Ad-hoc Research Study No.-125

Impact of Tejaswini Rural Woman Empowerment Programme on Empowerment of Rural Women through Cultivation, Processing and Marketing of Kodo-Kutki in Dindori District of Madhya Pradesh

Study Sponsored by
Madhya Pradesh Woman Finance and Development Corporation
(Government of Madhya Pradesh)

AGRO-ECONOMIC RESEARCH CENTRE
FOR MADHYA PRADESH AND CHHATTISGARH
Jawaharlal Nehru Krishi Vishwa Vidyalaya,
Jabalpur - 482 004 (M.P.)

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PROJECT TEAM

Data collection

Mr. Sateyendra Singh Thakur
Mr. Rajendra Singh Bareliya
Mr. Prem Ratan Pandey
Mr. Akhilesh kuril

Tabulation & Compilation of Data

Dr. Hemant Kumar Niranjan
Dr. Ravi Singh Chouhan

Interpretation and Report Writing

Dr. Hari Om Sharma
Dr. S. B. Nahatkar
Dr. Deepak Rathi

Study conducted by

Agro-Economic Research Centre for Madhya Pradesh and Chhattisgarh
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.)

PREFACE

The present study entitled “Impact of Tejaswini Rural Woman Empowerment Programme on Empowerment of Rural Women through Cultivation, Processing and Marketing of Kodo/Kutki in Dindori District of Madhya Pradesh” has been sponsored by Madhya Pradesh Woman Finance and Development Corporation, Government of Madhya Pradesh, Bhopal (M.P.).

The study comprises 50 SHGs Beneficiaries and 50 Non- Beneficiaries Kodo/Kutki growers of Dindori district. It is observed from the study that “Tejaswani's” SHGs played an important and significant role in upliftment of standard of living of tribal women through competent cultivation, effective processing and professional marketing of Kodo/Kutki. Although, there is still scope to increase farm women's income by reducing the yield and adoption gap in cultivation. The income of farm women will also be increased though introduction of more efficient processing and marketing techniques of different products and by products of Kodo/Kutki and also by forming the Farmer Producer’s Organization.

The present study was conducted by Dr. H. O. Sharma, Dr. S. B. Nahatkar and Dr. Deepak Rathi of this University. They have done field investigation, tabulation, analysis, interpretation and drafting of the report. I wish to express my deep sense of gratitude to team members namely; Mr. S.K. Upadhye, Dr. Ravi Singh Chouhan, Dr. Hemant Kumar Niranjan, Mr. S.S. Thakur, Mr. Rajendra Singh Bareliya, Mr. P.R. Pandey, Mr. Akhilesh Kuril and Mr. P. K. Patidar for their untiring efforts in bringing this innovative study to its perfect shape with in 3 months from the inception of the project.

On behalf of the Centre, I express deep sense of gratitude to Dr. P. K. Bisen, Hon'ble Vice-Chancellor and Chairman Advisory Body of AERC, Jabalpur, Smt. Sonali Ponkshe Vayangankar, Managing Director, Shri A. S. Bhal, Deputy Programme Director, Madhya Pradesh Woman Finance and Development Corporation, Dr. P.K. Mishra, Dean Faculty of Agriculture, Dr. Dhirendra Khare, Director Research Services, Dr. S. D. Upadhyay, Director Instruction, Dr. (Smt.) Om Gupta, Director of Extension and Dr. R. M. Sahu, Dean, College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur for providing the valuable guidance and all facilities during various stages in successful completion of this study of high importance.

I express sincere thanks to Shri Yashwant Sonwani, Add. District Project Manager Tejaswani Programme of Dindori district and their field staff for providing not only providing secondary data but also extending great assistance in collection of field data from the beneficiaries and non beneficiaries respondents.

I hope the findings and suggestions made in the study will be useful for policy makers of the State and other organizations.

Date: 15. 09.2018
Place: Jabalpur

(Hari Om Sharma)
Prof. & Director /
Nodal Officer

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CHAPTER-I

INTRODUCTION

1.1 Background

Millets are the cereals belonging to the family poaceae (Gramineae) which have small sized grain. Most common minor millets are Kodo millets (kodo), little millets (Kutki), pearl millets, sorghum, finger millets (Ragi) and small millets namely fox millets (Kangni), prosomillets (Cheena), and barnyard millets (Sawan). Kodo/Kutki millets are high in fiber content and low in calorie value. Kodo-Kutki millets are Indian origin minor millets. It is a short duration Kharif crop that grown well in warm climate, divers soil, low rainfall and in areas widely differing in thermo and photo periods. Kodo-Kutki millet quite indispensable to rainfed, tribal and hilly agriculture where crop substitution is very difficult. Kodo (*Paspalum scrobiculatum (L.)* is very nutritious crop and it is good for diabetic patients. Kodo millet is good source of phosphorus and iron. The kodo millet is known for good shelf life. The grains dried to 10-12% moisture can be stored for many years in farm homes. It is of interested to note that low incidence of constipation, ulcer, cardiovascular diseases and diabetes are reported among regular kodo millet consumers.

Utilization of this crop as food for human consumption is common among tribal community of Madhya Pradesh. The straw is often used as precious fodder for bovines and birds' feeds. The grain is consumed in traditional way and almost the entire produce is utilized at the farm/village level. Inspite of high nutritive value of grains their use is largely confined to rural areas and very little finds its way to urban market. The problem of pest and diseases in kodo millet is negligible. The nutrient composition of kodo millet (Indira and Naik, 1971) is given in table 1.1. Kodo millet is a monocot and an annual grass that grows to heights of approximately four feet. It has an inflorescence that produces 4-6 racemes that are 4–9 cm long. Its slender, light green leaves grow between 20 to 40 centimeters in length. (Fig. 1.1)

Fig. 1.1 : Field view of Kodo

Fig. 1.2 : Kodo grain

The grain are very small and ellipsoidal, being approximately 1.5 mm in width and 2 mm in length; they vary in colour from being light brown to a dark grey.(Fig. 1.2) Kodo millet has a shallow root system which may be ideal for intercropping. Kodo millet is propagated from seed, ideally in row planting instead of broadcast sowing. Kodo is better suited to dried conditions than its wild counterpart, which requires approximately 800–1200 mm of rainfall annually and is well suited to sub-humid aridity condition. With very low competition from other plants or weeds for nutrients, it can grow well in poor-nutrient soils. However, it does best in soils supplemented with a general fertilizer. Kodo millet prefers full sunlight for optimal growth, but can tolerate some partial shading. Ideal temperature for growth is 25-27 °C. It requires four months until maturity and harvesting. (Fig. 1.3)

Fig. 1.3 : Kodo rice

Little millet (Panicum sumatrense Roth. Ex. Roem. and Schultz. , Syn.: Panicum miliare) is an important small seeded crop in the family Poaceae. It is native to India and is called Indian millet. The species name is based on a specimen collected from Sumatra (Indonesia). Its colloquial names are Kutki, Samai, Samalu and Same. The crop is strongly associated with tribal agriculture and grown as important catch crop. The green plant can also be used in part as cattle feed. It is mainly cultivated in the Caucasus, China, East Asia, India, and Malaysia. Little millet is adapted to both temperate and tropical climates. Little millet has long history of

Table 1.1: Nutrient composition of kodo-kutki as compared to other cereals (100g)

Crop / Nutrient	Protein (g)	Fat (g)	Fiber (g)	Minerals (g)	Iron(mg)	Calcium (mg)	Calories (kcal)
Pearl Millet	10.6	4.8	1.3	2.3	16.9	38	378
Finger Millet	7.3	1.5	3.6	2.7	3.9	344	336
Foxtail Millet	12.3	4	8	3.3	2.8	31	473
Kodo Millet	8.3	3.6	9	2.6	0.5	27	309
Little Millet (Kutki)	7.7	5.2	7.6	1.5	9.3	17	207
Barnyard Millet	11.2	3.9	10.1	4.4	15.2	11	342
Sorghum	10.4	3.1	2	1.6	5.4	25	329
Proso Millet	12.5	2.9	2.2	1.9	0.8	14	356
Rice	6.8	2.7	0.2	0.6	0.7	10	362
Wheat	11.8	2	1.2	1.5	5.3	41	348

Sources : National Institute of Nutrition (NIN), Hyderabad

Fig. 1.4 : Inflorescence of Kutki

cultivation of more than thousand years and grown in many states. It is widely cultivated as a cereal across India, Nepal, and western Myanmar. In India, crop is cultivated in Tamil Nadu, Andhra Pradesh, Maharashtra, Jharkhand, Madhya Pradesh, Odisha, Chhattisgarh and Gujrat. In India, the crop is grown in an area of 291 thousand hectares with annual production of 102 thousand tones and 349 kg ha-1 productivity. Madhya Pradesh ranks second in area of little millet after kodo millet , where the crop is cultivated in 42.68 thousand hectares with average yield of 520 kg ha-1 during 2015-16 (www.landrecords.mp.gov.in).

It is an annual herbaceous plant growing 30 – 200 cm tall with erect or geniculate culms.. Special forms of this variable species have been selected for cultivation in the drier parts of the tropics, especially tropical Asia. Plants with a denser and more profuse panicle, which droops at maturity under the weight of the spikelet's are grown as a cereal crop. (Fig. 1.4)

It prefers a mean annual rainfall in the range of 350 – 500 mm, but tolerates 150 - 1,200 mm. The plant can withstand both drought and water logging. The crop prefers a pH in the range 5.5 - 6.2.The crop can be cultivated in all types of soils and sustains adverse climatic conditions. Plants can produce a crop even on very poor soils. They are usually sown together with a major cereal. The plant can mature a crop in 75 - 150 days from sowing the seed. The harvest yield is from 230 to 2000 kg/ha depending upon agronomic management.

Little millet tends be confused with common millet, but it is generally shorter and has smaller panicles and seeds than common millets. Mixed with wheat Kodo is a good diet for diabetes patients. Protein-rich Kutki too is a good grain substitute for diabetics. It has 20 per cent less carbohydrate than rice and wheat (Table 1.1). The plant varies in height between 30 to 90 cm and panicle varies in length between 14 to 40 cm. It is mostly cultivated as mixed crop with other millets, pulses and oilseeds. The seeds

Fig. 1.5 : Kutki grain

Fig. 1.6 : Kutki Rice

of little millet are smaller than those of common millet. (Fig. 1.5) It is generally consumed as rice and any recipe that demands staple rice can be prepared using.(Fig. 1.6)

Madhya Pradesh covers 33.4 per cent of area and contributes 26.6 per cent of production of small millets in the country. (Table 1.2) Kodo (70 %) and Kutki (24 %) occupy together 94 per cent of area of small millets in Madhya Pradesh.

Kodo-kutki have more nutritive value as compared to other cereals. There are various value added products with good nutritive value can be prepared using these millets. Marketing of value added products of kodo & kutki is common in the area. Now a day various dishes of kodo and kutki were found to serve in 5 star hotels at metropolitan cities due to its nutritive and medicinal value. The tribal farmers growing these millets are organic in nature for value added product. Although, farmers found to use kodo and kutki as un-husked grain (rice), laddu, lai, papdi, kheer, halwa, chaklHi, upama etc. for their home consumption. They were also found to prepare laddu and chakli as a value added products and used to sell out in the market (Haat Bazar) and even more profit from value added product (Sharma and Rathi 2017). Even though, the last half of the 20th century has witnessed some improvements in gender equality, gender disparities still persist in most of developing countries and thus "Empowerment of women through SHGs" has been surveyed to examine the impact on empowerment of women. In almost all developing countries, women do not possess the same legal, social and economic rights as do men. Similarly, gender gaps are widespread in access to and control over resources, in economic opportunities, in power and political voice (World Bank, 2001).

Despite considerable efforts, many countries in the world have not been able to eliminate the gender gaps. In fact, with the background of the patriarchal system of society, women need special attention to ensure their development and participation in the decision making process at home in the community and governance. Some efforts were made to bring economic and social development of women and improving their status in the community development activities in the past.

Self Help Group (SHGs) thrift and credit groups are mostly informal groups whose members pool savings and re-lend within the group on rotational or need basis (Minimol and

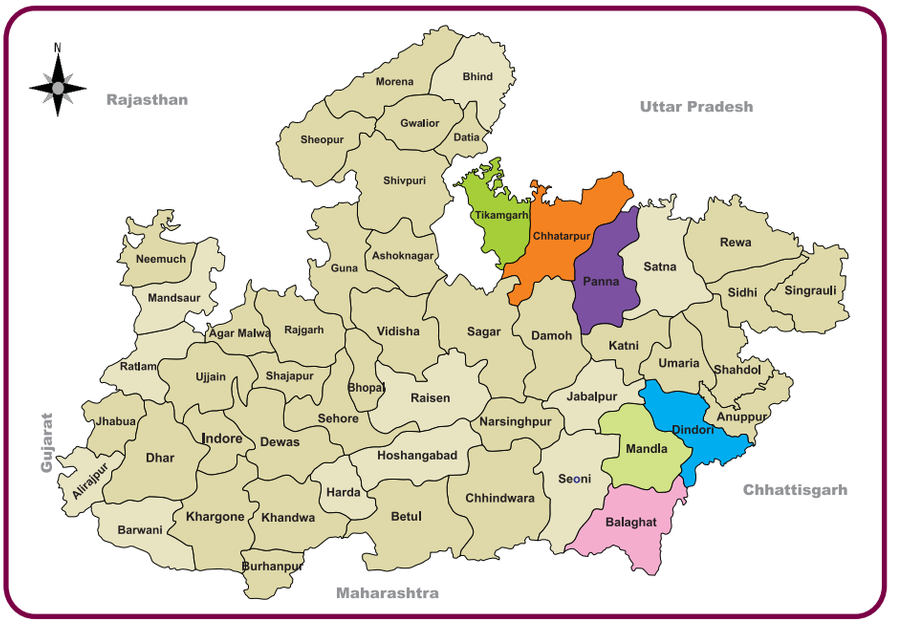

Fig. 1.7 : Selected districts in Madhya Pradesh under Tejaswini Programme

Makesh, 2012). There groups have a common perception of need and impulse toward collective action. Women self help groups, formed exclusively for rural women, being an effective medium for community involvement in developmental activities, can be a powerful tool for elevating rural poverty through the empowerment of women by freeing themselves from the clutches of usuries moneylenders.

The positive impact of the SHGs' (especially micro level programmes) on economic and social empowerment of the rural poor and women (Puhazhendhi & Satya Sai 2000; Cheston and Kuhn 2002; Anand 2002; Malathi and Vijayarani 2012 and Sarania (2015) were found to be in microfinance programmes which were successful to diversify the economic activities in rural areas and enhancing income of the individual as well as household and also empowered women economically, socially, psychologically and politically as reported by Basargekar (2009), Vekatesh (2010), Kusakabe (2010), Basargekar (2009), Bansal (2011), Rajendran (2012), Thangamani and Muthuselvi (2013), Longkumer and Jha (2014), The participation of women in National Rural Livelihood Mission (NRLM) also showed a significant impact on their empowerment both in social and economic aspect (Samuel et al 2011 and Jagadeeswari 2015). There was a significant difference in economic empowerment of the SHG members in post-SHG situation when compared with pre-SHG situation (Krishnan, 2008; Malathi and Vijayarani, 2012).

In order to make women economically and socially empowered, to make them self-dependent and self-reliant, on 31, October 1988, Madhya Pradesh Women's Development

Corporation was established under the "Non-Commercial Corporation". Subsequently, for the strengthening of the corporation, the amendment was made in the bank's biographies on 31.03.2001 and the name of the corporation was registered under the Societies Registration Act, (1973).' and named as Madhya Pradesh Mahila Finance and Development Corporation.

International Fund and Agricultural Development (IFAD) assisted Tejaswini Rural Woman Empowerment Programme is being implemented by the M.P. Women Finance and Development Corporation in 6 districts of M.P, namely Balaghat, Dindori, Mandla, Panna, Chhatarpur and Tikamgarh (Fig 1.7). The criteria for selecting these districts were mainly poverty, gender imbalances and tribal dominance. The project started in the year 2007 and is to be completed during the financial year 2018-19. Under the project, 206850 rural women through 16498 women SHGs were mobilized in 6 districts. It may be noted that the beneficiaries selected belong to poorest of the poor section of the society. This selection was done on the basis of household survey/wealth ranking survey conducted for the program. These groups as well as the group members were provided with different empowerment inputs /trainings, namely group management and accounting, decision taking and prioritizing their needs, conflict management, gender sensitization, income enhancement, legal awareness, health & hygiene and management of the group funds for improving the lives of the member women. The present study is an attempt to assess the role of self help groups formulated by Tejaswini in improving the socio economic status of the rural women through Cultivation, Processing and Marketing of Kodo-Kutki in Madhya Pradesh with following specific objectives:-

1.2 Objectives of the Study

1. To analyze the key features of the initiative and role of different institutions /partners in dissemination of technology.
2. To determine the socio-economic profile of the selected beneficiaries and non beneficiaries.

Fig. 1.8 : Collection of Primary data

Fig. 1.9 : Collection of secondary data

3. To analyze the impact of cultivation, processing and marketing of Kodo/Kutki.
4. To identify bottlenecks in adoption of technologies related to cultivation, processing and marketing of Kodo/Kutki and suggest ways and means to overcome these constraints.

1.3 Data and Methodology

The study is confined to Madhya Pradesh keeping in view the maximum share of small millets (Table 1.2) and importance of these particular crops in view of the global perspectives. The study attempted to cover Kodo and Kutki for in depth analysis as the

Table 1.2: Contribution of area, production & productivity of small millets in different States of India

States	Area		Production		Yield
	000' ha	% to total	000' t	% to total	Kg/ha
Andhra Pradesh	28	4.1	22	5.1	786
Arunachal Pradesh	22.7	3.3	23.8	5.5	1050
Assam	5.4	0.8	3.3	0.8	614
Bihar	2.8	0.4	2.1	0.5	755
Chattisgarh	112.8	16.5	25.1	5.8	223
Gujarat	38	5.6	41	9.5	1079
Himachal Pradesh	4.6	0.7	3.2	0.7	685
Jammu & Kashmir	5.1	0.7	2.4	0.6	473
Karnataka	24	3.5	13	3	542
Kerala	0	0	0	0	875
Madhya Pradesh	**227.7**	**33.4**	**114.5**	**26.6**	**503**
Maharashtra	57	8.4	29	6.7	509
Meghalaya	2.8	0.4	2.5	0.6	872
Nagaland	8.7	1.3	9.8	2.3	1125
Orissa	19.3	2.8	9.7	2.3	502
Rajasthan	13.7	2	4.5	1	330
Sikkim	3	0.4	3	0.7	1003
Tamil Nadu	32.4	4.8	35.2	8.2	1085
Uttar Pradesh	8	1.2	6	1.4	750
Uttarakhand	64.5	9.5	78.1	18.2	1211
West Bengal	1.5	0.2	1.5	0.4	975
D & N Haveli	0.2	0	0.2	0.1	957
All India	**682.3**	**100**	**429.9**	**100**	**630**

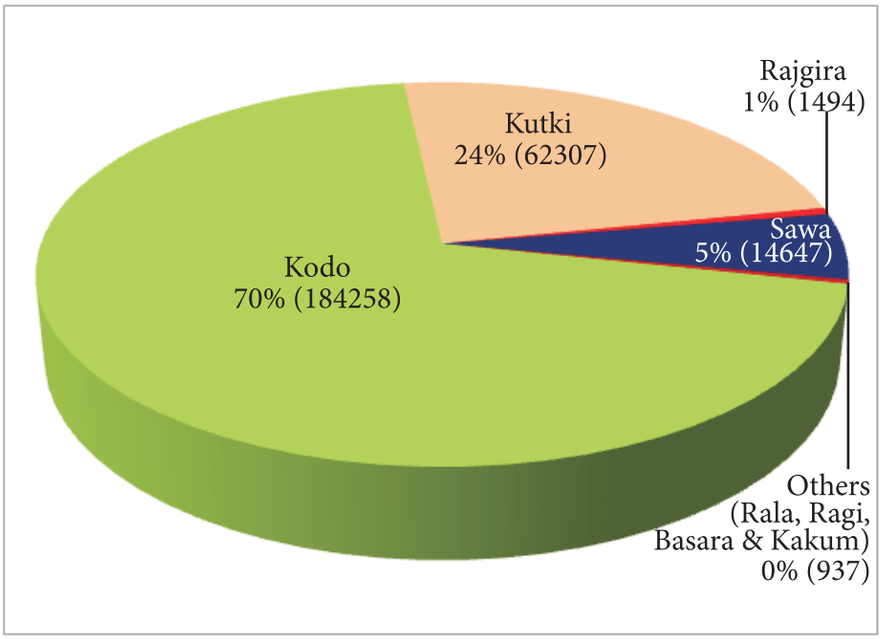

Fig 1.10 : Area occupied under different Small Millets in Madhya Pradesh

major area was found to be occupied under these crops. (Fig.1.10)

A list of all the beneficiaries (8817) under different locations viz. Mandla (4050) and Dindori (4767) was provided by the office of the MVVN, Bhopal. In these 2 districts Dindori has been selected purposively on the basis of maximum numbers of beneficiaries. (Fig. 1.11)

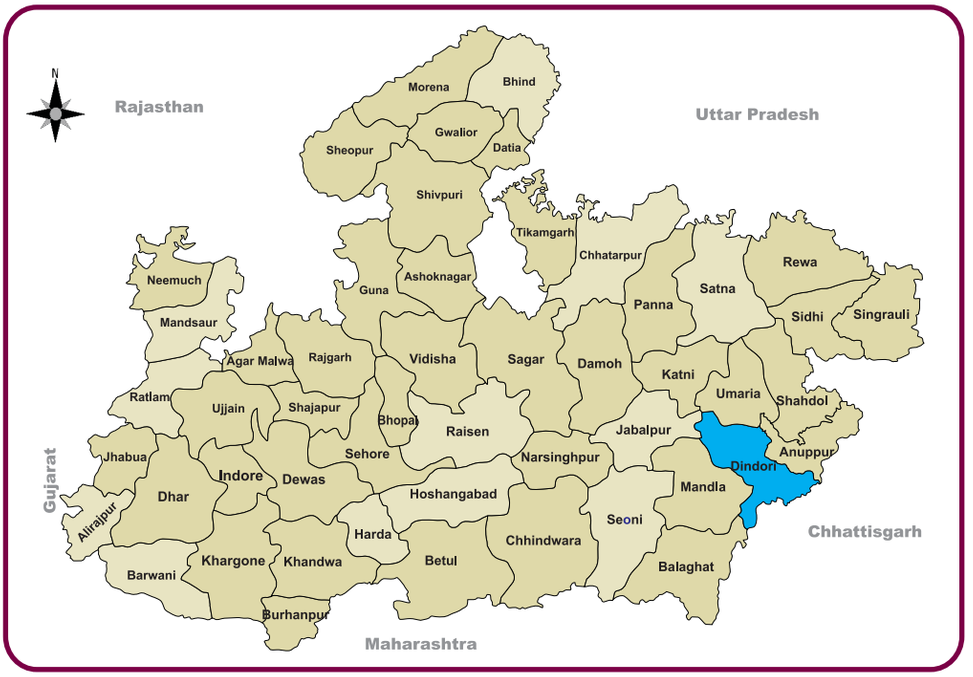

Fig. 1.11 : Selected district for Kodo/Kutki under the study

Out of total numbers of beneficiaries one percent (50) has been selected for the study. An equal numbers of non beneficiaries (50) were also selected from the same village having identical size of holding and socio economic status. Thus, the total size of sample was of 100 respondents. Both primary and secondary data were collected for the study. (Fig. 8 & 9) The primary data were collected from the selected respondents on various parameters viz. socio economic conditions, land use pattern, cropping pattern, cost of cultivation of Kodo-Kutki along with cost of processing and marketing vis-a-vis local practices, family consumption etc. control Vs treated technique was used to analyze the impact of Cultivation, Processing and Marketing of Kodo/Kutki over local practices. The suitable analytical tools i.e. mean & percentage were used to draw conclusion. The period of the study was 2018-19. The primary data were collected for the year 2018-19. Following concepts were used to draw conclusion.

1. **Percentage Change over Non-Beneficiaries**

   Percentage Change =(Yn–Yo)/Yo *100

   Yn=Beneficiaries–Yo=Non- Beneficiaries

2. **Mean**

The average of the variables used for the study.

$$X = \sum x/n$$

Where,

X= Mean of the variables

∑ X=Sum of scores (observation) of variables

n= Total number of respondents

3. **Interest of working Capital**@10 per cent of variable inputs
4. **Rental Value of owned land**@1/6 of gross income
5. **Interest on fixed capital**@10 per cent of total capital assets (excluding land).
6. **Managerial Cost**@10 per cent of total cost to account for managerial input.
7. **Cost of cultivation (per acre)** = Operational Cost+Input Cost+Fixed Cost+Manageria Cost
8. **Net Return** = Gross Return- Total Cost of Cultivation.
9. **Cost of production (per q)** = (Total cost of cultivation –value of by product)/ Yield
10. **Benefit Cost Ratio**= Gross Income /Total Cost of Cultivation
11. **Cropping intensity** : It is the ratio of the total cropped area to net area sown

    Cropping intensity (%) = (Gross cropped area/net operated area)X100
12. **Additional Cost**= Cost incurred in processing of different stages viz. rice, floor & food product over grain
13. **Additional Benefit ratio**=Additional net return/base price received overgrain

1.4 Limitations of the Study

The present study is purely based on primary data. The study pertains to the primary

data collected for the Agriculture year 2018-19. Moreover, respondents provided information based on their recall memory. Thus, there is a possibility of certain memory bias to enter in the presentation of the data. Therefore, considerable care is taken while generalizing the acceptability of the results of this study.

1.5 Organization of the Study

The study is organised into 4 chapters. Chapter I cover the introductory part of the study and key featurs of the programme is given in Chapter II, impact of cultivation, processing & marketing are presented in chapter III and concluding remarks and policy implication are given in chapter IV.

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CHAPTER-II

KEY FEATURES OF THE PROGRAMME

This chapter deals with interventions and outreach in terms of number of beneficiaries of Kodo and Kutki cultivation, processing and value addition, development/implementation process adopted, role of different institutions in implementing the interventions and key features of the interventions with strength and weakness. This chapter also deals with contributing factors for the success and failure of the programm.

2.1 Intervention

Target group and total outreach in terms of number of beneficiaries of the kodo-kutki cultivation, processing and value addition intervention in terms of both direct (those own and manage the unit) and indirect beneficiaries (those using the unit on nominal charge/job-work basis). As for as cultivation, production, processing and value-addition of kodo-kutki is concerned, 4767 beneficiaries out of total members (31416) of the beneficiaries of federation (Tejaswani Nari Chetna Mahila Sangh, Mehandwani) were selected from 9 federations covering 7 blocks of the district.

The facilities provided to the beneficiaries for upgrading & up scaling the existing situation, realizing the benefits in a sustainable manner for longer period and mobilizing the society (community) in this direction to achieve impact in real terms. For this purpose following interventions were imposed.

2.1.1 Cultivation of Kodo-kutki : Following interventions were taken into consideration for cultivation of Kodo and Kutki

(i). Training on preparation of weed free land

(ii) Providing certified seed

(iii) Providing pesticides

(iv) Analyzing and providing treatment on different cultivation aspects

(v) Management of storage

(vi) Marketing Management

2.1.2 Processing and Value Addition :

Following interventions were taken into consideration for processing and value addition of Kodo and Kutki

Fig. 2.1: Tejaswini for Empowerment of Women

Fig. 2.2: Training of Federation Members

Fig. 2.3: Kodo-Kutki Processing Unit at Mehadawani, Dindori

Fig. 2.4: Processing of Kodo-Kutki

(I) Providing mechanical processing option to the beneficiaries

(ii) Kodo rice processing The only unit available in the district which is established in Mehadwani block by Tejaswani Nari Chetna Mahila Sangh. The unit is actively involved in preparing of various processed products to fetch reasonable profit. In preparation of various products and managing unit the employment is created for 10-15 persons, they were also benefited through this process. Federation used to purchase kodo/kutki produced by beneficiaries, at 10 % higher than the market prices and thus, beneficiaries are getting remunerative price for their products.

2.2 Development/Implementation Process

The community used to produce wheat, paddy, kodo-kutki, millets and corn but due to lack of technical know-how, access to markets and involvement of middlemen to sell their produce, getting proper value of their products was a basic constraint. Earlier they used to produce only a quintal out of their small land holding (0.5 to 1 acre) and had low market value of INR 8-10 per kg resulting into thus, very low income from kodo-kutki.

Integrated Nutrient Management as well as Integrated Pest Management technique for insect management was used where farmers were encouraged to use neem oil. The farmers were also encouraged to use vermicompost in integrated manner. (this approach was inducted on the farm to increase the yield parameters to enhance the total productivity of the crops undertaken), in order to help them to get quality produce of small millets for better marketability and generating more income.

2.3 Role of Different Institutions

Role of different institutions and partners in implementing the intervention for an effective manner the tranning was provided to each farmer (women) on millet production technology involving experts of Krishi Vigyan Kedra (KVK) Dindori, Jawaharlal Nehru Krishi

Vishwa Vidhyalaya, Jabalpur, NGOs and project staff. In order to determine the efficacy of new initiatives, it was ensured that the selected members were not involved in any other livelihood activity, so the income generation could be measured solely in terms of the new initiative. To support these farmers in the production of millets, exposure visits were arranged for selected Community Resource Persons (CRPs) to the (KVK) at Dindori . Under the technical guidance of KVK, JK – 48 and JK – 439 important varieties of Kodo and JK – 8 important variety of Kutki were selected for cultivation. Latest sowing equipments were provided under the project for maximization of production and profit.

2.4 Key Features of the Intervention

Key features of the intervention with strengths and weakness in cultivation of kodo-kutki, processing and value addition are given below:

2.4.1 Strength

- The geographical location and climate of Dindori district is very favorable for cultivation of Kodo-Kutki.
- The tribes residing in Dindori district were found to be fully dependent on Kodo-Kutki for their livelihood food security since ancient times.
- The beneficiaries have been encouraged to produce Kodo-Kutki through adopting improved technologies.
- The purchasing centres were found to be operating for procurement of Kodo-kutki form producers in the village cluster, which encourage farmers to produce more for getting high benefit.

2.4.2 Weakness

- Most of the agricultural land in Dindori district is undulated and mountainous and in maximum cases seeds, fertilizers, etc. run away with rain water due to sloppy topography leading to heavy losses in production.
- The economic condition of group is weak due to scarce resources for income generation.

Fig. 2.5: Collection of primary data from respondent

Fig. 2.6: Distribution of Kodo Patti in Aaganwadi Centre

- Low level of adoption of improved production practices.

2.5 Contributing Factors

Contributing factors for the success and failure are as under-

- The approach adopted by Tejawani for increasing the area under kodo - kutki by the interested members and involving different institutions for providing knowledge on improved cultivation package & practices to enhance the productivity, supported by providing remenurative prices for their produce and scaling up with processing facilities for developing various value added products and popularizing these products in elite groups i.e. Mid-Day Meal Program, Anganwadi etc. The efforts made by Tejaswani was dully recognized by conferring with Skoch Award and Sitaramrao Livelihood Asia Award by Hon'ble Venkaihya Naidu, Vice-President of India and formal Union Minister of Rural Development.

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CHAPTER-III

IMPACT OF CULTIVATION, PROCESSING AND MARKETING OF KODO/KUTKI

Socio-economic profile, operational area, irrigated area, cropping pattern, cost and return, marketed & marketable surplus, value addition, and its impact on SHGs across different parameters on sample holding. This helps in understanding the existing situation of SHGs, income received from different value added products.

3.1 Socio-economic Profile of the Respondents

Socio-economic characteristics of selected beneficiaries and non beneficiaries households (HHs) of the study area is presented in Table 3.1.

Table 3.1. : General characteristics of respondents

Particulars		Beneficiaries	Non-Beneficiaries
Number of respondents		50	50
Average age of respondents (Years)		34	39
Caste (% of respondents)			
	Other Backward Class OBC)	8.2	6.38
	Schedule Tribe (ST)	91.8	93.62
Education status of respondent			
	Illitrate	52.8	59.7
	Middle	33	29.4
	High School	11.4	9.6
	Higher Secondary	2.8	1.3
Religion- Hindu		100	100
Agriculture as main occupation (%)		100	100
Secondary	Ag. labour	66.6	75.2
	Self employment	33.40	24.80
Family size (Number)			
	Male	3	4
	Female	3	2
	Children (<16 Years)	2	1
Persons engaged in farming		4	4
Experience in farming (Years)		32	35
Average Annual income/member (Rs.)		40000	36500
	On-farm	31000	28000
	Off-farm	9000	8500

CHAPTER-III

IMPACT OF CULTIVATION, PROCESSING AND MARKETING OF KODO/KUTKI

Socio-economic profile, operational area, irrigated area, cropping pattern, cost and return, marketed & marketable surplus, value addition, and its impact on SHGs across different parameters on sample holding. This helps in understanding the existing situation of SHGs, income received from different value added products.

3.1 Socio-economic Profile of the Respondents

Socio-economic characteristics of selected beneficiaries and non beneficiaries households (HHs) of the study area is presented in Table 3.1.

Table 3.1. : General characteristics of respondents

Particulars		Beneficiaries	Non-Beneficiaries
Number of respondents		50	50
Average age of respondents (Years)		34	39
Caste (% of respondents)			
	Other Backward Class OBC)	8.2	6.38
	Schedule Tribe (ST)	91.8	93.62
Education status of respondent			
	Illitrate	52.8	59.7
	Middle	33	29.4
	High School	11.4	9.6
	Higher Secondary	2.8	1.3
Religion- Hindu		100	100
Agriculture as main occupation (%)		100	100
Secondary	Ag. labour	66.6	75.2
	Self employment	33.40	24.80
Family size (Number)			
	Male	3	4
	Female	3	2
	Children (<16 Years)	2	1
Persons engaged in farming		4	4
Experience in farming (Years)		32	35
Average Annual income/member (Rs.)		40000	36500
	On-farm	31000	28000
	Off-farm	9000	8500

It is observed from the data that the average age of beneficiary HH was found to be 34 years with 21 years of experience in farming and had a family of 8 members including 3 male, 3 female and 2 children. All the beneficiaries HHs choose farming as a main occupation and all of them also found to be engaged themselves in a secondary occupation. In secondary occupation the majority of them work as agricultural labours followed by self employment. In case of non-beneficiaries 3/4th were found to be engaged as agricultural labour and 1/4th were self employed while in case of beneficiaries this ratio was found to be 2/3rd and 1/3rd respectively. The average income per member/year in case of beneficiaries (Rs.40000/-) was found to be more than 10 per cent as compared to non-beneficiaries (Rs. 365000/-), which shows that beneficiaries are comparatively in better position as compared to non-beneficiaries as for as their socio-economic condition is concerned. As regards to their educational status the majority of them were illiterate (52.8%) followed by up to middle (33%), high school (11.4%) and higher secondary (2.81%). On an average a beneficiary HH had an annual income of Rs. 40000/- in which farming (Rs.31000/year) was main source of income.

It is also observed from the data that the average age of non beneficiaries HHs was 39 years with 24 years of experience in farming and had a family of 7 members including 4 male, 2 female and 1 child. All the non-beneficiaries HHs choose farming as a main occupation and all of them also found to be engaged themselves in a secondary occupation. In secondary occupation the majority of them used to work as agricultural labours (75.2%) followed by self employment (24.80%). As regards to their educational status the majority of them were illiterate (59.7%) followed by up to middle (29.4%), high school (9.6 %) and higher secondary (1.30%). On an average a beneficiary HH had an annual income of Rs. 36500/- in which farming (Rs.28000/year) was main source of income. Hence it is concluded from the above that beneficiary HHs were found to be more literate, more self capable and earning more income than non-beneficiary HHs while other things remain almost same in both the cases.

3.2 Present Value of Farm & Home Assets

The present value of farm as well as home assets of beneficiary and non-beneficiary households (HHs) have been analysed and presented in Table 3.2.

It is observed from the data that an average beneficiary HH (Rs. 8931.41) owned 21.11 per cent more farm and home assets as compared to non beneficiary (Rs. 7374.67). In total value of farm assets of beneficiary HH (Rs. 1706.5), the present value of bullock cart (52.45%) was found to be more as compared to other farm assets i.e. tifan (8.93%), Bakkhar (25.35%) and wooden plough(13.26%) . In total

Table 3.2. : Present value of assets of respondents (Rs/HH)

Particulars	Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
Farm Assets			
Bakkhar	432.6 (25.35)	410.22 (18.95)	5.46
Tifan	152.45 (8.93)	382.45 (17.66)	-60.14
Wood Plough	226.34 (13.26)	201.37 (9.3)	12.4
Bullock Cart	895.11 (52.45)	1171.09 (54.09)	-23.57
Total	1706.5 (100)/47.43/	2165.13 (100)/29.36/	-21.18
Home Assets			
Television	3426.81 (47.43)	2648.27 (50.84)	29.4
Fan	573.13 (7.93)	349.25 (6.7)	64.1
Mobile	1254.39 (17.36)	957.18 (18.37)	31.05
Cycle	1970.58 (27.27)	1254.84 (24.09)	57.04
Total	7224.91 (100)/80.89/	5209.54 (100)/70.64/	38.69
Grand Total	8931.41 /100/	7374.67 /100/	21.11

Fig. in parenthesis show percentage to respective total, while in slashes show percentage to grand total

value of farm assets of non-beneficiary HH (Rs. 2165.13), the present value of bullock cart (54.09%) was found to be more as compared to other farm assets i.e. tifan (17.66%), *bakkhar* (18.95%) and wooden plough(9.30%).

Out of total home assets of an average beneficiary HH's farm (Rs. 7224.91), the present value of TV (47.43%) was found to be more as compared to cycle (27.27%), mobile (17.36%) and fan (7.93%). Out of total home assets of an average non beneficiary HH's farm (Rs. 5209.54), the present value of TV (50.84%) was also found to be more as compared to cycle (24.09%), mobile (18.37%) and fan (6.7%).

It was observed that the present value of home assets of an average beneficiary HH was found to be 39 per cent more due to upliftment in socio-economic status while, the present value of farm assets was found to be 21 per cent less as compared to non-beneficiaries indicating the well being of beneficiaries HH over non-beneficiaries.

3.3 Monthly Expenditure

The monthly expenditure pattern of an average beneficiary and non beneficiary HH was also observed and presented in table 3.3.

It is observed from the data that an average beneficiary HH (Rs. 3421/month) spent 47.97 per cent more in his monthly expenditure than that of non beneficiary HH (Rs. 2312/ month). Amongst the different item of monthly expenses, an average beneficiaries was found to spend maximum on food (17.95%) followed by clothes (10.73%), education of children (8.77%), medicines (6.43%), animal (4.38%) and expenses on social and religious programmes (5.85%). Amongst the different item of monthly expenses an average non-beneficiary was found to spent more on food (16.96%) followed by clothes (9.08%), education of children (8.65%), medicines (7.79%), expenses on animal (2.16%) and social & religious programmes (4.33%).

Thus, it can be concluded that in all the items of monthly expenditure an average beneficiary HH was found to spend more as compared to non-beneficiary HH. The out of

Table 3.3. : Monthly expenditure pattern of respondents (Rs./HHs)

Particulars	Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
Food material (vegetable, pulses fruits etc)	614 (17.95)	392 (16.96)	56.63
Cloth	367 (10.73)	210 (9.08)	74.76
Education (Books & School fees)	300 (8.77)	200 (8.65)	50.00
Health (Medical) Exp.	220 (6.43)	180 (7.79)	22.22
Animal (Grass, Grain & Medicine)	150 (4.38)	50 (2.16)	200.00
Social program	200 (5.85)	100 (4.33)	100.00
Other	1570 (45.89)	1180 (51.04)	33.05
Total	3421 (100)	2312 (100)	47.97

Fig. in parenthesis show percentage to respective total

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Health (Medical) Exp.	220 (6.43)	180 (7.79)	22.22
Animal (Grass, Grain & Medicine)	150 (4.38)	50 (2.16)	200.00
Social program	200 (5.85)	100 (4.33)	100.00
Other	1570 (45.89)	1180 (51.04)	33.05
Total	3421 (100)	2312 (100)	47.97

Fig. in parenthesis show percentage to respective total

maximum amount of monthly expenditure was found to be spent on food material followed by clothing and other expenditure in both the categories. This shows the impact of adoption of improved technology in production, processing and marketing of Kodo/Kutki.

3.4 Land Use Pattern

Land use pattern of an average beneficiary and non beneficiary HH was analyzed and presented in table 3.4.

It is observed from the data that an average beneficiary HH and non beneficiary HH owned 5.22 and 4.49 acres of land respectively,

Table 3.4 : Land use pattern of respondents (Acre/HH)

Particulars	Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
1. Total Size of Holdings	5.22 (100)	4.49 (100)	16.26
2. Un-Cultivated Land -			
A. Uncultivated & other grassing	0.04 (0.77)	0.07 (1.56)	-42.86
B. Current Fallow	0.08 (1.53)	0.12 (2.67)	-33.33
3. Cultivated Land	5.10 (97.7)	4.30 (95.77)	18.6
4. Leased in- Land	0.26	0.18	44.44
Net Cultivated Area (3+4)	5.36	4.48	19.64
Rental value of leased in land (Rs/acre)	2550	2520	1.19
Irrigated area	1.04 (19.4)	1.19 (22.2)	-12.61

which 0.04 and 0.07 acres land was found to be uncultivated & grazing land. It is also found that he used to keep 0.08 and 0.12 acre of land fallow in current Rabi season due to lack of irrigation. The only 19.40 and 22.20 per cent of net cultivated area of an average beneficiary and non beneficiary HH, respectively was found to be under irrigation. Leased in land was also found in the practice, an average beneficiary & non beneficiary HH used to occupy 0.26 and 0.18 acres leased in land, respectively during the year under study. The area under cultivation with an average beneficiary was found to be 5.10 & 4.30 and operational area 5.36 & 4.48 acres in case of beneficiary and non- beneficiary respectively.

An average beneficiary HH used to have 44.44 per cent more leased in land than non beneficiary HH. His net cultivated area was also

found to be 19.64 per cent more than non beneficiary HH, while the area under uncultivated and grazing land and current fallow was found to be 42.86 and 33.33 per cent less as compared to an average non beneficiary HH.

Thus, it can be concluded that the un-cultivated and fallow land was found to be lower in case of beneficiary's as compared to non-beneficiaries farm resulted in higher percentage of cultivated land owned by beneficiary HH as compared to non- beneficiary HH. Although, irrigated area was found to be less in beneficiary farm as compared to non- beneficiary farm.

3.5 Cropping Pattern

Cropping pattern of an average beneficiary and non beneficiary HH is presented in table 3.5. An average beneficiary HH (169%) was found to cultivate his land 36.09 per cent more intensively than an average non beneficiary HH (143%) during the year under study. An average beneficiary and non-beneficiary HH used to cultivate crops in both the seasons of a year. Although Kharif was found to be main season for cultivation of crops in which an beneficiary and non-beneficiary HH used to allocate 57.13 & 61.35 per cent, while in Rabi 42.87 & 38.65 per cent of gross cropped area respectively.

All the beneficiary HHs used to cultivate improved high yielding varieties of crops i.e. JK- 48, Jk-62, Jk-76, Jk-439, Jk-42, Jk-106 and JK-13 (Kodo), JHK 8 (Kutki), IR 64 (Paddy), GW-47 (Wheat) and JG-15 (Gram), while majority of the non beneficiaries HHs were found to be use local varieties of seed. (Table 3.5)

In Kharif season, Kodo, Kutki, Paddy and Maize were found to major crops in which an average beneficiary and non beneficiary HHs cultivate their 32.69 & 33.33, 35.20 & 26.96, 17.02 & 18.63 and 11.03 & 17.16 per cent of total kharif area, while wheat, gram and Seasme were found to be major rabi crops cultivated by them and they found to cultivate 25.00 & 31.52, 22.16 & 29.57 and 42.53 & 25.68 per cent of total rabi area, respectively. An average beneficiary HH also found to cultivate 26.72 and 50.97 per cent more area in Kharif and Rabi season, respectively than an average non- beneficiary HH.

Hence, it can be concluded that due to efficient training and demonstrations to beneficiary HHs, varietal adoption of Kodo-Kutki & Paddy in Kharif and Wheat & Gram in Rabi is in favour of increasing productivity. In case of Kharif cropped area allocated to different crops was found to be 26.67% higher on beneficiary's farm as compared to non-beneficiary's farm. The beneficiaries used to allocate 25 per cent more area under Kodo and 65 more under Kutki as compared to non-beneficiaries amongst major crops grown during Kharif season. In Rabi season percentage allocated in different crops was also higher in beneficiary's farm than non-beneficiaries farm, which resulted in higher cropping intensity on beneficiary's farm (169%) as compared to non-beneficiaries farm (143%).

Table 3.5 : Cropping pattern of respondents (Acre/farm)

Crops	Variety	Beneficiaries	Variety	Non-Beneficiaries	% Difference over Non-Beneficiaries
Kharif Season					
Kodo	JK-48, JK-62, JK-76 JK-439, JK-42, JK-106 and JK-13	1.69 (32.69)	Local	1.36 (33.33)	24.26
Kutki	JK-1 (Dindori-1)	1.82 (35.2)	Local	1.1 (26.96)	65.45
Paddy	IR-64	0.88 (17.02)	Local	0.76 (18.63)	15.79
Maize		0.57 (11.03)		0.7 (17.16)	-18.57
Other		0.21 (4.06)		0.16 (3.92)	31.25
	Total Kharif	**5.17 (100)/57.13/**		**4.08 (100)/61.35/**	**26.72**
Rabi Season					
Wheat	GW-47	0.97 (25.00)	Local	0.81 (31.52	19.75
Gram	JG-15	0.86 (22.16)	Local	0.76 (29.57)	13.16
Seasme		1.65 (42.53)	Local	0.66 (25.68)	150
Other		0.4 (10.31)		0.34 (13.23)	17.65
	Total Rabi	**3.88 (100)/42.87/**		**2.57 (100)/36.45/**	**50.97**
Gross Cropped Area (GCA)		**9.05 /100/**		**7.05 /100/**	**36.09**
Cropping Intensity (%)		**169**		**143**	**158.64**

Fig. in parenthesis show percentage to respective total Rabi & Kharif, while in slash show percentage to total GCA

3.6 Cost of Cultivation and Return

The cost incurred and returns obtained from the production of Kodo and Kutki have been analysed both for beneficiaries and non beneficiaries HHs and presented in this subhead.

3.6.1 Cost of Cultivation of Kodo

The cost of cultivation of Kodo for beneficiary and non beneficiary HHs presented in table 3.6. It is observed from the data that an average total cost of cultivation of

Kodo under beneficiary HH (Rs.6690.70/acre) was found to be 3.03 per cent less than that of an average non beneficiary HH (Rs. 6899.94). An average beneficiary HH found to spend 31.78, 13.94, 7.30 and 3.89 and per cent less in case of hired human labour, seed treatment material, seed, bullock labour, while 38.28 per cent more in case of manures & fertilizer in cultivation of Kodo as compared to non beneficiary HH.

The indirect cost (fixed cost) was found to be 6.94 per cent higher in case of an average

Table 3.6 : Cost of cultivation of Kodo (Rs/Acre)

Particulars		Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
Operational Cost				
Human labour	Family	1446.24 (51.26)	1560.4 (46.93)	-7.32
	Hired	784.85 (27.82)	1150.46 (34.6)	-31.78
B. Bullock labour		590.32 (20.92)	614.22 (18.47)	-3.89
Total Operational Cost		**2821.41 (100)**	**3325.08 (100)**	**-15.15**
Material Cost				
A. Seed		354.21 (38.68)	382.11 (50.64)	-7.30
B. Seed Treatment		35.5 (3.88)	41.25 (5.47)	-13.94
C. Manure & Fertilizers		458.04 (50.02)	331.23 (43.9)	38.28
B. Depreciation		68.03 (7.43)	71.42 (9.46)	-4.75
Total Material cost		**915.78 (100)**	**754.59 (100)**	**21.36**
Total Variable cost		**3737.19**	**4079.67**	**-8.39**
Fixed Cost				
A. Rental Value of own land		1749.06 (74.58)	1356.5 (61.86)	28.94
C. Revenue /tax		12.00 (0.51)	12 .00 (0.55)	0
D. Interest on Fixed capital		584.2 (24.91)	824.5 (37.60)	-29.14
Total Fixed Cost		**2345.26 (100)**	**2193.00 (100)**	**6.94**
Managerial Cost		608.245	627.267	-3.03
Total Cost of Cultivation		6690.7	6899.94	-3.03

Figures in Parenthesis show the percentage to respective total

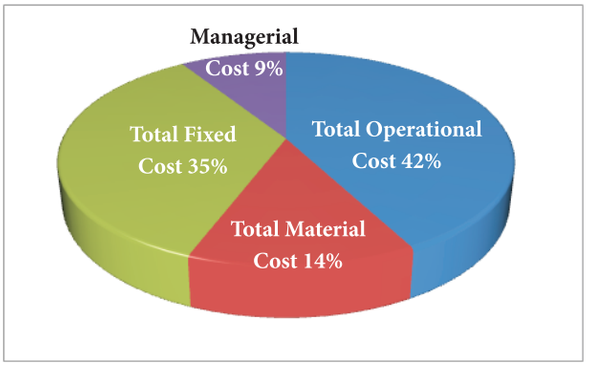

Fig. 3.1 : Contribution of different cost in cost of cultivation of Kodo(Beneficiaries)

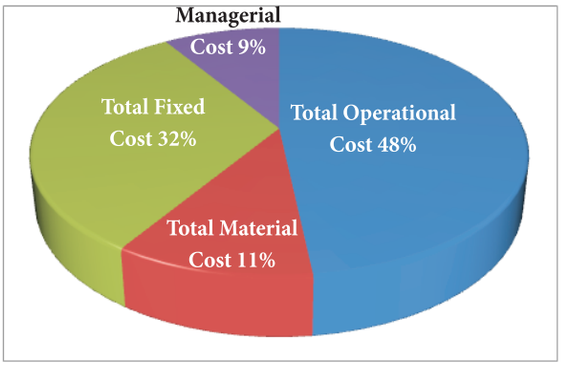

Fig. 3.2 : Contribution of different cost in cost of cultivation of Kodo(Non-Beneficiaries)

beneficiary HH (Rs.2345.26/acre) as compared to an average non beneficiary HH (Rs. 2193.00/acre). In total cost of cultivation of Kodo the share of total operational cost (42 & 48%), total material cost (14 & 11%), total fixed cost (35 & 32 %) and managerial cost (9 & 9%) were found to be more in case of beneficiaries and non- beneficiaries farms, respectively (Fig. 3.1 & 3.2).

3.6.2 Cost of Cultivation of Kutki

The cost of cultivation of Kutki for beneficiaries and non beneficiaries HHs presented in table 3.7. It is observed from the data that an average total cost of cultivation of Kutki under beneficiary HH (Rs. 6598.71/acre) was found to be 6.17 per cent lower than an average non beneficiary HH (Rs. 7032.64). The hired human labour (19.86%), bullock labour (23.96%), seed (16.35%), seed treatment material (33.48%) were found to be less except manures & fertilizer (100.00%) in cultivation of Kutki by beneficiary as compared to non beneficiary HH.

The indirect cost (fixed cost) was also found to be 8.72 per cent more in case of an average beneficiary HH (Rs. 2381.86/acre) as compared to an average non beneficiary HH (Rs. 2190.85/acre). In total cost of cultivation of Kutki, the share of total operational cost (39 & 46%), total material cost (16 & 14%), total fixed cost (36 & 31 %) and managerial cost (9 & 9 %) was found to be in beneficiaries and non-beneficiaries farms, respectively (Fig. 3.2).

Hence, it can be concluded that the cost of cultivation of Kodo/Kutki on beneficiaries and non-beneficiaries farm shows that the share of operational cost is higher as compared to material and managerial cost, while fixed cost account identical on beneficiaries and non-beneficiaries farms. In total operational cost, expenditure on family labour is higher as compared to hired human labour and the total operational cost per acre is lower on beneficiary's HHs farms as compared to non-beneficiary's HHs farms. This reflects that due to awareness and increases in efficiency of human and bullock labour leads to lower down the cost of operation. In case of material cost it

Table 3.7 : Cost of cultivation of Kutki (Rs/Acre)

Particulars		Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
Operational Cost				
Human labour	Family	1208.37 (46.94)	1492.35 (46.04)	-19.03
	Hired	694.34 (26.97)	866.42 (26.73)	-19.86
B. Bullock labour		671.4 (26.08)	882.92 (27.24)	-23.96
Total Operational Cost		**2574.11 (100)**	**3241.69 (100)**	**-20.59**
Material Cost				
A. Seed		516.88 (49.56)	617.94 (64.32)	-16.35
B. Seed Treatment		28.06 (2.69)	42.18 (4.39)	-33.48
C. Manure & Fertilizers		425.78 (40.83)	212.36 (22.1)	100.5
B. Depreciation		72.14 (6.92)	88.29 (9.19)	-18.29
Total Material cost		**1042.86 (100)**	**960.77 (100)**	**8.54**
Total Variable cost		**3616.97**	**4202.46**	**-13.93**
Fixed Cost				
A. Rental Value of own land		1848.41 (77.6)	1424.65 (65.03)	29.74
C. Revenue /tax		12.00 (0.5)	12.00 (0.55)	0
D. Interest on Fixed capital		521.45 (21.89)	754.2 (34.42)	-30.86
Total Fixed Cost		**2381.86 (100)**	**2190.85 (100)**	**8.72**
Managerial Cost		599.883	639.331	-6.17
Total Cost of Cultivation		6598.71	7032.64	-6.17

Figures in Parenthesis show the percentage to respective total

is more on beneficiary's HH farm as compared to non beneficiary's HH farm mainly due to adoption of recommended doses of manures & fertilizers.

Inspite of adoption of technology of cost of cultivation on beneficiary's HHs farmsthe total cost of cultivation of kodo and kutki was found to be lowered by only 3.03 to 6.17 per cent as compared to non- beneficiary's HHs farms in which, shows that adoption of

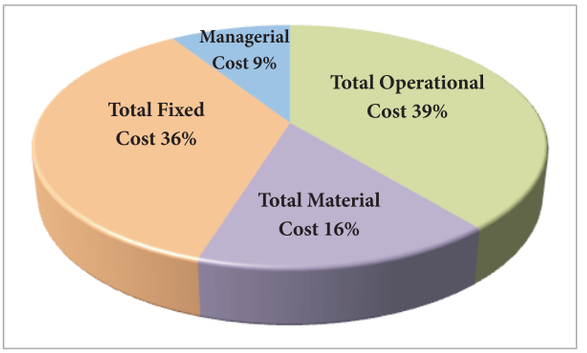

Fig. 3.3 : Contribution of different cost in cost of cultivation of Kutki (Beneficiaries)

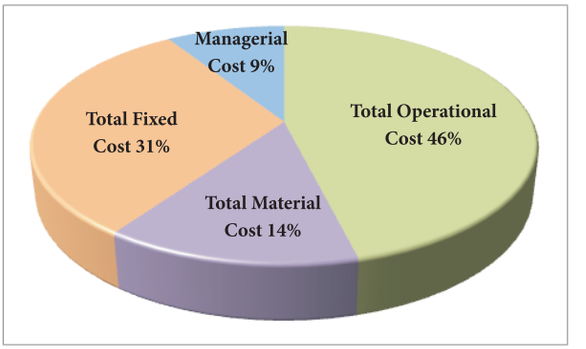

Fig. 3.4 : Contribution of different cost in cost of cultivation of Kutki (Non-Beneficiaries)

technology makes the difference and at the same time the reduction in cost of cultivation was also observed among beneficiarie's HH over non-beneficiaries HH .

3.6.3 Profitability of Kodo

The cost of production to produce a quintal of grain was also found to be 31.22 & -26.08 per cent less at total variable cost and total cost of cultivation of Kodo on an average beneficiary's HH farm as compared to an average non- beneficiary's HH farm (Table 3.8), while net income received from production of Kodo was found to be 66.46 & 206.98 per cent more at total variable cost and total cost of cultivation respectively, resulted per rupee return by 40.76 & 32.97 per cent more at total variable cost and total cost of cultivation, on an average beneficiary's HH farms as compared to an average non- beneficiary's HH farm respectively.

Table 3.8 : Profitability in cultivation of Kodo (Rs./Acre)

Particulars		Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
Yield (q/acre)		5.17	3.97	30.23
Rate/quintal (Rs.)		1925	1921	0.21
Main Product (Rs./acre)		9952.25	7626.37	30.5
By Product		542.13	512.63	5.75
Gross Return		10494.38	8139	28.94
Net Income	Over Variable Cost	6757.19	4059.33	66.46
	Over Total Cost	3803.69	1239.06	206.98
Cost of production (Rs/q)	Over Variable Cost	618	898.5	-31.22
	Over Total Cost	1189.28	1608.89	-26.08
Return/Rs. investment	Over Variable Cost	2.81	2.00	40.76
	Over Total Cost	1.57	1.18	32.97

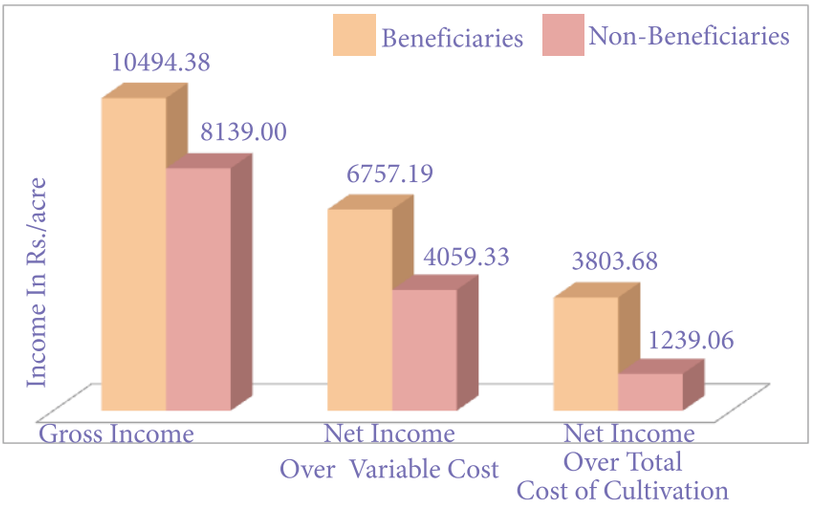

Fig. 3.5 : Income received from cultivation of Kodo in beneficiaries & non-beneficiaries farms

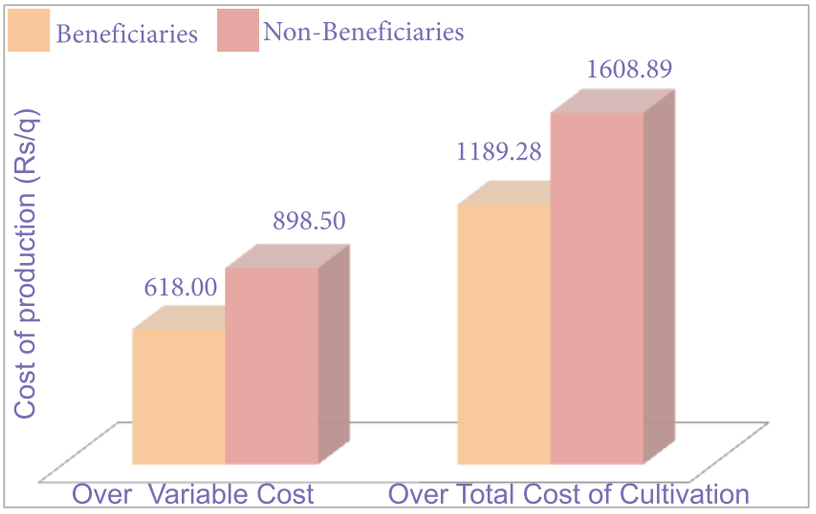

Fig. 3.6 : Cost of production of Kodo in beneficiaries & non-beneficiaries farms

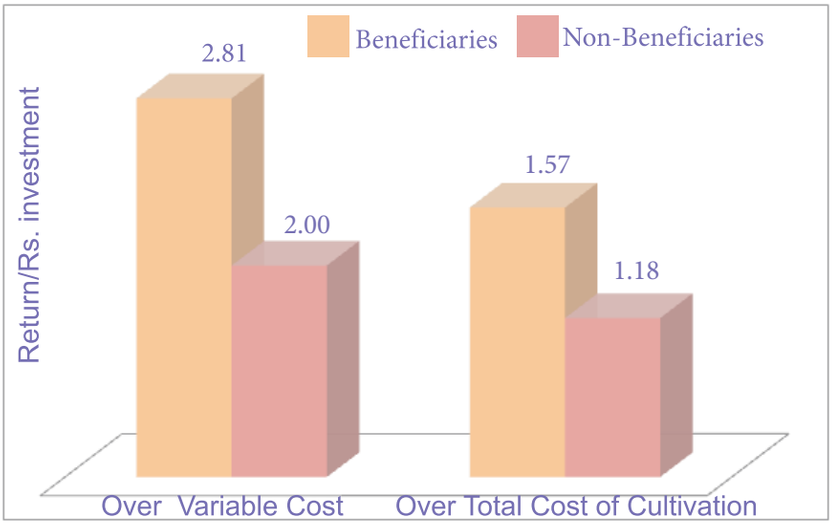

Fig. 3.7 : Return/rupee investment of Kodo in beneficiaries & non- beneficiaries farms

3.6.4 Profitability of Kutki

The cost of production to produce a quintal of grain was also found to be 33.33 & 32.81 per cent less at total variable cost and total cost of cultivation of Kutki on an average beneficiary HH as compared to an average non beneficiary HH (Table 3.9), while net income received from production of Kutki was found to be 71.98 & 196.43 per cent more at total variable cost and total cost of cultivation on an average beneficiary HH as compared to an average non beneficiary HH respectively. The return per rupee investment was found to be 59.58 & Rs. 46.37 per cent more at total variable cost and total cost of cultivation on an average beneficiary's HH farm as compared to an average non beneficiary's HH farm respectively.

Table 3.9 : Profitability in cultivation of Kutki (Rs./Acre)

Particulars		Beneficiaries	Non-Beneficiaries	% Difference over Non-Beneficiaries
Yield (q/acre)		4.17	3.23	29.1
Rate/quintal (Rs.)		2540	2500	1.6
Main Product (Rs./acre)		10591.8	8075	31.17
By Product		498.67	472.91	5.45
Gross Return		11090.47	8547.91	29.74
Net Income	Over Variable Cost	7473.5	4345.45	71.98
	Over Total Cost	4491.76	1515.27	196.43
Cost of production (Rs/q)	Over Variable Cost	867.38	1301.07	-33.33
	Over Total Cost	1462.84	2177.29	-32.81
Return/Rs. investment	Over Variable Cost	3.07	1.92	59.58
	Over Total Cost	1.68	1.15	46.37

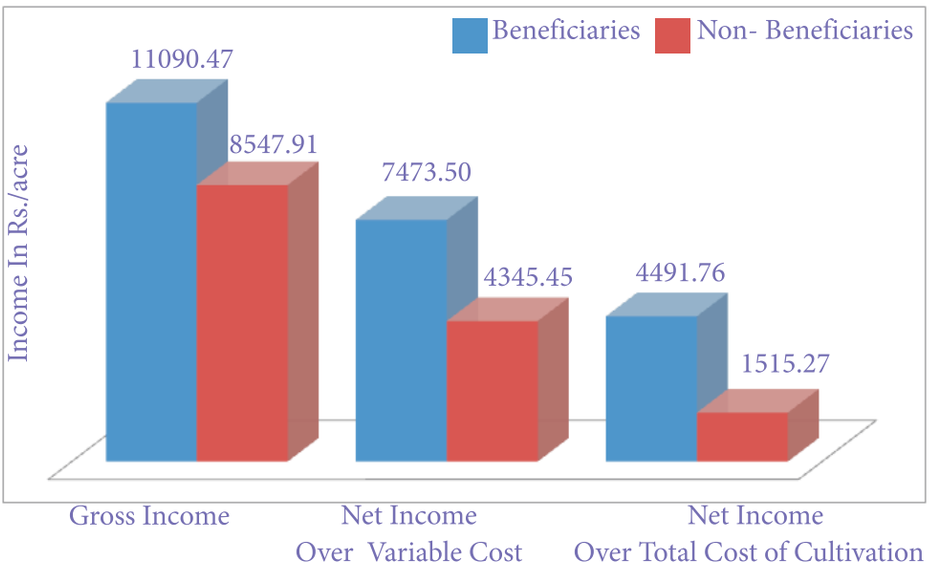

Fig. 3.8 : Income received from cultivation of Kutki in beneficiaries & non- beneficiaries farms

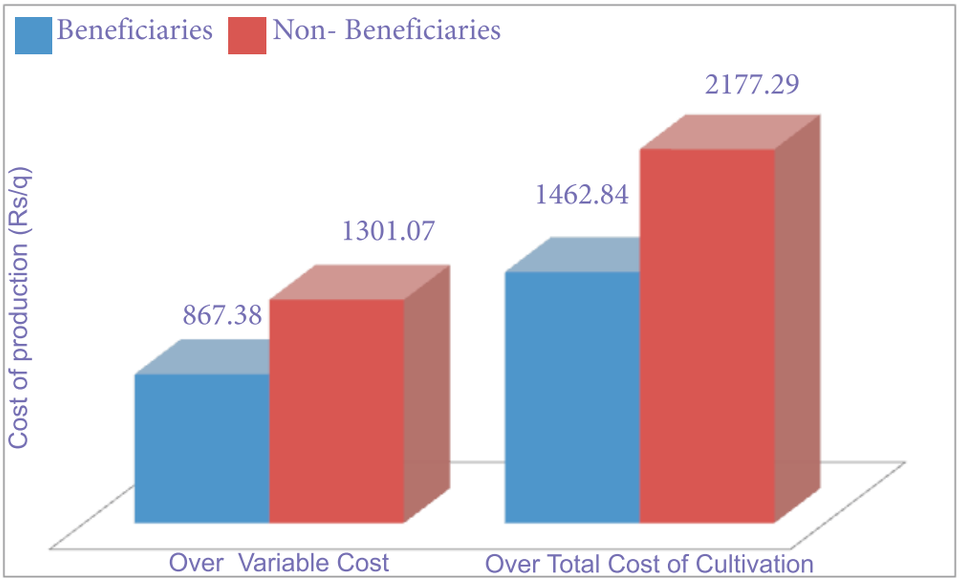

Fig. 3.9 : Cost of production of Kutki in beneficiaries & non-beneficiaries farms

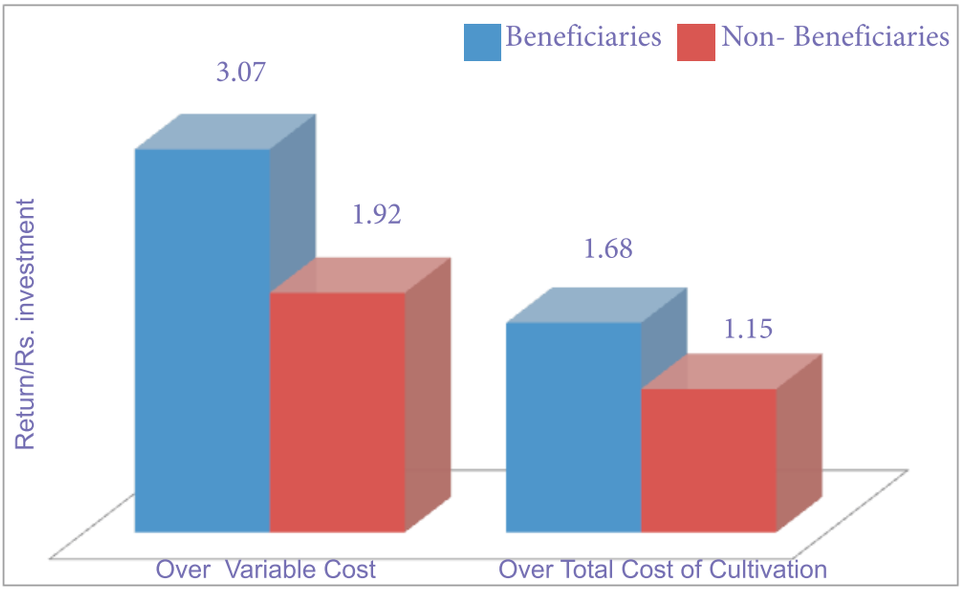

Fig. 3.10 : Return/rupee investment of Kutki in beneficiaries & non- beneficiaries farms

Thus, it can be concluded that due to adoption of technology for cultivation of Kodo and Kutki by beneficiaries HHs resulting into enhancement in yield by more that 30 per cent over non-beneficiaries HHs. The net income of beneficiaries HH was also found to be increased by more than 200 per cent due to adoption of technology which not only reduces the cost of cultivation on one hand but also increases the productivity on the other hand. The cost of production (Rs./qtl) was also found to be decreased over total cost & total variable cost respectively. Return per rupee investment was also found to be higher in beneficiary's HH farm as compared to non- beneficiary's HH farm.

3.7 Adoption Gap and Potential for Increasing Income

An attempt was also made to compare the economics of cultivation of Kodo and Kutki with recommended package of practices (RPP). The RPP for each crop in different location used to be decided/recommended by the team of scientists based on field trials/demonstrations for harnessing its full potential through utilizing resources in an efficient manners. It means RPP is nothing but recommendations of scientist regarding application of different resources using various methods on different time to achieve the maximum yield/output and analyse the adoption gap and potential for increasing farm income in the area under study.

3.7.1 Kodo

The comparative analysis of cultivation of Kodo in beneficiary's HH farm vs RPP is presented in table 3.10. It is observed from the data that an average beneficiary HH was found to obtain 35.53 per cent less gross return (Rs.

Table 3.10 : Adoption and yield gap of Kodo in beneficiaries vs RPP (Rs./acre)

Particulars		Beneficiaries	RPP	% Difference over RPP
Operational Cost				
Human labour		2231.09	3437.50	-35.10
Bullock labour		590.32	0	
Total Operational Cost		2821.41	3437.50	-17.92
Material Cost				
Seed		354.21	135.00	162.38
Seed Treatment		35.50	41.25	-13.94
Manure & Fertilizers		458.04	2750.00	-83.34
Total Material cost		847.75	2926.25	-71.03
Total Variable cost		3669.16	6363.75	-42.34
Yield per acre	Main Produced	1925	1925	0
	By-Product	43.37	43.37	0
Return (Rs.)	Main Produced	5.17	8.10	-36.17
	By-Product	12.50	15.80	-20.89
Rate per quintal	Main Produced	9952.30	15592.50	-36.17
	By-Product	542.13	685.25	-20.89
Gross Return (Rs./acre)		10494.38	16277.75	-35.53
Net Return on Variable cost		6825.22	9914	-31.16

10494.38/acre) in cultivation of Kodo as compared to RPP (Rs. 16277.75/acre). Beneficiary HH also get 36.17 per cent less yield (5.17q/acre) as compared to RPP (8.10 q/acre).

An average beneficiaries also found to engage less human labour (35.10 %), seed treatment material (13.94%) and manure & fertilizers (83.34%) while used more seed (162.38%) in cultivation of Kodo as compared to RPP. The total variable cost and net return on variable cost was found to be 42.34 & 31.16 per cent less in case of an average beneficiary HH (Rs. 3669.16 & 6825.22/acre) as compared to RPP (Rs.6363.75 & 9914.00/acre).

3.7.2 Kutki

The comparative analysis of cultivation of Kutki in beneficiary HH farms vs RPP is presented in table 3.10. It is observed from the data that the gross & net return on variable cost in cultivation of Kutki under beneficiary HH (Rs. 11090.48 & 7445.65/acre) was found to be 46.29 & 47.13 per cent less than RPP(Rs.

Table 3.11 : Adoption and yield gap of Kutki in beneficiaries vs RPP (Rs./acre)

Particulars		Beneficiaries	RPP	% Difference over RPP
Operational Cost				
Human labour		1902.71	3437.50	-44.65
Bullock labour		671.40	0	
Total Operational Cost		2574.11	3437.50	-25.12
Material Cost				
Seed		516.88	148.00	249.24
Seed Treatment		28.06	41.25	-31.98
Manure & Fertilizers		425.78	2750.00	-84.52
Total Material cost		970.72	2939.25	-66.97
Total Variable cost		3544.83	6376.75	-44.41
Yield per acre	Main Produced	4.17	7.89	-47.15
	By-Product	13.50	16.50	-18.18
Return (Rs.)	Main Produced	2540	2540	0
	By-Product	36.94	36.94	0
Rate per quintal	Main Produced	10592	20040.6	-47.15
	By-Product	498.68	609.49	-18.18
Net Return on Variable cost		7545.65	14273.34	-47.13
Gross Return (Rs./acre)		11090.48	20650.09	-46.29

20650.09 & 14273.34). He was get found to -47.15 per cent less yield (4.17q/acre) as compared to RPP (7.89q/acre). He was also found to use less human labour (44.65%), seed treatment material (31.98%) and manure & fertilizers (84.52%), while used more seed (249.24%) in cultivation of Kutki as compared to RPP. The total variable cost was found to be 44.41 per cent less in case of beneficiary HH (Rs. 3544.83/acre) as compared to RPP (Rs. 6376.75/acre).

Hence, it can be concluded that beneficiaries HH used more material cost due to higher seed rate as compared to Recommended Packages of Practices (RPP) mainly because of the fear that seed which they are having may have low germination percentage and due to undulated topography most of the seed runaway in case of rains which, reflect in yield gap and ultimately resulted reduction in net income. It shows there is still potential to increase HH income of beneficiary HHs through cultivation of Kodo and Kutki by 31.16 and 47.13 per cent respectively, through adoption of RPP.

3.8 Marketable & Marketed Surplus

Marketed surplus of Kodo as well as Kutki was analysed both for beneficiary and non beneficiary HHs and presented in Table 3.12 & 3.13.

3.8.1 Kodo

It is observed from the data that on an average beneficiary HH (3.94 q/acre) sold 157.52 per cent more quantity of Kodo in the market/processing plant of Kodo than non beneficiary HH (1.53 q/acre). He used to keep 37.55 & 28.57 per cent less Kodo as compared to non- beneficiary for home consumption and retain for seed for the next year respectively (Table 3.12).

Table 3.12 : Marketable and Marketed surplus of Kodo (q/acre)

Particulars	Beneficiaries	Non- Beneficiaries	% Difference over Non-Beneficiaries
Total Production	5.17	3.97	30.23
Remaining quantity	0.5	0.3	66.67
Total Availability	5.67 (100)	4.27 (100)	32.79
Home Consumption	1.58 (27.87)	2.53 (59.25)	-37.55
Seed requirement for next year	0.15 (2.65)	0.21 (4.92)	-28.57
Marketed Surplus	3.94 (69.49)	1.53 (35.83)	157.52

Out of the total availability, an average beneficiary HH (5.67 q/acre) found to sell 69.49 per cent in the market and 27.87 & 2.65 per cent retain for home consumption and seed for the next year for cultivation, while an average non beneficiary HH found to be retain maximum quantity of total availability of Kodo (4.27

20650.09 & 14273.34). He was get found to -47.15 per cent less yield (4.17q/acre) as compared to RPP (7.89q/acre). He was also found to use less human labour (44.65%), seed treatment material (31.98%) and manure & fertilizers (84.52%), while used more seed (249.24%) in cultivation of Kutki as compared to RPP. The total variable cost was found to be 44.41 per cent less in case of beneficiary HH (Rs. 3544.83/acre) as compared to RPP (Rs. 6376.75/acre).

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Out of the total availability, an average beneficiary HH (5.67 q/acre) found to sell 69.49 per cent in the market and 27.87 & 2.65 per cent retain for home consumption and seed for the next year for cultivation, while an average non beneficiary HH found to be retain maximum quantity of total availability of Kodo (4.27

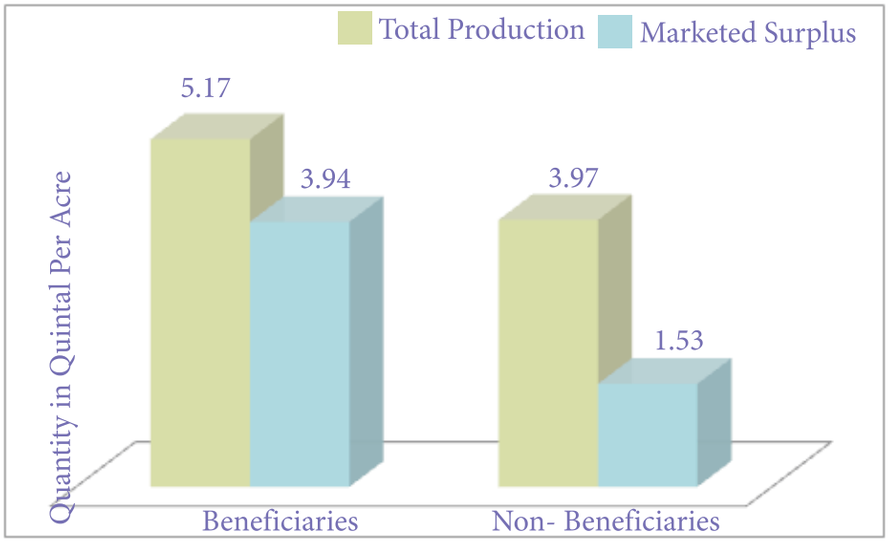

Fig. 3.11 : Marketed surplus in total production of Kodo in beneficiaries and non-beneficiaries farms

q/Acre) kept for home consumption (59.25 %) followed by sell in the market (35.83 %) and retain for seed (4.92 %).

3.8.2 Kutki

An average beneficiary HH found to sell 87.32 per cent more quantity (2.66 q/acre) of Kutki in the market/processing plant of Kutki rice/floor than non beneficiary HH (1.42 q/acre). He used to retain 6.78 & 28.00 per cent less quantity of Kutki for home consumption and seed for the next year respectively (Table 3.13).

Out of the total availability, an average beneficiary HH (4.49q/acre) found to be sell 59.24 per cent Kutki in the market and 36.75 & 4.01 per cent retain for home consumption and seed for the next year for cultivation, while an average non beneficiary HH found to retain maximum quantity of total availability of Kodo (3.23 q/Acre) for home consumption (51.45%) followed by sell in the market (41.28%) and retain for seed (7.27%). As marketed surplus reflected the pace of growth of

Table 3.13 : Marketable and Marketed surplus of Kutki (q/acre)

Particulars	Beneficiaries	Non- Beneficiaries	% Difference over Non-Beneficiaries
Total Production	4.17	3.23	29.1
Remaining quantity	0.32	0.21	52.38
Total Availability	4.49 (100)	3.44 (100)	30.52
Home Consumption	1.65 (36.75)	1.77 (51.45)	-6.78
Seed requirement for next year	0.18 (4.01)	0.25 (7.27)	-28.00
Marketed Surplus	2.66 (59.24)	1.42 (41.28)	87.32

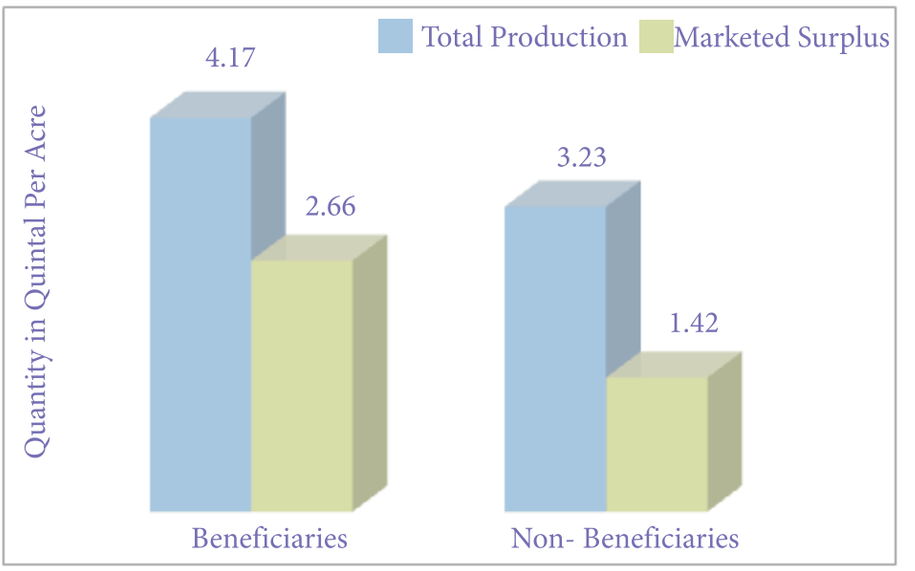

Fig. 3.12 : Marketed surplus in total production of Kutki in beneficiaries and non-beneficiaries farms

commercialization Hence, it is clear from the above discussion that beneficiary HHs were found to be more commercialized than non-beneficiary HHs.

Thus, it can be concluded that marketable and marketed surplus of Kodo and Kutki is found to be more in beneficiary as compared to non- beneficiary HHs farm. Both the crops are the staple food for the tribal community and therefore marketed surplus is lower in case of non-beneficiary than beneficiary HHs farm. The remunerative price provided by the processing plants, beneficiary HHs used to keep less quantity of Kodo/Kutki for consumption & supplement their foods through other cereals. Therefore, marketed surplus is higher in beneficiary's HH farm as compared to non- beneficiary's HH farm.

3.9 Processing of Kodo-Kutki

After the production of Kodo-Kutki, processing take place and grain converted into Kodo/Kutki rice. Further, it is converted in to Kodo/Kutki floor for making of several value added products. The per quintal processing cost of Kodo/Kutki to Kodo/Kutki rice and Kodo/Kutki rice to Kodo/Kutki floor has been analysed both for traditional and modern machine method related to beneficiaries HHs and presented in table 3.14 to 3.17.

3.9.1 Kodo to Kodo Rice

The per quintal processing cost of Kodo to Kodo rice was found to be 80.46 per cent less in modern machine technique (Rs.85/q) as compared to traditional method (Rs.435 /q). The processing of Kodo to Kodo rice was also found to be 8.11 per cent more in modern machine technique (0.80 q) as compared to traditional method (0.74 q). The quantity of broken rice and husk was found to be 31.25 and 1.00 per cent less in modern machine method as compared to

Table 3.14 : Income received from processing of Kodo to Kodo rice (Rs./q)

Particulars		Traditional	Modern (Machine)	% Difference over Traditional
Production of Rice (per qtl.)	Rice	0.74	0.80	8.11
	Broken Rice	0.16	0.11	-31.25
	Husk	0.10	0.09	-10.00
Processing Cost		435.00	85.00	-80.46
Kodo (Raw Materials)		2150.00	2150.00	0.00
	Total Cost	2585.00	2235.00	
Selling Price	Kodo Rice	4840.00	5816.00	20.18
	Broken Rice	288.00	214.50	-25.52
	Husk	84.00	77.40	-7.86
Gross Benefit		5211.60	6107.90	17.20
Net Benefit per quintal		2626.60	3872.90	47.45
Return/Rs. investment		2.02	2.73	35.55

traditional method (Table 3.14). On the investment of Re.1.00 a processor was found to get 35.55 per cent more benefit in case of processing of kodo to kodo rice in modern machine method (Rs. 2.73) as compared to traditional method (Rs. 2.02).

Hence, it can be concluded that on processing of a quintal of Kodo grain recovery of rice is higher in case of modern method of processing as compared to traditional method because in traditional method percentage of broken rice is more. Besides this, processing cost in traditional method is higher as compared to modern machine, which leads to increase in total cost of processing. Gross as well as net benefit is also higher in case of modern machinery with higher return/rupee Investment. This shows that for increasing income of the beneficiary's HHs not only production practices but awareness about

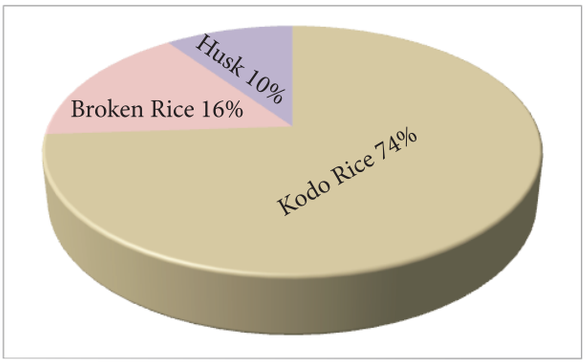

Fig. 3.13 : Share of rice, broken rice and husk in Kodo processing through traditional method

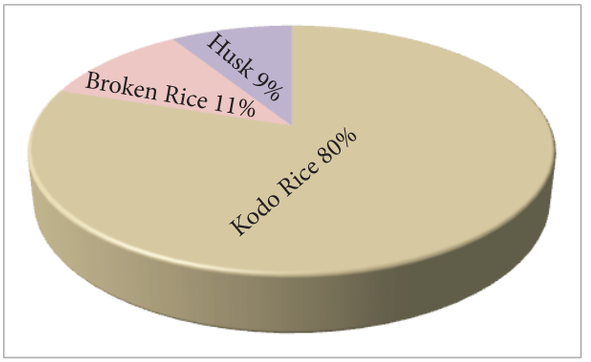

Fig. 3.14 : Share of rice, broken rice and husk in Kodo processing through modern machine

modern method of processing is equally important.

3.9.2 Kutki to Kutki Rice

The per quintal processing cost of Kutki to Kutki rice was found to be 78.38 per cent less in modern machine technique (Rs.112/q) as compared to traditional method (Rs.518 /q) (Table 3.15).

The processing of Kutki to Kutki rice was also found to be 13.24 per cent more in modern machine technique (0.77 q) as compared to traditional method (0.68 q). The quantity of broken rice and husk was found to be 35.29 and 20.00 per cent less in modern machine method as compared to traditional method. On the investment of Re.1.00 a processor was found to get 32.10 per cent more benefit in case of processing of Kutki to Kutki rice in modern machine method (Rs. 2.06) as compared to traditional method(Rs. 1.56) .

Hence, it can be concluded that in case of processing of the Kutki to Kutki rice the

Table 3.15 : Income received from processing of Kutki to Kutki rice (Rs./q)

Particulars		Traditional	Modern (Machine)	% Difference over Traditional
Production of Rice (per qtl.)	Rice	0.68	0.77	13.24
	Broken Rice	0.17	0.11	-35.29
	Husk	0.15	0.12	-20.00
Processing Cost		518.00	112.00	-78.38
Kodo (Raw Materials)		2730.00	2730.00	0.00
Total Cost		3248.00	2842.00	-12.50
Selling Price	Kutki Rice	4637.60	5544.00	19.54
	Broken Rice	340.00	242.00	-28.82
	Husk	82.20	62.40	-24.09
Gross Benefit		5059.80	5848.40	15.59
Return/Rs. investment		1.56	2.06	32.10
Net Benefit per quintal		1811.80	3006.40	65.93

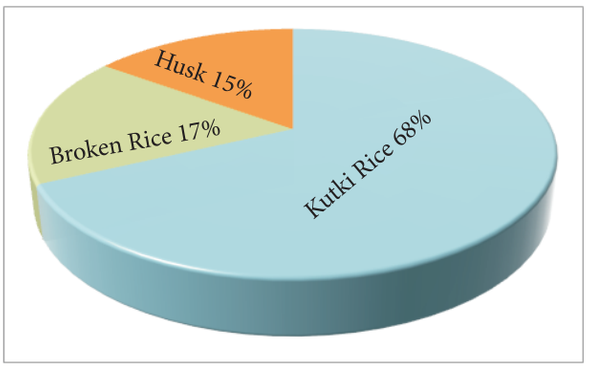

Fig. 3.15 : Share of rice, broken rice and husk in Kutki processing through traditional Method

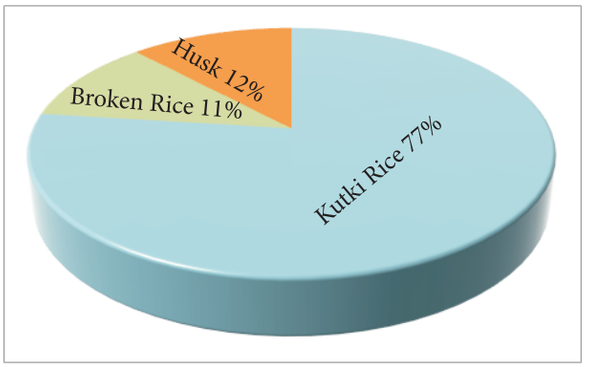

Fig. 3.16 : Share of rice, broken rice and husk in Kutki processing through modern machine

percentage of broken rice and husk is higher in case of traditional method as compared to modern method of processing. There by percentage of rice recovery is higher by 13.24 per cent in modern method. The cost per quintal of processing is about 78 per cent higher in case of traditional method as compared to modern machine method. The higher quality of processing through modern machine an average HH fetch 19.54 per cent higher price of rice as compared to traditional processing which ultimately reflect higher rate of return (32.10%).

3.9.3 Kodo Rice to Kodo Floor

The per quintal processing cost of kodo rice to kodo floor was found to be (65.96%) less in modern machine technique (Rs.80/q) as compared to traditional method (Rs.235/q). The benefit from Kodo floor was also found to be 55.49 per cent more in modern machine technique (Rs 1415/q) as compared to traditional method (Rs. 910/q). An average processor of modern machine earn 7.04 cent more benefit on investment of Re. 1.00 for conversion of Kodo to Kodo rice in modern machine method (Rs. 1.21) as compared to traditional method (Rs. 1.14). (Table 3.16) .

Fig. 3.17 : Modern machinery : Grain to rice

Fig. 3.18 : Modern machinery : Rice to floor

Thus, it can be concluded that cost of processing in traditional method of Kodo rice to Kodo floor is about 66 per cent higher as compared to modern method of processing. The

Table 3.16 : Income received from processing of Kodo rice to Kodo floor (Rs./q)

Particulars	Traditional	Modern (Machine)	% Difference over Traditional
Kodo Rice buy at market Rate	6505	6505	0.00
Processing Cost	235	80	-65.96
Total Cost	6740	6585	-2.30
Selling Price of floor at market Rate	7650	8000	4.58
Benefit from floor	910	1415	55.49
Return/Rs. Investment on floor	1.14	1.21	7.04

HH also fetches higher selling price when the processing done by modern machine, which enhance the benefit by 59.41 per cent and 7.04 per cent higher rate of return over traditional method of processing of Kodo rice to Kodo floor.

3.9.4 Kutki Rice to Kutki Floor

The per quintal processing cost of Kutki rice to Kutki floor was found to be 65.15 less in modern machine technique (Rs.115/q) as compared to traditional method (Rs.330/q). The net return from Kutki floor was also found to be 59.88 per cent more in modern machine technique (Rs 8500/q) as compared to traditional method (Rs. 8200/q). An average HH earn 6.79 cent more return on investment of rupee 1.00 for conversion of Kutki to Kutki floor through modern machine method (Rs. 1.19) as compared to traditional method (Rs. 1.12).

Table 3.17: Income received from processing of Kutki rice to Kutki floor (Rs./q)

Particulars	Traditional	Modern (Machine)	% Difference over Traditional
Kodo Rice buy at market Rate	7010	7010	0.00
Processing Cost	330	115	-65.15
Total Cost	7340	7125	-2.93
Selling Price of floor at market Rate	8200	8500	3.66
Benefit from floor	860	1375	59.88
Return/Rs. Investment on floor	1.12	1.19	6.79

Hence, it can be concluded that processing of Kutki rice to Kutki floor through traditional method involve 65 per cent which resulted higher net return in modern machine over traditional machine by about 60 per cent. The rate of return is also higher in modern machine as compared to traditional method.

3.10 Value Added Products

There were several value added products found to prepared from Kodo/Kutki viz. Kodo idle, Kodo sev, Kodo rice and Kodo patti etc., in

Fig. 3.19 : Traditional Method: Processing grain to rice

Fig. 3.20 : Traditional Method: Processing rice to floor

which Kodo Sev, Kodo Patti and Kutki Laddu were found to be prepared on commercial line in the area under study. The cost incurred and profit received per kg has been analyzed for all these value added products at working cost and presented in Table 3.18.

It is observed from the data that a processor received maximum profit from Kodo Patti (Rs. 49.50kg) as compared to Kodo Sev (Rs. 37.10/kg) and Kutki Laddu (Rs.26.50/kg), while per kg cost incurred was found to be more in Kutki Laddu (Rs.123.50/kg) followed by Kodo Sev (112.90/kg) and Kodo Patti (Rs.80.50/kg).

These value added products were found to be sold in Aganwadi and mid day meal programme of school children.

Thus, it can be concluded that several value added products like Sev & Patti (Kodo) while Laddu is prepared with Kutki rice. In preparation of Sev the total cost incurred is Rs. 113/kg. The major component of preparation of Sev are Kodo floor and edible oil. The selling price of Kodo Sev is Rs. 150/kg which resulted in Rs. 37.10/kg of net return. In preparation of Kodo Patti major component are Kodo rice, Soya floor and Gur. The cost incurred in preparation

Table 3.18 : Cost incurred in value addition of Kodo/Kutki (Rs./kg)

Products	Items	Qty. (gm)	Rate/kg	Cost (Rs.)	MRP (Rs.)
		Kodo			
Sev	Kodo floor	730	80	58.4	150 (37.10)
	Gram floor	300	45	13.5	
	Oil	250	85	21.25	
	Spice	50	180	9	
	Salt	50	15	0.75	
	Expenses on labour	1	150	10	
	Total	1		112.9	
Patti	Kodo rice	300	80	24	130 (49.50)
	Soybean floor	150	50	7.5	
	Groundnut floor	50	90	4.5	
	Til floor	100	60	6	
	Gur	300	40	12	
	Vegetable oil (l.)	100	65	6.5	
	Expenses on labour	1	150	20	
	Total	1		80.5	
		Kutki			
Laddu	Kutki rice	500	90	45	150 (26.50)
	Dry fruits	150	500	50	
	Sugar	250	45	12	
	Ghee	100	65	6.5	
	Expenses on labour	0	150	10	
	Total	1		123.5	

Fig. 3.21 : Value addition: Kodo into Kodo rice

Fig. 3.22 : Value addition : Preparation of Kodo Patti

of 1 kg Kodo Patti is Rs. 80.50/kg, while selling price is Rs. 130/kg with net value addition of Rs. 49.50/kg. In case of Kutki Laddu net value added is about 26 per cent and major component cost are Kutki rice and rice food. All these items can be prepared at HH level using their own raw material, which will help in enhancing their income through participation in value chain of Kodo and Kutki.

3.11 Economics of different Value Added Products of Kodo/Kutki

Economics of different value added products of Kodo/Kutki over Kodo/Kutki grains has been analysed and presented in Table 3.19.

3.11.1 Kodo

Amongst the different value added products of Kodo viz. Kodo rice, Kodo floor, Kodo Sev and Kodo Patti, Kodo Patti (Rs.

Table 3.19 : Economics of value added product of Kodo/Kutki grain (Rs./q)

Particulars		Additional Cost	Additional Return Over Kodo	Additional Net Return Over Kodo	Additional Benefit Ratio Over Kodo
Kodo					
Kodo Floor	Traditinal Method	435	4777	2627	1.22
	Morden Machine Method	85	6023	3873	1.80
Kodo Rice	Traditinal Method	235	7415	5265	2.45
	Morden Machine Method	80	7920	5770	2.68
	Kodo Sev	5475	9525	7375	3.43
	Kodo Patti	5650	10850	8700	4.05
Kutki					
Kutki Floor	Traditinal Method	518	4542	1812	0.66
	Morden Machine Method	112	5736	3006	1.10
Kutki Rice	Traditinal Method	330	7870	5140	1.88
	Morden Machine Method	115	8385	5655	2.07
	Kutki Laddu	78.5	14922	12192	4.47

8700/q) was found to be more profitable followed by Kodo Sev (Rs.7375/q), Kodo floor through modern machine (Rs.5770/q), Kodo floor with traditional method (Rs.5265/q), Kodo rice with modern machine (Rs. 3873/q), Kodo rice with traditional method (Rs. 2627/q. It gaves the more return over per rupee investment in Kodo Patti (Rs. 4.05) followed by Kodo Sev (Rs. 3.43), Kodo floor through modern machine (Rs. 2.68) Kodo floor with traditional method (Rs.2.45/q), Kodo rice with modern machine (Rs. 1.80) and Kodo rice with traditional method (Rs. 1.22) over Kodo grain.

3.11.2 Kutki

Amongst the different value added products of Kutki viz. Kutki rice, Kutki floor, and Kutki Laddu, Kutki Laddu (Rs 12192/q) was found to be more profitable followed by Kutki floor through modern machine (Rs. 5655/q), Kutki floor with traditional method (Rs.5140/q), Kutki rice with modern machine (Rs. 3006/q) and Kutki rice with traditional method(Rs.1812/q). The return per rupee investment over Kutki grain was found to be maximum in Kutki laddu (Rs. 4.47) followed by Kutki floor through modern machine (Rs. 2.07), Kutki floor with traditional method (Rs.1.88/q), Kutki rice with modern machine (Rs.1.10), and Kutki rice with traditional method(Rs. 0.66) which is presented in table 3.19.

Hence, all these value added products are found to be economically viable which provide handsome return on per rupee investment from Kodo (Rs. 4.05) and Kutki (Rs. 4.47) grain.

It can be concluded that processing of Kodo to Kodo rice and Kodo rice to Kodo floor and Kutki to Kutki rice and Kutki rice to Kutki floor using both traditional and modern method incremental income and incremental cost benefit ratio of HH was found to be higher in modern method as compared to traditional method instead of selling raw material. Hence, farmers should be trained and provided more community processing centre for enhancing their HH income. Kodo/Kutki floor and rice can be used for production of Sev & Kodo Patti and Kutki Laddu and can be sold out in urban and peri-urban area resulting into the higher additional and leads to enhance the income of the beneficiaries HH as compared to Kodo grain.

3.12 Impact of Activities on Living Status & of Members

The overall impact of SHGs over the standard of living was found to be positive on beneficiaries life as the majority of beneficiary HHs reported that their standard of living improved very much (84%) and their level of self assessment (72%), educational standard of children (96%), participation in social activities (68%), health Status (66%) and level of decision making capacity (50%) have been also improved after joining the SHGs. (Table 3.20).

The majority of them also reported that after linkage with SHGs, it was found that they were able to purchase more farm viz. TV, mobile & motor cycle etc. (84%). Their saving habits

Table 3.20 : Impact of SHGs activities on living status of beneficiaries (%)

S. No.	Particulars	No Improvement	Neutral	Improved	Very much Improved
	Overall benefit				
1	Level of Self Assessment	0	4	72	24
2	Level of Living Status	0	0	16	84
3	Education of Children	0	0	96	4
4	Social Activities	0	12	68	20
5	Health Status	0	66	22	12
6	Decision Making Capacity	28	22	50	0
7	Maintenance of Animal	54	16	30	0
	Saving Habits				
1	Improvement in Saving	0	12	74	14
2	Saving Capacity	16	32	42	10
3	Control on financial Expenditure	0	36	58	6
4	Earning Income Capacity	26	34	18	22
5	Freedom from Capitalistic	8	82	10	0
	Assets Ownership and Modern Instruments				
1	Purchase of Land	78	16	6	0
2	Purchase of Animal	70	20	10	0
3	Adoption of Technology in Farming	6	14	58	22
4	Ability of utilize in Capital Services	34	22	44	0
5	Purchase of T.V., Mobile & Motorcycle etc)	84	12	4	0

(74%), saving capacity (42%) and control over financial expenditure (58%) have been improved after joining to SHGs.

The assets ownership and modern instruments were also judged and found that their ability to adopt modern technology (58%) and utilized capital services (44%) were found to be improved in farming. Although, no improvement was found to be in purchase of new land (78%) and animal (70%) after linkage with SHGs.

3.13 Constraints Related to Production and Value Addition of Kodo/Kutki

The constraints which were faced by the respondents in production and Marketing of Kodo/Kutki and thier value added products are identified and presented in table 3.21.

The constraints reported by the majority of beneficiaries were low productivity (94%) followed by huge price spread (gap) between price paid by the consumer and price received by the producer due to absence of Minimum Support Price (MSP) for Kodo & Kutki (90%), lack of suitable extension and development support for production of Kodo/Kutki (70%), non-adoption of Recommended Package of Practices of Kodo & Kutki by the respondents (66%), lack of organized seed production and lack of supply of HYVs of seeds (54%).

Table 3.21 : Constraints related to production and value addition (%)

Production		
1	Research on genetic improvement in Kodo/Kutki was not given utmost importance	24
2	Low productivity	94
3	Non-adoption of Recommended Package of practices of kodo & Kutki by the respondents	66
4	Lack of suitable extension and development support for production of Kodo/Kutki	70
5	Lack of organized seed production and supply of HYVs of seed	54
6	Huge price spread (gap) between price paid by the consumer and price received by the and producer due to absence of Minimum Support Price (MSP) for Kodo & Kutki	90
Value Addition		
1	Change in the consumption habits among the urban households coupled with time consuming and tedious procedure of food preparation making utilization difficult	42
2	Lack of advance and cost effective processing technologies for entrepreneurship development	52
3	Comparatively poor shelf life of miller based products	36
4	Lack of remunerative price for the produce and marketing facilities	82
5	Lack of suitable extension and development support for production of value added products of Kodo & Kutki in the state.	78

The major constraints related to value addition as reported by majority of respondents were; lack of remunerative price for value added products and marketing facilities (82%) followed by lack of suitable extension and development support for production of value added products of Kodo/Kutki (78%), lack of advance and cost effective processing technologies for entrepreneurship development (52%), change in the consumption habits among the urban households coupled with time consuming and tedious procedure of food preparation (42%) and comparatively poor shelf life of miller based products (36%).

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CHAPTER-IV

CONCLUDING REMARKS AND POLICY SUGGESTIONS

This chapter deals with the results emerged from the study and policy implications for further improvement in the State

4.1 Conclusion

The following results are emerged from the study:-

4.1.1 Socio-Economic Status

- The beneficiary HHs were found to be more literate, more self capable and earning more income than non-beneficiary HHs' while other things remain almost same in both the cases.

4.1.2 Value of Home Assets

- The present value of home assets of an average beneficiary HH was found to be 39 per cent more due to upliftment in socio-economic status, while the present value of farm assets was found to be 21 per cent less as compared to non-beneficiaries indicating the well being of beneficiaries HH over non- beneficiaries
- An average beneficiary HH has (21.18%) less farm assets as compared to non beneficiary, while in case of home assets an average beneficiary HH has more (38.69%) home assets than non-beneficiaries.

4.1.3 Monthly Expenditure

- An average beneficiary HH was found to be spend more monthly expenditure as compared to non-beneficiary HH. The maximum amount of monthly expenditure was found to be spent on food material followed by clothing and other expenditure in both the categories.

4.1.4 Land and Irrigation

- Un-cultivated and fallow land was found to be lower in case of beneficiaries farm as compared to non-beneficiaries farm, resulted in higher percentage of cultivated land owned by beneficiary HH as compared to non- beneficiary HH. Although, irrigated area was found to be less in beneficiary's HH farm as compared to non- beneficiary's HH farm.

4.1.5 Training and Demonstrations

- Due to efficient training and demonstrations to beneficiary HHs, varietal adoption of Kodo-Kutki & Paddy in Kharif and Wheat & Gram in Rabi is in favour of increasing productivity.
- In case of Kharif cropped area allocated to different crops was found to be 26.67% higher on beneficiary's farm as compared to non-beneficiary's farm.
- The beneficiaries used to allocate 25 per cent more area under Kodo and 65 more under Kutki as compared to non-beneficiaries amongst major crops grown during Kharif season.

In Rabi season percentage allocated in different crops was also higher in beneficiary's farm than non-beneficiaries farm, which resulted in higher cropping intensity on beneficiary's farm (169%) as compared to non-beneficiaries farm (143%).

4.1.6 Cost of Cultivation

- The cost of cultivation of Kodo/Kutki on beneficiaries and non-beneficiaries farm shows that the share of operational cost is higher as compared to material and managerial cost, while fixed cost account identical on beneficiaries and non-beneficiaries farms.
- In total operational cost, expenditure on family labour is higher as compared to hired human labour and the total operational cost per acre is lower on beneficiary's HH farm as compared to non- beneficiary's HH farm. This reflects that due to awareness, efficiency human and bullock labour increases which lead to lower down the cost of operation.
- In case of material cost it is more on beneficiary's HH farm as compared to non beneficiary's HH farm mainly due to adoption of recommended doses of manures & fertilizers.

4.1.7 Adoption of Technology

- Inspite of adoption of technology of cost of cultivation on beneficiary's HH farm is lower by only 3.03 to 6.17 per cent as compared to non- beneficiary's HH farm in Kodo and Kutki respectively, which shows that adoption of technology makes the difference and at the same time the reduction in cost of cultivation among beneficiaries over non-beneficiaries was also observed in the area under study.
- The yield of Kodo and Kutki was found to be more than 30 per cent on beneficiary's HH farm as compared to non-beneficiary's HH farm. The net income of beneficiaries HH was also found to be increased by more than 200 per cent due to adoption of technology which not only reduces the cost of cultivation on one hand but increases the productivity on the other.
- The cost of production (Rs./qtl) was also found to be decreased over total cost & total variable cost respectively, return per rupee investment was also found to be higher in beneficiary's HH farm as compared to non-beneficiary's HH farm.

4.1.8 HH Income

- Beneficiaries HH used more material cost due to higher seed rate as compared to RPP mainly because of the fear that seed which they are having may have low germination percentage and due to undulated topography most of the seed runaway in

- case of rains, which reflect in yield gap and ultimately resulted reduction in net income. Thus, there is still potential to increase HH income of beneficiary HH through cultivation of Kodo and Kutki by 31.16 and 47.13 per cent respectively, through adoption of RPP.

4.1.9 Marketable and Marketed Surplus

- Marketable and marketed surplus of Kodo and Kutki is found to be more in beneficiary as compared to non- beneficiary HH farm. Both the crops are the staple food for the tribal community and therefore marketed surplus is lower in case of non-beneficiary than beneficiary HHs farm.
- The remunerative price provided by the processing plants, beneficiaries HHs used to keep less quantity of Kodo/Kutki for consumption & supplement their foods through other cereals therefore marketed surplus is higher in beneficiary HH farm as compared to non- beneficiary HH farm.

4.1.10 Processing

- Processing of one quintal of Kodo grain recovery of rice is higher in case of modern method of processing as compared to traditional method because in traditional method percentage of broken rice is more. Besides this, processing cost in traditional method is higher as compared to modern machine, which leads to increase in total cost of processing.
- Gross as well as net benefit is also higher in case of modern machinery with higher return/rupee. Investment. This shows that for increasing income of the beneficiary's HH not only production practices but awareness about modern method of processing is equally important.
- Cost of processing in traditional method of Kodo rice to Kodo floor is about 66 per cent higher as compared to modern method of processing. The HH also fetches higher selling price when the processing done by modern machine, which enhance the benefit by 59.41 per cent and 7.04 per cent higher rate of return over traditional method of processing of Kodo rice to Kodo floor.
- Processing of Kutki rice to Kutki floor through traditional method involve 65 per cent more cost as compared to modern machine method, which resulted higher net return in modern machine over traditional machine by about 60 per cent. The rate of return is also higher in modern machine as compared to traditional method.

4.1.11 Value Added Products

- Several value added products viz. Sev & Patti (Kodo), while Laddu is prepared with Kutki rice. In preparation of Sev the total cost incurred is Rs. 113/kg. The major

- components of preparation of Sev are Kodo floor and edible oil. The selling price of Kodo Sev is Rs. 150/kg which resulted in Rs. 37.10/kg of net return.
- In preparation of Kodo Paati major components are Kodo rice, Soya floor and Gur. The cost incurred in preparation of 1 kg Kodo Patti is Rs. 80.50/kg, while selling price is Rs. 130/kg with net value addition of Rs. 49.50/kg.
- In case of Kutki Laddu net value added is about 26 per cent and major component cost are Kutki rice and rice food.
- The value added product can be prepared at HH level using their own raw material, which will help in enhancing their income through participation in value chain of Kodo and Kutki.
- The processing of Kodo to Kodo rice and Kodo rice to Kodo floor and Kutki to Kutki rice and Kutki rice to Kutki floor using both traditional and modern method incremental income and incremental cost benefit ratio of HH was found to be higher in modern method as compared to traditional method. Instead of selling raw material.
- In value addition for selling in urban and peri-urban areas Kodo/Kutki floor and rice can be used for production of Sev & Kodo Patti and Kutki Laddu, can be sold out in urban and peri-urban over resulting into the higher additional and leads to enhance the income of the beneficiaries HH incremental income as compared to Kodo grain.

4.2 Policy Recommendations

The following policy implication can be suggested from the above conclusions:-

4.2.1 Yield Gap

- ☑ Although, Beneficiaries HHs cultivated Kodo/Kutki in commercial line but still adoption and yield gap were observed in their farms with respect to RPP. Hence, efforts should be made to narrow down this gap by adopting RPP in cultivation of Kodo/Kutki with replacement of recommended HYVs varieties, timely sowing, balance nutrition and other crop management practices such as optimum spacing and cultivation technologies.
- ☑ Introduction of cropping pattern for remunerative farming involving short duration varieties of pulses with kodo/kutki are required to be made.
- ☑ Location specific crop production technologies need to be identified and improvised further to achieve higher productivity.

4.2.2 Promotional Activities

- ☑ The tribal community should be involved in promotional activities related to

production, processing and marketing of value added products of Kodo/Kutki.

- ☑ Large scale production demonstration combined with value added and marketing techniques of Kodo/Kutki are required to increase production as well as enhancing income.

4.2.3 Development of Entrepreneurial Skill

- ☑ SHGs played an important and significant role in processing and processing value added products of Kodo/Kutki in the area under study. However, entrepreneurs skill in food processing and product development are required to be promoted and developed through disseminating complete knowledge on nutritional importance, linkage of farmers with market, processing, value addition etc.
- ☑ The Tejawani should not only include more and more urban and rural entrepreneurs, progressive farmers, NGOs etc. but entrepreneurship development programme for the tribal's and other stakeholders should be organized on regular basis.

4.2.4 Promotion of Nutritional Benefits

- ☑ Tejaswani provide bonus price to their beneficiaries but for popularization of Kodo/Kutki in a big way nutritional and health benefits should receive adequate attention among all the stake holders.
- ☑ The fixation of Minimum Support Price for the Kodo/Kutki is rational, which will help to get fair price to the tribal growing these crops. This is very important because looking to its nutritional and health benefits to Kodo/Kutki various product are getting popularity in 5 star International Hotels, Shopping Malls and Big-Bazar.
- ☑ Awareness regarding nutritional health and environmental advantages may be created thorough various strategies so that the consumers will become conscious and start taking the advantage by including of Kodo/Kutki and its products in their daily diet.

4.2.5 Demonstration of Technology

- ☑ Instead of distribution of seed and other inputs to the members HHs of the SHGs, 2 to 4 method demonstrations are required to be plan in a village for complete transfer of technology with full package of practices and to show the impact a Kisan Mela should be organized near the field.
- ☑ If there is a problem or incidence of insect and disease, a field day should be organized in front of all the farmers of the village so that they learn by seeing, it is for their better and proper understanding of all the technologies related to crop cultivation.

4.2.6 Literacy

- ☑ Literacy should be a pre-requisite, while selecting the members of the SHGs for effective implementation of the

programme involving some more key person.

4.2.7 Formation of Farmers Producing Organize (FPOs)

☑ With the successful implementation of Tejaswini Women Empowerment Programme by forming SHGs and enhancing income involving its members in various activities and intervention through backward and forward linkages, it has become imperative that they should not be left unattended in future and it is therefore required to form Farmers Producing Organization for their self sustain in a profitable mode

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APPENDIX

''मध्य प्रदेश में कोदो एवं कुटकी की खेती, प्रसंस्करण और विपणन के द्वारा ग्रामीण महिला सशक्तिकरण पर तेजस्विनी महिला सशक्तिकरण कार्यक्रम का प्रभाव''

साक्षात्कार अनुसूची

साक्षात्कार दिनांक..... साक्षात्कार कर्त्ता का नाम.....

स्व सहायता समूह का नाम : .....

गाँव का नाम		तहसील	
जिला			

1. सामान्य जानकारी

1. प्रतिवादी का नाम	
2. पिता / पति का नाम	
3. मोबाइल न.	
4. उम्र (वर्ष में)	
5. शैक्षणिक योग्यता	अशिक्षित-1, प्राइमरी-2, हाईस्कूल-3, हायरसेकण्ड्री-4, स्नातक-5, स्नातकोत्तर-6
6. वर्ग (अ)	सामान्य-1, अ.पि.व.-2, अ.जाति-3. अनु.जनजाति-4
7. फार्म (अ)	हिन्दू-1, मुस्लिम-2, सिख-3, इसाई-4, जैन-5, अन्य-6
8. कृषक का व्यवसाय *	मुख्य :---------- सहायक :----------
9. परिवार के कुल सदस्यों की संख्या ----	पुरुष :------ महिला:----बच्चें (<16 वर्ष):-----
10. खेती में लगे परिवार के सदस्यों की संख्या	
11. कृषि कार्य का अनुभव (वर्षों में)	
12. वार्षिक आय (रु.)	कृषि एवं संबद्ध :---------- गैर-कृषि स्त्रोतों से आय :----------

★ कोड: कृषि एवं संबद्ध-1, कृषि श्रम-2, स्व-घरेलू उद्योग में कार्यरत-3, स्व सेवाओं में कार्यरत -4, गैर-कृषि आकस्मिक श्रम-5, वेतन भोगी श्रम-6, घर का कार्य -7, पेंशनभोगी-8, अन्य -9 (विशिष्ठ)

2. फार्म मशीनरी (Farm Assets)

विवरण	संख्या	वर्तमान कीमत (रुपये में)	रखरखाव
ट्रेक्टर			
ट्राली			
कल्टीवेटर			
सीडड्रिल			
बखर			
त्रिफन			
हल			
बैल गाड़ी			
अन्य			

3. घरेलू उपभोगी वस्तुऐं (Home Assets) :

विवरण	मात्रा/संख्या	वर्तमान कीमत (रुपये में)	मासिक खर्च
टेलीविजन			
पंखा			
मोबाइल			
मोटर साइकिल			
साइकिल			
अन्य पदार्थ(यदि कोई)			

4. घरेलु मासिक खर्चे (Monthly Household Expenditure Patterns)

विवरण	कीमत (रुपये में)
खाद्य सामग्री (फल,सब्जी एवं दालों आदि सहित)	
कपडे	
शिक्षा (स्कूल फीस एवं पुस्तकों सहित)	
स्वास्थ्य खर्चे	
पशुपालन (चारा दाना एवं दवाओं सहित)	
सामाजिक कार्यक्रम	
अन्य कोई (विशिष्ट)	

5. भू- उपयोग पद्धति (Land use pattern)

विवरण	सिंचित	असिंचित	कुल	सिंचाई के स्त्रोत*	सिंचाई किराया रु./एकड़
स्वयं का रकबा					
कास्तकारी भूमि					
किराये पर ली गयी भूमि					
किराये पर दी गयी भूमि					
गैर कृषि योग्य भूमि स्थायी व अन्य चारागाह					
वर्तमान पडत भूमि					
पुरानी पड़त भूमि					
किराये पर ली गयी भूमि का किराया रू/ एकड़					
किराये पर दी गयी भूमि का किराया रू/ एकड़					

* कोड: कुआं -1, ट्यूब बेल -2, नहर-3, नदी-4, तालाब,अन्य (विशिष्ट)-5

6. फसल पद्धति (Cropping pattern)

सीजन	फसल / सब्जी	किस्म	रकबा (एकड़ में)	
			सिंचित	असिंचित
खरीफ				
रबी				
जायद				

7. कोदो / कुटकी उत्पादन में आदान लागत

विवरण	कोदो				कुटकी			
	आदान सामग्री (Input Material)		श्रम लागत (Labour Cost)		आदान सामग्री (Input Material)		श्रम लागत (Labour Cost)	
	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत
गोबर खाद (कु.)								
गहरी जुताई								
बुबाई								
बीज (कि.ग्रा.)								
बीजोपचार(कल्चर १ ग्रा.)								
उर्वरक (कि.ग्रा.) यूरिया								
डी.ए.पी.								
एम.ओ. पी.								
सूक्ष्म तत्व								
कीटनाशक (मि.ग्रा.)								
नीदनाशक (मि.ग्रा.)								
सिंचाई								
कटाई								
थ्रेशिंग								
परिवहन								

8. उत्पाद से आय

विवरण	मुख्य उत्पादन (कु.)		बेची गई मात्रा (कु.)		कीमत (रुपये / कु.)	
	मुख्य उत्पादन	अन्य उत्पादन	मुख्य उत्पादन	अन्य उत्पादन	मुख्य उत्पादन	अन्य उत्पादन
कोदो						
कुटकी						

9. कोदो-कुटकी मार्केट सरप्लस (कु.)

विवरण	कोदो	कुटकी
कुल उत्पादन		
पिछले वर्ष का शेष (यदि कोई)		
स्वयं का उपभोग		
अगले वर्ष के लिए रखी गई मात्रा		
पशु के उपयोग हेतु		
नष्ट हुआ अनाज		
बाज़ार मे बेंची गयी मात्रा		

10. प्रसंस्करण कोदो चावल

विवरण	परंपरागत (स्थानीय)	आधुनिक (मशीन)
उत्पादन (प्रति कु. कोदो)		
लागत (रु. प्रति कु. कोदो)		
विक्रय मूल्य (रु. प्रति कु. कोदो)		

11.कोदो कुटकी के मूल्य उत्पाद समर्थन की लागत (Cost incurred in Value added Products of kodo kutki)

अ. कोदो के मूल्य समर्थन लागत (प्रति .....)

विवरण	कोदो पट्टी		लडडू		सेव		अन्य	
	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत
अन्य अन्न का मिश्रण (चावल, दाल, सूजी आदि)								
शक्कर/ गुड़								
तरल पदार्थ (घी/तेल/दूध/पानी आदि)								
ड्राई फ्रूट्स (काजू, किसमिस, बादाम आदि)								
अन्य मसाले								
श्रम लागत								
बनाने की लागत								
परिवहन लागत								
अन्य लागत (यदि कोई)								
कुल लागत								

ब. कुटकी के मूल्य समर्थन लागत (प्रति .....)

विवरण	कोदो पट्टी		लडडू		सेव		अन्य	
	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत
अन्य अन्न का मिश्रण (चावल, दाल, सूजी आदि)								
शक्कर/ गुड़								
तरल पदार्थ (घी/तेल/दूध/पानी आदि)								
ड्राई फ्रूट्स (काजू, किसमिस, बादाम आदि)								
अन्य मसाले								
श्रम लागत								
बनाने की लागत								
परिवहन लागत								
अन्य लागत (यदि कोई)								
कुल लागत								

12. कोदो के मूल्य संवर्धन के उत्पाद से आय

विवरण	कोदो पट्टी		लडडू		सेव		अन्य	
	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत
कुल उत्पादन								
बेची गई मात्रा								
1. थोक विक्रेता को								
2. फुटकर विक्रेता को								
3. आंगनवाड़ी को								
4. अन्य स्व-सहायता समूह को								
5. अन्य (यदि कोई हो)								
कुल आय								

13 कुटकी के मूल्य संवर्धन के उत्पाद से आय

विवरण	कोदो पट्टी		लडडू		सेव		अन्य	
	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत	मात्रा	कीमत
बेची गई मात्रा								
1. थोक विक्रेता को								
2. फुटकर विक्रेता को								
3. आंगनवाड़ी को								
4. अन्य स्व-सहायता समूह को								
5. अन्य (यदि कोई हो)								
कुल आय								

14. स्व-सहायता समूह का जीवन स्तर पर प्रभाव
(Impact of Self Help Group on Living Status)

विवरण	1	2	3	4	5
स्वसहायता समूह का सम्पूर्ण प्रभाव (Over all benefit of SHGs)					
1 आत्म विश्वास का स्तर					
2 रहन-सहन का स्तर					
3 बच्चों कि शिक्षा					
4 सामाजिक गति विधियां					
5 स्वास्थ्य स्तर					
6 निर्णय लेने कि क्षमता					
7 पशुपालन का रखरखाव					
B. बचत आदतन (Saving Habit)					
1 बचत में सुधार					
2 बचत क्षमता					
3 वित्त/पूँजी/खर्चो पर नियंत्रण					
4 आय बढाने/कमाने की क्षमता					
5 पूँजी पतियों से स्वतंत्रता					
C-सम्पति स्वामित्त एवं आधुनिक साधन (Assets Ownership and Modern Instruments)					
1 भूमि खरीद					
2 पशु खरीद					
3 खेती में तकनीक के अंगीकरण में					
4 पूँजी सेवा में तकनीक के उपयोग की योग्यता					
5 मोबाइल, टी.वी., मोटर साइकिल की खरीद					

* code : 1= Not at all improved, 2= No improvement, 3=Neutral, 4= Improved, 5= Very much Improved

15. स्व-सहायता समूह के सदस्यों को कोदो- कुटकी उत्पादन से संबंधित आने वाली समस्यायें ।

1----------

2----------

3----------

4----------

16. मूल्य संवर्ध लागत मे आने वाली समस्यायें ।

1----------

2----------

3----------

4----------

17. स्व- सहायता के सदस्यों को कोदो- कुटकी उत्पादन से संबंधित सुझाव ।

1----------

2----------

3----------

4----------

18. स्व- सहायता समूह के सदस्यों को कोदो-कुटकी प्रसंस्करण से संबंधित सुझाव ।

1----------

2----------

3----------

4----------

19. स्व-सहायता समूह के सदस्यों को कोदो - कुटकी उत्पादन से संबंधित प्रशिक्षण की आवश्यकता ।

1----------

2----------

3----------

4----------

20. सदस्य की टीप (यदि कोई)

1----------

2----------

3----------

4----------

Agro-Economic Research Centre for Madhya Pradesh & Chattisgarh

Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) 482 004

Tele-fax : 0761-2680315, E-mail : aerc_jbp@yahoo.co.in, Web: www.aerc.jnkvv.org