products are major considerations for their limited production. This could also be the reason for the weak patronage of their products according to them. It is however, important to assess the still commercially designed bamboo crafts being produced. People who have modernised their interior designs may necessitate artistic style and designs to meet their colonial taste. This is why capacitation and continued upgrading of the bamboo craft processors in terms of training be given particular attention to improve the local bamboo industry.

Trading Profile of Bamboo Growers and Bamboo Craft Processors

The trading characteristics of the two key operators were also obtained. For the bamboo growers, the following information were gathered:

1. Species cultivated
2. Typical bamboo buyers
3. Frequency of selling
4. Number of bamboo poles sold.

For the bamboo craft processors, the following data was gathered:

1. Species purchased
2. Source of bamboo culms
3. Frequency of buying
4. Number of poles purchased

As indicated in Table 4, *Bambusa blumeana* or kawayang tinik is the species of bamboo cultivated by all growers. It is also the bamboo species required by 76.5 percent of bamboo craft processors. According to Roxas (2012), *B. blumeana* is the most commonly used bamboo in the Philippines. This species develop erect culms that grow 15-25m tall and 6-10cm in diameter and are used for construction, basketry, furniture and parquet, concrete reinforcements, chopsticks, hats and toys. Bamboo craft processors in the Rinconada District produce household furniture, nipa huts and novelty items, while private individuals make use of bamboo for their own consumption as a material for housing, fencing, props for banana plants and as fish pens.

Table 4: Trading characteristics of bamboo growers and bamboo craft processors in Rinconada District

Variable	Bamboo growers		Variable	Bamboo craft processors	
	Frequency (n=51)	%		Frequency (n=60)	%
<i>Bamboo Species Cultivated</i>			<i>Bamboo Species Purchased</i>		
Bambusa blumeana	51	100	Bambusa blumeana	60	100
<i>Buyers of Bamboo Poles</i>			<i>Source of Raw Materials</i>		
Bamboo Craft Processors	39	76.5	Bamboo growers	60	100
Own Use	12	23.5	Own Cultivation Area	-	-
<i>Frequency of Selling</i>			<i>Frequency of Buying</i>		
1-2x a year	43	84.3	1-2x a year	2	3.3
Once a month	6	11.7	Once a month	58	96.7
2x a month	1	2	2x a month	-	-
Weekly	1	2	Weekly	-	-
<i>Number of Bamboo Poles Sold</i>			<i>Number of Bamboo Poles Purchased</i>		
100-500	51	100	1-500	57	95
501-1000	-	-	501-1000	1	2
> 1000	-	-	> 1000	2	3

In terms of frequency of selling, 84.3 percent of the bamboo growers indicated that they sell bamboo poles once to twice a year while 11.7 percent claimed that they sell once a month only. On the other hand, majority (96.7%) of the bamboo craft processors buy bamboo raw materials once a month. The difference in this part of bamboo trade could be pointed out to the bulk of bamboo craft orders from processors. It can be noted that 66.67 percent of craft processors produce only 1-10 sets of bamboo craft because of limited supply of bamboo raw materials.

As for bamboo poles sold per transaction, all of the bamboo growers stated that they sell as much as 500 poles per transaction, which is consistent with ninety-five percent of processors purchasing the same quantity per transaction. Only five percent of the processors purchase more than 500 to a maximum of 1000 poles per transaction, as they are the ones that produce bamboo craft orders in bulk.

Issues of Bamboo Craft Processors

Although bamboo craft processing has demonstrated its sustainability in the Rinconada District, it is saddled with varied issues. The researcher categorised them into supply and demand issues. The former refers to factors that restrict bamboo craft production due to quality and volume of bamboo poles as raw materials, while the latter are those issues that limit manufacturing of bamboo crafts due to quality of products made and customer satisfaction.

On the supply side, half of the bamboo craft processors rated the quality of bamboo poles as raw materials a 'very serious' issue while the volume requirements is rated by fifty-five percent as a 'serious' issue (Table 5). Their perception on the quality and volume of bamboo raw materials was rated as such because according to them instances like inconsistency of required

Table 5: Perception on the degree of seriousness of supply and demand issues in bamboo craft processing in Rinconada District

Issues	Degree of seriousness (n=60)			Total
	Not serious	Serious	Very serious	
<i>Supply Issues</i>				
Quality of bamboo poles	1.67	48.33	50	100
Volume requirements	31.67	55	13.33	100
<i>Demand Issues</i>				
Quality of products	3.33	43.33	53.33	100
Customer satisfaction	6.67	53.33	40	100

dimensions and unmet volume requirements of bamboo poles usually occur.

On the demand side, 53.33 percent of bamboo craft processors rated quality of bamboo craft products as a 'very serious' issue and customer satisfaction as a 'serious' issue. Underlying reasons for this result include production of low quality traditionally designed bamboo crafts, which is the common feedback of their customers.

Proposed Recommendations for the Bamboo Craft Industry in Rinconada District, Camarines Sur

With more than a decade of operation, the bamboo industry sector in Rinconada District has high propensity for development. The recently drafted Philippine Bamboo Industry Roadmap is a welcomed step to support bamboo industry development in the country. However, in addition to the interventions in the roadmap, the following strategies are suggested for local implementation in Rinconada District such as:

On Bamboo Pole Production

1. To compensate for the basic level of education, there should be an aggressive training capacitation among bamboo growers in terms of practical and proven technologies on bamboo pole production.
2. The academe, government and private agencies may collaboratively conduct research and development (R&D) activities to sustain production of quality bamboo poles.
3. Allocation of land areas dedicated for massive bamboo cultivation should also be considered. This should be led by local government units and incentives be provided to encourage bamboo plantation development.
4. Other bamboo species may be cultivated in addition to *Bambusa blumeana* for bamboo craft processing.
5. Inventory of bamboo resources should be conducted to estimate pole production for the local bamboo-based enterprises.

On Bamboo Craft Processing

1. To produce industrialised bamboo products, adoption of proven and useful tech-

nologies in bamboo craft processing from other regions can be done.

2. The academe, government and private agencies should conduct R&D on bamboo preservation for product quality improvement and prototype development of tools or equipment to hasten craft production.
3. In collaboration with the government, skills in product design and processing should be upgraded to produce impressive range of high-value bamboo product lines.
4. Other bamboo species may also be utilised for processing of bamboo crafts.

CONCLUSION

It can be recalled that the general aim of this paper was to profile the main operators of the local bamboo craft industry, which are the bamboo growers and bamboo craft processors, in Rinconada District, Camarines Sur Province. It was revealed that bamboo growers are mostly male, in their middle age, married with a large family size and finished elementary education. Majority manage their own plantation of less than one hectare. Bamboo cultivation ranges from 3-5 years producing 100-500 bamboo poles, which are sold once or twice a year. *Bambusa blumeana* or kawayang tinik is the species of bamboo cultivated by all growers.

The majority of bamboo craft processors have been in the business for more than 10 years and are into sole proprietorship. They produce bamboo furniture on a daily basis. They purchase bamboo poles once a month from bamboo growers. For them, the quality of bamboo poles as raw materials and bamboo craft products are very serious concerns to look into while volume requirements for bamboo poles and customer satisfaction are considered serious setbacks in their business. With these, strategies were proposed by the researcher to improve the current condition of the bamboo craft industry in Rinconada District.

RECOMMENDATIONS

In light with the findings of this study, other studies may be conducted in other provinces in

Bicol Region to obtain a complete picture of the bamboo industry in the region. Likewise, the strategies offered by the researcher for policy makers, researchers and development practitioners is recommended for implementation to boost the local bamboo craft industry in Rinconada District, Camarines Sur.

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**Paper received for publication in February, 2020
Paper accepted for publication in February, 2020**