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Betelvine Farming in Agricultural Economy: A Study of Bhograi Block in Odisha

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Abstract: Betelvine cultivation provides livelihood income to the rural farmers throughout the year from a small piece of land. It is a good crop; as because it is useful for social, cultural, religious, medicinal purposes. It has good market throughout the world. Bhograi block under the state of Odisha is famous for its favourable climate for agriculture and especially Betelvine(Pann), Fish(Mina) and Paddy(Dhana). This work highlights the betelvine farming under Bhograi block. It studied how betelvine farming contributed for rural economy of Bhograi in particular and state of Odisha in general. By interaction with the farmers the researcher experienced the problems faced by betelvine farmers presently regarding production, marketing, and also some general constraints. The work is produced by the data from both primary and secondary sources. And to make it more scientific, both quantitative and qualitative methods are applied. From the work, it is experienced that the infrastructural assistance provided by the Government are not sufficient enough. It is also experienced that there is inaction of the government for its development and preservation during natural disasters and post natural disaster period. In the study, the researcher suggested some measures out of which recognition of betelvine (Pann) and tigertail (Khadi) as agricultural produce and insurance of these are important.

Keywords: Betelvine, Agriculture, Pann Baraja, Livelihood, Economy, Government.

INTRODUCTION

Agriculture plays a vital role in the Indian economy. Over 70 per cent of the rural households depend on agriculture. Agriculture is an important sector of Indian economy as it contributes about 17% to the total GDP and provides employment to over 60% of the population (Arjun, K. M. 2013). Out of many agricultural activities betel vine cultivation is a type of agricultural activities which provided livelihood for the rural farmers. Farmers collected seasonal income from other crops, while betel vine cultivation produced income throughout the year from a small piece of land. By this it can reduce poverty & unemployment level. Beyond economic benefits; it has social, cultural, religious and physiological importance in the society. Hence, betel leaf is called as the "Golden heart of nature". Betel leaf popularly known as "Pann" in India and the betel vine leaves are in deep green colour with heart shape which is widely used in India and the scientific name of betel vine is piper betels. "Pann" belongs to the family of piperaceac. There are more than 90 varieties of betel vine in the world, of which about 45 are found in India. It is also known as Nagaballi, Nagurvel, Saptaseera, Sompatra, Tamalapaku, Tambul, Tambuli, Vaksha Patra, Vettilai, Voojangalata etc in different parts of the country (Guha, P., & Jain, R. K. 1997). Further, Pann /Betel leaf has good export potential and India exports betel leaf to the neighboring countries with rich foreign exchange. From a small Boroj of about three decimal area one can generate employment opportunity for an agricultural worker throughout the year helping him to maintain his family (Bhowmick. S. 1997). Further, as far as the national employment generation is concerned, it is estimated that about 20 million people derive their livelihood directly or indirectly, partly or fully from production, processing, handling, transportation and marketing of betel leaves in India (Jana, B. L. 1996). Betel vine cultivation is highly Labour intensive and particularly suited to small holdings. Once established, a betel vine becomes a perennial source of employment and income for farmers to meet their daily requirements. Betel leaf is grown as a cash crop in southern parts of India, mostly in the states of AP, Telangana, Karnataka, Kerala, and Tamil Nadu, Odisha. Betel leaf is also cultivated in Bihar, Assam, Madhya Pradesh, Maharashtra, Tripura, Uttar Pradesh, and West Bengal. In Odisha basically four types of betel leaf are cultivated. These are Nova Cuttak, GodiBangala, Sanchi and Birkoli varieties. In the study area peoples are cultivated only one variety that is GodiBangala (Bhainchigodi). Odisha is one of the major producing states of betel vine. The betel cultivation is mostly done in the coastal districts of Puri, Balasore, Jagatsinghpur, Ganjam and Khurda in Odisha.Further, in the district of Balasore, Bhograi block is renowned in the country for its betel vine cultivation. Having realised the significance of this cultivation, the problem and prospects the researchers have undertaken this work in the Bhograi block as the study area.

Research Problem

The past has proved betel vine cultivation has contributed a lot to rural agricultural economy of Bhograi Block of Odisha. The place was/is famous for supplying betel leaf to outside the state and country. But presently, this betel vine (Pann) cultivation is hindered with many problems like frequent loss of the farmers due to natural calamities, lack of promotion to this cultivation, lack of governmental assistance, increasing popularity and easy excess to Gutkha, migration of local youth to other areas be allured by easy money etc... Hence, with the expectation of revamping and rejuvenating again the Pann cultivation; the present researcher tried to highlight the problems faced by the cultivation anticipating some constructive measures.

Hypotheses

- Whether Betel farming contributes for the development of rural economy of Bhograi.
- Whether Government takes any measures for development of betel farming in Bhograi block in Odisha.

OBJECTIVE

- To study the conceptual and historical background of the betel leaf cultivation.
- To examine the economic status of the betel leaf cultivators under the study area.
- To study and analyze the governmental measures taken and followed up to develop the betel leaf farming in the block.

RESEARCH METHODOLOGY

This work is based on both theoretical and filed work. The theoretical aspect of the works is based on secondary data from the books, articles in Journals, Newspaper, reports, internet sources etc. The primary data have been collected on the basis of interview method, group discussion and PRA (Participatory Rural Appraisal). For interview, printed structured schedules of questions have been administered on the respondents i.e. Pann cultivators, who are also lowest sample units in the sample area. The researcher has used purposive random sampling design and the sample size is limited to 115 from entire block. The collected data are coded, tabulated and analyzed through the computer and the SPSS software (Statistical Package for Social Science) by using simple statistics like percentage, mean, median and standard deviation etc. In short, the work has become scientific, behavioral and triangular.

Significance of the Study

Betel leaf farming is profitable which contributes a lot to the rural economy. Beyond economic benefits; it has social, cultural, religious and physiological importance in the society. In this away **"**Pann" have multi-dimensional significances. But presently, the cultivators hurdled with many problems which need to be exposed for its rejuvenation. Hence, this work is very significant.

LITERATURE REVIEW

The aim of the literature review is to discover what available knowledge exists related to the present research topic. It helps to find research gaps in published research works on the concerned topic that may generate new original ideas in the present research. The present researcher has undertaken an ideal amount of books, articles etc. for literature review and tried to find out the research gap.

(Sahoo, M., & Sahoo, D. R. 2017) in their work 'Betel Leaf Cultivation in Odisha: Problems and Prospects'**,** stated that betel cultivation can be a viable source of livelihood for rural households as the profit margin is very high. But while cultivation, it has been found that farmers encountered various problems relating to production and marketing such as lack of soil moisture (drought), insufficient water supply, occurrence of natural calamities, disease and pest attack, non-availability of skilled labour, high labour cost, lack of storage facilities, transportation facilities, large number of intermediaries, lack of export promotional activities etc. Besides, betel cultivators also face some general problems like lack of research centre in the area, non-availability of loan facilities, betel crop insurance, subsidies during natural calamities etc. (Patra, B., & Pradhan, S. N. 2018) in their work "A study on socio-economic aspects of betel vine cultivation of Bhogarai area of Balasore District, Odisha," emphasize on well coordination between farmers, traders, scientists, administrators and policy makers initiated to boost up the national economy through proper exploration of this leaves. The central and state government should jointly take necessary steps to improve pest management of betel farm activities and also establish a research and development board for awareness among betel growers. (Jana, H. 2016) in his work 'Betelvine cultivation: Importance in Indian perspective' asserted on development board to enhance export oriented activities with regard to global standards, to reduce intermediaries in marketing; to stabilize the betel prices; to increase the area under betel farm cultivation and to raise awareness among betel growers. These initiatives will enable India's betel leaf crop to contribute a significant portion to India's foreign trade in the near future. (Jana, B. L. 1996) in his paper "Improved technology for betel leaf cultivation' held that the vast economic potentiality of the crop can be adequately established by the fact that about 15-20 million people consume betel leaves in India on a regular basis. (Guha, P. 2006) in his article 'Betel Leaf: The Neglected Green Gold of India' commented that the economic aspect of the crop evidently proves that betel leaf is one of the most promising commercial crops capable of attracting substantial amount of foreign exchange to the country. This adequately justifies its nomenclature as the "Green Gold of India".

Research Gap

The available literatures have covered economic aspect of betel vine cultivation highlighting its profitable characteristics and especially with a macroscopic focus. But the present work is focused on microscopic study. The present researcher tried to plug that gap.

Conceptual Framework

Betel vine (Piper betle L.) belongs to Genus Piper of the family Piperaceae. There are about 200 varieties of betel vine in the world, of which about 40 are found in India The crop is grown in India, Sri Lanka, Malaysia, Philippines, Thailand, Taiwan and other Southeast Asian countries (Sharma, M. L. *et al.*, 1996). The probable places of origin of betelvine are India, SriLanka, Malaysia and Indonesia (Jana, H. 2016). Betel vine has been cultivated for its leaf since time immemorial in India. Betel vine, commonly known as Pan (Piper betel Linn.) is a perennial, dioecious, evergreen creeper, cultivated in moist, tropical and sub-tropical regions of India. India has a long ancient history of betelvine culture as mentioned in Atharva Veda. The betel leaf occupies a significant place in everyday life of Indian people as it is used in rituals and in Indian system of medicine as cure for many diseases and disorders. It is the most important commercial crop and also most profitable amongst all cultivated crops which plays a vital role in the overall livelihood security of farm families. It offers perennial employment and income to small and marginal farming community because of its capital and labour intensive characteristics. Betelvine cultivation is highly intensive and particularly suited to small holding may be 5 to 10 decimal land. It is an important cash crop of Andhra Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. Based on shape, size, brittleness and taste of leaf blade, betelvine is classified into pungent and nonpungent varieties. Important betelvine varieties cultivated in- (a) Andhra Pradesh- Karapaku, Chennor, Tellaku, Bangla and Kalli patti (b) Assam- Assam patti, Awani pan, Bangla and Khasi pan (c) Bihar- Desi pan, Calcutta, Paton, Maghai and Bangla (d) Karnataka:- Kariyale, Mysoreale and Amdadiale (e) Kerala- Nadan, Kalkodi and Puthukodi (f) Madhya Pradesh- Desi Bangla, Calcutta and Deswari (g) Maharashtra- Kallipatti, Kapoori and Bangla(Ramtek) (g) Orissa-Godi Bangla, Nova Cuttak, Sanchi and Birkoli (i)Tamil Nadu- Pachai kodi and Vellaikodi (j) Uttar Pradesh- Deswari, Kapoori, Maghai and Bangla (k) West Bengal- Bangla, Sanchi, Mitha, Kali Bangla and Simurali Bangla. Odisha is one of the major producing states of betel vine (Acharjee, S., & Sengupta, K. 1991). The betel cultivation is mostly done in the coastal districts of Puri, Balasore, Jagatsinghpur, Ganjam and Khurda in Odisha. The farmers and consumers name the cultivars after their localities, village or towns. The cultivers Bali and Chandrakana are cultivated in Bhogarai block under the district of Balasore (Balasubrahmanyam, V. R. *et al.*, 1995). (1) Piper betle L. var. Jaleswar or Bali Pana in local vernacular is known differently as Desi Pana, Mitha Pana, Birkuli Pana whose leaves are long, thin, smell good, juice and sweet taste; (2) Piper betle L. var. Bangladeshi or Chandrakana Pana in local vernacular is known differently as Matiali Pana, Athila Pana, Raga Pana whose leaves are rounded and big, thick, smell good, pungent taste and near the petiole surface are very close (Chaveerach, A. *et al.*, 2006).

The vast economic potential of the Betel farming can be adequately established by the fact that it is consumed by millions of people and can generate direct or indirect employment opportunities millions of people in India. Besides employment creations, it also contributes to the nation in terms of foreign exchange earnings. Betel leaves has good export potential and thus is most promising commercial leafy crop capable of attracting substantial amount of foreign exchange to the country. Besides having significant medicinal properties and nutritional values, betel leaf is widely used in social, cultural and religious occasions (Sripradha, S. 2014).

Establishment of Betelvine Yard (Baraja)

Betelvine is cultivated in a hut like structure called Baraja which is made of either square or rectangular in shape. Usually a path of about one meter width is left all around the

Fig. No 1. Showing the Betelvine Yard (Pann Baraja)

Garden on the inner side of the enclosure to serve as walking space. Afterwards, beds of 100-125cm wide and as long as the entire length of side are prepared, leaving about 30 cm walking path between two adjoining beds. The side wall is strengthened and supported by bamboo poles inside the Baraja. The distance from one horizontal pole to another is about 20-25cms. The roof, side walls are generally covered

with sticks or Khadi (tigertail), paddy straw and coconut leaves etc. The height of boroj may be 7 to 8 feet. For assured water supply to the betelvine yard at least 10 decimal pond is sufficient for 5 decimal Baraja. The pond soil may be utilized for raising the Baraja site.

Establishment of New Crop

Piper betle L. is a vegetatively propagated crop. Cutting with one or two nodes along with attached leaves are generally used as the propagation material. Planting season varies from place to place. After plantation it takes about one month for root formation and sprouting. When 5-7 leaves are emerged, then plants are provided support.

Harvesting Betel Leaf

Harvesting starts after 1 year of planting by plucking the leaves. Local people term the harvests as, "Nua pan", "Jhanji pan","Jagannath pan", "Vejua pan", "Maghei pan". Nua pan is collected in mid of February-April. During this plucking time cultivators remove dry or damage leaves. Jhanji pan is collected during May-mid July. This season provides highest yield. This time cultivators remove some damaged Khadi(tigertail) or Chaee stick. Jagannath pan is collected during August-September. In this plucking; farmer selectively collects the leaves from the lower part of the branches. Vejua pan is collected during October- November. In this plucking; cultivators select the top portion of branches. Maghei pan is harvested during December-January and continued till February. In this collection all total leaves are plucked. This time sizes of Pana are too small.

The Betel Farming: Problems and Prospects

The betel vine cultivation has been widely adopted by the farmers of the locality of Bhograi particularly and India generally for good economic returns to sustain the family. Easy availability of all materials required for preparation of make shift farm house for cultivation of betel vine, locally known as "Pana Baraja", availability of manual labourers, harvesting, transporting and packing of pan leaves throughout the year encourage the farmers to do this farming. But now-a -days, the farmers of this locality are facing many problems due to the decrease in the market demand of the betel leaf due to popularity of packaged mouth fresheners like " Gutkha" both in the local and national markets. The consequence of this is the sharp decline in the commercial value of pan leaf as a result of which the betel vine cultivation is not now economically sustainable. There is increase in the price of different raw materials required for the preparation of "Pana Baraja". Many times, the farmers are facing problems to manage the diseases due to lack of proper training to save their crop. The unemployed youths of the rural area are now mostly attracted towards different cities; there is a case of shortage of manual labourers. During summer period, most of the feeding ponds of the "Pana Baraja" dry up as a result there is acute shortage of water to meet the crop demand. The "Pana Baraja" of the area has been heavily damaged during the recent tropical cyclones like Philine, Hud Hud and Amphan. Because of all these reasons, this traditional cultivation which serves as the economic back-bone of Bhogarai area is now at stake.

Problems of the Cultivator

Cultivation of betel vine is affected by many unknown diseases and insects that results in great loss for the farmers. Another problem is transportation of seedling. It invites the damage of the seedlings. The problems in marketing were transport, too many middlemen, absence of grading, fluctuating price and inadequacy of finance. The agro-biological factors limiting the production were severity of pests and diseases, inadequacy of water, soil condition, severity of rains and winds. Traditionally managed operations and untrained labour, poor planting materials are the main causes of low yield of betel leaf.

Disease Management

Three diseases are seen in betel vine, namely "Foot rot", "Leaf spot", and "Powdery mildew" (Vijayakumar, J., & Arumugam, S. 2014). The most important fungal disease caused by Phytophthora spp. (Chattopadhyay, S. B., & Maiti, S. 1990). Foot rot is harmful to the plantation. It is reported that the occurrence of foot rot caused by P. parasitica and Phythium vexans de Bery (Phythium piperinum Dastur). The description of the symptoms has been given by Dastur (Haider, M. R. *et al.*, 2013). The lamina of leaves slowly start to droop and petiole remains erect. This disease locally called 'Khada kala' or 'Khada pacha' or 'Madua'. To prevent these disease from spreading; local cultivators spray Blitox and Tegron medicine.

Leaf spot disease is caused by Fusarium semitectum Berk. et Rav. (Chattopadhyay, S. B., & Gupta, S. S. 1955). This diseases also caused by Drechslera rostrata, Cladosporium pipericola, Cercospora piperis-betle and Corynespora cassicola were reported in Madhya Pradesh and Uttar Pradesh in India (Mohanty, N. M., & Mahapatra, P. K. 1968). Leaf spot disease locally is known as 'Champa fulia' or 'Champa tipa'. Tip of the leaves seen small and rolling. When it is noticed; farmers cut diseased leaves immediately, otherwise within few days infection spread on main stem of betel vines. It also spread from one vine to another through ants and insects. This disease is seen in rainy season. To prevent these disease; the farmers spray Di-ethen-M 45 and urea water (Maiti, S., & Sen, C. 1979).

In India, it is observed that the Powdery mildew disease has been occurred in Mysore. Powdery mildew disease is mainly caused by Oidium piperis Uppal (Narasimhan, K. J. 1933). This disease is locally known as 'Jhalma'. The disease appears on the under surface of the leaves as white to light brown powdery patches. In this stage small white and black dust found in upper and

lower portion of the leaves. This is highly infectious. There is no prevention to cure this disease. Farmers spray dry fruit dust and leaf juice of Neem tree (Azadirachta indica A. Juss.) mixed with water above the leaves of the betel vine.

Impact of Betel Leaf on National Economy

The vast economic potentiality of the crop can be adequately established by the fact that about 15-20 million people consume betel leaves in India on a regular basis (Jana, B. L. 1996) besides those in other countries of the world which may include over 2 billion consumers (Jeng, J. H. *et al.,* 2002). That apart from a small Boroj of about three decimal area can generate employment opportunity for an agricultural worker throughout the year (Bhowmick, S. 1997) helping him to maintain his family. Further, as far as the national employment generation is concerned, it is estimated that about 20 million people derive their livelihood directly or indirectly, partly or fully from production, processing, handling, transportation and marketing of betel leaves in India. In this way, the crop provides a National Income to the tune of Rs 6000- 7000 million every year. The leaves are also in great demand in several other countries of the world where it is either not grown at all or the demand exceeds the local supply. Consequently, leaves worth about Rs 30-40 million are exported to the countries like Bahrain, Canada, Great Britain, Hong Kong, Italy, Kuwait, Nepal, Pakistan, Saudi Arab and many other European countries (Singh, K. K. *et al.,* 1990). This clearly indicates the foreign exchange earning potentiality of the crop, which is required to be strengthened in the interest of the nation. This may be achieved through proper research on export systems and intelligence besides modulation of the export-policy-decisions for boosting up export of betel leaves.

Uses and Benefits of Betel Leaf

The betel leaf is used generally in traditional ceremonies governing the lives of Hindus. It is used for deworming. According to traditional ayurvedic medicine, chewing areca nut and betel leaf is a good remedy against bad breath. Betel leaf has aphrodisiac properties. Betel leaf juice is credited with diuretic properties. Betel leaves are beneficial in the treatment of nervous disorders and it has analgesic and cooling properties. It can be applied to relieve intense headaches. Betel leaves are useful in pulmonary afflictions suffered in childhood and old age.

In the case of constipation in children, a suppository made of the stalk of betel leaf dipped in castor oil can be introduced in the rectum. This instantly relives constipation. Local application of the leaves is effective in treating sore throat. Betel leaves can be used to heal wounds. The herb is also an effective remedy for boils. The application of leaves smeared with oil is said to be promote the secretion of milk when applied on the breasts during lactation. Betel leaf is a popular spice in South-East Asian cooking with the leaves being used in their raw and cooked form. Leaves are so attractive; they are often used as a base for decorating platters, with food arranged on top of them. The white flower spikes of the betel plant develop into seeds/fruits that look a little like a green /brown mulberry when ripe and can be eaten; it is a tasty morsel of sweet jelly-like pulp. The edible portion is green leaf, used as masticatory along with areca nut, lime and catechu. Chewing of pan leaf is an ancient habit having existed for more than 2000 years. The pan leaf contains vit.B and C and also beneficial in accelerating the process of digestion. It also possesses antimicrobial activity due to peroxidase, nitric and secretary antibodies which offer protection against microbial proliferation in mouth so that tooth and gum decay is kept under check. The betel leaf is also used as cosmetic purposes now. – Extract of betel leaves has antioxidant property due to presence of chevibetol (CHV), allylpyrocatechol (APC) etc. Betel leaves have anti-carcinogenic properties due to presence of hydroxyl-chevicol. Betel vine is grown as an important cash crop. Betel chewing is considered as a good and cheap source of dietary calcium. Betel leaves oil has several medicinal uses. Betel leaf consumption reduces gastric pain. Betel leaf consumption increases hunger. A hot poultice of betel leaves help to reduce joint pain in arthritis. Betel leaves can be used by people who are on weight loss programme. It cures erectile dysfunction in men. Betel leaf treats ear infections. Betel leaf even treats insect-bites. Red betel leaf is said to control blood sugar levels in diabetic patients. Betel leaf juice can be applied externally on the skin to treat skin diseases like psoriasis and eczema. Betel leaves can work effectively to treat any type of skin infections caused due to bacteria and fungus. When mixed with a little amount of honey, betel leaf extract is a good remedy to treat cough. Betel leaf treats gastric ulcers. Betel leaf is used for treatment of warts. In some area of Indonesia, betel leaf chewing is a well-established tradition. It is used for elimination of body odour. It stops the bleeding of the nose and brightens up the complexion. The betel leaf when chewed produces a sense of well-being and if taken particularly after dinner it produces a pleasant effect, refreshing the mind, giving vital power and removing bad odour from the mouth.

Profile of the Study Area

Balasore is one of the coastal districts of Odisha and Bhograi is one of the coastal blocks of Balasore. It located in north-eastern part of Odisha state in India. It is situated between 20.48 N and 21.59 Latitude and between 86.16 and 87.29 East-Longitude. The study area is mainly dependent on agriculture, which is very often affected by flood, cyclone and drought. The soil is mostly clay, clay loam and sandy loam which is fertile for paddy and betel vine cultivation. The field experiment is conducted in the field of Bhogarai in 2021. The climate of the Balasore district is characterized by hot summer and high humidity during rainy season, dry winter and low diurnal range of temperature.

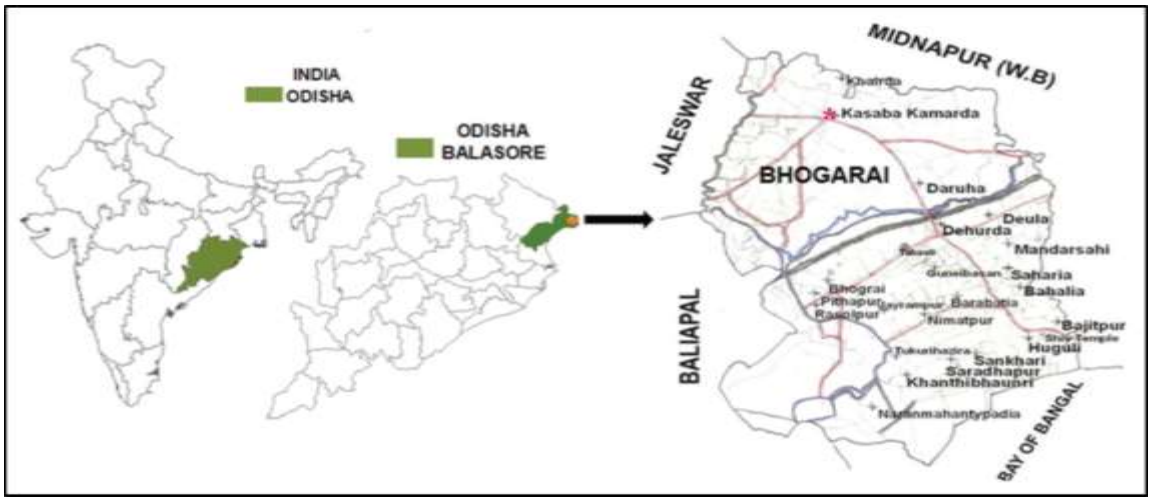


Fig. No 2. Showing the Map of the Study Area

Average monthly data of rainfall (1988-2019), maximum temperature and relative humidity (1993-2019) in Balasore have been collected and depicted in table no 2. The study area generally experiences three distinct seasons. Although the Bay of Bengal is very adjacent to the study area; the average rainfall, maximum temperature and relative humidity in study area was 1714.0 mm, 32 °C, 71.5 % respectively. It has been studied that the highest average of maximum temperature is 36.73 °C in the month of May in the study area (Dibiat, N., & Jena, D. 2020).

Findings and Analysis

In this project work the researcher has many findings to his credit. He has tested the concerned hypotheses on the basis of the data collected in the field study. He has tried his best to study the perceptions of the respondents i.e. betel leaf farmers, public officials, private servants, self-employed, daily labourers, farmers, house wives etc, of Bhograi block under the district of Balasore to analyze the problems and prospects of the betel farming. They collected data from 115 respondents cautiously and systematically.

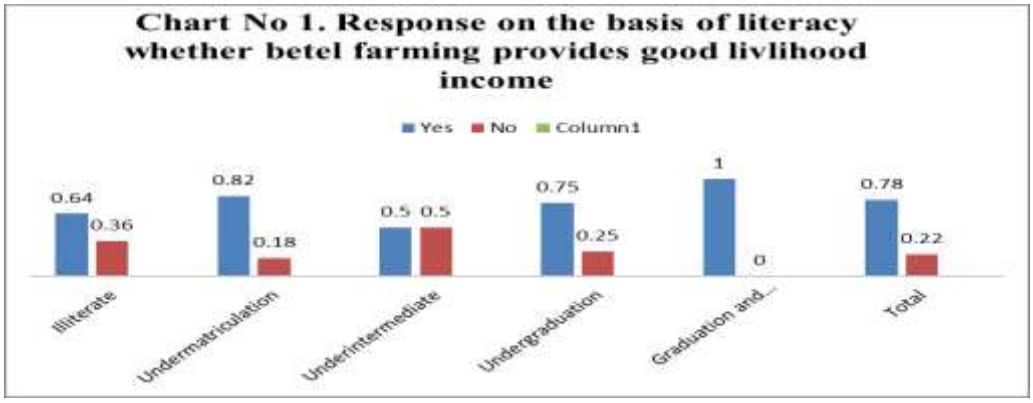
The researcher to prove or disprove the hypothesis No 1, i.e. whether betel farming provides good livelihood income, has tried to unearth the truth. He asked a question to the respondent i.e.whether he/she gets good livelihood income throughout the year from the betel farming. For that purpose the researcher interviewed 73 betel farmers of which 61(83.56%) answered with "Yes" but a negligent numbers of farmers i.e. 12(16.44%) desperately responded with "No". Again, out of 7 daily labourers, 6(85.71) agreed that betel farming gives a good livelihood income whereas only a negligible number of daily labourer i. 1(14.29%) was not agreed that betel vine farming provides a good livelihood income. Further, out of 20 housewives those who are involved in the farming and very well know about the income from the Pann Baraja 14(70%)

	Do you get livelihood income from betel agriculture?		
	Yes	No	**Total**
Respondents			
Government Servant	6(60)	4(40)	**10(100)**
Private Servant	2(66.66)	1(33.34)	**3(100)**
Self-employed	1(50)	1(50)	**2(100)**
Daily labourer	6(85.71)	1(14.29)	**7(100)**
Farmer	61(83.56)	12(16.44)	**73(100)**
House wife	14(70)	6(30)	**20(100)**
Total	**90(78.26)**	**25(21.74)**	**115(100)**

(The figures in parenthesis denote percentage)

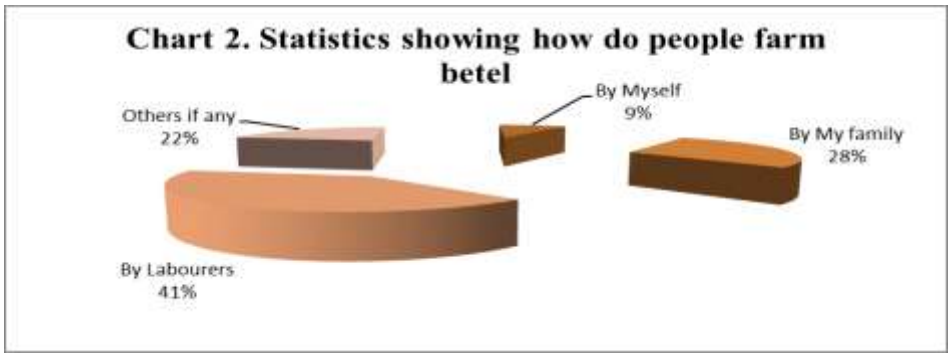
Asserted that there is good livelihood income whereas only 6(30%) rejected of getting good Livelihood income from the Pann Baraja. Over all out of 115 respondents 90(78.26%) confirmed with "Yes" whereas only 25(21.74) rejected with "No" of having a good livelihood income from Pann Baraja. From this statistics, it is crystal clear that betel farming is a good source of income not only for farmers but also for the daily wagers and housewives those who work in the Baraja part time and it has definitely contributes to rural economy of Bhograi in particular and India in general.

Further, the researcher also tried to prove the hypothesis on the education status of the respondents. The statistics have been shown in the chart No 1.

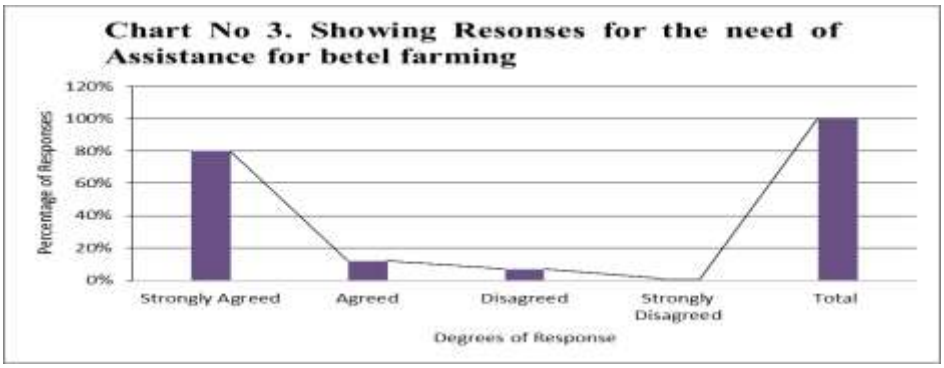


From the chart it is found that, even majority of illiterate respondents i.e. 64% asserted that betel farming provides a good livelihood income. Likewise, 82%, 50%, 75% and 100% respondents from the group of matriculation, intermediate, under graduation and graduation and above respectively opined that betel farming is a good source of livelihood income.

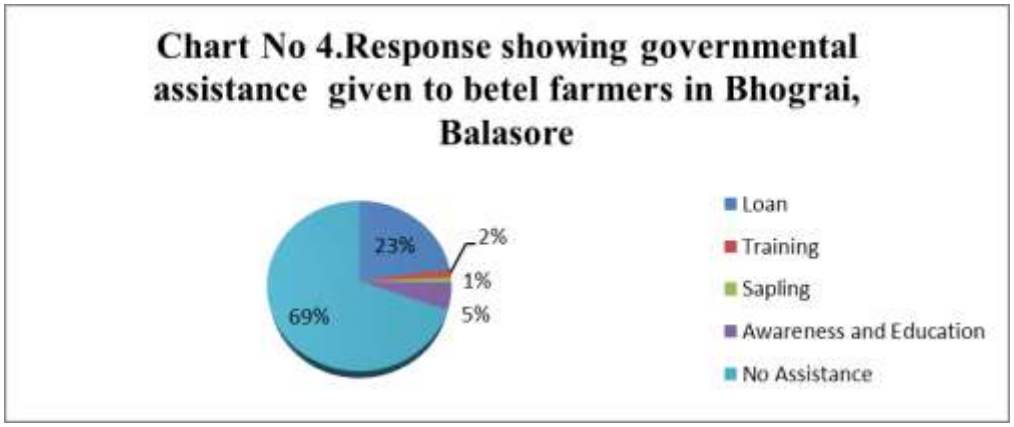
The betel farming is very much adoptive as because of feasible physiographical advantages of the Bhograi area and suitability to harness the labour of family members as part time workers. For the second reason the sole farmer is relaxed and the crop becomes as shared property of all the members some extent. The details of the persons doing betel farming is given in the Chart No 2.



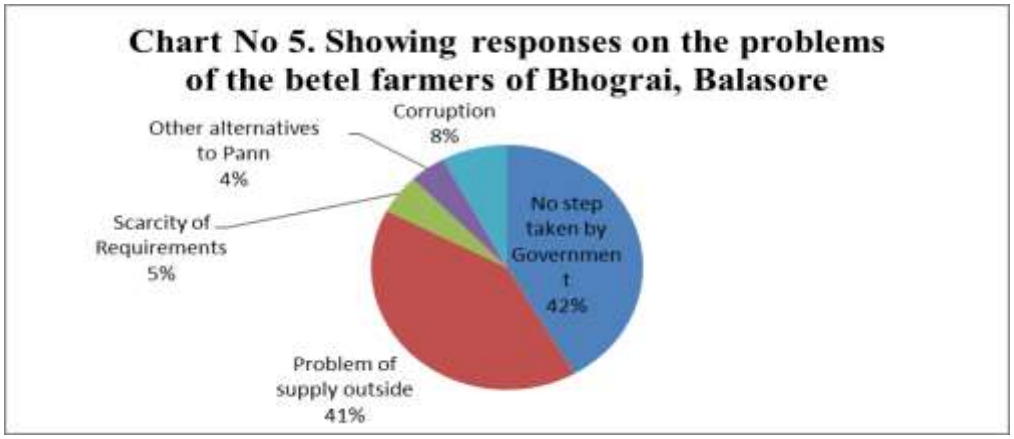
From the group discussion with the farmers it was revealed that the profit from the betel farming has been decreased significantly in comparision to earlier due to the factors like various noble diseases, preservation, readymade 'gutkha", natural calamities, transport problem especially during covid 19 pandemic, intermediaries etc. Hence they are very desparate for such cultivation. To know their reaction for probable assistance the researcher asked for their opinion which has been shown in chart No 3.



From their reaction it was confirmed that 92(80%) respondents "Strongly Agreed" for assistance from the government whereas 14(12%) revealed their perception as "agreed". At the same time 8(7%) and 1(1%) people "Disagreed" and "Strongly Disagreed" for assistance of the government respectively.



Again, the researcher enquired about the governmental assistance so far to the betel farmers by analyzing the responses of the respondents. By the interview, it is experienced that 26(22.6%) respondents responded that government provide loan to the farmers. By enquiry it is known that only by a special resolution Balasore Bhadrak Central Cooperatve Societies Ltd. Provide loan without subsidy and with high rate of interest.Further, 2(1.7%), 1(0.9%), 6(5.2%) respondents answered that assistance is given in the form of training, sapling and awareness and education respectively. Further, it is pathetic that out of 115, 80(69.6%) with all their resentment manifested that there is no assistance from the government. It is ridiculed that out of near about 1200 farmers in Bhograi only 100 farmers were given at the rate of only Rs 2000/- after damage of Pann Baraja due to cyclone Amphan.



Further, to have some suggestions for the development the researcher has enquired about the problems faced by the farmers. It is pertinent to mention that, the data have been collected during 2021 whenever the covid 19 has already broken the spinal cord of the betel farmer in Bhograi block of Balasore. For easier understanding, the responses regarding problem has been shown in the chart no 5. In the study, 48(42%) responded that government has not taken any step for the development of the betel farmers. With frustration they blame the government for not recognizing the betel as agricultural produce for which there is no insurance, compensation, subsidy, fertilizers, pesticides, irrigation facility, training are availed to the betel farmers. But, only and only utopian dreams and promises are shown and committed by the politicians. Rather there is smell of corruption on whatever amount provided by the government. Again, 47(41%) respondents replied that supply of betel leaf is a big problem during the covid 19. It is pertinent to mention that most of the time the marginal farmers are exploited by the intermediaries. 6(5.2%) respondents complained that scarcity of requirement like tiger tail (Khadi) due to lack of promotion of the government also impacts on the betel leaf production. Other requirement like lack of cold storage affects seriously for the profit from pann farming. In the same way, the requirements like fertilizers, pesticide, use of scientific method and machine, research, training etc. seriously impact on the higher production of betel leaf. Another important problem about which the respondent talked about is easier availability alternative to betel leaf is readymade 'gutkha' 'safal' and other 'pann masala' etc. Further, 9(7.8%) respondents opined that nothing is reaching to the level of betel farmers whatever meager amount is sanctioned by the government due to corruption.

Suggestion and Conclusion

Very important step the government is to undertake is to provide recognition to betel leaf as agricultural produce which has been demanded by the people of

Bhograi time and again. This will act as key to all opening. Another important matter is Khadi farming also should be recognised as agricultural produce as because it is very important requirement for betel farming and it is hugely farmed under the block of Bhograi, Balasore. A well coordination between farmers, traders, scientists, administrators and policy makers can boost up the national economy through proper exploration of this leaves. The central and state government should jointly take necessary steps to improve pest management of betel farm activities and also establish a research and development board for awareness among betel growers. There may also be steps to reduce intermediaries in marketing to stabilize the betel prices. There is also no research based information on the effect of soil erosion due to weeding and cleaning around the betel vines. Piper betel showed valuable antibacterial activities. Market price should be decided and published frequently by the government to help the farmers. Periodic inspection of the farm is required to prevent diseases. There should be establishment of export promotion council through which betel leaves can be exported to every corner of India and outside India. Awareness of plant protection practices to control pests and diseases are required. It can be possible through the NGOs and agencies to educate the farmers. Organized credit through commercial banks for the cultivation of betel vine would help the growers from depending on the credit from traders. To achieve good yield, selection of healthy plant materials are necessary. There are need to select good quality material through new planting techniques with modern technology. The efficiency of the system can be increased by periodic inspection of the farm.

As there is no betel leaf research institute in India, diseases that afflict the plant have serious consequences and farmers are unable to contain their spread even after applying pesticides and germicides. Healthy plants are important to achieve good yields and quality betel leaves. There is a need to select good quality material and use new planting techniques. Scientific management and trained labour are the main causes of higher yield of the betel leaf. Betel leaf exports earn a significant portion of foreign exchange for the country. Yet, there is a need for proper research on export systems and gathering of market intelligence besides a continual modulation of export policy decisions to boost exports. The central and state governments should jointly take appropriate steps to improve pest management in betel farms, and establish a Betel Research and Development Board, to enhance export oriented activities with regard to global standards, reduce intermediaries in marketing; stabilize the betel prices; increase the area under betel farm cultivation and raise awareness among betel growers. These initiatives will enable India's betel leaf crop to contribute a significant portion to India's foreign trade in the near future.

Many years before, majority of people of our country depended on cultivation for their survival, livelihood and progress. That time, there were lot of limitations in cultivation even in many cases, there were no scientific technologies to cultivate the crops. Nowadays, lot of scientific technologies is there, production has increased manifold for most of the crops, lot of agricultural implements are coming in market to facilitate various agricultural operations, high demand of many commercial crops, though youth generations of our country are leaving agriculture and chasing a white colour job or simply a petty job in industry where maintaining self-respect is a matter of question and it is the breeding ground of nuclear family where depth of happiness is very confined.

Therefore, time has come to call the youths to back in agriculture. If our young generations think deeply and try to find a job in agriculture, obviously they will find it because agriculture provides variety of job opportunities. Due to liberalization, privatization and globalization, farmers have a golden opportunity to sell their products from village market to global market according to their quality and it provides an opportunity to earn more. Moreover, mobile, internet and other mass media have opened a wide door for market information and market intelligence. Due to pressure of population in our country, there is pressing need of agricultural produces to meet the domestic consumption as well as export to other countries. In this respect, crop diversification, use of seed of high yielding varieties, integrated nutrient management (INM), integrated weed management (IWD), integrated pest management (IPM), integrated disease management (IDM), adoption of drip irrigation, proper storing,

Overall value addition and market intelligence will be conducive for upliftment of economic condition of the farmers. It is equally true in case of betelvine cultivation also, because this crop is the most profitable amongst all cultivated crops. Betelvine cultivation is highly intensive and particularly suited to small holding (may be 5 to 10 decimal land). Therefore, small and marginal farmers also have an opportunity to engulf this technique of cultivation. Therefore, public and private extension agencies who are working at grass-root levels must aware the farmers about the importance of betelvine cultivation through various extension teaching methods.

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