

**STUDY ON PRODUCTION AND MARKETING OF MORINGA
DRY LEAVES IN RANCHI DISTRICT OF JHARKHAND**



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**STUDY ON PRODUCTION AND MARKETING OF MORINGA
DRY LEAVES IN RANCHI DISTRICT OF JHARKHAND**



PROJECT SUBMITTED TO
BIRSA AGRICULTURAL UNIVERSITY

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By

Mr. Sukesh Kumar

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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Dated _____

CERTIFICATE

This is to certify that the thesis entitled, **“STUDY ON PRODUCTION AND MARKETING OF MORINGA DRY LEAVES IN RANCHI DISTRICT OF JHARKHAND”** submitted in partial fulfillment of the requirements for the degree of **MASTER OF BUSINESS ADMINISTRATION** in Agribusiness of the Faculty of Post-Graduate Studies, Birsa Agricultural University, Kanke, Ranchi Jharkhand is faithful record of bona fide project work carried out by **Mr. Sukesh Kumar** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

It is further certified that such assistance and help received by him during the course of this investigation have been duly acknowledge.

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Dedication

To my parents

Mr. Surendra Prasad & Mrs. Kamala Devi

And to my siblings Shilpy & Sidharth

Along with all hard working and respected

Teachers and my companions

It takes dedication and hard work to constantly

improve ourselves in order to achieve our dreams

and you all have continuously evaluated me,

supported me and been through all the up down

during the completion of this journey

Hence, This humble work is a sign of my love to

you!

....Sukesh Kumar

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SUKESH KUMAR

ABSTRACT

Moringa (*Moringa oleifera*) belonging to the family *Moringaceae* is native to the Indian subcontinent and has become naturalized in the tropical and subtropical areas around the world. The tree is known by regional names such as Benzolive, Drumstick, Horseradish, Kelor, Marango, Saijihan and Munga (Fahey, 2005). The plant is known worldwide for its nutritional and medicinal benefits as well as industrial uses. It is one of the most useful tropical trees. Almost every part of the moringa plant has nutritional value. Over the years, moringa products such as moringa dry leaf powder have seen a growth in the sales in the global market. The global moringa product market is estimated to value over US\$ 6 Bn in 2019, and is projected to register a growth in CAGR of 12.9% yearly in terms of revenue over the forecast period. Though the existing marketing channel is fetching the farmers livelihood and source of employment, introduction of processing facilities like solar drying, room drying and proper information related to prices and demand of moringa leaves would help the farmer to process the leaves themselves, hence to have a deeper view at the existing problems and suggest adequate measures a study was conducted in Angara and Bedo blocks of Ranchi district under the National Rural Livelihood Mission project under Jharkhand State Livelihood Promotion Society with the following objectives, (i) To find out the constraints in production and marketing of moringa dry leaves (ii) To assess the profit in production and marketing of moringa dry leaves and (iii) To study the socio economic condition of the moringa cultivators in the study area. The study revealed that the farmers were categorized into three divisions, namely progressive, medium and poor farmers. The progressive farmers had a profit of 19,672₹. The medium farmers had a profit of 12,070₹ and the poor farmers earned a profit of 10,519₹ from production and marketing of the moringa dry leaves. Only 10% farmers could maintain high quality while production of dry moringa leaves. Only 5% farmers, possessed proper knowledge about market value of dry moringa leaves. Most of the farmers (38%) faced the problem of poor storage facility of the dry moringa leaves. Most of the farmers engaged in moringa dry leaves production are either illiterate or educated till intermediate. Most of the farmers were marginal farmers constituting 2.5 acres of land. Most of the farmers were still unaware about soil health card (63%). Hence, market linkage and promotion of location specific demand with high efficiency needs to be addressed. With suitable modifications, this intervention could be out scaled for larger benefit of the society.

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Fresh and dry leaves, leaves of moringa olifera

CHAPTER – 1

INTRODUCTION

Moringa (Moringa oleifera) belonging to the family *Moringaceae* is native to the Indian subcontinent and has become naturalized in the tropical and subtropical areas around the world. The tree is known by regional names such as Benzolive, Drumstick, Horseradish, Kelor, Marango, Saijihan and Munga (Fahey, 2005). The plant is known worldwide for its nutritional and medicinal benefits as well as industrial uses. It is one of the most useful tropical trees. Almost every part of the moringa plant has nutritional value. The dried leaves of moringa have the following mineral contents: calcium (3.65%), Phosphorus (0.3%), magnesium (0.5%), potassium (1.5%), sodium (0.164%), sulphur (0.63%), zinc (13.03 mg/kg), copper (8.25%), manganese (86.8 mg/kg), Linolenic acid (44.57%) having the highest value followed by heneicosanoic acid (14.41%), g-linolenic acid (0.20%), palmitic acid (0.17%) and capric acid (0.07%). It has the highest concentration of vitamin E (77 mg/100 g).

The leaves are highly nutritious, being a significant source of β -carotene, Vitamin A, C, protein, iron, calcium and potassium. The leaves are cooked and used like spinach. Moringa leaves contain more than seven times the vitamin C oranges, four times the calcium and two times the protein found in milk, four times the vitamin A found in carrots, and three times the potassium found in bananas (Fahey 2005). They can be consumed fresh, cooked or dried. Since dried moringa leaves retain their nutrient content, it is possible to convert them into leaf powder, when there is an abundance of leaves.

Moringa dry leaves are beneficial for curing diseases like asthma, hyperglycemia, dyslipidemia, flu, heart burn, syphilis, malaria, pneumonia, diarrhoea, headaches, scurvy, skin diseases, bronchitis, eye and ear infections. They also reduce blood pressure and cholesterol and act as an anticancerous, antimicrobial, antioxidant, antidiabetic and anti-atherosclerotic agents, neuroprotectant. The isothiocyanates found in moringa dry leaves are anticancerous agents. The presence of minerals and vitamins help in boosting the immune system and cure a myriad of diseases. (Mbikay 2012; Jung 2014). The leaves of *moringa* are mostly used for medicinal purposes as well as for human nutrition, Since they are rich in antioxidants and other nutrients, which are commonly deficient in people living in undeveloped countries, *moringa dry* leaves have been used for the treatment of various diseases like malaria and typhoid fever to hypertension and diabetes (Sivasankari et al 2014).

The moringa leaves consumption should be followed by different communities. It should be consumed dry. Dried leaves can be stored for a long time and can be used regularly. The leaves should be covered with a cloth to keep them clean from dust and insects. The leaves can be spread out in a thin layer, while being mixed frequently. Ensure the leaves are dried out completely and stored in an airtight container, otherwise leaves might struggle with molds and mildew. Clean, dried moringa leaf powder must be stored in airtight container, away from light and temperatures above 24°C. It can be stored for up to 6 months. Moisture content of fresh moringa leaves is 75 to 80% and dried leaves is 7 to 10 %.

Many companies across the world are manufacturing various products of Moringa leaves such as Moringa Tea, Moringa Tablets, Moringa Capsules, Moringa leaf powder, Moringa soaps and Moringa face wash. Some beverages are also available in market prepared by Moringa leaves. It is necessary to have hygienically dried and processed moringa leaves for further uses. The medicinal benefits of moringa dry leaves are at its peak hence consumed with diet in form of capsules, dietary supplement etc, Separate industries have also been developed for this purpose.

The increasing awareness about the health advantages of moringa products will be one of the major factors that has led to a positive impact on the global moringa products market. Over the years, moringa products such as moringa dry leaf powder have seen a growth in the sales in the global market. The global moringa product market is estimated to value over US\$ 6 Bn in 2019, and is projected to register a growth in CAGR of 12.9% yearly in terms of revenue over the forecast period. The first five-year cumulative revenue for (2019-2023) is projected to be over US\$ 41 Bn, which is estimated to increase fairly over the later part of the five-year forecast period.

The increasing millennial population across the globe is one of the key trends that has contributed to the growth of the moringa dry leaves products market demand in the forthcoming years. The higher consumption rate of moringa products is mainly recorded among the millennial generation due to their higher inclination toward trying out new products and flavors in comparison to the older generation. Also, the growing millennial population in Asia drives the market for moringa dry leaves product as they are the largest consumers of the moringa-based products.

Interestingly, 80 per cent of the production of moringa leaves happens in India, fetching crores of foreign exchange for the country. Growing at a rate of 26-30 per cent annually, the export of moringa dry leaves is a big business in Tamil Nadu, Andhra Pradesh, Karnataka and Odisha. In India, planting of moringa tree material is also a house hold practice in rural area. In semi- urban area the agro farm and Self Help Groups are also engaged in the supply chain business of moringa to the local market. The industry prospective of this can be treated as a seasonal business. There are several research institutes in India which have worked on the processing and development of various products from moringa leaf. Efforts are also being done to bring out value-added products to the market. India exported moringa dry leaves worth Rs 14.6 crore in 2015, compared to Rs 11.61 crore in 2014. The export of these leaves was worth Rs 2.5 crore in January and February in the year 2016. The latest trend in the moringa market is the shift towards organic leaves and usage of solar driers. The export market has been increasing at the rate of over 30 per cent. Moringa leaves have applications in pharmaceutical and cosmetics industries.

Moringa grows best between 25 to 35°C, but survive up to 40°C. The rain fall amounts ranges from 250 to 1500 mm. Germination percentage is normally within the range of 80-90%. Moringa prefers a well-drained sandy loam or loamy soil. It tolerates a soil pH of 5.0-9.0. Moringa requires a thoroughly prepared land or seedbed. Moringa is planted either by direct seeding especially in high density mono-cropping or transplanting usually in intercropping with other crops. Leaves from high density moringa fields can be harvested after plant grows 1.5-2.0 m, which usually takes at least 60-90 days. Spacing for growing moringa includes 60cm x 30 cm.

The marketing channel of any product involves a proper supply channel including supply of the product from the producers to manufacturer, through to its eventually delivery to the end user. In case of marketing of moringa dry leaves the supply chain includes supply of moringa dry leaves from producers (farmers) to SHG to Middleman/Commission agent to industry and finally to end-consumers. Leaves after getting harvested by the producer group (farmer) who cultivate moringa as a group or samooch called self help groups reach the managing organization who have provided training to the farmers i.e., Jharkhand State Livelihood Promotion Society which in turn sell the dried moringa leaves to agencies like “Sonahatu Agro Produce Company Limited” who process the dried leaves and further sell it to industry which converts the processed leaves into tea leaves, capsules, face packs etc. Though the existing marketing channel is fetching the farmers livelihood and source of employment,

introduction of processing facilities like solar drying, room drying and proper information related to prices and demand of moringa leaves would help the farmer to process the leaves themselves and directly sell in the market providing the farmers better growth and profit opportunities in the sector.

Hence, the present study is carried out to analyse and strengthen the livelihood of moringa leaves cultivators with the following objectives:-

1. To find out the constraints in production and marketing of moringa dry leafs.
2. To assess the profit in production and marketing of moringa dry leafs.
3. To study the socio economic condition of the moringa cultivators in the study area.

CHAPTER-2

REVIEW OF LITERATURE

Review of literature provides information to the surveyor and the researcher regarding 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.

Srikanth *et al.* (2014) considered moringa dry leaves as one of the important trees with reference to nutritional security of rural communities. Therefore moringa dry leaves were used to improve human health and assisted in combating malnutrition especially for developing countries.

Anjorin *et al.* (2010) observed that moringa dry leaves had numerous uses. As a plant based mineral supplement in animal and human nutrition, it is rich in proteins, minerals, vitamins, beta-carotene and trace elements.

Khalafalla *et al.* (2010) reported that moringa dry leaves occurred and were distributed widely in many tropics and sub-tropics and were cultivated all over the world due to its multiple purpose uses. The tree was one of the world's most beneficial trees; every part of the tree had been used for food, medication and industrial purposes.

Kasolo *et al.* (2010) found that moringa dry leaf was useful in the treatment of diverse medical conditions among rural dwellers and it was currently being considered as an immune stimulant for HIV people. Moringa extracted in 80 percent ethanol serves as an effective plant growth hormone.

Anwar *et al.* (2007) observed that moringa dry leaves had enormous medicinal value, and the leaves had been used for treatment of different human diseases in the indigenous medicine especially in South Asia.

Leone *et al.* (2015) reported that there was a National Association of Moringa dry leaves which aimed to organize people, including producers, consumers, processors and researchers to speak on a common platform on issues of moringa dry leaves in order to influence policy on promotions, production, consumption and marketing of the products.

Bezabih and Hadera (2007) identified constraints in production and marketing of dry moringa leaves, which were lack of market access, marketing formation, and many biological factors, lack of awareness on product packaging, handling, transport, labeling and processing equipment.

Jaleta (2007) indicated that, lack of market outlets, storage and processing problems, lack of marketing information, capital constraints, high transportation cost and price variation were some of the important constraints in moringa dry leaves production.

Abuye *et al.* (2003) investigated on production, marketing as well value chain potential and activities of moringa which would create job opportunity and sources of entrepreneurship.

Foidl *et al.* (2001) observed the tree crop whose leaves were of economic importance and could be grown at relatively cheaper rate, all year round, with high quality food for both humans and animals. It was also rich in health promoting phytochemicals such as carotenoids, phenolics (chlorogenic acids), flavonoids, various vitamins and minerals.

Bharat *et al.* (2010) showed that, moringa dry leaves had very high nutritional properties that would be useful as a food supplement. It has nutritional and medicinal applications for both human and animals and in various industrial applications .

Jaleta (2007) indicated that, lack of market outlets, storage and processing problems, lack of marketing information, capital constraints, high transportation cost and price variation were some of the important constraints in vegetable production.

Nadeau and Zakaria (2012) documented nutritional and medicinal properties of Moringa that also provide excellent economic opportunities for agricultural producers, traders and processors thereby making it effective in tackling micronutrient insecurity while equally holding the promise of sustainable economic returns to the farmers.

CHAPTER-3

METHODOLOGY

Research methodology deals with methods, procedures and techniques used in the study for collecting and analysing data with respect to objectives formulated.

Selection of location for study:-

Ranchi district is situated at 23⁰17' North latitude, 85⁰19' East longitudes and at an altitude of 625 meter above mean sea level. This place has a sub-tropical climate characterized with hot and dry summer, cold winter with moderate annual rainfall. This region receives rainfall from both the streams of south-west and north-east monsoon. The mean annual precipitation of this region is 1400 mm of which 80-85 percent is received during June to September. Temperature of this region varies as low as 2.2⁰C in the winter and as high as 42.4⁰C in summer. The relative humidity (R.H.) rises up to 93 percent during July-August and falls down to 37% during April-May.

Ranchi has a hilly topography and its combination with dense tropical forests ensures that it enjoys a comparatively moderate climate compared to the rest of the state. Previously, it was accorded a 'hill station' status during the British rule. Rapid population growth and industrialization have caused considerable change in the weather pattern and rise in average temperatures.

Angara and Bedo blocks of Jharkhand will be selected purposively as training have been provided by JSLPS to the farmers for production of moringa under the JOHAAR project. JSLPS is the prime source for purchase of moringa from the farmers cultivating moringa. One village each from Angara namely Bhadri and and one village named Jamtoli from Bedo block were selected purposively.

Languages spoken here include Hindi as the main language. Nagpuri is local language. Asuri, an Austroasiatic language spoken by approximately 17,000, partly in the north of Ranchi, and Bijori, a Munda language distantly related to Khmer and Vietnamese, spoken by about 25,000. Kurukh language is partly spoken in West of Ranchi (mainly by Kurukh people).

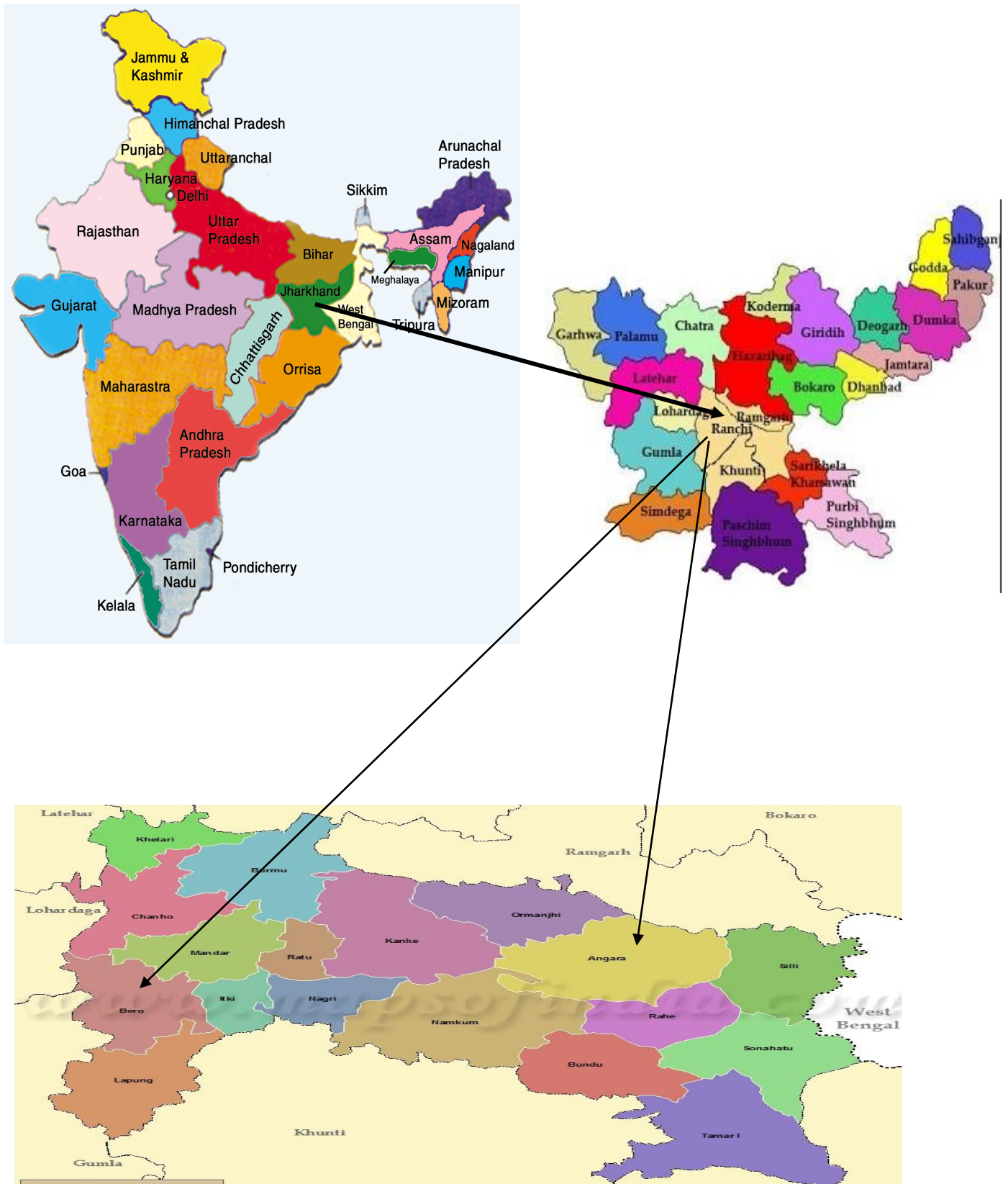


Plate:1 Map of study site

Selection of respondents:-

Farmer will be selected from villages involved in moringa cultivation . Out of two blocks the number of farmers selected were forty (20 farmers X 2 blocks= 40 farmers).

Therefore, the total number of farmers selected were forty.

Also secondary data was collected from agencies involved in marketing moringa products.

Collection of data:-

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

Data collection:-

Primary data (Basic information) will be collected through field visit and interactions with farmers. Secondary data will be collected from published information and media reports and agencies.

Data analysis:

All collected data from various sources will be processed and analysed using frequency, percentage and other relevant statistical methods.



Plate:2 Farmers removing weed from Moringa cultivable area



Plate:3 Moringa cultivators of Bhadri village, Ranchi



Plate:4 Interaction with farmer cultivating Moringa



Plate:5 Sun dried Moringa leaves



Plate:6 Moringa dry leaves (Conventional without strong facility)



Plate:7 Moringa dried leaves (With Proper Storage Facility)



Plate:8 SHG Meeting Of female Moringa cultivators



Plate:9 Moringa cultivators receiving cheque for sale of 15 kg of Moringa dried leaves



Plate:10 Moringa cultivators receiving cheque for sale of 17 kg of Moringa dried leaves



Plate:11 Interaction with farmers of Angara block, Ranchi



Plate:12 Moringa Cultivated at Jamtoli village of Bedo Block, Ranchi



Plate:13 Interaction with farmer of Bedo Block

ORGANIZATION PROFILE

Government of Jharkhand is creating an institutional architecture through Jharkhand State Livelihood Promotion Society for fight against poverty, Enabling and empowering for the poor to access better livelihoods and improve their standards of living would be one of the key objectives of State rural livelihood mission in Jharkhand. JSLPS aims to improve rural livelihood options and work towards social and economical empowerment of rural poor's and women.

The development objective of the Jharkhand Opportunities for Harnessing Rural Growth (JOHAR) Project is to enhance and diversify household income in select farm and non-farm sectors for targeted beneficiaries in project areas of Jharkhand. Over 200,000 rural households and some 3,500 farmer producer groups are expected to benefit from the project with women as principal actors in production, processing and marketing. Women SHG members, including from scheduled castes and tribes, and smallholder and landless households from 17 districts and 68 blocks of rural Jharkhand are expected to benefit.

The project of moringa cultivation and processing is an undertaking of JOHAR project under JSLPS. This project was initiated in 2018 as a means to promote livelihood provide support rural farmers. Project was promoted through providing training to farmers, formation of SHG and provide support in the form of fund and agricultural input to SHG . The input include: seed, fertilizer, and training. The project of moringa cultivation was established in the blocks of Angara and Bedo with a view to support the rural population. The Jharkhand State Livelihood Promotion Society, provides the farmer engaged in moringa cultivation and processing a market for sale of their produce. Besides, getting a proper market for the sale of moringa farmers also receive better prices in return.

To increase the market potential of moringa locally, farmers must be provided information about the medicinal & industrial uses and the market demand, price, value should be inculcated to the growers. They should be also be informed about the benefit of organic production. Solar drying being the most important component of increased rate of dry leaves must be kept into consideration by the growers.

CHAPTER-4

RESULT AND DISCUSSION

The results of the experiment entitled “Study on production and marketing of moringa dry leaves in Ranchi district of Jharkhand” is presented in detail with the help of tables, figures and plate and the salient finding of the experiment are being discussed in this chapter by giving experimental evidences. Attempts have been made to discuss the important observation recorded during the course of present investigation to explain the ‘Cause’ and ‘effect’ relationships in the light of scientific reasoning and to find out information of practical significance.

4.1. Constraints in production and marketing of moringa dry leaves.

4.1.1 Production related constraints

Table: 4.1.1 Availability of quality seed for production of moringa leaves

Quality	Number of respondents (N=40)	Percentage
Good	6	15.00%
Very good	12	30.00%
Average	20	50.00%
Poor	2	5.00%

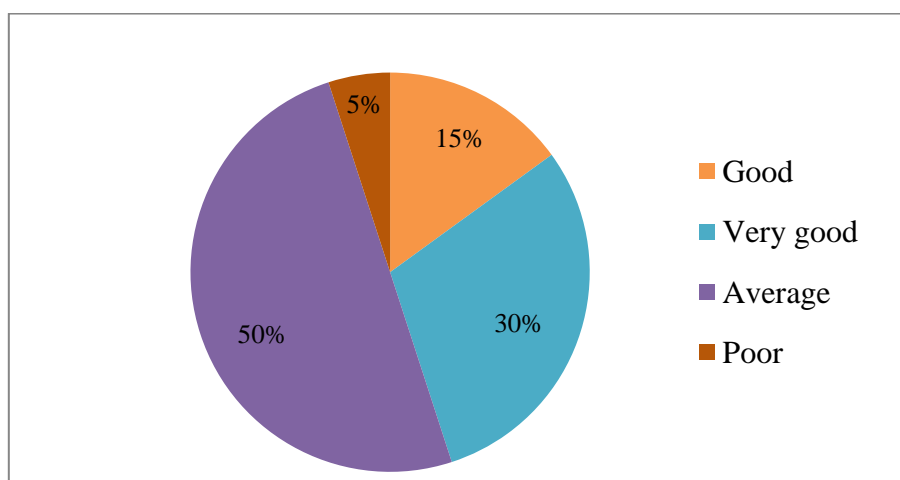


Fig: 4.1.1 Availability of quality seed for production of moringa leaves

The data presented in Table 4.1.1 and Fig 4.1.1 revealed the information related to the availability of quality seeds for moringa leaves production, on the basis of germination rate the seeds provided to the farmer of study area and from the above table it is clear that 50 per cent of farmers had access to average quality of seed ,15per cent of farmers possess good quality seed ,30 per cent of farmers considered the quality of seeds as very good while the rest 05 per cent have access to poor quality of seeds.

4.1.2 Availability of quality fertilizer for production of moringa leaves

Table: 4.1.2 Quality fertilizer for production of moringa leaves

Quality	Number of respondents (N=40)	Percentage
Good	9	22.00%
Very good	5	13.00%
Average	20	50.00%
Poor	6	15.00%

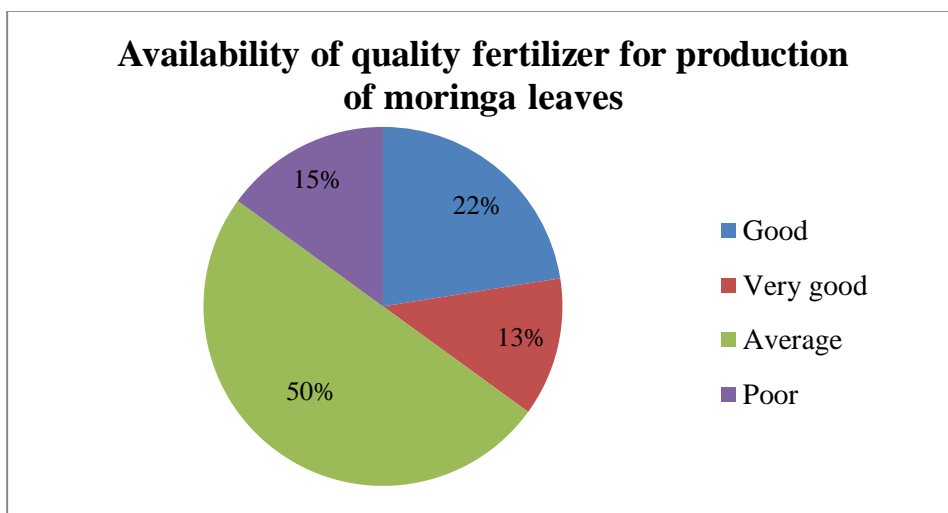


Fig: 4.1.2 Availability of quality fertilizer for production of moringa leaves

The data presented in Table 4.1.2 and Fig 4.1.2 indicated information related to availability of quality fertilizer to the farmers of study area for production of moringa leaves. In production of moringa leaves only organic fertilizer (Neem Khalli) was used. It is evident from the table that majority of respondent i.e. 50 per cent had access to quality organic fertilizer only 13 per cent farmers had very good access to quality organic fertilizer while 22 per cent respondent

toward good access of quality organic fertilizer and 15 per cent farmers had no access to quality organic fertilizer.

4.1.3 Knowledge about moringa dry leaves production

Table: 4.1.3 Knowledge about production

Level of knowledge	Number of respondents (N=40)	Percentage
Less	13	32.00%
Average	7	17.00%
More	5	13.00%
No knowledge	15	38.00%

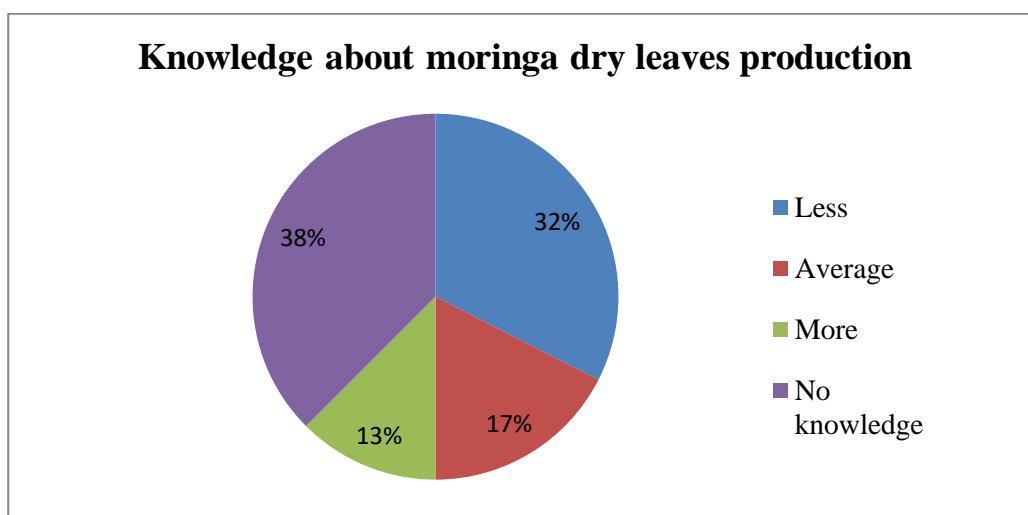


Fig:4.1.3 Knowledge about moringa dry leaves production

The data presented in Table 4.1.3 and Fig 4.1.3 revealed that technical know how of moringa cultivation for leaves were known to cultivators. 13 per cent respondent had more knowledge about technical know-how, 17 per cent respondent had average to good perception where as 32 per cent had less knowledge and 38 per cent farmers lacked the proper knowledge regarding processing of moringa leaves.

4.1.4 Maintaining quality of moringa dry leaves while production

Table:4.1.4 Maintaining the quality while production

Level of maintenance	Number of respondents (N=40)	Percentage
Low	23	57.00%
Moderate	6	15.00%
High	4	10.00%
No maintenance	7	18.00%

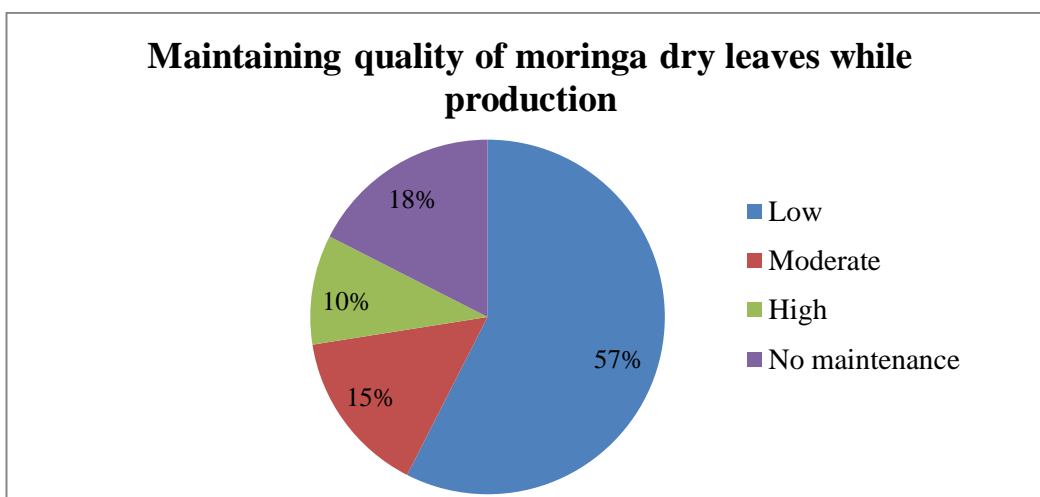


Fig: 4.1.4 Maintaining the quality while production

Though farmers cultivating moringa have received training regarding cultivation of moringa they have not been provided with adequate information related to maintenance of moringa including preserving the moisture content of moringa leaves, suitable temperature required for storage of moringa, adequate weather conditions etc. Hence only few farmers could maintain exact quality of moringa dry leaves as the equipments required for maintaining the quality involved high cost but based on the data collected which is presented in Table 4.1.4 and Fig 4.1.4 it is clear that 57 per cent of farmers maintained low quality of dry leaves for production while 15 per cent farmers maintained moderate quality of the dry leaves, 10 per cent of farmers maintain high quality of moringa dry leaves for production, while the rest 18 per cent farmers did not maintain or had no idea about the maintenance of quality of moringa leaves for production.

4.1.5 Marketing related constraints

Table: 4.1.5 Knowledge about market value of moringa dry leaves

Level of maintenance	Number of respondents (N=40)	Percentage
Less	10	25.00%
Average	23	57.00%
More	2	5.00%
No knowledge	5	13.00%

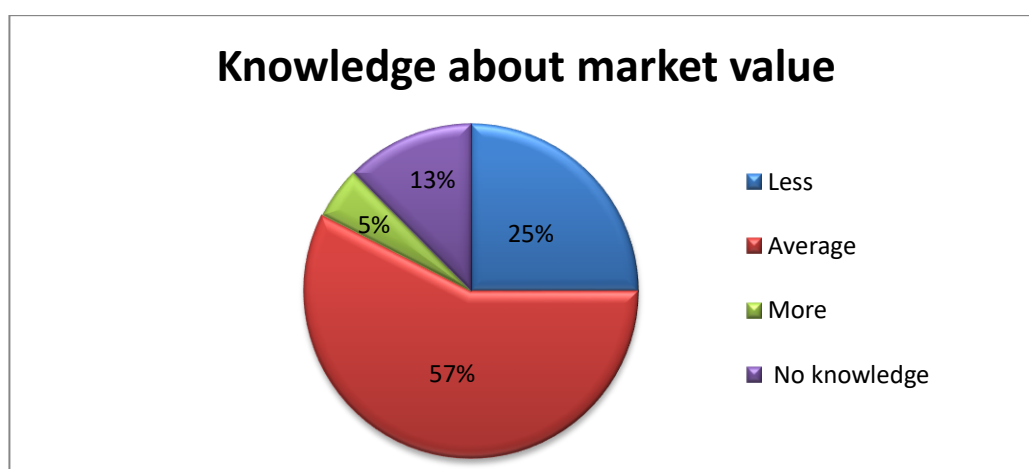


Fig: 4.1.5 Knowledge about market value of moringa dry leaves

The data presented in Table 4.1.5 and Fig 4.1.5 indicated information related constraints faced by the farmers of the study area. The concept of moringa dry leaves production was a new concept for the farmers and the produce of the farmer was bought by the managing agency i.e., Jharkhand State Livelihood promotion Society which is provided training to the farmers hence blocking the route of market related information regarding the market rate or value of dried moringa leaves and from the above table it is clear that 57 per cent of farmers had average level of knowledge related to the market where as 25 per cent of farmers have less knowledge about the market 5 per cent of farmers showed much knowledge about the market while the rest 13 per cent farmers had no idea about the market conditions.

4.1.6 Availability of storage facility

Table: 4.1.6 Availability of storage facility

Level of facility	Number of respondent (N=40)	Percentage
Good	3	7.00%
Very good	0	0.00%
Average	22	55.00%
Poor	15	38.00%

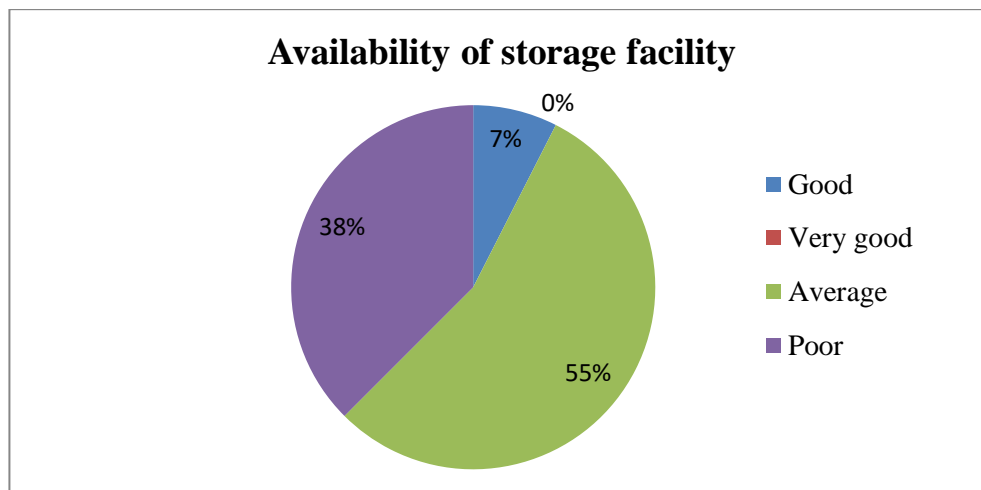


Fig: 4.1.6 Availability of storage facility

The appropriate conditions for storage of dried moringa leaves included placing the leaves in an air tight container at a room temperature of (24°C). The leaves could be stored in this condition up to 6 months but due to unavailability of equipment farmers were unable to measure room temperature and other activities. Farmer also lacked adequate storage facilities. The data presented in Table 4.1.6 and Fig 4.1.6 made it clear that there were 38 per cent farmers with poor storage facility in the study area, 55 percent farmers had average storage facility, 7 per cent farmers had access to good storage facility whereas there are no farmers with very good storage facility of dried moringa leaves.

4.1.7 Knowledge about value addition

Table: 4.1.7 Value addition

Level of knowledge	Number of respondent (N=40)	Percentage
Less	6	15.00%
Average	24	60.00%
More	10	25.00%
No knowledge	0	0.0%

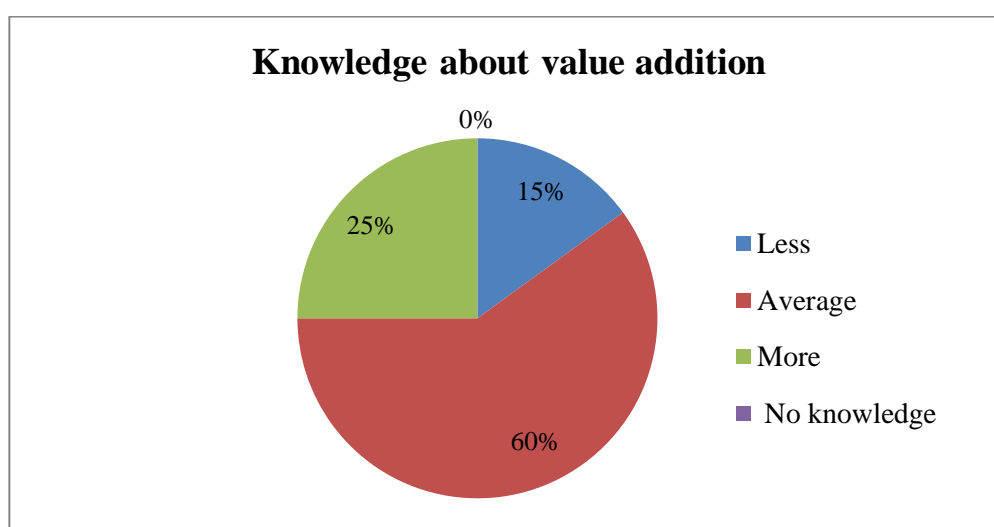


Fig: 4.1.7 Knowledge about value addition

Respondent were assessed for their knowledge in value addition of moringa leaves and the data thus obtained are presented in Table 4.1.7 and Fig 4.1.7. It is evident from the table that majority of respondent had knowledge about value addition and 60% farmers respondent high to average knowledge regarding value additions of moringa dried leaves. Only 15 % farmers had less knowledge about value addition.

4.2 To assess the profit in production and marketing of moringa dry leaves.

The profit analysis was carried out for 800m² area as JSLPS provided inputs only for 800m² area. Farmers are categorized in three types namely Progressive, Medium & poor farmers as per their profit in moringa dry leaves cultivation.

PROGRESSIVE FARMERS

4.2.1 Variable cost

Table no: 4.2.1

S.no	Item	Quantity	Rate	Average cost incurred (₹)
1.	Land preparation	800m ²	-----	1,467
2.	Seed	1.5kg	1000/kg	1,500
3.	Labour	46	200	11,333
4.	Irrigation	-----	-----	341
5.	Organic fertilizer	40kg	18.75/kg	750
	TOTAL			15,391 ₹

4.2.2 FIXED COST

Table no: 4.2.2

S. no	Item	Average cost incurred(₹)
1.	Solar dry equipment	-----
2.	Farm equipment	1,350
	Less depreciation of 5year	

	TOTAL	270
--	--------------	------------

FORMULA

TOTAL COST=Variable cost + Fixed cost

$$=15,391 + 270$$

$$=15,661 \text{ ₹ per year}$$

Profit = Selling price – Cost incurred

$$=35,333 -15,661$$

$$=19,672 \text{ ₹ per year}$$

The progressive farmers could harvest better return by utilizing all available resources and inputs at proper time and total profit would come around Rs.19672 (Nineteen thousand six hundred seventy two) only.

MEDIUM FARMERS

4.2.1 Variable cost

Table no: 4.2.3

S.no	Item	Quantity	Rate	Average cost incurred (₹)
1.	Land preparation	800m ²	-----	1,310
2.	Seed	1.5kg	1000/kg	1,500
3.	Labour	46	200	9,900
4.	Irrigation	-----	-----	320
5.	Organic fertilizer	40kg	18.75/kg	750
	TOTAL			13,780 ₹

4.2.1 FIXED COST

Table no: 4.2.4

S. no	Item	Average cost incurred(₹)
1.	Solar dry equipment	-----
2.	Farm equipment	1,250
	Less depreciation of 5year	
	TOTAL	250

FORMULA

TOTAL COST=Variable cost + Fixed cost

$$=13,780 + 250$$

$$=14,030 \text{ ₹ per year}$$

Profit = Selling price – Cost incurred

$$=26,100-14,030$$

$$=12,070 \text{ ₹ per year}$$

The medium farmers could harvest average return by utilizing available resources and inputs at proper time and total profit would come around Rs.12,070(Twelve thousand seventy) only.

POOR FARMERS

4.2.1 Variable cost

Table no: 4.2.5

S.no	Item	Quantity	Rate	Average cost incurred (₹)
1.	Land preparation	800m ²	-----	1,240
2.	Seed	1.5kg	1000/kg	1,500
3.	Labour	46	200	7,992
4.	Irrigation	-----	-----	308
5.	Organic fertilizer	40kg	18.75/kg	750
	TOTAL			11,790 ₹

4.2.2 FIXED COST

Table no: 4.2.6

S. no	Item	Average cost incurred(₹)
1.	Solar dry equipment	-----
2.	Farm equipment	1,108
	Less depreciation of 5year	
	TOTAL	221

FORMULA

TOTAL COST=Variable cost + Fixed cost

$$=11,790+ 221$$

$$=12,011 ₹ \text{ per year}$$

Profit = Selling price – Cost incurred

$$=22,530-12,011$$

$$=10,519 ₹ \text{ per year}$$

The poor farmers could not harvest better return by utilizing all available resource and input at proper time and therefore total profit would be around Rs.10,519(Ten thousand five thunder nineteen)

4.3 To study the socio economic condition of the moringa cultivators in the study area.

The socio economic status of the respondents was studied to know their profit using age, family types, land holding, level of education, occupation, livestock, irrigation facility, etc. The result are sum marised below:

4.3.1 Age

Table 4.3.1 Classification Of farmers on the basis of age group

Category of age	Number of respondent(n=40)	Percentage (%)
20-30year	17	42%
31-40year	18	45%
41-50year	05	13%

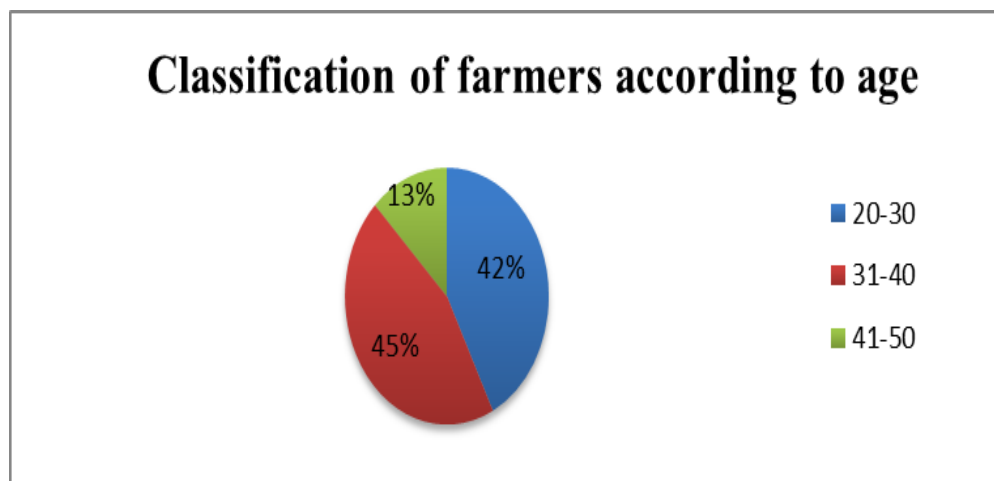


Fig 4.3.1 Classification of farmers on the basis of age group

The data presented in Table 4.3.1 and Fig 4.3.1 on the based of interaction with the farmers of the study area clearly indicated that maximum number of farmers i.e.,45% of farmers belonged to the age group 31-40 years followed by 42% of the farmers having to age group 20-30 years. Rest 13% belonged to age group 41-50 years. Only female were found to be engaged in cultivation of moringa in the area under study.

4.3.2 Family type of the farmers

Table4.3.2 Family type

Types	Number of respondent (n=40)	Percentage
Nuclear	15	37%
Joint	25	63%

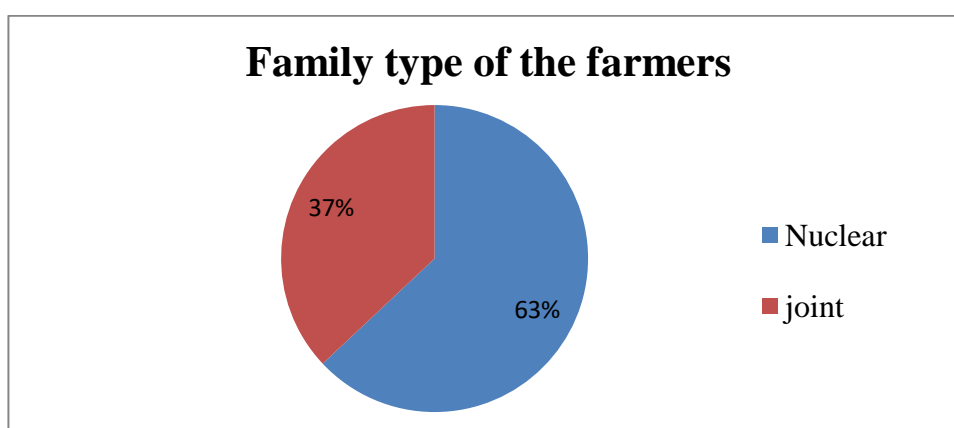


Fig 4.3.2 Farmer family type

The data presented in Table 4.3.2 and Fig 4.3.2 indicated that 63% respondent were in joint family system while 37% were found to possess nuclear family structure. Majority of the respondent belonged to joint family system.

4.3.3 Education level of farmers

Table:4.3.3 Education level

Level of education	Number of Respondent(n=40)	Percentage
Illiterate	9	22.00%
Primary school	8	20.00%
Intermediated	15	38.00%
High school	8	20.00%

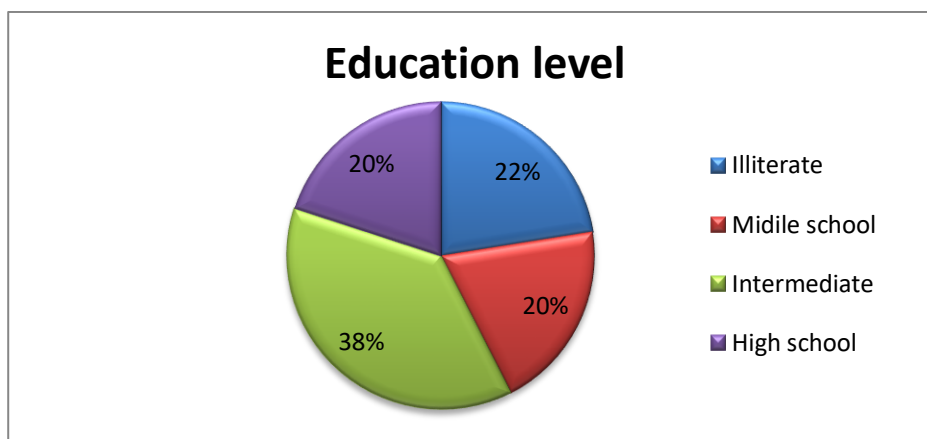


Fig: 4.3.3 Education level of farmers

The information related to the level of education of the farmers of the study area are presented in Table 4.3.3 and Fig 4.3.3 It is event from table that 38.0per cent cultivation had education up to intermediate class while 20.0 per cent farmers had only primary level of education. Rest 22.0 per cent were illiterate.

4.3.4 Land holding

Table:4.3.4 Land holding according to the respondent

Types of farmers	Number of respondent(n=40)	percentage
Landless	0	0%
Marginal	17	42.00%
Small	10	25.00%
Semi-Medium	9	23.00%
Medium	4	10.00%
Large	0	0%

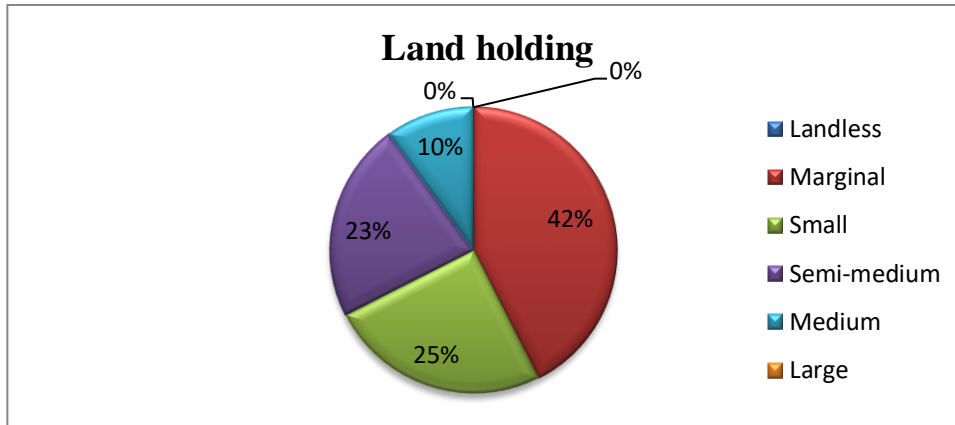


Fig 4.3.4 Land holding

The data presented in Table 4.3.4 and Fig 4.3.4 provide information related to the land holding of the farmers of the study area. It is clear that 42 per cent of farmers were marginal farmers possessing (1.00 hectare) land, 25 per cent of farmers were small farmers having (1.00-2.00 hectare) land, 23 per cent of farmers are semi-medium farmers possessing (2.00-4.00 hectare) land, 10 per cent of farmers were medium farmers possessing (4.00-10.00 hectare) land and there were no landless or large farmers in the area.

4.3.5 Occupation of respondent

Table: 4.3.5 Occupation of respondent

Types of occupation	Number of respondent(n=40)	Percentage
Agriculture & allied	20	50.00%
Labor	4	10.00%
Both	9	22.00%
Agriculture + Other	7	18.00%

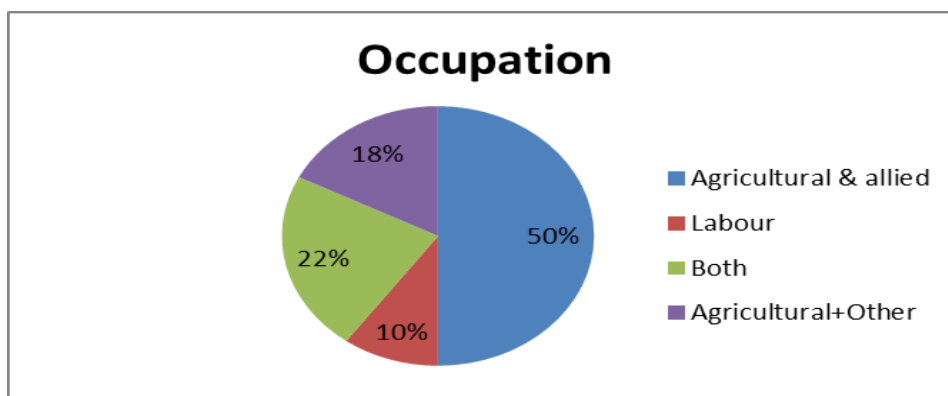


Fig: 4.3.5 Occupation of the respondent

The data presented in Table 4.3.5 and Fig 4.3.5 provide information related to the occupation of the farmers of the study area. It is clear that 50 per cent of the farmers were engaged in agriculture and allied activities, 10 per cent of farmers were engaged in labor activities, 22 per cent of farmers were engaged in both agriculture & labor activities and the rest 18 per cent of farmers were engaged in agriculture & other activities.

4.3.6 Possession of agricultural equipments

Table: 4.3.6 Possession of agricultural equipments by respondent

Item	No. of farmers possessing equipments
Tractor	0
Power tillage	0
Thresher	0
Plough	0
Irrigation equipment	5

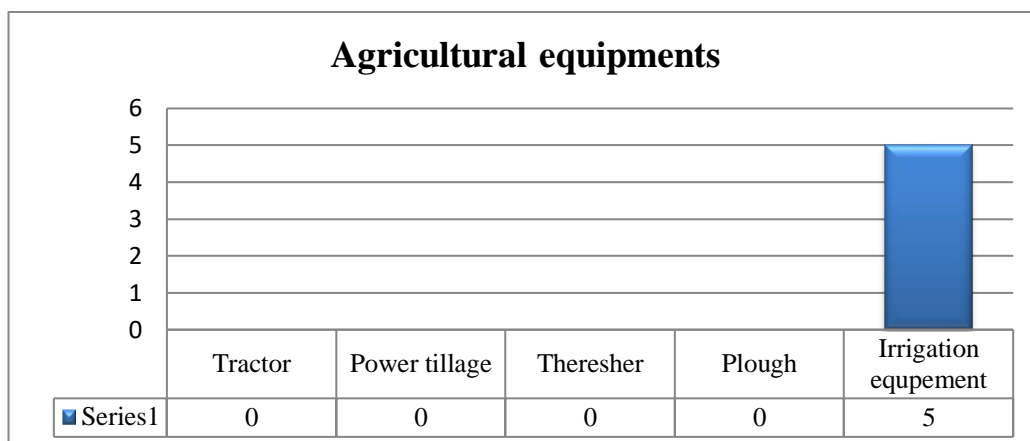


Fig no :- 4.3.6 Availability of agricultural equipment's

The data presented in Table 4.3.6 and Fig 4.3.6 provide information related to the possession of agricultural equipments by the farmers of the study area and from the above table it is clear that out of 40 respondent, only five possessed irrigation facilities. None of the respondents had other agricultural implements like tractor, power tiller, thresher or plough.

4.3.7 Mode of transport

Table no:- 4.3.7 Mode of Transportation

Item	Number of Farmers
Motorcycle	6
Cycle	33
Motorcycle + cycle	6

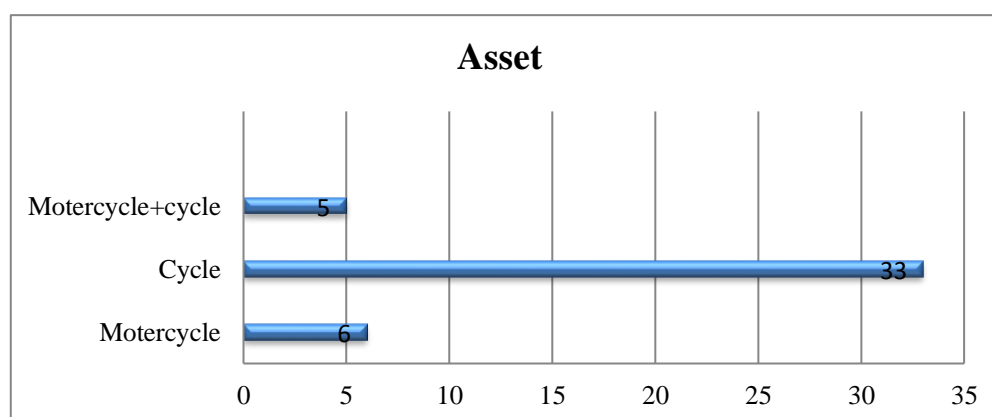


Fig no: 4.3.7 Possession of transportation media

The data are presented in Table 4.3.7 and Fig 4.3.7 on the basis of information collected from the farmer of Angara and Bedo block. It is clear that out of the total 40 farmers only 6 farmers possessed motor cycle as the only source of transportation, another 6 farmers possessed motor cycle along with cycle for transportation while the remaining 33 farmers possess only cycle as the transportation media.

4.3.8 Live stock

Table: 4.3.8 Availability of live stock

Live stock	No. of Farmers with available livestock (n=40)
Cow	4
Ox	4
Buffalo	2
Poultry	3
Buffalo + ox	5
Cow + ox	7
Poultry + ox	1
Poultry + buffalo	0
Buffalo + cow	0
Poultry + cow	0
No live-stock	14

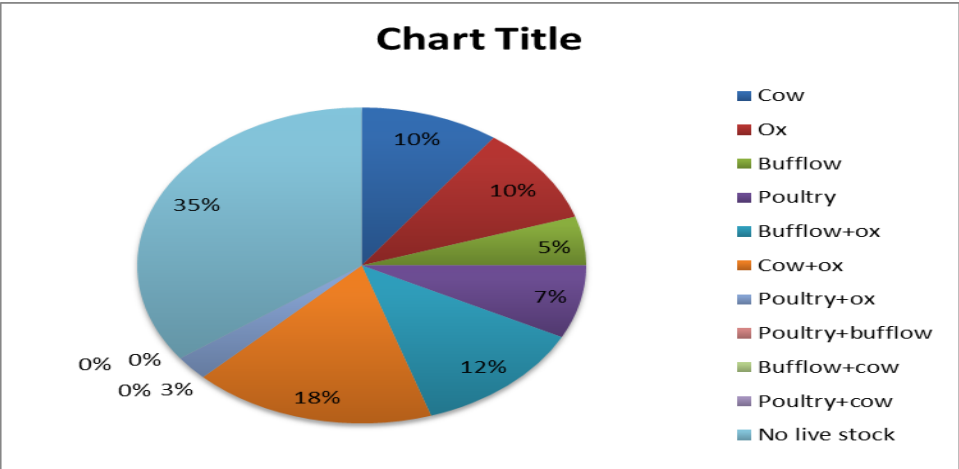


Fig: 4.3.8 Number of live stock

The data presented in Table 4.3.8 and Fig 4.3.8 provide information related to livestock reared by the farmers of the study area. It is clear that 35% farmer possessed no livestock, 18% farmer possessed both cow and ox, 12% farmer possessed buffalo along with ox, 10% farmer possessed only ox another 10% farmer possessed only cow, 7% farmer possessed poultry and the remaining 5% farmer possess buffalo while there were no farmers who possessed poultry along with buffalo, buffalo and cow, poultry and cow together.

4.3.9 Irrigation facility

Table 4.3.9 Irrigation facility of farmers

Irrigation facility	Number of farm(n=40)
Well	18
Well + river	8
Pond	2
Pond + rain	4
Rain	5
River	3

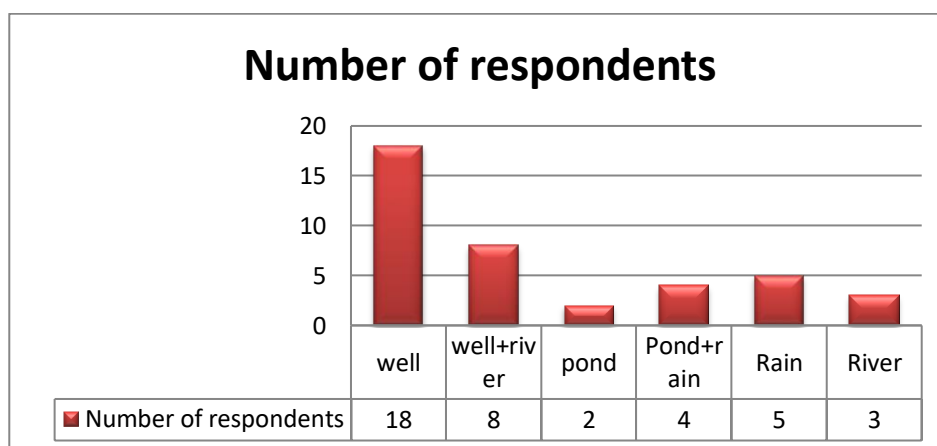


Fig: 4.3.9 Number of respondents

The data are presented in Table 4.3.9 and Fig 4.3.9 It is clear that 18 number of farmers used well for irrigation purpose, 8 farmers had well and they also utilized river for irrigation facility, 4 farmers had access to pond along with river for irrigation facility, 5 farmers depended on rain as source of irrigation, 3 farmers had access to river for irrigation while 2 farmers has access to pond for irrigation.

4.3.10 Aware about soil health card

Table 4.3.10 Soil health card

Awareness	Number of respondents(n=40)	Percentage
Yes	15	37.00%
No	25	63.00%

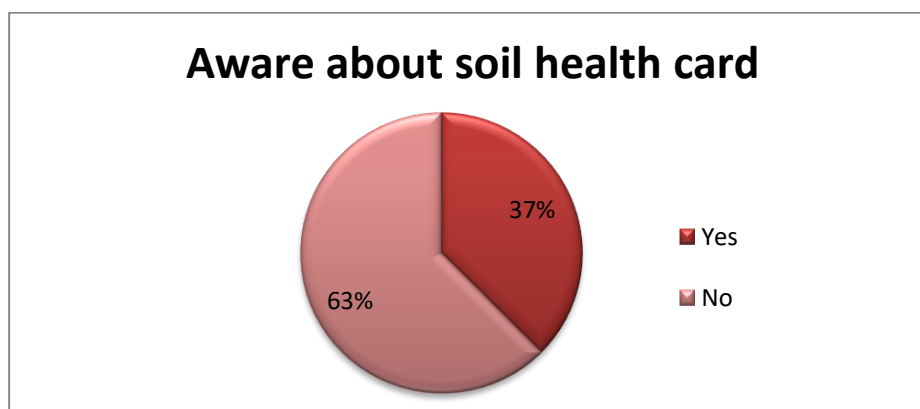


Fig: 4.3.10 Aware about soil health card

The data on awareness of soil health card are presented in Table 4.3.10 and Fig 4.3.10. It is clear that only 37 percent farmers of the study area were aware about the soil health card while the rest 63 percent were not aware about the soil health card.

4.3.11 Source of mass media

Table 4.3.11 Source of media

Source of mass media	Number of respondents(n=40)	Percentage
Television	2	5.00%
Radio	5	12.00%
Newspaper	3	8.00%
Internet	2	5.00%
Training	28	70.00%

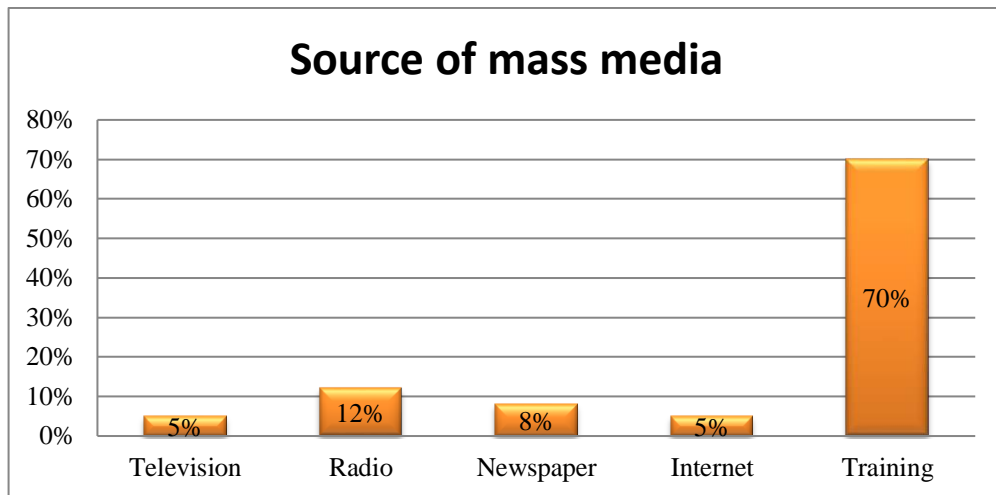


Fig: 4.3.11 Source of mass media

The data presented in Table 4.3.11 and Fig 4.3.11 provide information related to source of mass media possessed by the farmers of the study area and from the data it is clear that 70 % of the farmers received information through group or SHG meeting, 12% farmers use radio as the source of mass media , for 8% farmers the source of mass media where newspaper, 5% farmers possessed television to receive information and the rest 5% farmers had access to internet facility as source of mass media to receive information.

CHAPTER-5

SUMMARY AND CONCLUSION

From the field visit of Bedo and Angara and interaction with farmers of Bhadri & jamtoli village it was clear that through the business of moringa dry leaves production, with the training, help & guidance provided to them by JSLPS, but they still lacked adequate facility, access to proper storage facility, proper market to sell their produce and proper information related to atmosphere and adequate weather conditions for production and storage of moringa dry leaves. Hence, focus should be given on market linkage activity and dispersement of proper information at the right time to the farmers for upliftment of this sector/business.

- It is clear that only 50% of the farmers have access to very good quality of seed.
- Only 13% of farmers had proper knowledge about cultivation and processing of moringa dry leaves, while 38% of farmers lacked knowledge related to dry moringa leaves.
- Only 10% farmers can maintained high quality while production of dry moringa leaves.
- Only 5% farmers, possessed proper knowledge about market value of dry moringa leaves.
- Most of the farmers 38% faced the problem of poor storage facility of the dry moringa leaves.
- Only 25% farmers possess proper information related to value addition of moringa leaves.
- The farmers were categorized into three divisions, namely progressive, medium and poor farmers. The progressive farmers had a profit of 19,672₹. The medium farmers had a profit of 12,070₹ and the poor farmers earned a profit of 10,519₹ from production and marketing of the moringa dry leaves.
- Despite of the income level and total earning 25% of the population constitute of joint family.
- Most of the farmers engaged in moringa dry leaves production were either illiterate or educated till intermediate.
- Most of the farmers were marginal farmers constitution 2.5 acre land.
- Most of the farmers received income from agriculture allied activities,
- Most of the farmers were still unaware about soil health card (63%)

SUGGESTION

Following suggestion are proposed based on the survey work of the project:

1. The trainee appointed to provide training to the farmers must possess a degree in the area of study to provide appropriate and adequate training to the farmers related to all the activities since the time of production till its sale in the market and receiving the price for produce.
2. Proper storage facility should be made available to the farmers.
3. The organization should look over the poor market condition and work to make available farmers with organized market.
4. Awareness scheme should be organized about dry moringa leaves cultivation.
5. Organization should provide good quality of seed to the farmers.
6. Moringa dry leaf production can viable economic ventures to meet the growing demand for moringa dry leaf production. Cultivation system are varied, form intensive monocropping to intercropping, from direct to cutting. It is important to make an appropriate choices according to the local context and available means.
7. The productivity of moringa in industrial plantations can be very but there is a need for continued research to find out whether, in the long term, this kind of productivity is truly sustainable.
8. Moringa should be promoted for further consumption to improve nutrition and medicinal functions and as well as for climate change mitigation.

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Constraints in production & marketing of moringa leavea

1. Production related constraints

i. Availability of quality seed for production of moringa leaves.

a) Good b) Very good c) Average d) Poor

ii. Availability of sufficient irrigation water for production of moringa leaves.

a) Good b) Very good c) Average d) Poor

iii. Availability of labour for production of moringa leaves.

a) Good b) Very good c) Average d) Poor

iv. Availability of fertilizer for production of moringa leaves.

a) Good b) Very good c) Average d) Poor

v. Knowledge about moringa leaves production.

a) Less b) Average c) More d) No knowledge

vi. Lack of equipment/machinery to process of moringa leaves.

yes/no

vii. Availability of proper drying facility for leaves.

Yes/No

viii. Maintaining quality of moringa leaves while production.

a) Low b) Moderate c) High d) No maintenance

2. Marketing related constraints

i. Knowledge about market value of moringa leaves.

a) Less b) Average c) More d) No knowledge

ii. Inadequate transportation facility.

a) Good b) Very good c) Average d) Poor

iii. Availability of marketing information.

a)Less b) Average c)More d) No knowledge

iv. Availability of storage facility.

a)Good b)Very good c)Average d)Poor

v. Inadequate packing facility.

a)Less b) Average c)More d) No knowledge

vi. Knowledge about value addition.

a)Less b) Average c)More d) No knowledge

Assessment the profit in production and marketing of moringa leaves

1. Variable cost of cultivation per hec.

S.no	Item	Quantity	Rate(₹)	Amount	Remark
1.	Land preparation				
2.	Seed				
3.	Labour (sowing, fertilizer, irrigation, harvesting, processing)				
4.	Irrigation				
5.	Organic Fertilizer				

2. Fix cost

S.no	Item	Quantity	Rate (₹)	Amount	Remark
1.	Ware house				
	Farm equipment				

3.

S.no	Item	Rate (₹)
1.	Total cost of production	

4.

S.no	Yield	Kg per tree
1.	Fresh leaves	

5.

S.no	Yield	Kg/ha
1.	Yield fresh leaves/ha	
2.	Dry leaves/ha	

6.

S.no	Item	Quantity	Rate (₹)
1.	Marketable output		
2.	Marketable return		

**SOCIO-ECONOMIC CONDITION OF THE MORINGA DRY LEVES CULTIVATOR IN
THE STUDY AREA**

Name of the farmer:

Age :

Gander :

Mob :

1.Address

Tola	
Village	
Panchayat	
Block	

2.Family Type

a) Nuclear

b) Joint

3. Family Size

Member	Number
Male	
Female	
Child	

4. Education level

Illiterate		Middle school		Intermediate	
High school		Graduate & above			

5. Land Holding _____ Acres

- a) Landless b) Marginal c) Small
 d) Semi- medium e) Medium e) Large

6. Occupation

- a) Agriculture & allied b) Labor c) Both d) other

7. Type of house:

- a) kaccha b) Pakka c) Semi-pakka

8. source of light:

- a) Eletricity b) Solar lamp c) Kerosene d) Gas e) other

9. Water facility:

- a) Own/public b) River c) Community well d) Government

10. Types of sanitation facility:

- a) Own toilet room b) Share facility of any kind c) Open air defecation

11. Assets:

S.no	Item	Yes	No	If yes ,Number
1.	Tractor			
2.	Power tillage			
3.	Thresher			
4.	Plough			
5.	Motorcycle			
6.	Cycle			
7.	Television			
8.	Phone			
9.	Irrigation equipments			

12. live stock:

S.no	Item	Yes	No	If yes ,Number
1.	Cow			
2.	Ox			
3.	Buffalo			
4.	Poultry			

13. Seed used:

a) Seed of last year b)Purchase from the market c)Hybrid seed d)
JSLPS

14. Irrigation:

a) Well b) Well+river c) Pond d)pond+rain
e)Rain f)River

15. Are you aware about soil health card.

a)Yes b)No

16. Source of mass media:

a)Television b) Radio c) Newspaper d)Internet
e) Training

17. Estimated annual income from crop:

S.No	Income source	Yes /No	Rs.
1.	Agricultural & allied		
2.	Moringa leaves		
3.	Other		