

MARKETING OF BAMBOO AND IT'S PRODUCTS IN TRIPURA

काशी हिन्दू
विश्वविद्यालय



BANARAS HINDU
UNIVERSITY

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

Master of Agri-Business Management

Supervisor
Prof. P.S. Badal

Submitted by
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ID. No. 19412ABM021

2021

Enrolment No. 419094

Dedicated to



*My Beloved Parents
who sacrificed their today
for my tomorrow*



Ref. No.

Dated

CERTIFICATE

To
The Registrar (Academic)
Banaras Hindu University
Varanasi – 221005 (INDIA).

Through: The Head, Department of Agricultural Economics
Institute of Agricultural Sciences, B.H.U., Varanasi.

Dear Sir,

I have great pleasure in forwarding the project entitled “**Marketing of Bamboo and it's products in Tripura**” submitted by **Mr. SHAYAN DAS, ID. No. 19412ABM021**, in partial fulfillment of the requirements for the degree of **Master of Agri-Business Management**, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi and placing on record that he has completed the requisite residential requirements as contained in the statutes of the University.

I certify that the entire scheme of investigation presented here in was planned and carried out solely by the candidate under my guidance and supervision. The data presented in the project, to the best of my knowledge and belief, are genuine and original.

Thanking you.

Yours faithfully,

Forwarded by

(Dr. P.S. Badal)
Supervisor

Head

MARKETING OF BAMBOO & IT'S PRODUCTS IN TRIPURA



By
Shayan Das

Project submitted in partial fulfillment of the
requirements for the degree

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*At the outset, being the student of this great institution. I bow my head within great reverence to the lotus of **Mahamana Pandit Madan Mohan Malaviya Ji**, the founder of the Banaras Hindu University whose everlasting desire was to serve the mankind.*

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Last but not least, I bow my head before the feet of almighty "**Baba Vishwanath**", seeking their blessings to accomplish the daunting task ahead in my life.

Place: Varanasi

Date:

(Shayan Das)

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INTRODUCTION

Bamboo is one of the most valuable resource of India and it has vast diversity in its applicability and enormous scope for improvement of rural and tribal livelihoods and for the environment. It may be leveraged towards the alleviation of rural poverty, empowerment of women and environmental rejuvenation. Marsh and Smith (2007) claimed that the presence of re-source value addition in modern value chains implies that the industrial component of the bamboo sector has an excellent potential in terms of its pro-poor impact in poverty alleviation. The industrialisation of the bamboo sector is, thus an essential task for bamboo to have any true effect on the lives of the millions who depend upon it.

Bamboos are tall perennial grasses with tree stature that grow up to about 30 m in height and 35 cm in diameter. They belong to the Poaceae (Gramineae) family and Bambuseae sub-family (Ohrnberger, 1999). The main stem of the aboveground part of the plant is the culm, while the underground part constitutes the rhizome and root system. Most bamboo plants flower only once in their lifetime (14 to 50 years) in most species and then die soon. They emerge again from germinating seeds if the site is not severely disturbed by detrimental factors such as rodents, fire, etc. These phenomena were actually observed in bamboo forests (Liese, 1985). According to the Forest Survey of India (FSI), India has 8.96 million hectares of forest area, which is about 12.8 per cent of the total forest cover. In India, shoots of *Bambusa bambos*, *B. multiplex*, *B. tulda*, *B. vulgaris*, *D. giganteus*, *D. hamiltonii*, *D. longispathus*, *D. strictus* and *Sinobambus elegans* are used as vegetables and pickle products. Bamboo is one of Tripura's most important natural resources. The state is home to tropical moist deciduous woods, as well as areas of evergreen forests and a large area under bamboo brakes. The climate is damp to humid, with annual rainfall ranging from 2,250 to 2,500 mm. Bamboos are found in abundance in the state, with at least 19 kinds being common in all of Tripura. Bamboos are utilised for a wide range of applications, particularly in East and Southeast Asia. Some bamboo species' seeds are consumed as grains, and some bamboo species' cooked young shoots are eaten as

vegetables. Livestock can eat the raw leaves as feed. Fine-quality paper is made from the pulped fibres of numerous bamboo species, including *Dendrocalamus strictus* (Male Bamboo) and *Bambusa bambos*. The jointed stems of bamboo have perhaps the most numerous uses; the largest stems supply planks for houses and rafts, while both large and small stems are lashed together to form the scaffoldings used on building-construction sites. Buckets are made by splitting the stems.

Bamboo is used in the following ways in Tripura:

Rural Housing: posts, walls, roof structure, roofing material, scaffolding, fencing, and gates (Bari, Barak, Muli, Makal)

Agricultural implements, baskets, and food grain containers are only a few examples. rain shields, headgear, and other useful items, Bamboo shoots that are edible for food, are consumed throughout, especially in indigenous societies.

Toys, stools, winnowing trays, hand fans, mats (Muli, Paora, and Mritinga), wall panels, screens (Mritinga, makal), umbrella handles (Muli), fishing rods (Kanak kaich), and Agarbatti sticks are examples of handicraft items (Paora, Dolu, Barak) (source: Forest Dept. Tripura).

Bamboo is a valuable resource for generating revenue and improving the nutritional status of nearly 2 billion poor people, the majority of whom live in rural areas. It also provides a resource base for the expansion of the SME sector, which provides job and income-generating opportunities to help people out of poverty, particularly in rural areas and communities. Bamboo can be an ideal entrance point for poverty alleviation programmes and efforts because of its qualities. Bamboo also benefits rural-urban populations since it

- (a) Blends in with agricultural methods
- (b) Bamboo-based industrial growth benefits communities by establishing a demand for human resources for bamboo cultivation, harvesting, transportation, and processing.

- (c) may be cultivated on non-agricultural land with annual harvests,
- (d) Bamboo stalks provide a healthy source of nutrition and
- (e) is straightforward to process.

Keeping in view of all the above aspects of bamboos, the present study has been framed to be under taken with respect to the following objectives:

Objectives of Study

1. To study the role of agents/agencies in marketing of bamboo.
2. To recommend the measures for Value Addition.
3. To promote Marketing of the Bamboo products.



REVIEW OF LITERATURE

Review of Literature provides information to the surveyor and the researcher regarding the previous work done in that area of work or that field of work and thereby helps them in identifying the theoretical framework and methodological issues relevant to the study.

Bamboo plants are giant, fast-growing grasses that have woody stems. The characteristics of each vary in size, growth habit, sun tolerance, soil moisture needs and heat/cold temperature tolerance. Several investigators have examined bamboo as a source of bast fibre and as a source of cellulose from pulping the bamboo [Ahmad *et. al.*, 2005; Rajulu *et. al.*, 1998 and Chen *et. al.* 1998). One of the benefits of using bamboo fibres is that the bamboo is an abundant natural resource in Asia and Middle & South America. Bamboo fibers are often known as natural glass fiber due to its high strength with respect to its weight derived from fibres longitudinally aligned in its body (Okubo *et. al.*, 2004). The tensile strength of bamboo is relatively high and can reach upto 370 MPa (Thwe *et.al.*, 2003). This makes bamboo an attractive alternative to steel in tensile loading application. In India, shoots of *Bambusa bambos*, *B. multiplex*, *B. tulda*, *B. vulgaris*, *D. giganteus*, *D. hamiltonii*, *D. longispathus*, *D. strictus* and *Sinobambusa elegans* are used as vegetables and pickle products. A comprehensive list of edible bamboo species growing world over has been prepared by Vatsala (2003). Large stature bamboos of the genera *Bambusa* and *Dendrocalamus* are well known to be very important in the rural economy of Nepal, (Stapleton, 1982) being multipurpose species, they provide constructional materials, animal fodder, fuel-wood, food, and woven products for agricultural and domestic purposes, as well as baskets for transport of most commodities beyond the road heads in the hills.

Marketing of Bamboo

Klop *et al.* (2003) carried out a study on ‘*Guadua angustifolia*’ Ecuador in order to get better insight into the products and actions involved in the growing,

manufacture, trading and end use of this indigenous bamboo species. The study revealed a whole variety of uses ranging from all round bamboo culms to parquet flooring. Most of the Guadua consumptions are domestic and for household or construction uses. The export market is limited and mainly concentrated on bamboo poles for the construction sector. The largest potential market seems to be national demand for the agriculture and construction sectors. The growing interest in bamboos as an alternative natural product and the opening up of new markets create new opportunities for Ecuador, although much work has to be done on information gathering and promotion of guadua as a new quality product.

Bamboo in road construction

Patel et al. (2013) studied that bamboo culms are cylindrical shells and are divided by nodes as solid transversal diaphragms. The strength distribution is more uniform at the bottom of bamboo than at the top or at the middle of it, since it is subjected to maximum bending stress due to wind at the top portion of the culms. Applying the load, they had their observations recorded. In the plain slab panel test specimen, the first crack occurred vertically from the point of load application which was flexure crack and the crack was widened. In singly reinforced concrete slab panel the crack was seen to be going in a vertical direction. Then the crack got widened. The crack was rising very smoothly and slowly. From various tests conducted, results of Elasticity of bamboo strips is evaluated as 5098 N/mm² which is comparatively same as steel. Same load carrying capacity of bamboo strips with concrete is justifying with steel reinforcement. Replacement of steel reinforcement can be possible by using bamboo as bonding element in concrete. Bamboo is a naturally available material as compared to steel but properties as well workability of bamboo is compatible.

Priyadarshee et al. (2014) attempted to employ bamboo in the building of a Low volume rigid pavement, stating that the bamboo was put 50mm from the top of the pavement to help reduce cracking during initial setting and also to help control cracking caused by temperature changes. The bamboo mesh was mounted atop 100 mm wooden spacers, ensuring that the reinforcement's required 50mm cover would be

maintained. As the concrete pouring progressed, the wooden blocks were removed. According to the findings, the ultimate tensile strengths of bamboo splints and mild steel are 133.50 N/mm² and 255.00 N/mm², respectively, with yield strengths of 68.75 N/mm² and 207.50 N/mm², making bamboo an appealing steel substitute in tensile loading applications.

The mechanical properties of bamboo-glass fibre reinforced polypropylene hybrid systems are dependent on fibre weight ratios, fibre length, and adhesion characteristics between the fibres and the matrix, according to **Rassiah *et al.* (2015)** studies on characterization of bamboo-glass fibre reinforced polymer matrix hybrid composite. The results were achieved utilising the mould press method with different bamboo fibres of 3 mm and 6 mm, and 10% to 40% bamboo fibre was loaded with and without MAPP. When bamboo fibre content was increased from 10% to 30%, the average tensile strength only improved somewhat, and when 40% (by weight) fibre content was used, the average tensile strength declined by 16% compared to 10% (by weight)

According to **Kurhekar *et al.* (2015)**, bamboo's tensile strength is quite strong, reaching 370 N/mm². As a result, bamboo can be used in tensile loading applications instead of steel. This is because bamboo's tensile strength to specific weight ratio is six times that of steel, and its flexural strength is adequate, making it appropriate for use as reinforcement in low-cost housing constructions made of Reinforced Cement Concrete (R.C.C.).

Ahmad *et al.* (2014) observed that the cubes after 28 days of curing has marginally increase in ultimate strength of concrete by reinforcing it with bamboo fibres. The reason for this low strength at early stage may be due to weak bond between bamboo fibres and concrete in early days. The fiber's surface friction must be increased to see the effect on the increase in the strength of bamboo reinforcement concrete in early stage but due to lack of time, it could not be done. The stress strain curve for bamboo reinforced concrete cube is almost linear showing the elastic behaviour. The results show that modulus of elasticity of concrete increases on

addition of bamboo fibres. For plain concrete it has been found to be 23.30kN/mm² whereas for fibres reinforced concrete it gains as high as 47.62kN/mm².

Singh et al. (2014) have given a critical review of the characterization for natural fiber reinforced composite. The mechanical properties of the natural fiber composites (bamboo, sisal) primarily depend upon the fiber interfacial adhesion. Though the natural fibres are superior in properties, but due to its hydrophilic nature, it possesses poor bonding nature with the hydrophobic polymer matrix. This has resulted in the degradation of its mechanical properties. The optimum fiber length, loading and low moisture absorption nature of the fibres have improved the mechanical properties of the composite. The addition of flame retardants has resulted in the increase of thermal stability of the composite. The natural fiber reinforced composites got high potential of replacing the conventional material used in the electrical appliances.

Bamboo is a versatile reserve, according to **Bindu et al. (2016)**, with a high strength-to-weight ratio and ease of operation with simple tools. Bamboo fibres are utilised as a natural fibre in concrete to lower the weight of Bamboo Fibres Reinforced Concrete (BFRC) and to improve its properties. The elasticity modulus of bamboo fibres is higher than that of any other natural material. A fibre's tensile strength improves with its length. Bamboo fibres increase the mechanical and tensile strength of concrete. It has a low specific weight as well. Bamboo fibres are vulnerable to biological attacks like fungus and insects.

Ahad et al. (2015) has given a critical literature review of the application of Steel fiber in rigid road construction for increasing the strength, life-period and reducing overall cost of road construction. Steel fibres are economical as well as effective in increasing the strength of pavement. It is one of the good alternative solutions to the modern transportation system of developing countries like India. By the use of steel fibres, the thickness of road reduces up to 25per cent to 30per cent with the increase in the durability of the road pavement, so it can decrease the Overall cost of the road construction. The different types of loads are easily movable without the construction of any special type of pavement. It is totally favorable to the

Government of the specific country in the economical investment on the roads. And it is also helpful to reduce the material consumption in the construction of roads. Because of reducing the concrete or material usage, the ill effect of cement usage reduces on the environment. It also possesses high strength, so it has long durability.

Kaware *et al.* (2013) stated that water absorption of bamboo is quite high. To reduce this effect seasoning or other suitable treatment should be given. Tensile strength of bamboo is good and can be used as reinforcement in Reinforced Cement Concrete (R.C.C.) Construction. As bamboo is weak in shear it cannot be used as shear reinforcement in R.C.C. structure. Moisture content of bamboo changes according to topography and climatic condition. Moisture content directly affects the strength of bamboo.

Production of particle board

Yang *et al.* (2014) reported that over the past decades, many non-wood lignocellulosic biomasses, including bamboo, wheat straw, cotton stalks, sunflower stalk and kenaf stalk, have been used to produce particleboards or other end products. In the search for alternative processes, it was discovered that bamboo is a great option for particle production. **Khalil *et al.* (2012)** stated that bamboo can be an alternative to the production of particleboards as well being used to reinforce bio-composites.



RESEARCH METHODOLOGY

This chapter deals with methods, procedures and techniques used in the study for collecting and analyzing data with respect to objectives formulated.

Selection of Locale of Study

West district of Tripura was selected purposively as it has area under Bamboo forests. Out of 9 blocks in the district, two nearest blocks were selected and two villages were selected in each block.

Selection of Respondents

Ten farmers were selected from each village. So, out of the Two villages the number of farmers selected were Twenty (10 farmers x 2 villages = 20 farmers).

Therefore, the total number of farmers selected were Twenty.

Also, data was collected from 2 Bamboo agencies.

West district

| | | |
|-----------------|-----------------------|---------------------|
| Block | Mohanpur | Belbari |
| Villages | Sidai Mohanpur | Champaknagar |

Collection of Data

Both primary and secondary data were collected as per the objective of study.

Data Collection

1. **Primary data** (Basic information) were collected through field visit and interaction with the farmers, processors and retailers. The data collection points are:
 - a) Collection center managed by agencies.
 - b) Collection center managed by retailers.
 - c) Collection from farmers.
2. **Secondary data** were collected through published information & media reports.

Data Analysis

All collected data from the two sources were processed and analyzed:

First, data from both the blocks were compiled together & analyzed through frequency and percentage.

Data Interpretation and Presentation

Analyzed data were interpreted on the basis of locale situation and review of literature which were presented in the form of tables, charts, etc. which was submitted in the form of report.



RESULTS AND DISCUSSION

1. Role of Agencies in the marketing of Bamboo

1.1 Distribution of purchase of Bamboo culm by the agencies

By the field visit and interaction with the agencies of the two blocks namely Mohanpur and Belbari, the number of Bamboo sellers who sell bamboo culm to the agencies is presented in Table 1 and Figure 1.

Table 1: Classification of Sellers of Bamboo to the Agencies in the market

| S.No. | Sellers of Bamboo | No. | Percentage |
|--------------|--------------------------|------------|-------------------|
| 1. | Framers | 10 | 50 |
| 2. | Agencies | 7 | 35 |
| 3. | Others | 3 | 15 |
| Total | | 20 | 100 |

From the above Table 1 it is clear that 50 per cent of the sellers of Bamboo selling to the agencies were the farmers. More over the agencies that were selling Bamboo to the other agencies were 35 per cent and the rest that is 15 per cent was sold by others to the agents/agencies. This gives us an idea of the number of farmers who are dependent on bamboo production and majority were farmers selling to the agencies.

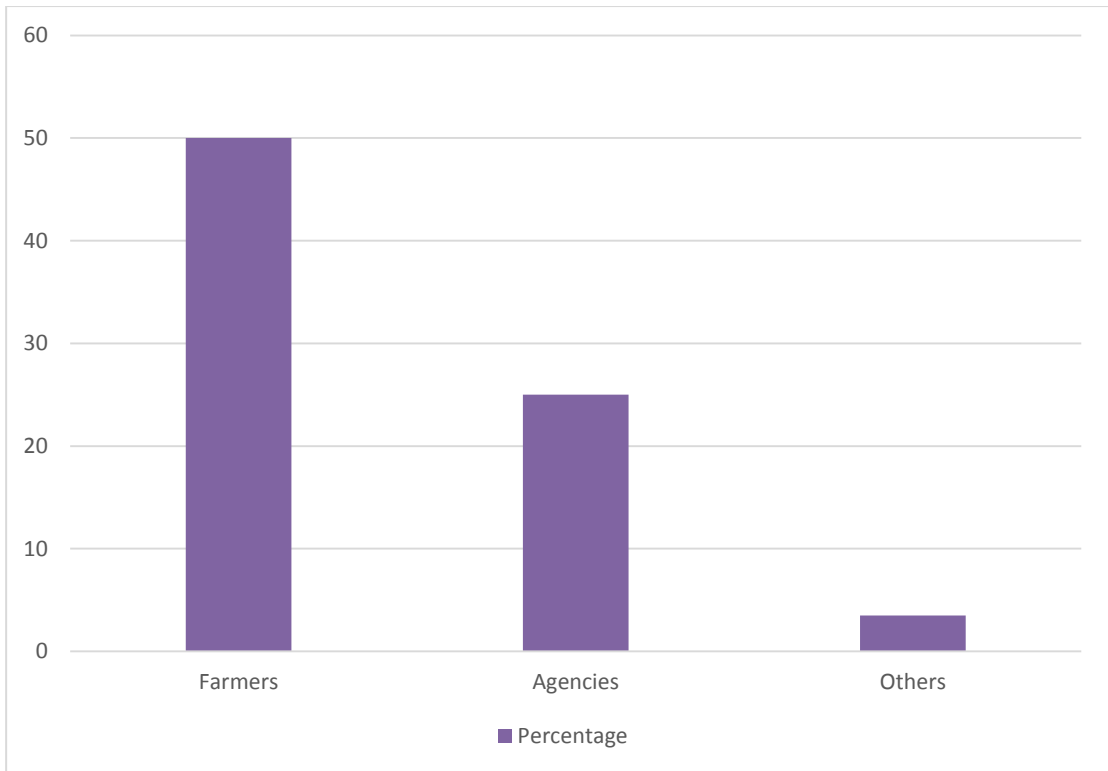


Figure 1: Classification of Sellers of Bamboo to the Agencies in the market

1.2 Distribution of Types of Bamboo Agencies present in the market

The number of registered and non-registered Bamboo agencies who buy bamboo culm is presented in Table 2 and Figure 2.

Table 2: Classification of Bamboo Agencies

| S.No. | Types of Bamboo Agencies | No. | Percentage (%) |
|--------------|---------------------------------|------------|-----------------------|
| 1. | Registered Agencies | 7 | 35 |
| 2. | Non-Registered Agencies | 13 | 65 |
| Total | | 20 | 100 |

The above Table 2 depicts that most of the Bamboo agencies were non-registered that is 65% and very few were registered that is 35%. As majority of the agencies were non-registered, they lacked the infrastructure & facilitation to enable farmers in increasing their income.

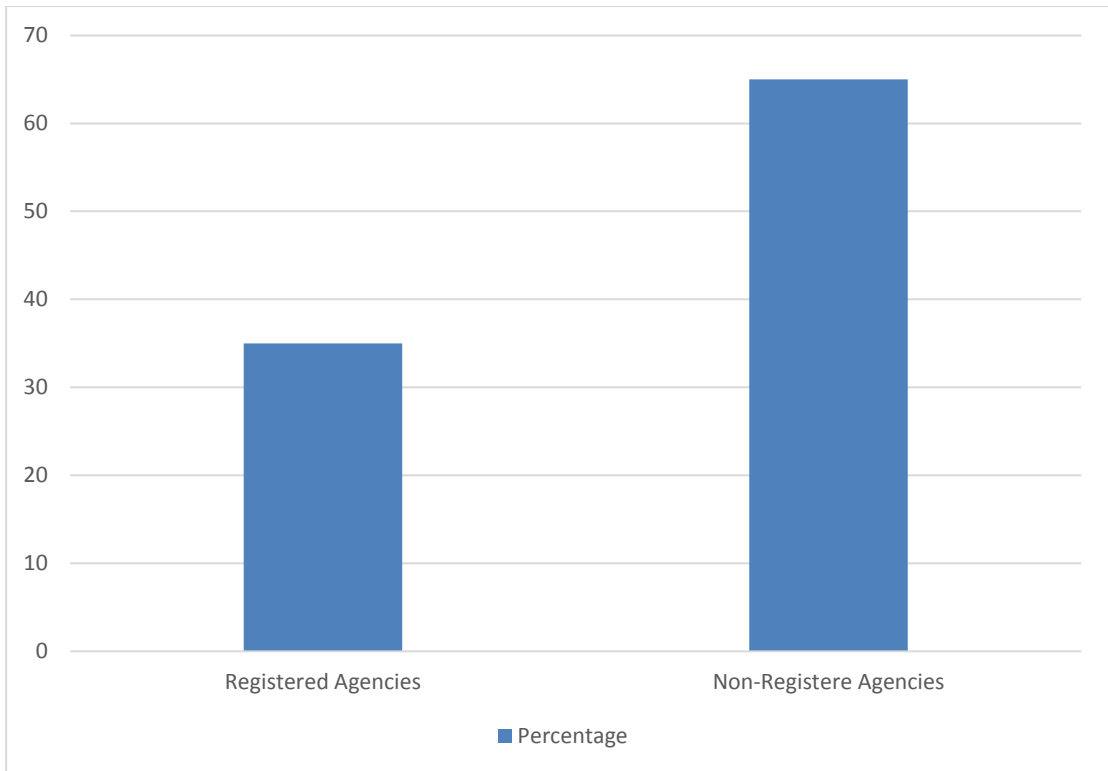


Figure 2: Classification of Bamboo Agencies

1.3 Type of Bamboo purchased by the Agent

The types of bamboo purchased from the farmers of the two villages are presented in Table 3 and Figure 3.

Table 3: Type of Bamboo purchased by the Agent

| S.No. | Types of Bamboo | No. | Percentage (%) |
|--------------|------------------------|------------|-----------------------|
| 1. | Processed | 6 | 30 |
| 2. | Unprocessed | 14 | 70 |
| Total | | 20 | 100 |

The Table 3 shows that the type of Bamboo purchased by the Agents/Agencies were mostly of unprocessed type that is 70% and the rest 30% was of processed type. The main reason being the cheap availability of unprocessed Bamboo as compared to processed Bamboo. This also means that more & more number of people can sell this un-processed bamboo and earn a living for themselves easily.

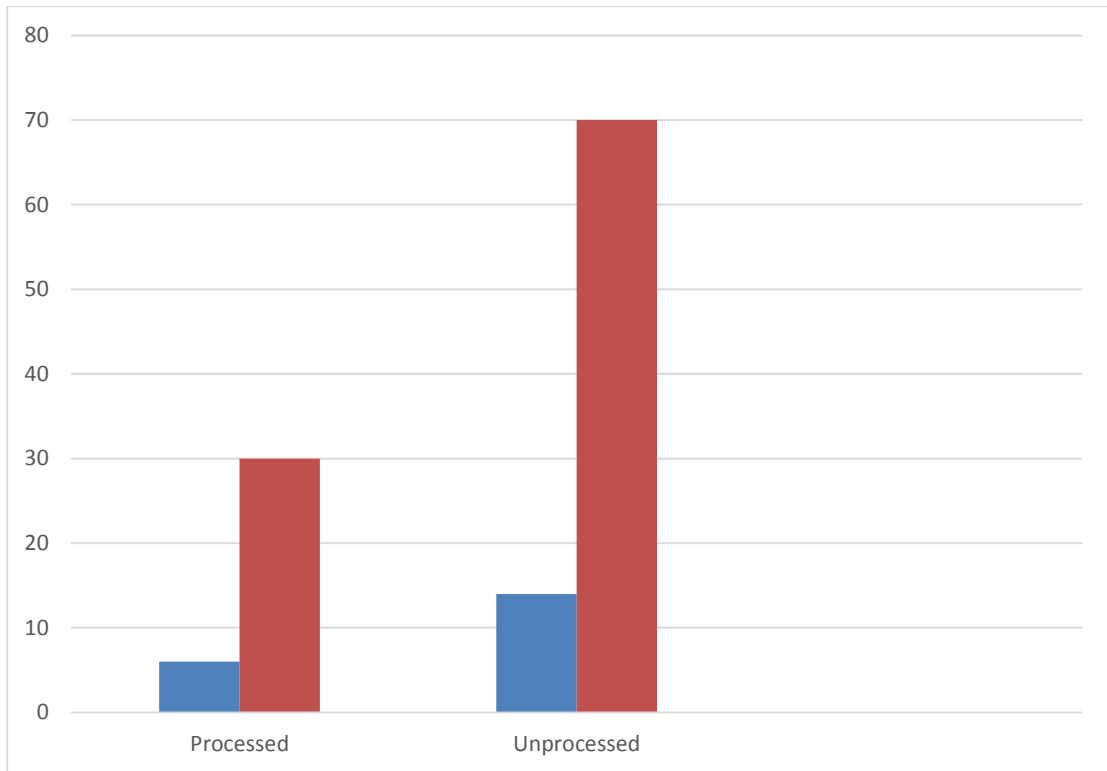


Figure 3: Types of Bamboo purchased by the Agencies

1.4 Mode of transportation by the farmers to the agencies

By the field visit and interaction with the agencies of the two blocks namely Mohanpur and Belbari, the mode of transport is presented in Table 4 and Figure 4.

–
Table 4: Mode of transportation by the Agencies

| S.No. | Mode of Transportation | No. | Percentage (%) |
|--------------|-------------------------------|------------|-----------------------|
| 1. | Lorry truck | 6 | 30 |
| 2. | Tractor | 14 | 70 |
| Total | | 20 | 100 |

–
The Table 4 above depicts that the Agencies used Tractor as their main source or mode of transportation that is 70% and the rest preferred lorry truck for transportation that is 30%. Since maximum bamboo cultivators are of small scale, they hardly need large carriers to transport their products. It is the Agencies which collect all the products and to export them trucks are required as the products are of bulk amount.

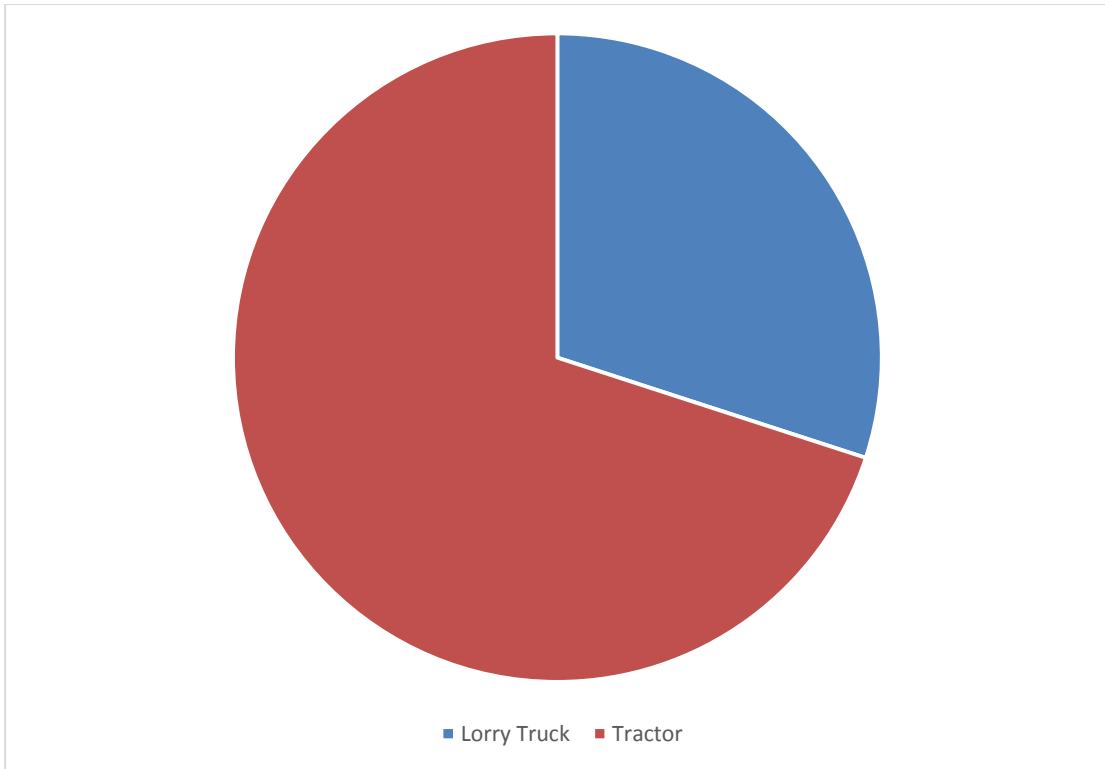


Figure 4: Mode of transportation by the agencies

1.5 Incentive given to farmers by the agencies

Incentives provided to the farmers by the agencies is presented in Table 5 and Figure 5.

Table 5: Incentive given to farmers by the Agencies

| S.No. | Incentive given to farmers | No. | Percentage (%) |
|--------------|----------------------------|-----------|----------------|
| 1. | Yes | 5 | 25 |
| 2. | No | 15 | 75 |
| Total | | 20 | 100 |

The above Table clearly shows that maximum of the farmers were not given any incentive by the Agencies that is 75% and very few number of the farmers were given help in the form of incentive which is 25%. As we have seen in table 1.3, due to most of the agencies being non-registered they also could not provide incentives due to lack of funds which in turn is de-motivator for the farmers and one of the reasons fewer bamboo farmers remain today.

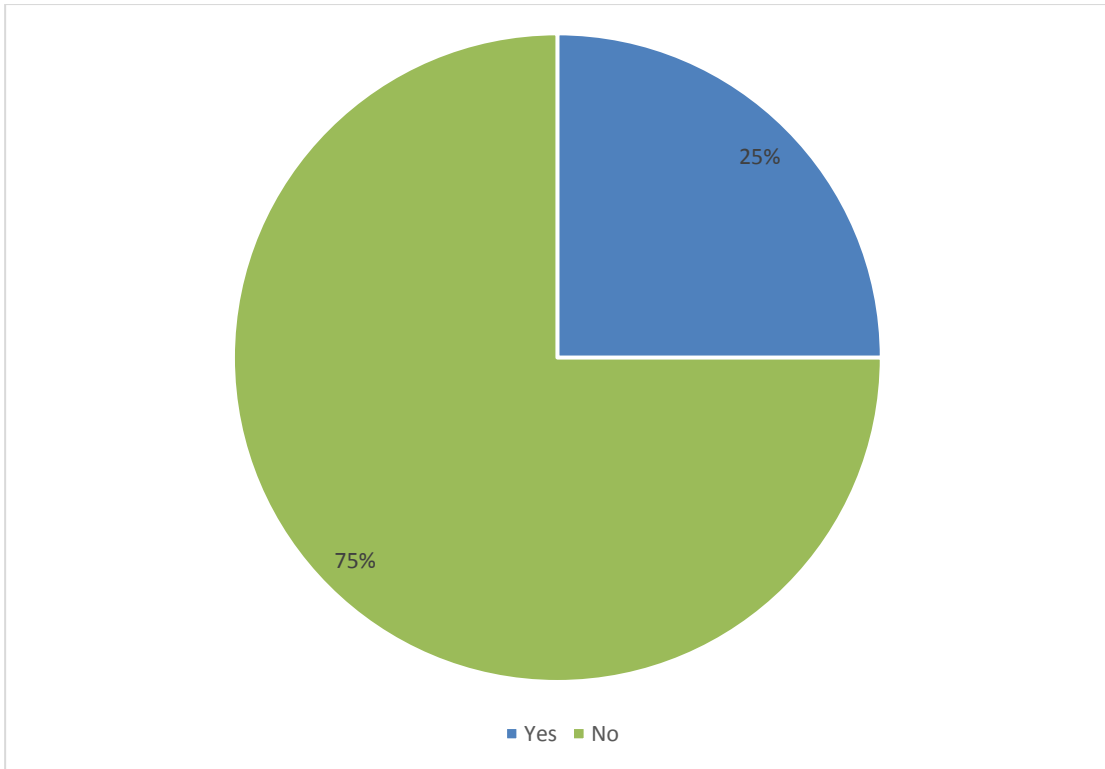


Figure 5: Incentive given to farmers by the Agencies

1.6 Training given to farmers by the Agencies

By the field visitations the following data on training given to farmers is presented in Table 6 and Figure 6.

Table 6: Training given to farmers by the Agencies

| S.No. | Training given to farmers | No. | Percentage (%) |
|--------------|----------------------------------|------------|-----------------------|
| 1. | Yes | 13 | 65 |
| 2. | No | 7 | 35 |
| Total | | 20 | 100 |

From Table 6 it is clear that regular trainings were given by the Agencies to the farmers that is 65% and few of the farmers did not receive training by the Agencies, comprising of 35%. The main reason behind many people not undergoing training is the lack of interest among the farmers as well as a few of the agencies. It has hampered Progress as people don't have the knowledge to cultivate bamboo, or make a product out of it. Not only that, the number of Artisans also have greatly reduced.

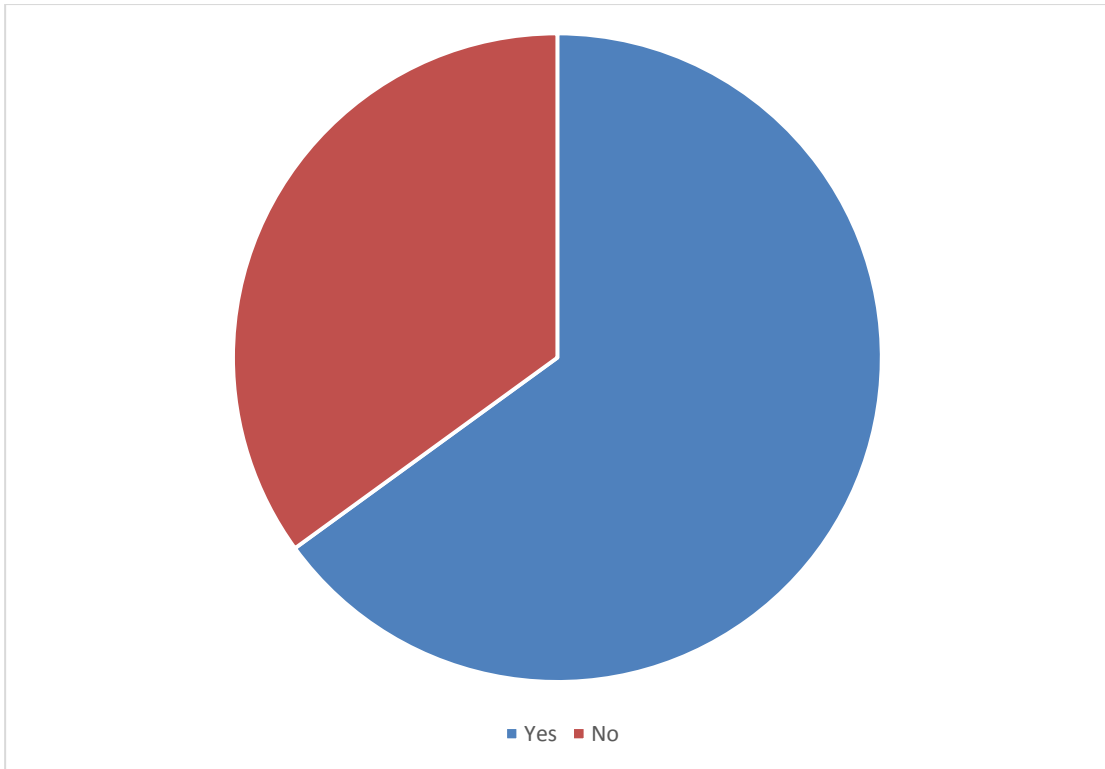


Figure 6: Training given to farmers by the Agencies

1.7 Mode of payment to the farmers by the Agencies

The mode of payment by the agencies to the farmers is presented in Table 7 and Figure 7.

Table 7: Mode of payment to farmers by the Agencies

| S.No. | Mode of payment | No. | Percentage (%) |
|--------------|------------------------|------------|-----------------------|
| 1. | Cash | 6 | 30 |
| 2. | Cheque | 14 | 70 |
| Total | | 20 | 100 |

The Table 7 shows that approximately 70% of the farmers received payments in cheque form followed by cash payment which was 30%. Cheque form of payment has ascertained that farmers who previously had no bank account, make one. It has his benefits ensuring safe transactional quality and introduces the farmer to rural banking.

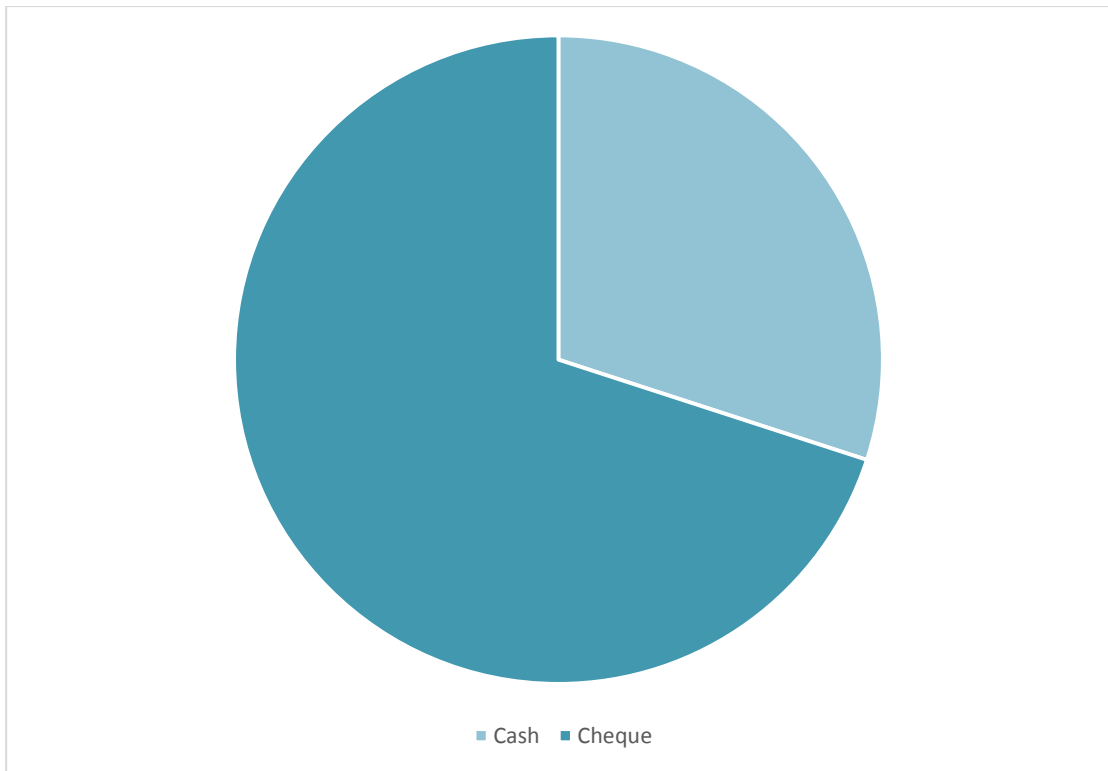


Figure 7: Mode of payment to farmers by the Agencies

1.8 Time span of payment to the farmers by the Agencies

Time span of payment to the farmers by the agencies is presented in Table 8 and Figure 8.

Table 8: Time span of payment to farmers by the Agencies

| S.No. | Time span | No. | Percentage (%) |
|--------------|------------------|------------|-----------------------|
| 1. | Within a week | 11 | 55 |
| 2. | No clear cut | 6 | 30 |
| 3. | Within a month | 3 | 15 |
| Total | | 20 | 100 |

Table 8 shows that majority of the farmers used to get their payments within a week that is 55%, 15% got their payments within a month and 30% of the farmers had no clear-cut timespan of payment. The govt. registered agencies pay their farmers timely but those selling to other agencies and emporiums sometimes face this problem as most of the sales are done verbally with no legal obligations.

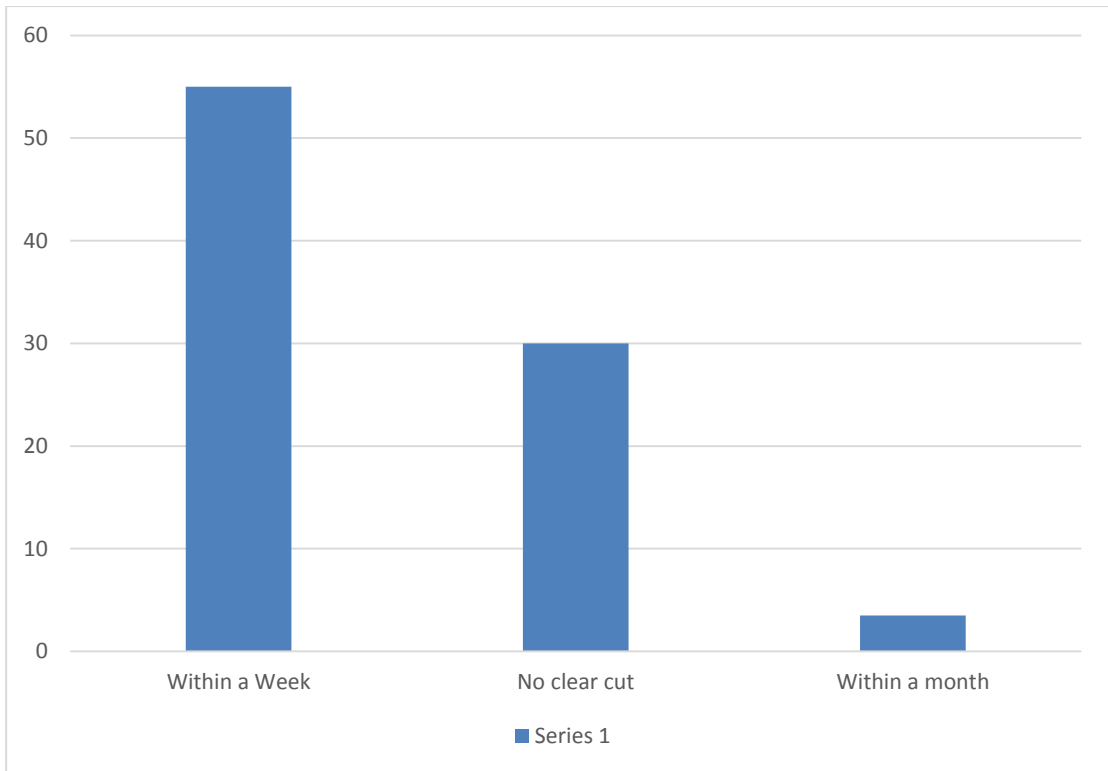


Figure 8: Time span of payment to farmers by the Agencies

1.9 Peak period of Bamboo or its product sells by the Agencies:

This is shown in Table 9 and Figure 9.

Table 9: Peak period of Bamboo or its product sells by the Agencies

| S.No. | Peak period of sell | No. | Percentage (%) |
|--------------|----------------------------|------------|-----------------------|
| 1. | April-June | 5 | 25 |
| 2. | Jan.-Mar. | 11 | 55 |
| 3. | Oct.-Dec. | 4 | 20 |
| Total | | 20 | 100 |

–

The given Table 9 shows that highest or peak period of sell was in the month ranging from Jan.-Mar. that is 55%, medium period of selling was in the month ranging from April- June that is 25% and lowest period of selling was in the month ranging from Oct.-Dec. that is 20%. The reason behind the highest sale or purchase of bamboo % its products are in Jan-March is because most bamboos are matured % harvested by then.

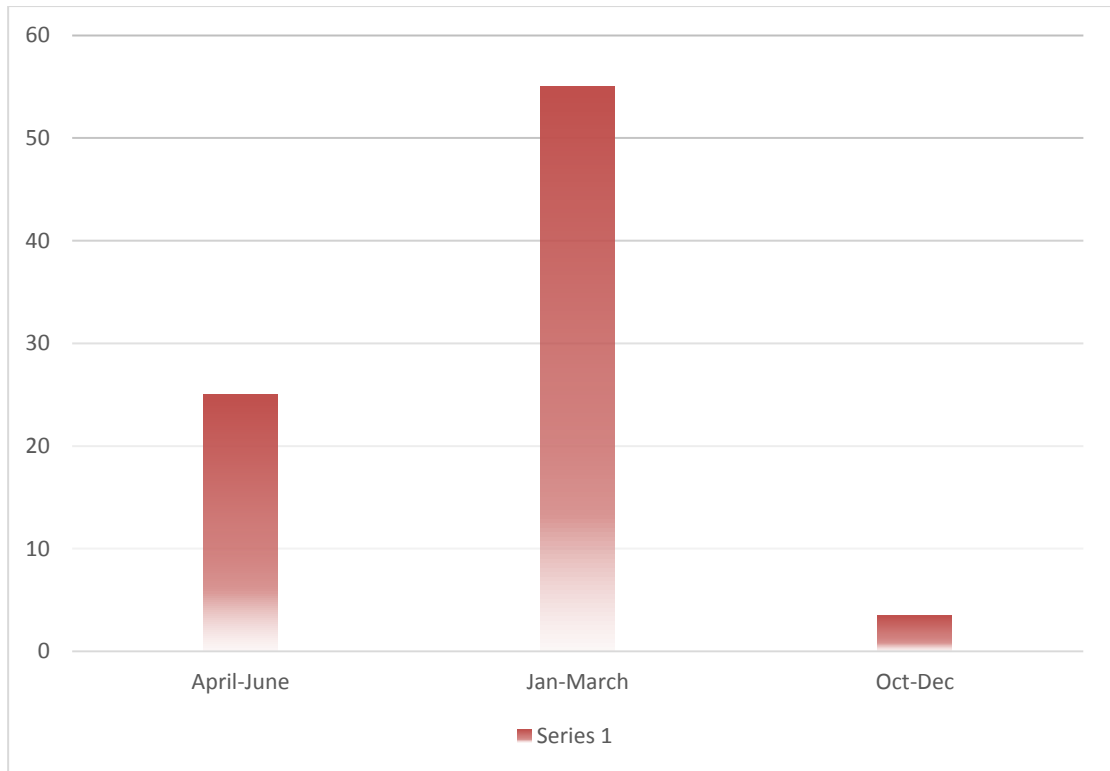


Figure 9: Peak period of Bamboo or its product sells by the Agencies

1.10 Marketing or selling of Bamboo by the Agencies

Marketing of bamboo in itself by the agencies is presented in Table 10 and Figure 10.

Table 10: Marketing or selling of Bamboo by the Agencies

| S.No. | Marketing or selling of Bamboo | No. | Percentage (%) |
|--------------|---------------------------------------|------------|-----------------------|
| 1. | Retail | 7 | 35 |
| 2. | Bulk | 13 | 65 |
| Total | | 20 | 100 |

From Table 10 it is clear that majority of the marketing or selling of Bamboo was done by the Agents/Agencies in bulk that is 65% and the rest in retail that is 35%. Most agencies have partnerships with agro-based companies that need bamboo in either its raw or processed form.

Since they have orders for large quantities, the agencies take the responsibility of collection and then transportation of those bamboo.

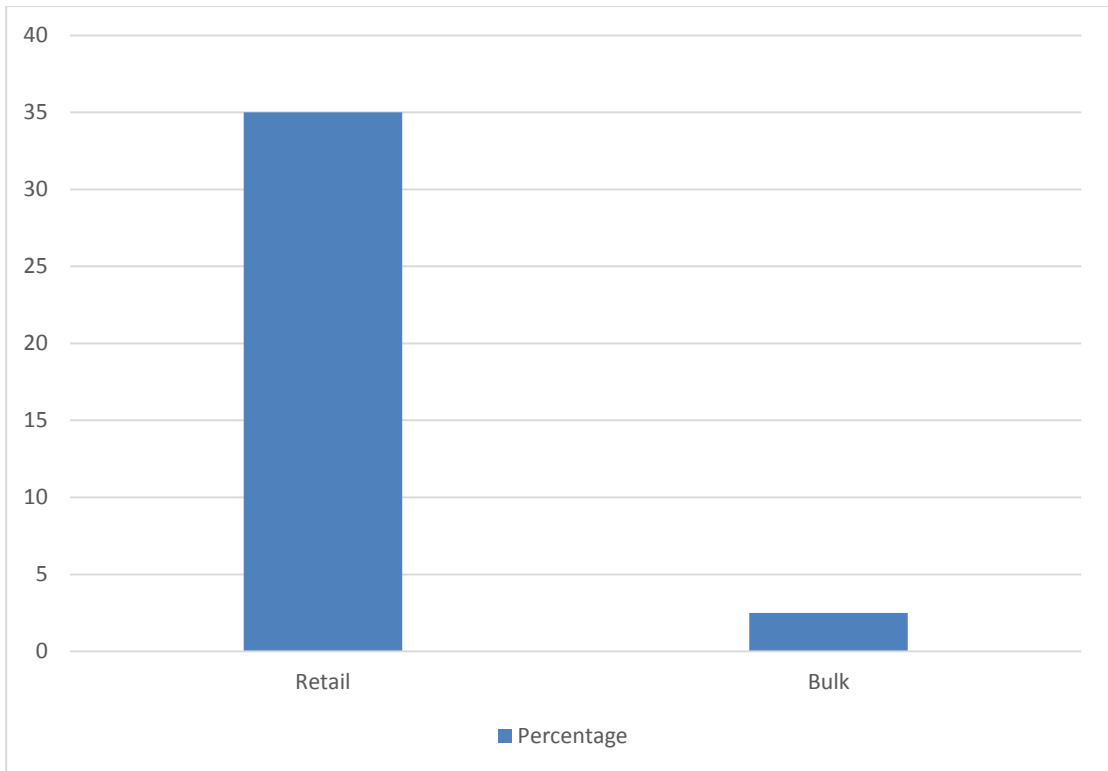


Figure 10: Marketing or selling of Bamboo by the Agencies

1.11 Marketing or selling of Bamboo product by the Agencies

By the field visit and interaction with the agencies of the two blocks – Mohanpur and Belbari, the selling of bamboo products is presented in Table 11 and Figure 11.

Table 11: Marketing or selling of Bamboo product by the Agencies

| S.No. | Marketing or selling of Bamboo Products | No. | Percentage (%) |
|--------------|--|------------|-----------------------|
| 1. | Retail | 11 | 55 |
| 2. | Bulk | 9 | 45 |
| Total | | 20 | 100 |

From Table 11 it is clear that majority of the marketing or selling of Bamboo products was done by the Agents/Agencies in retail that is 55% and the rest in bulk that is 45%. Bamboo products are on the other hand, needed based upon customer demands and because of this reason, most of the bamboo products are sold in retail.

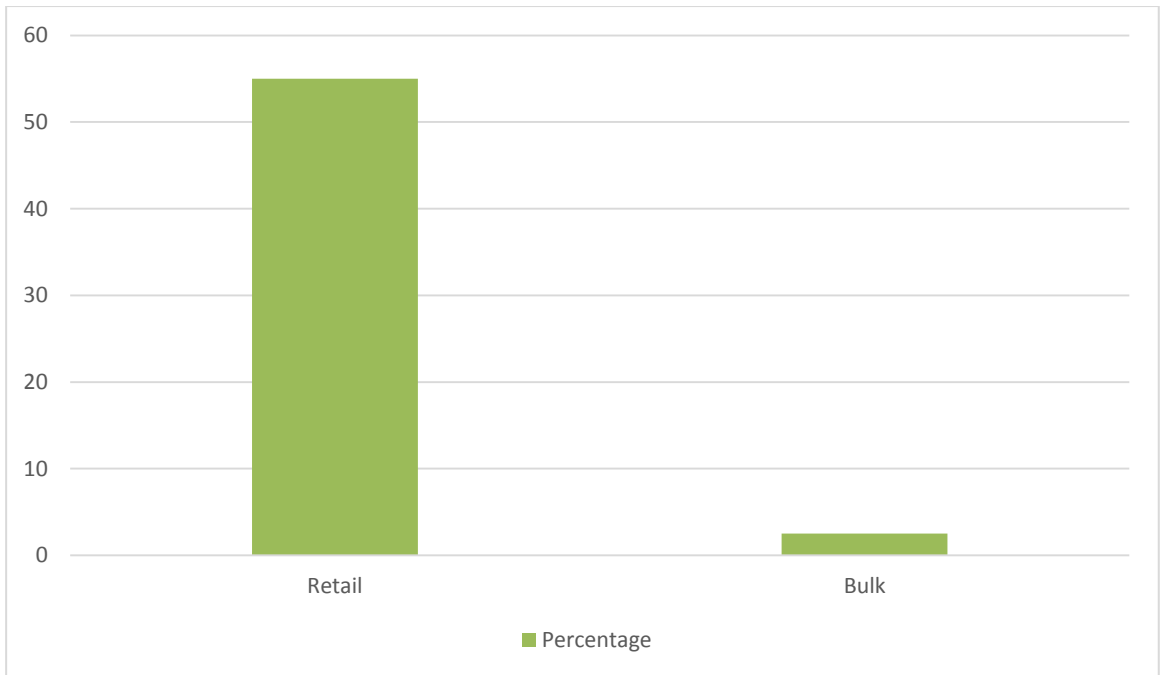


Figure 11: Marketing or selling of Bamboo product(s) by the Agencies

1.12 Training given to the farmers by the Agencies:

This is shown in Table 15 and Figure 15.

Table 15: Training given to the farmers by the Agencies

| S.No. | Training given to the farmers | No. | Percentage (%) |
|--------------|--------------------------------------|------------|-----------------------|
| 1. | Yes | 5 | 25 |
| 2. | No | 15 | 75 |
| Total | | 20 | 100 |

Table 15 depicts the status of training given to the farmers by the Agents/Agencies. By looking at the Table it can be clearly understood that only 25% of the farmers were given training and the rest that is 75% of the farmers were completely deprived of the trainings. The main reason behind this was lack of interest among the farmers as well as the Agents/Agencies. On the part of farmers, the lack of interest was due to the lack of knowledge on how they can change their standard of living.

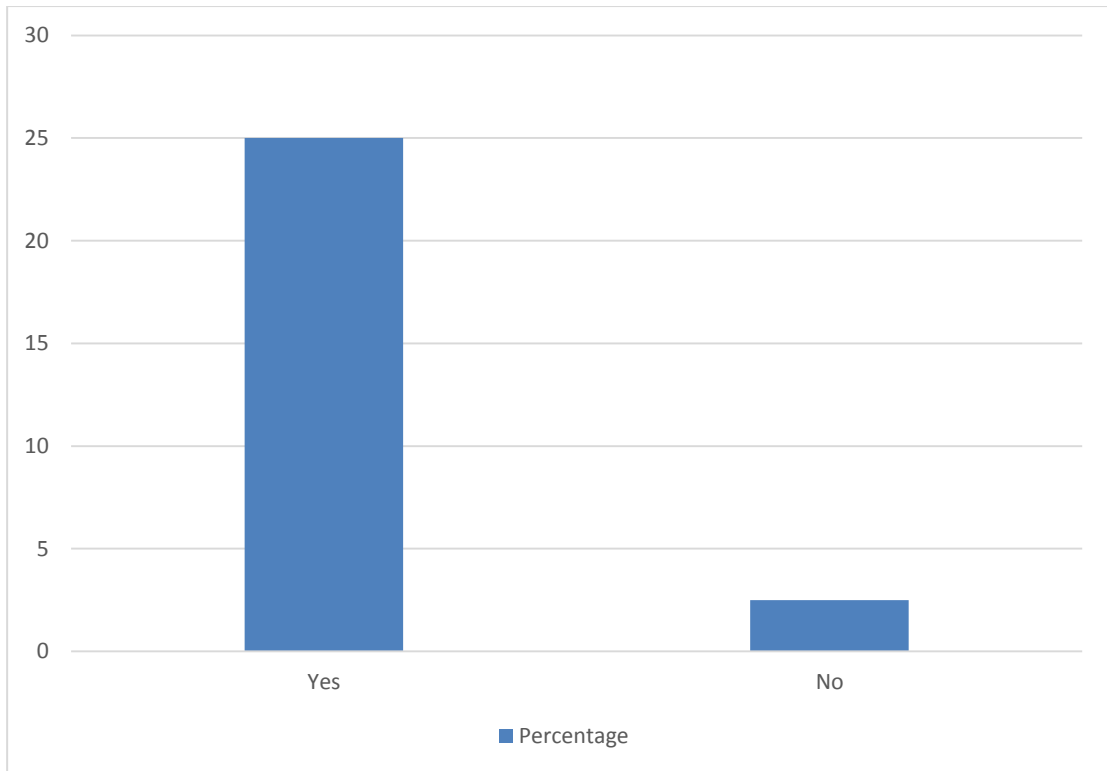


Figure 15: Training given to the farmers by the Agencies

1.13 Training institutions known by the Agencies

Training institutions which are well known is presented in Table 13 and Figure 13.

Table 13: Training institutions known by the Agencies

| S.No. | Training institutions | No. | Percentage (%) |
|--------------|------------------------------|------------|-----------------------|
| 1. | TBM | 12 | 60 |
| 2. | NBM | 5 | 25 |
| 3. | NABARD | 3 | 15 |
| Total | | 20 | 100 |

From Table 13 it is clear that majority of training institutions known by the Agents/Agencies were the TBM (Tripura Bamboo Mission) that is 60%, followed by NBM (National Bamboo Mission) that is 30% and NABARD (National Bank for Agriculture and Rural Development) that is 15%. TBM has the greatest impact on the bamboo farmers as it aims to promote Bamboo production in Tripura and provide a strong and vibrant platform to the lakhs of tribal and rural community who depend on bamboo for their livelihood. Among them, Majority of the beneficiaries were women and minorities.

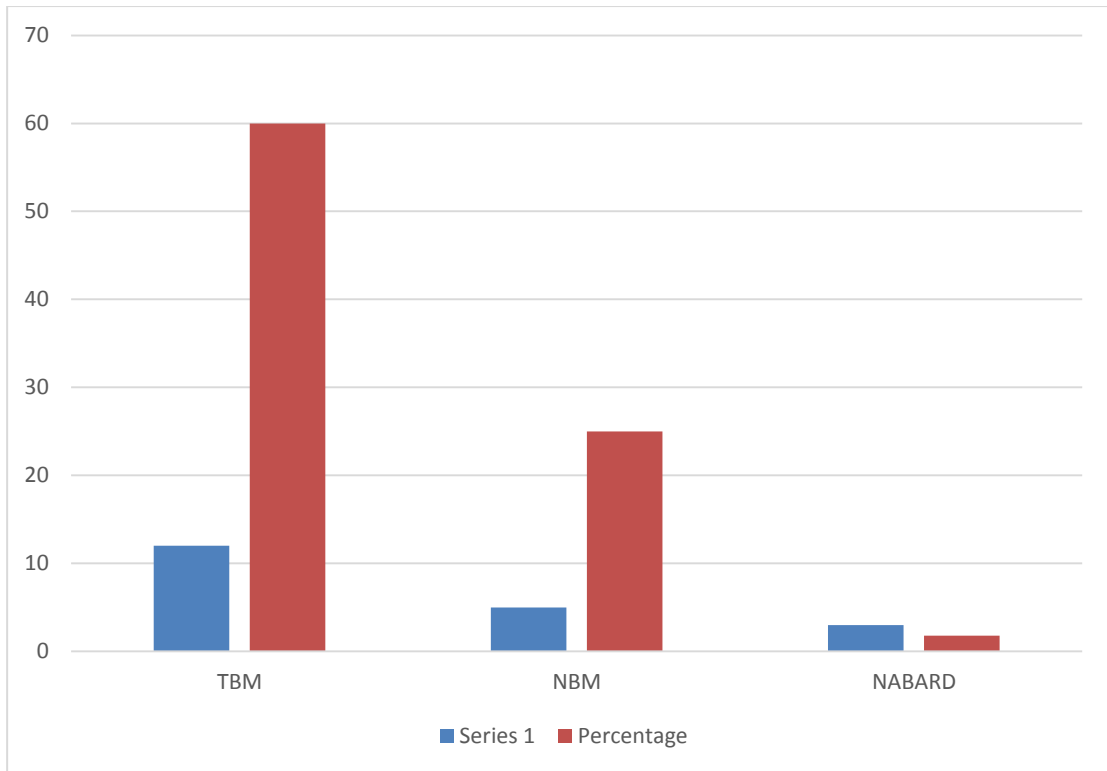


Figure 13: Training institutions known/heard by the Agencies

1.14 The media through Training Institution's name was first known by the Agencies

As we can see there are a number of factors which are depicted in the form of Table 14 and Figure 14.

Table 14: The media through which training institution's name was first known by the agencies

| S.No. | Source of Information | No. | Percentage (%) |
|--------------|------------------------------|------------|-----------------------|
| 1. | Friends/Relatives | 8 | 40 |
| 2. | Magazine | 3 | 15 |
| 3. | Newspaper | 5 | 25 |
| 4. | TV | 4 | 20 |
| Total | | 20 | 100 |

—
From Table 14 it is clear the media or the source of information through which Training Institution's name was first known by the Agents/Agencies was the most through friends/relatives that is 40%, next was through newspaper that is 25%, further through TV that is 20% and only 15% was through the magazines.

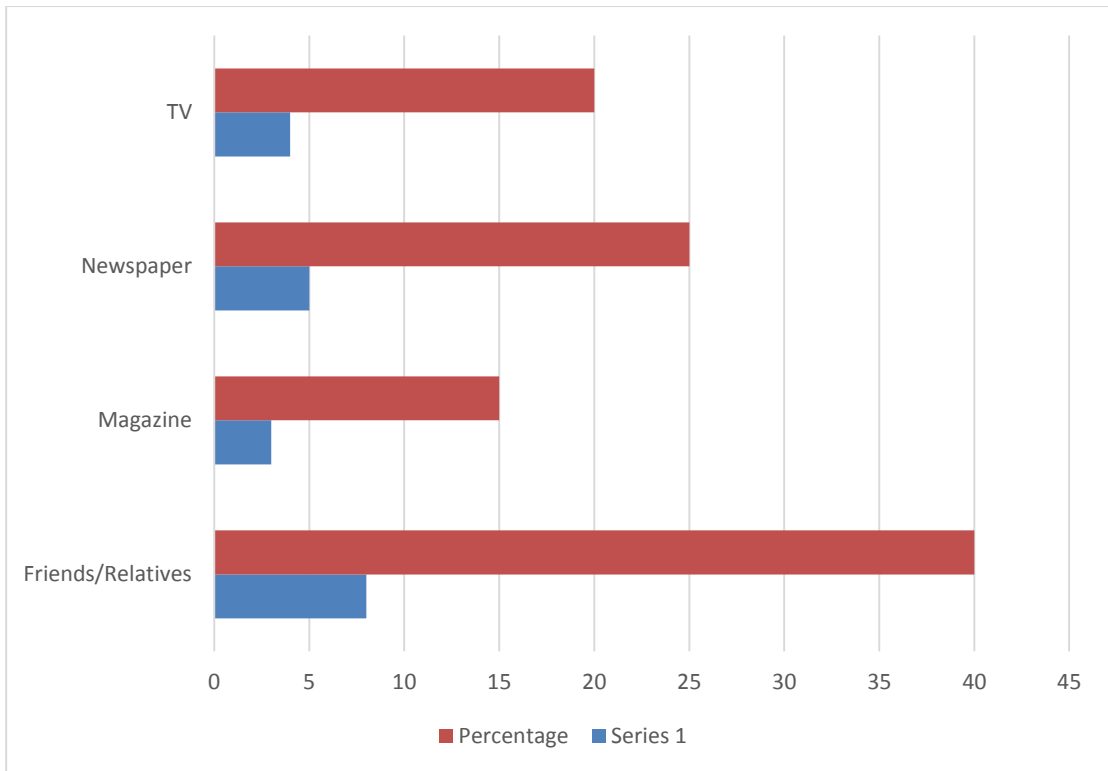


Figure 14: The media through which Training Institution's name was first known by the Agencies.

1.15 Training given to the farmers by the Agencies sponsoring organization

Sponsored Training provided to the farmers is presented in Table 18 and Figure 15.

Table 15: Training given to the farmers by the Agencies sponsoring organization

| S.No. | Training sponsored by organizations | No. | Percentage (%) |
|--------------|--|------------|-----------------------|
| 1. | Govt. | 9 | 45 |
| 2. | NGO | 2 | 10 |
| 3. | Others | 9 | 45 |
| Total | | 20 | 100 |

Table 15 shows the training sponsoring organizations. Looking at the table it is clear that 45% of the trainings were sponsored by the government, 10% of the trainings were sponsored by the NGOs (Non-Government Organizations) and the rest that is 45% of the trainings were sponsored neither by the government nor by the NGOs, it was sponsored by others like SHGs (Self Help Groups) or other groups. The aspects of those training were Handicrafts, Incense sticks & resource generation.

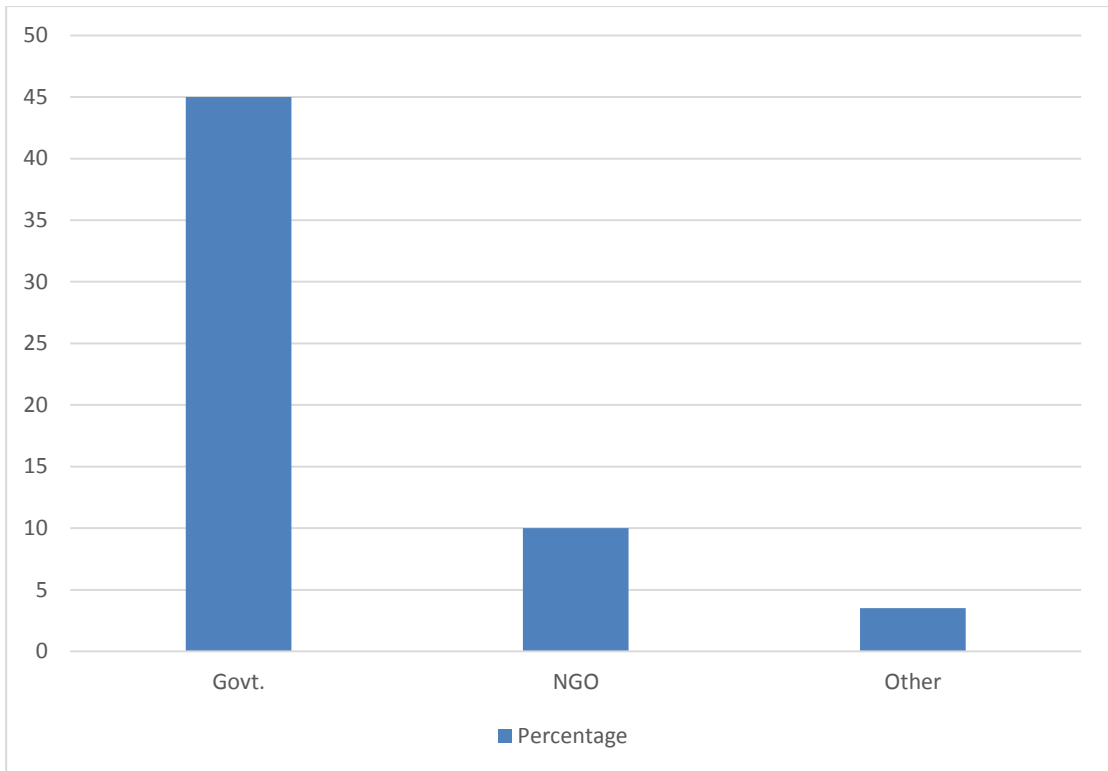


Figure 15: Training give to the farmers by agencies sponsoring organization

1.16 Days Training given to the farmers by the Agent's / Agencies sponsoring Organization

This is presented in Table 16 and Figure 16.

Table 16: Days Training given to the farmers by the Agencies sponsoring organization

| S.No. | Days | No. | Percentage (%) |
|--------------|--------------|------------|-----------------------|
| 1. | 30-90 days | 10 | 50 |
| 2. | 120-180 days | 2 | 10 |
| 3. | None | 8 | 40 |
| Total | | 20 | 100 |

Table 16 shows the number of days for which the trainings were sponsored by the Agencies. Looking at the table it is clear that 50% of the trainings sponsored were from the range of 30-90 days, only 10% of the training was from the range of 120-180 days and the rest that is 40% of the trainings were not organized. Skill Development is one important goal in these trainings where new members are taught the art of making intricate jewellery and utensils needed in daily lifestyle.

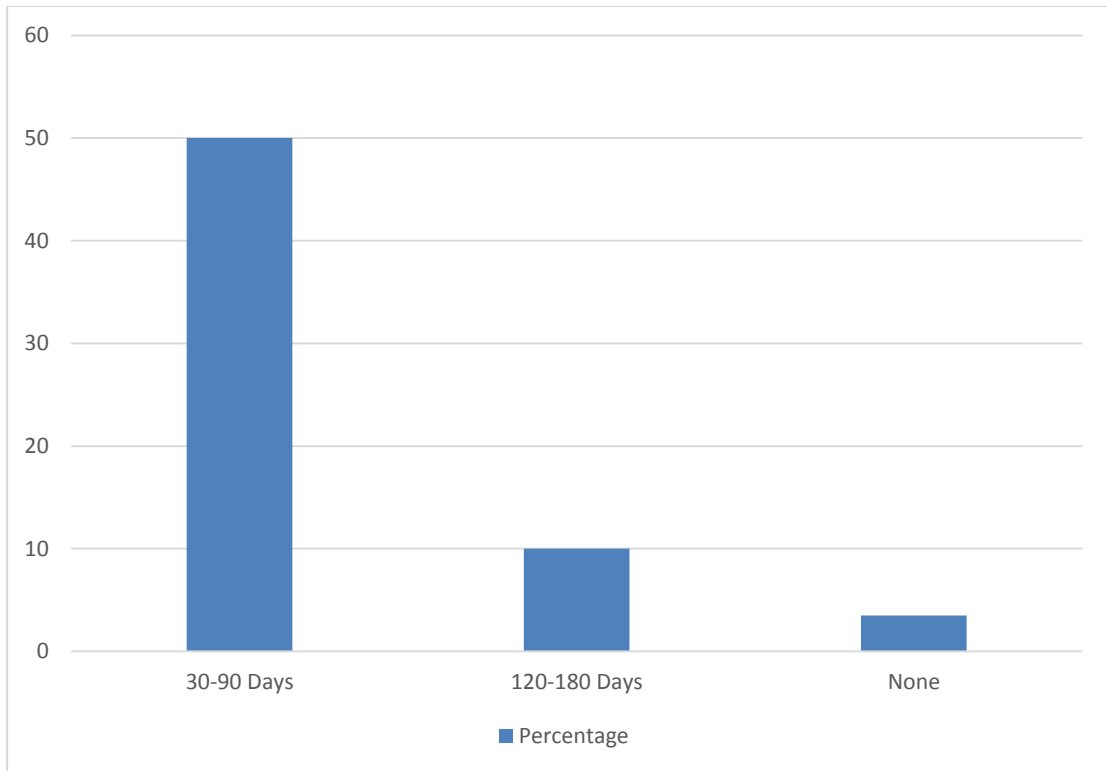


Figure 16: Days Training given to the farmers by the Agencies sponsoring organization

1.17 Recommendation of Training by the Agencies to friends/associate

The percentage of recommendations given by the agencies is presented in Table 17 and Figure 17.

Table 17: Recommendation of Training by the Agencies to friends/associate

| S.No. | Recommendation | No. | Percentage (%) |
|--------------|-----------------------|------------|-----------------------|
| 1. | Yes | 13 | 65 |
| 2. | No | 7 | 35 |
| Total | | 20 | 100 |

Table 17 shows recommendation of training by the Agents/Agencies to their friends/associate. From the table it is clear that 65% of the Agents/Agencies would recommend the training to their friends or associate whereas 35% of the Agents/Agencies would not recommend the training to their friends or associate. As the training and skill imparted proved beneficial to them, they felt the need to share the information to their friends and acquaintances as a sign of goodwill thereby including more and more people into training.

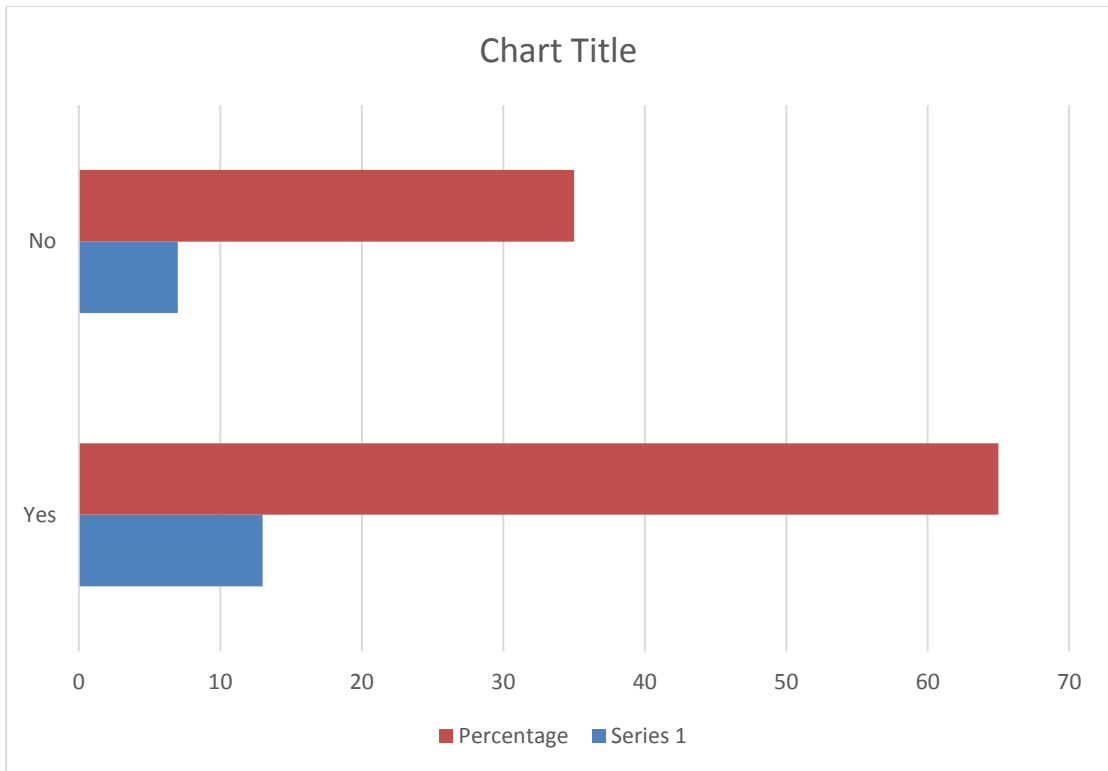


Figure 17: Recommendation of Training by the Agencies to friends/associate

1.18 Training for value addition of Bamboo given to farmers by the Agencies

Training for value addition is presented in Table 18 and Figure 18.

Table 18: Training for value addition of Bamboo given to farmers by the Agencies

| S.No. | Training for value addition | No. | Percentage (%) |
|--------------|------------------------------------|------------|-----------------------|
| 1. | Yes | 12 | 60 |
| 2. | No | 8 | 40 |
| Total | | 20 | 100 |

Table 18 shows the training for value addition of Bamboo given to farmers by the Agencies. Looking at the table it is clear that 60% of the agencies does not provide training for value addition of Bamboo whereas 40% of the Agencies have provided training. The main reason behind this could be the high cost of value addition.

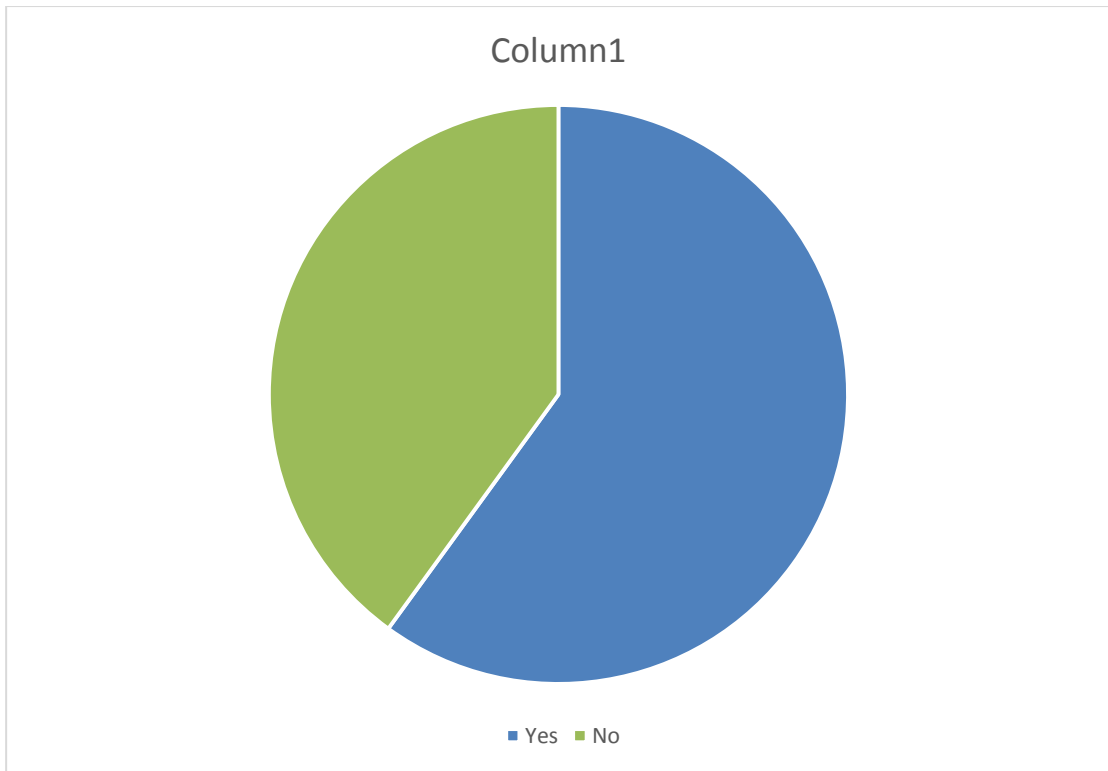


Figure 18: Training for value addition of Bamboo given to farmers by the Agencies

1.19 Type of value addition done by the farmers

The type of value addition done by the farmers is presented in Table 19 and Figure 19.

Table 19: Type of value addition done by the farmers

| S.No. | Type of value addition | No. | Percentage (%) |
|--------------|-------------------------------|------------|-----------------------|
| 1. | Cutting | 10 | 50 |
| 2. | Drying | 4 | 20 |
| 3. | Processing | 3 | 15 |
| 4. | All | 3 | 15 |
| Total | | 20 | 100 |

Table 19 shows the type of value addition of Bamboo done by the farmers. Looking at the table it can be said that 50 per cent of the farmers did cutting into small pieces, 20 per cent of the farmers did drying, 15 per cent of the farmers did processing and only 15 per cent of the farmers did all the three that is cutting, drying and processing. The main reason behind only 15 per cent of the farmers did all the three types of value addition namely: cutting, drying and processing.

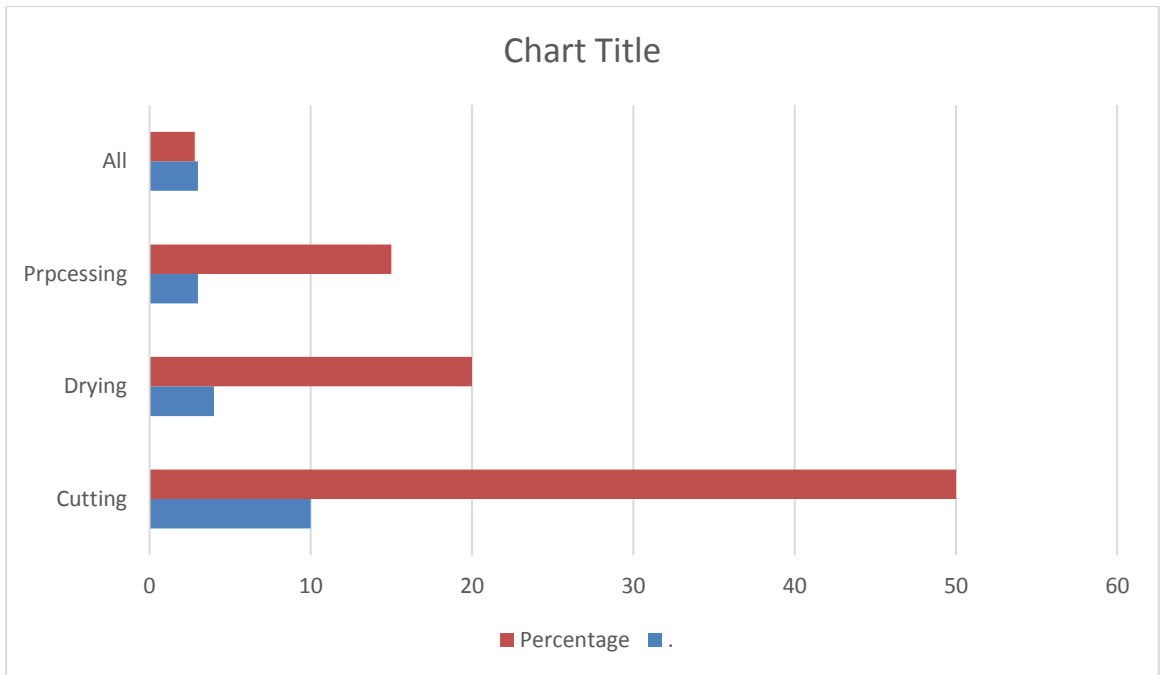


Figure 19: Type of value addition done by the farmers

1.20 Bamboo made products sold by agencies directly to customers

This is shown in Table 20 and Figure 20.

Table 20: Bamboo made products sold by the agents/agencies

| S.No. | Bamboo made Products sold | No. | Percentage (%) |
|--------------|----------------------------------|------------|-----------------------|
| 1. | Agent | 4 | 20 |
| 2. | Neighbor | 4 | 20 |
| 3. | Shopkeeper | 2 | 10 |
| 4. | Customer | 10 | 50 |
| Total | | 20 | 100 |

From the table 20 it is clear that almost 50% of the agents/agencies sold the Bamboo made products directly to the customer(s), 20% and 20% of the agents/agencies sold the Bamboo made product(s) to the agents as well as neighbors and only 10% of the agents/agencies sold the Bamboo made product(s) to the shopkeeper(s). The agents/agencies sold the Bamboo made products directly to the customer(s) mainly due to the reason that the profit margin was more in selling directly to the customer.

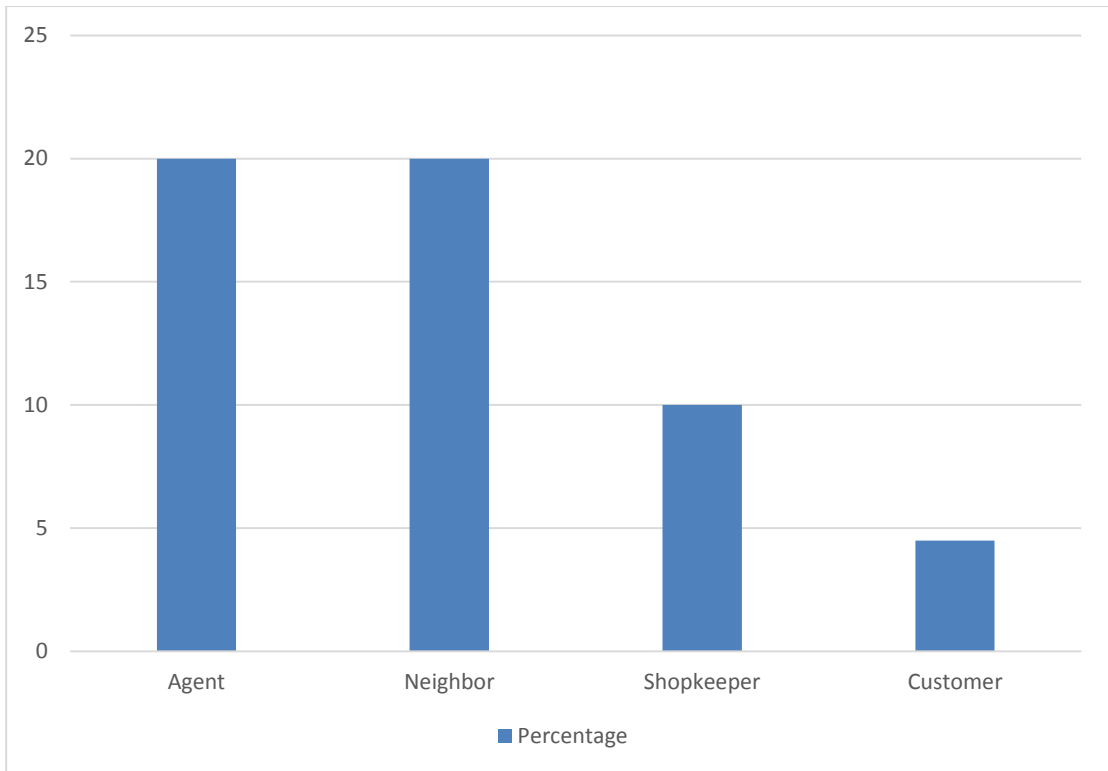


Figure 20: Bamboo made products sold by the agent

1.21 Bamboo made products sold by the agencies

The bamboo made products sold by the agencies is presented in Table 21 and Figure 21.

Table 21: Bamboo made products sold by the agent/agencies

| S.No. | Mode of selling | No. | Percentage (%) |
|--------------|------------------------|------------|-----------------------|
| 1. | Retail | 16 | 80 |
| 2. | Bulk | 4 | 20 |
| Total | | 20 | 100 |

From the above Table 21 of Bamboo made products sold by the agent/agencies it is understood that the Bamboo made products sold by the agent/agencies was 80 per cent in retail whereas 20 per cent was sold by the agent/agencies in bulk quantity.

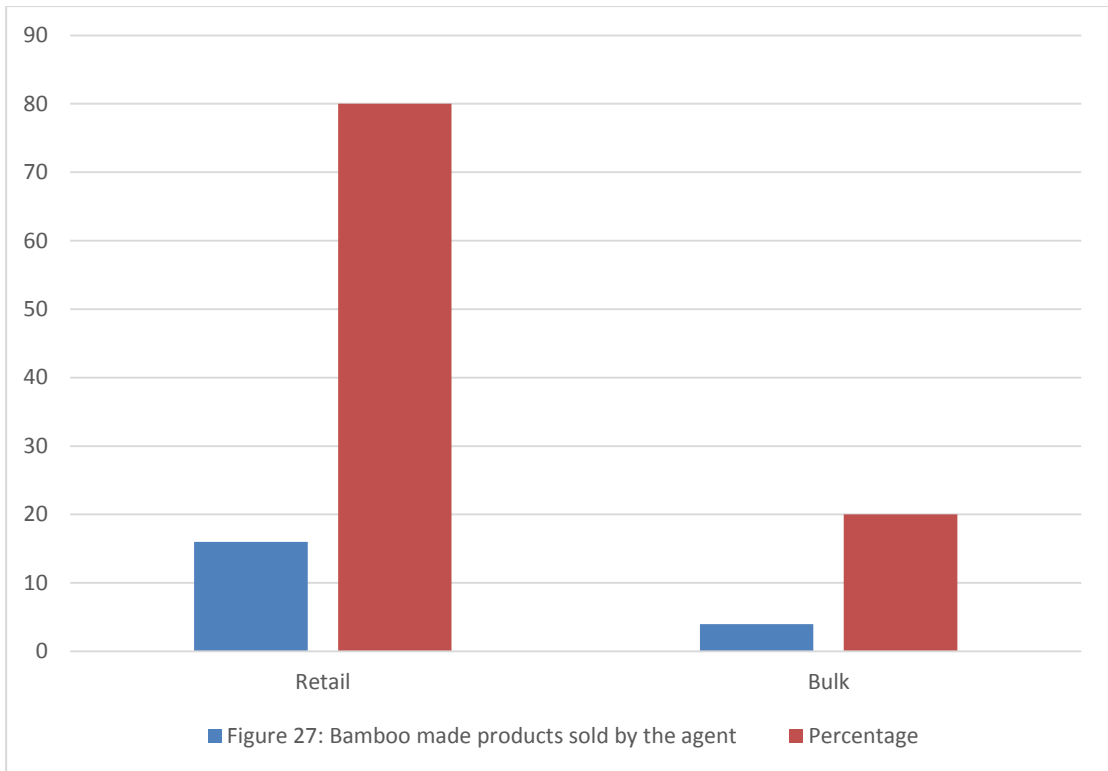


Figure 21: Bamboo made products sold by the agent/agencies

1.22 Willing to do value addition done of Bamboo or Bamboo made products

It was observed that some were willing to do value addition of bamboo products and some not, the difference is presented in Table 22 and Figure 22.

Table 22: Willing to do value addition done of Bamboo or Bamboo made

| S.No. | Value addition | No. | Percentage (%) |
|--------------|-----------------------|------------|-----------------------|
| 1. | Yes | 15 | 75 |
| 2. | No | 5 | 25 |
| Total | | 20 | 100 |

Table 22 shows the willingness for value addition of Bamboo or Bamboo made product(s) done by the agents/agencies. From the above table it is clear that 75% of the agencies were willing to do value addition of the Bamboo or Bamboo made product(s) whereas 25% of the agencies were not willing to do value addition of the Bamboo or Bamboo made product(s).

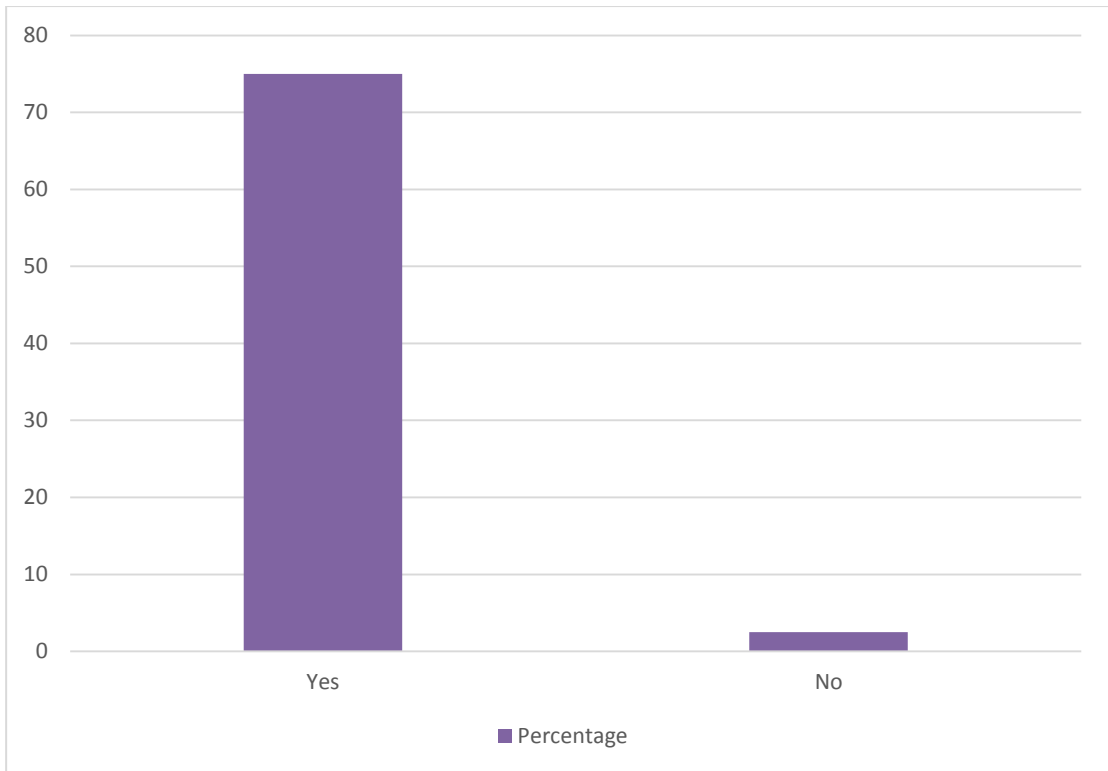


Figure 22: Willing to do value addition done of Bamboo or Bamboo made products

1.23 Getting good price for the Bamboo or Bamboo made products

By the field visit and interaction with the agencies of the two blocks namely Mohanpur and Belbari, the pricing conditions is presented in Table 23 and Figure 23.

Table 23: Getting good price for the Bamboo or Bamboo made products

| S.No. | Getting good price | No. | Percentage (%) |
|--------------|---------------------------|------------|-----------------------|
| 1. | Yes | 17 | 85 |
| 2. | No | 3 | 15 |
| Total | | 20 | 100 |

The Table 23 shows whether the agents/agencies are getting good price for the Bamboo or Bamboo made products. From the above table it is clear that 85% of the agents/agencies were getting good price for the Bamboo or Bamboo made products whereas the rest that is 15% of the agents/agencies were not getting good price. This became a significant factor in maintaining the economic conditions of the bamboo farmers as they got satisfaction from the payment received. It was a result of the agencies adopting online mode of selling which increased the percentage of sales thus leading to more profits.

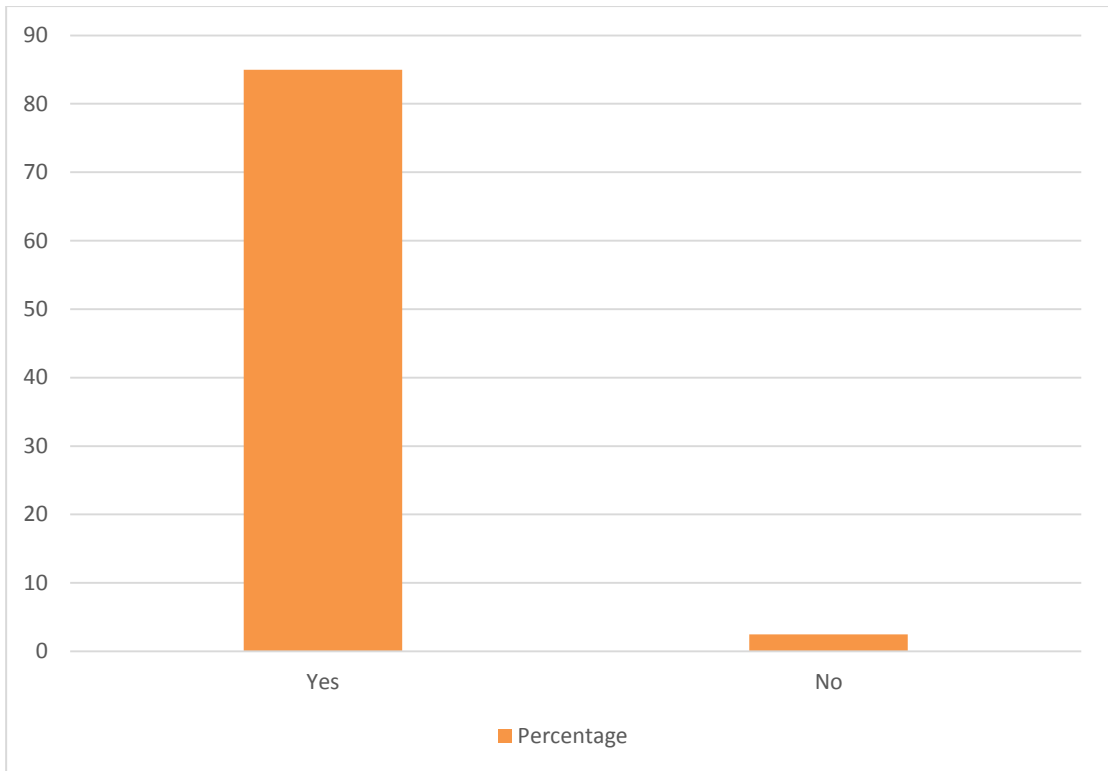


Figure 23: Getting good price for the Bamboo or Bamboo made

2.1 Training given to the farmers was sponsored by

Training given to farmers by either govt. or non-govt organizations is presented in Table 24 and Figure 24.

Table 24: Training was sponsored by

| S.No. | Institution(s) | No. | Percentage (%) |
|--------------|----------------|-----------|----------------|
| 1. | Govt. | 6 | 30 |
| 2. | NGO | 4 | 20 |
| 3. | Others | 2 | 10 |
| 4. | None | 8 | 40 |
| Total | | 20 | 100 |

The Table 24 shows the training sponsoring organization. From the above table it is clear that 30% of the training was sponsored by government, 20% of the training was sponsored by NGO, another 10% was sponsored by others like SHGs (Self Help Groups) and the rest that is 40% of the trainings where none got sponsored by any of the training institutions. Among them, the farmers who got training sponsored by government claimed to have proper training by experienced personnel. Trainings given by the NGOs were mostly from those who worked in the NGO itself. So was the case for most of SHGs. Due to the improper delivery of training, farmers have faced various problems hampering their source of income.

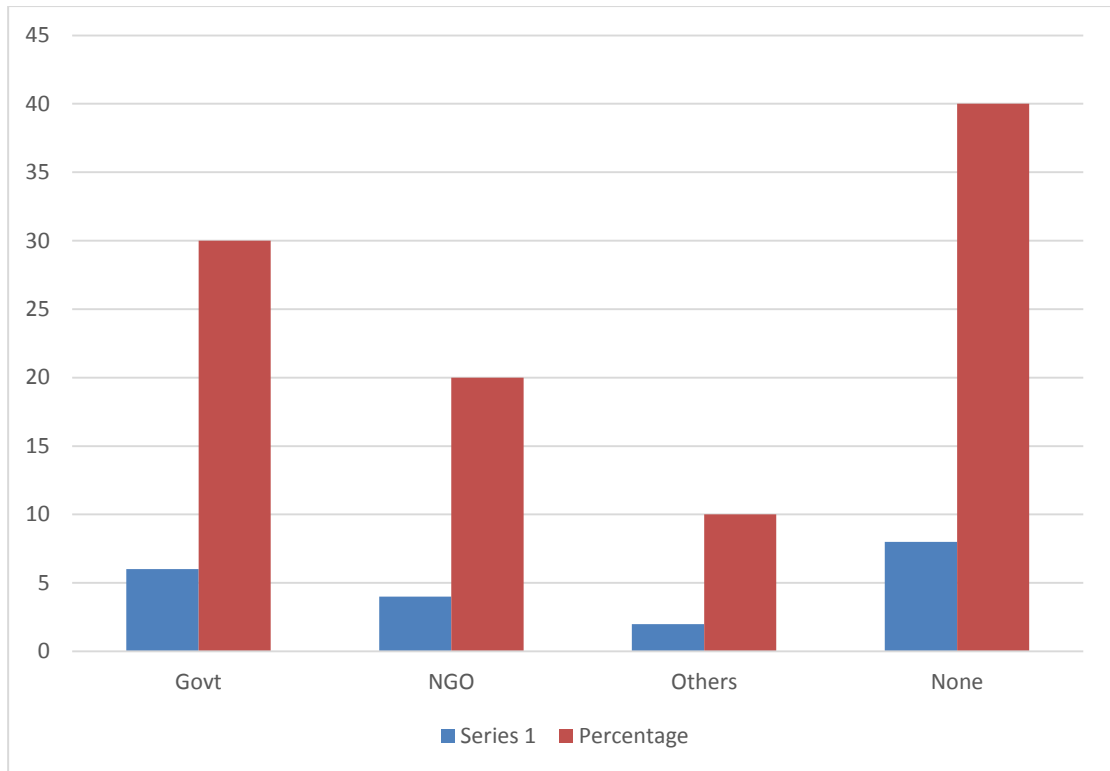


Figure 24: Training given to farmers by different orgs.

2.2 Having good knowledge but Bamboo farmers are not making bamboo product

The number of Bamboo producers who sell bamboo culm to the agencies is presented in Table 25 and Figure 25.

Table 25: Having good knowledge but not making bamboo product due to problems

| S.No. | Problem(s) | No. | Percentage (%) |
|--------------|-------------------|------------|-----------------------|
| 1. | Financial Problem | 13 | 65 |
| 2. | Labor Problem | 7 | 35 |
| Total | | 20 | 100 |

The Table 25 shows the reason why the farmers were not making ‘Quality Product’.

From the above table it is understood that 65% of the farmers were not making ‘Quality Product’ due to financial problems and 35% of the farmers could not due to Labour problems. The problem can be solved by the agencies advising farmers on various loans & schemes that can aid them in solving the financial crisis. Also keeping a record of un-employed people in the village/block will be beneficial to when it comes to searching for labor.



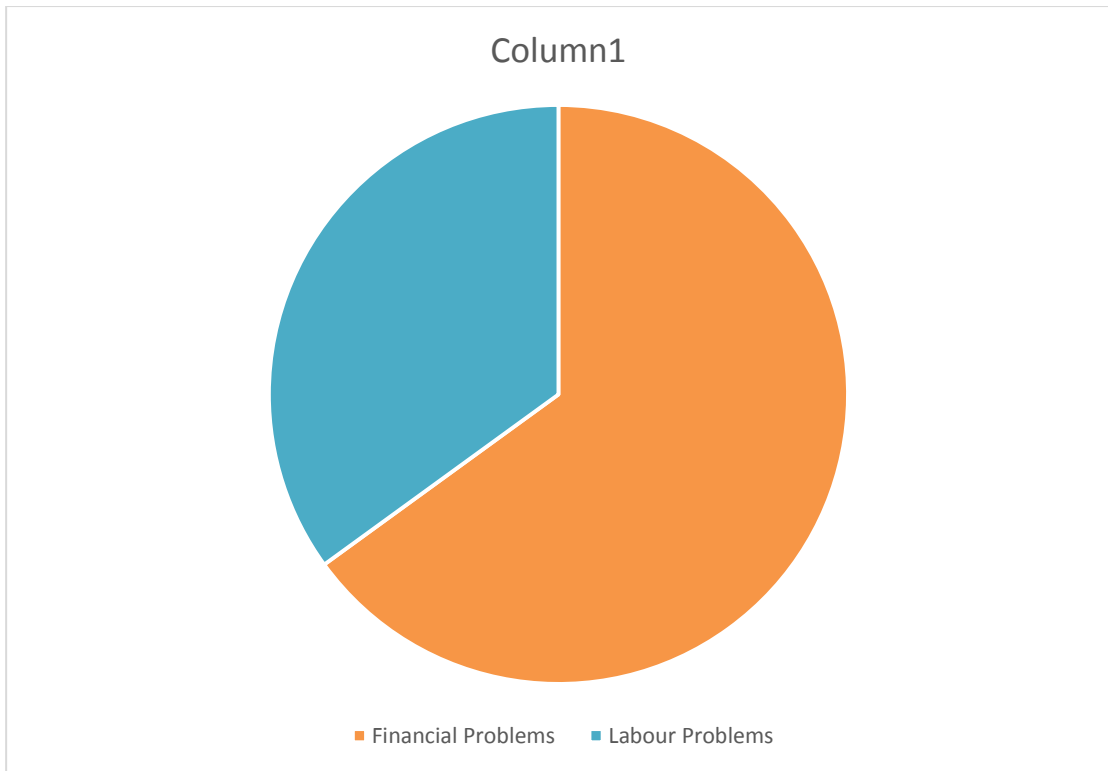


Figure 25: Inability of the farmers in producing Quality Products.

2.3 Training done in last 2 years

By the field visit and interaction, the percentage of farmers undergone training in the last two years is presented in Table 6 and Figure 6.

Table 26: Training done in last 2 years

| S.No. | Training done | No. | Percentage (%) |
|--------------|---------------|-----------|----------------|
| 1. | Yes | 12 | 60 |
| 2. | No | 8 | 40 |
| Total | | 20 | 100 |

–

The Table 26 shows the status of the farmers whether the farmers underwent training or not in the last 2 years. It is clear that 60% of the farmers did training in the training institutions whereas 40% of the farmers did no such training in the given period of time. As we can see max. number of people have undergone training in the last two years which proves that despite odds & evens, people have shown a certain interest and even introduced their friends and family. With such initiative, time is not far when Tripura Bamboo Mission will be a success.

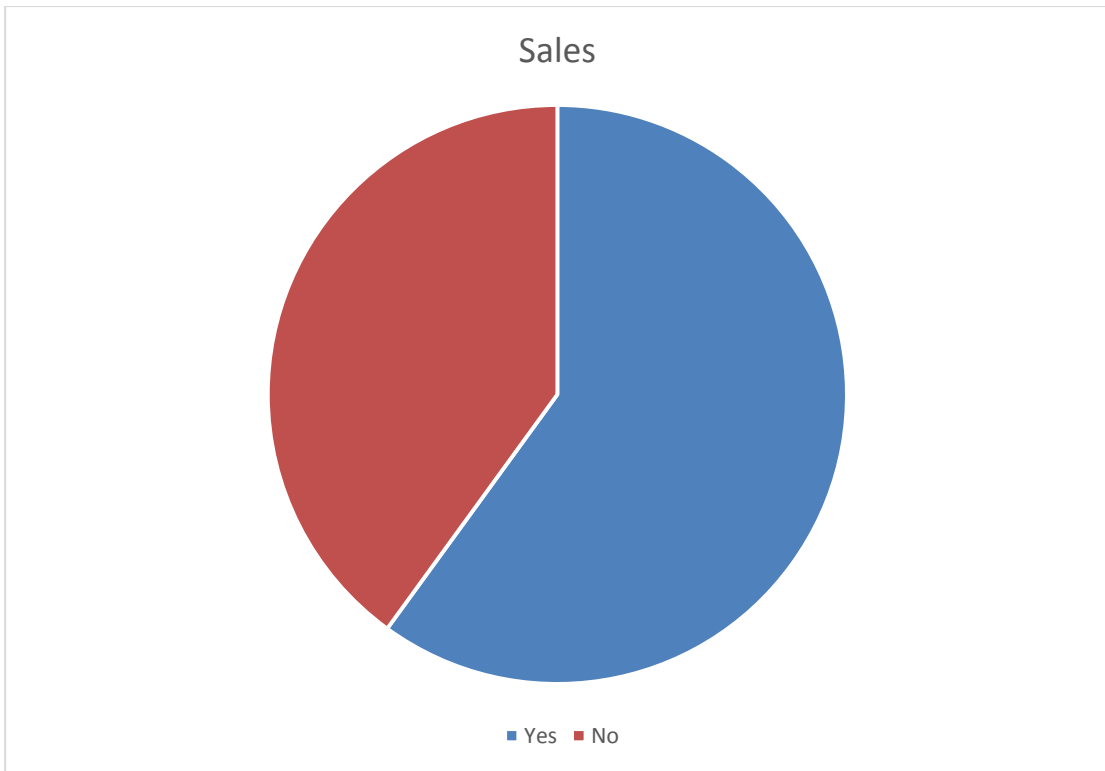


Figure 26: Chart depicting farmers who received training or not in the last 2 years.

Measures for value addition and marketing of Bamboo

- 3.1 **Bamboo farming cluster approach:** Land changes and farmer income are also important issues. The creation of the bamboo cluster is one viable solution to these issues. As a result, identifying potential, problems, strategic, and technical research is necessary to assist in the formulation of a good plan in order to materialize the bamboo cluster in the regency. It's critical to demonstrate that the bamboo plant has a high value so that people will want to plant and cultivate bamboo using appropriate innovation.
- 3.2 **Use of Handicraft Schemes:** The schemes shall be implemented by the Office of the Development Commissioner (Handicrafts), which should be broad in scope and not limited to a particular region, caste, or gender. The craftspeople should come from various walks of life, including women who profit from the programmes. Generic schemes should be implemented by the Office of the Development Commissioner (Handicrafts).
- 3.3 **Farmers' Use of CSR Assistance:** Associates should provide free consulting to poor farmers as part of their corporate social responsibility obligations. Firms could establish a training centre for economically disadvantaged and jobless youth, providing them with free instruction in the automation of high-tech farm machinery and encouraging them to pursue self-employment prospects.
- 3.4 **Internet marketing:** Internet marketing is the process of selling or promoting products and services via the Internet. In general, Internet marketing is primarily business-oriented, while it can also be utilized for charitable purposes. If we want to expand our company, online marketing will be a big element of our strategy. Fortunately, there is currently a government-sponsored body called 'Purbasha' that oversees all elements of online marketing for bamboo and its products. Bamboo items are available for purchase on websites such as Flipkart, Amazon, and Indiamart.com.



CONCLUSION

From the given tables and charts, we can see that 50% of bamboo sellers selling to Agencies were farmers. Most of the bamboo purchased by the agencies are un-processed so farmers can easily earn some income by growing bamboo. Transportation of those bamboos are majorly done by use of tractors as most of the farmers were marginal and small farmers.

Regarding the Incentives given, majority of the farmers did not receive an incentives due to improper or no form of help from the government at all. Training was provided of which 65% of the farmers got training and rest did not. 65% of the farmers has ever received training and the main reason behind it was the lack of interest among the farmers as well as a few agents. Among them most have come to know about training institutions through their neighbors, 25% through newspaper and rest from TV or Magazines. This has affected the total bamboo production in the state as lack of training has them fumbling over small problems which they should have been able to deal with it. On top of that, lack of incentives has made the opposite of moral boost and previous bamboo farmers have resorted to other means of survival.

Payment was mostly carried out in Cheque form and 55% of them got their payments within a week which is a good thing as most eagerly depends on that source of income.

Marketing of the bamboo is done in bulk amounts as it depends on the demand whereas marketing or selling of the bamboo made products are mostly preferred in retail, about 55%. To increase the farmer's income, Agents/Agencies offer Value Addition trainings. Among them, 45% were Govt. sponsored, 10% were non-govt NGOs and rest 45% was through SHGs. But the disadvantage is that not many agencies were providing such training, only 40% of them are offering such aid.

Upon further inquiry we came to know about the various value addition steps that are adopted in the state. 70% of the farmers were into cutting process, 15% processing, 10% dying and 5% of the farmers did all three types of value addition. Regarding the purchase of bamboo. 50% of the agencies sold bamboo products directly to the customers.

20% is sold to other agents 20% to it's neighbors. The least amount of selling is done with the shopkeepers, antique shops or emporiums i.e 10%. The reason behind selling most of the bamboo products directly to customers is the high profit margin the get which in turn allows them to pay more to the farmers.

Also, most agencies are willing to do value addition of bamboo or it's products and almost all are getting good prices for their products due to adoption of online marketing techniques. (85%)

Another problem is that 65% of the farmers were not able to make 'Quality Products' due to financial problems and the rest 35% of them could not due to the inability of hiring proper Labor.



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APPENDIX

Questionnaire

Part A: Socio-Economic Profile

1. Name of the Respondent-
2. Village- P.O-
3. Block-
4. Gender- a) Male..... b) Female.....
5. Do you have Transportation Facility?
If Yes, what kind -
6. Education –
7. Occupation –
8. Type of Farmer –

Part B: Awareness Programme

1. What type of bamboo is mostly sold?
2. Have you heard about any of these organizations?
NBM..... TBM..... NABARD..... Others.....
3. Have you done any training programme?
4. How did you know about the training programme?
5. Have you done any training in the last two years?
6. Training sponsored by.....
7. How many days training have you done?
8. From where did you learn about 'Quality Product'?
9. Having good knowledge of Quality Product but can't make because of.....

OBJECTIVE 2 & 3 - Value Addition & Marketing

PART C:

1. Whether Bamboo made products are sold or not?
2. Have you done any training for value addition of bamboo?

3. Type of Value addition done by you.....
4. Do you get any Incentive from any NGO or such?
5. To whom do you sell the bamboo products?
6. Which is the best period of selling in the market?
7. Whether any value addition of bamboo products is done?
8. Are you willing to do Value addition?
9. Do you get good prices for the bamboo or bamboo made products?
10. If not, why

OBJECTIVE 1 – Role of Agents/Agencies in marketing of Bamboo

PART A:

1. Name of the Agent/ Agency-
2. Village: P.O-
3. Gender:
4. From where do you purchase Bamboo culm?
5. Are you Registered or Non-registered? Yes / No
6. What type of product do you want to purchase?
Processed..... Un-processed.....
7. Whether any incentive is given to the farmers?
8. Peak period of Bamboo or its products selling.....
9. How are you marketing or selling bamboo & its products?
10. Problems faced by agents/agencies.....

AWARENESS PROGRAMME

PART B:

1. Have you heard about any govt led initiatives?
2. How did you first hear about it?
3. Have you given training to the farmers?
4. Have you given any training programme in the last 2 years?
5. Training was sponsored by.....

6. How many days training have you given to the farmers?

OBJECTIVE 2 & 3 - VALUE ADDITION & MARKETING

PART C:

1. Whether bamboo made products are sold or not?

2. Have you given any training for value addition?

3. Type of value addition done by the farmers -

4. Market Rate:

| Product | Cost Price | Selling Price |
|------------------|-------------------|----------------------|
| 1.Bamboo | | |
| 2.Bamboo product | | |

5. To whom do you sell the bamboo made products?

6. Preferred mode of selling -

7. Whether any value addition of Bamboo made products is done or not?

If not, why so.....

8. Are you willing to do Value addition of bamboo products?

9. Do you get good price from selling bamboo or bamboo products?

