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Reviving Shgs For Income Generating Activities Through Value Addition Of Momordica Dioica; An Underutilized NTFP In Tribal Dominated Area In Sirohi District Of Rajasthan (India)

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Abstract: ***A self-help group (SHG) is a village-based financial intermediary committee usually composed of 10–20 local women or men. A mixed group is generally not preferred. Most self-help groups are located in India, though SHGs can be found in other countries, especially in South Asia and Southeast Asia. Members make small regular savings contributions over a few months until there is enough capital in the group to begin lending. Funds may then be lent back to the members or to others in the village for any purpose. In India, many SHGs are 'linked' to banks for the delivery of micro-credit.***

The main objective of this programme is to bring the beneficiaries above the poverty line by providing income generating assets to them through bank credit and government subsidy. The Self-Help Groups (SHPs) are the major component of this scheme.

Based on the fact, value addition of nutritionally rich and medicinally important underutilized species of the region Momordica dioica was carried out for enhanced livelihood opportunities of tribal women's in Jamboori village of Abu road block in Sirohi district of Rajasthan. The drying and storage methods were standardized from 2014-16 and a demonstration cum training programme was organized to acquaint Bhurki Devi Mahila SHG, Jamboori. A good response was obtained from the members of SHG during this demonstration cum training programme. Besides, the group is also engaged in poultry activity introduced by Prabhu Foundation, Sirohi.

I. INTRODUCTION

Women are a vital part of the Indian Economy, both at the national and the household levels. They make one-third of the national labour force. Compared with their menfolk, Indian women contribute a much larger share of their earnings to basic family maintenance with the result that women's earnings positively and immediately affect the incidence and the security of poverty.

Despite all this, social conventions and gender ideology deprive them of the access to, and control over, the resources which would enable them to increase their productivity. Women form the backbone of agricultural operations and majority of agricultural labourers are woman. Seventy to eighty percent of the field work is done by women.

Most post-harvest and processing tasks are their sole responsibility. They are heavily involved in animal husbandry, particularly small livestock. About 85 percent of persons engaged in dairy production are women. Since independence, government's policy on women's development has taken varying types of emphasis: from the initial welfare oriented approach to the current focus on development and empowerment.

The planning commission of India, with the aim of converging the benefits in the social and economic development sectors for women in the Ninth plan, envisaged "inclusion of an identifiable women component plan in the programmes of the respective ministries right from the planning process, and to monitoring and implementation of programmes to ensure the reach of benefits to women".

The Ninth Plan Document (1997-2000) also laid emphasis on the participation of people in the planning process, and the promotion of self-help groups. Self-Help Group (SHG) is a homogeneous group of poor, women. This group is a voluntary one formed on areas of common interest so that they can think, organize and operate for their development.

Based on the fact, value addition of nutritionally rich and medicinally important underutilized species of the region *Momordica dioica* was carried out by Bhurki Devi Mahila Self Help Group for enhanced livelihood opportunities of tribal women's in Jamboori village of Abu road block in Sirohi district of Rajasthan. The group consists of 11 members and two facilitators and has a bank account.

II. BACKGROUND OF THE STUDY

Non-wood forest products (NWFPs) are goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. Non-timber forest products (NTFPs), another term frequently used to cover this vast array of animal and plant products, also include small wood and fuelwood. In India over 50 million people are dependent on NTFPs for their subsistence and cash income (Maithani, 1994; Hegde et al., 1996; Tejaswi, 2008). Around 50 % of forest revenues and 70 % of forest based export income of the country comes from NTFPs. Thus it can be depicted that NTFPs form one of the mainstays of income and sustenance for many tribal communities (Rao, 1987; Gauraha, 1992; Chopra, 1993; Mallik, 2000; Tripathi, 2016).

Furthermore, the harvesting and consumption of natural forest products is often a significant component in the lives of people who live in forest fringe villages. Forest-user communities across the country, depend on forests for fuel-wood, fodder, small timber and NTFPs. Though most NTFPs are sold by collectors in the raw form and yield poor returns. Incomes could be significantly raised by simple value addition options carried out at household or community level .Therefore, value addition activities of *M. dioica* was carried out through SHG members for better economic returns to the community.

III. STUDY AREA

Village Jamboori is among one of the 24 tribal dominated villages of Abu road block of Sirohi district in Rajasthan, India and is located in N=24^0 23. 621' and E=072^0 55.151'. Jamboori is a large village located in Abu Road of Sirohi district, Rajasthan with total 402 families residing. The Jamboori village has population of 2419 of which 1230 are males while 1189 are females as per Population Census 2011. Average Sex Ratio is 967 which is higher than Rajasthan state average of 928. Child Sex Ratio as per 2011 census is 895, higher than Rajasthan average of 888. Jamboori village has lower literacy rate compared to Rajasthan. In 2011, literacy rate of Jamboori village was 25.13 % compared to 66.11 % of Rajasthan. In Jamboori Male literacy stands at 34.68 % while female literacy rate was 15.52 %. As per constitution of India and Panchyati Raaj Act, Jamboori village is administrated by Sarpanch (Head of Village) who is elected representative of village. In Jamboori village, most of the village population is from Schedule Tribe (ST). Schedule Tribe (ST) constitutes 99.83 % of total population in Jamboori village. There is no population of Schedule Caste (SC) in Jamboori village of Sirohi.

In Jamboori village out of total population, 1019 were engaged in work activities. 41.71 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 58.29 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1019 workers engaged in Main Work, 265 were cultivators (owner or co-owner) while 49 were Agricultural labourer.

IV. LIVELIHOOD SYSTEMS:

Livelihood systems in the study area is complex. Agriculture and daily labour are the major source of livelihood. Bull farming is mostly practiced as the agriculture fields are situated on hilly terrain where mechanized farming can not be done. People in the area work as daily labourer but also visit to Abu Road, Koteshwer, Ambaji etc. in absence of the labour opportunity in nearby village. After agriculture and daily labourer, NTFP collection and selling is their source of livelihood which is nearly a year round activity even in the lean periods i.e. in April-May when there is no employment in Agriculture. Out of 24 tribal dominated villages *Jatropha curcas* (seeds) and *Diospyros melanoxylon* (fruits) are collected in 20 villages whereas *Momordica dioica*(fruits) and *Phoenix* (fruits) are collected in 16 and 12 villages respectively. Other NTFPs like Aritha seeds, Kaith fruits, Puar seeds, Kanji seeds etc. are collected in small quantities and have significant contribution in local market where as Aonla, Ber, Sitapha, Mahua flowers and seeds, Palash leaves and flowers etc. are consumed mainly for household purpose. Fuelwood is the only source of cooking and is being extracted from nearby forest. On average NTFPs contributes about 17% of the total income. However, the contribution ranges from 10-30% to different families (Table-1). On an average household collection ranges from 1500-2500 Kg annually (Tripathi, 2016).

Animal husbandry is also one of the important source of livelihood. Every family has one or two cows/buffaloes and 5-10 goats but the milk production from cows is very low i.e. 1-1.5 litres per day. People usually do not sell milk and they use it for household consumption. However, the sale of goat and poultry fetches some money (about 1000- 1500) every year. *Zea mays* (Maize), *Triticum aestivum* (Wheat), *Cajanus cajan* (Tuar), *Phaseolus vulgaris* (Chanwla/Lobia), *Cicer arientinum* (Chana/gram), Vegetables, *Ricinus Communis* (Arandi/castor), *Cyamopsis tetragonoloba* (Gawar), *Brassica juncea* (Raida), *Brassica campestric* (Mustard) are some of the important crops that are cultivated in the study villages (Tripathi and Arya,2016).

V. ABOUT THE SPECIES

Momordica dioica Roxb. ex. Willd is a perennial, dioceous climbing creeper belonging to family Cucurbitaceae. Its common name is Parora, kankoda . It has commercial importance and is exported. Indira Kankoda I (RMF 37) is a new commercial variety of Kankoda which is resistant to all major pests and insects and is cultivated commercially in the states of Chhattisgarh, Orissa, Uttar Pradesh, Maharashtra and Jharkhand. Many parts of Meghalaya also produce these vegetables. However, the tribals of Abu road area in Sirohi district of Rajasthan do not practice commercial farming but collect *M. dioica* fruits from their farm bund and consumes them as vegetable. On an average, tribals annually collect 30.75 ton of *M. dioica* fruits with prevailing cost of Rs. Rs.40-80/kg. It has high food value containing high amount of carotene among the cucurbitaceous vegetables and high amount of protein and fair amount of phosphorus, calcium and iron. It is a cheap source of vitamins and minerals. If kankoda seeds are once sown in the field, tubers sprout at the onset of monsoon every year. A good green yield can be harvested every year and up to five-six years from the same tubers or plants. On the other front, due to lack of organized cultivation practices, short harvesting period, low yield, tuber dormancy and lack of standard propagation and drying and storage methods, studies on improved post harvest methods is required so as to make it available throughout the year for tribals.

HABITAT

Kankoda is a warm and low humid season crop. This crop requires good sunshine for better growth and yield. The optimum temperature of 27 °C to 32 °C is suitable for its cultivation. Spine gourd/Kankoda can be grown on sandy loam to clay soils with pH value of 5.5 to 7.0. Soils with well drainage and good organic matter are best for it cultivation. Propagation in spine gourd farming can be done through seeds or tubers.

Every part of the creeper possesses medicinal properties and used by tribal folk to cure various ailments.

VI. MATERIALS AND METHODS

Fresh fruits were collected in September 2014 from tribal belt of Abu Road area in Sirohi district in Rajasthan. The collected plant material was placed in a polyethylene bag to prevent loss of moisture during transportation to the laboratory. The experiments were repeated in 2015.

PREPARATION OF THE PLANT MATERIALS FOR STORAGE

Next day, fruits were washed with distilled water and dried at room temperature (to remove residual moisture, then placed in paper envelope and left overnight. Next day, fruits were cut as raw, boiled, boiled with salt (1Kg. for each treatment) and then sun dried in plastic trays for three days.

The sun dried fruits were then kept for storage in five types of containers viz. earthen pot, steel, aluminum, glass, and plastic. The study is under way. The best results obtained so far for storage are- earthen pots, plastic and glass containers.

DETERMINATION OF CRUDE PROTEIN AND CARBOHYDRATES/ SUGAR

Kjeldahl method was used to determine the nitrogen content of the 2 g of dried fruits stem Crude protein was estimated by multiplying the value obtained for percentage nitrogen content by a factor of 6.25 (AOAC, 1990). Carbohydrates/ sugar estimation was carried out by Phenol-sulphuric acid method.

VII. RESULT AND DISCUSSION

It has high food value containing high amount of carotene among the cucurbitaceous vegetables and high amount of protein and fair amount of phosphorus, calcium and iron. It is a cheap source of vitamins and minerals. The reported average nutritional value per 100 g edible fruit contain 84.1% moisture, 7.7 g carbohydrate, 3.1 g protein, 3.1 g fat, 3.0 g fibre and 1.1 g minerals (Singh et al, 2009).

In our study, the nutritional analysis for sugar and protein of stored fruits were carried out after six and twelve months of storage in each container. The results are as under-

	Crude Protein		Carbohydrate		Ash %	
Containers	Six months	Twelve months	Six months	Twelve months	Six months	Twelve months
Earthen pot	17.51± 0.35	16.90± 0.20	7.81± 0.18	7.62 ±0.15	6.88± 0.15	6.20±0.11
Aluminum	12.65± 0.10	12.28± 0.15	6.25± 0.15	6.01±0. 16	6.82± 0.11	6.12±0.14
Glass	16.05± 0.30	14.75± 0.10	7.50± 0.10	7.20 ± 0.15	9.32± 0.12	9.00±0.125
Plastic	15.16± 0.15	16.20± 0.25	7.43± 0.16	7.42±0. 14	9.32± 0.12	8.80 ±0.12

Table 1

The seeds contain 26.3% oil and fruits contain 83.5 % moisture.

VIII. DISCUSSION

Rusting on steel containers was seen after one week; therefore, they were eliminated from the experiment. After fifteen days, salt deposition was observed on outer side of the aluminum containers. Therefore, after six months the best results for proteins and sugar were obtained in earthen pot followed by glass and plastic containers. The study is under way. Further analysis will be done after 12, 18 and 24 months of storage in different containers. During storage, rusting was seen on steel containers and salt deposition was observed on aluminum containers. Therefore, considering the facilities available to the tribals of study area, it is observed that earthen pot is the best container for storage of Kankoda fruits.

IX. VALUE ADDITION IN LABORATORY

For value addition, pickle was prepared and fungal infection was not observed after six months of storage, the same process was introduced for SHG members of Jamboori village and the product was distributed among SHG members, Officers/officials of State Forest Department, Sirohi and Officers of District Industries Centre, Sirohi for sample survey about the prepared value added product. A very good response was obtained. Next year, it will be prepared on large scale and SHG would be linked to District Industries Centre (DIC) for selling of the product in various trade fares etc.

X. VALUE ADDITION BY SHG MEMBERS

To carry out activity of value addition for *M. dioica* through VFPC/SHG members and linking them with District Industries Centre for income generation, a meeting of *Bhurki Devi Self Help Group, Jamboori* was organized in Jamboori village in August, 2016 and 9 SHG members with two facilitators, 3 foresters/ forest guards from Abu Road Range (SFD, Rajasthan) and 3 representatives from AFRI, Jodhpur were present in the meeting. The members were acquainted with aims and objectives of the project and they agreed for value addition of *M. dioica.*

Introduction of value addition methods in the Model village for SHG/VFPC: For introduction of value addition methods of nutritionally rich and medicinally important *M. dioica* (Kankeda) in the Jamboori village for SHG members, organized three days training cum demonstration programme in first week of September, 2016 for members of Bhurki Devi Mahila SHG, Jamboori (constituted with the help of SFD, Rajasthan and Prabhu Foundation, Sirohi) in tribal dominated area of Abu Road (Sirohi district, Rajasthan). A very good response of SHG members was obtained in this programme.

XI. CONCLUSION

Kankoda is available for very short period but it possesses many medicinal properties, therefore, attempts are being done to enhance its shelf life. Due to lack of organized cultivation practices, short harvesting period, low yield, tuber dormancy and lack of standard propagation and drying and storage methods, further studies on drying and storage methods and value addition will definitely be very helpful to make it available for longer time. Besides, these activities will be a good source of income for SHG members in near future.

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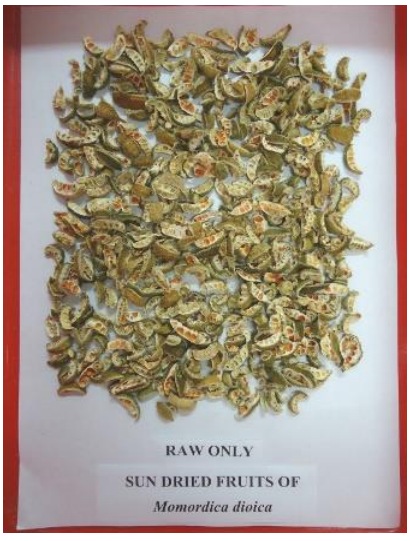
PHOTOPLATES

Selling of Momordica dioica fruits in Market

Drying for different treatments



Treatments: Raw and sun dried fruits

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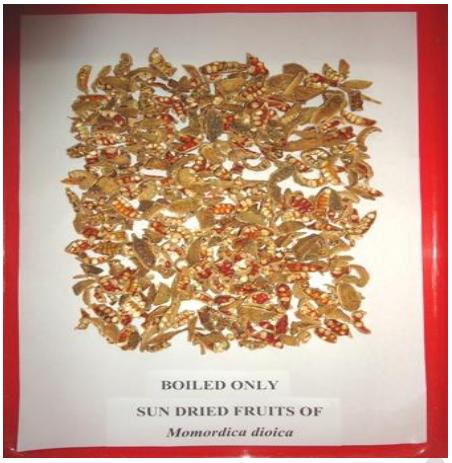
Fruits boiled with salt and sun dried



Boiled and sundried fruits

Freshly cut fruits

Passed through boiled water

Scanting off excessive water

Members of Bhurki Devi SHG in Jamboori village

Meeting with Bhurki Devi SHG in Jamboori village (August 2016)

Weighing and sorting of fruits

Cutting of fruits

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Passing through boiled water & Scanting off excessive water

Demonstration and preparation of M. dioica pickle by SHG members in tribal area of Abu Road in Rajasthan (Sept., 2016)

Various steps in pickle preparation

Prepared pickle

Packing of Pickle and distribution to SHG Members by Ms. Vandita Ranawat, IFS Probationer, Sirohi

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