P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 3; March 2025; Page No. 378-382

Received: 23-01-2025
Accepted: 04-03-2025

Indexed Journal
Peer Reviewed Journal

# Participation and need assessment of tribal women in secondary agriculture

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**DOI:** https://www.doi.org/10.33545/26180723.2025.v8.i3e.1765

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**Abstract**

The primary occupation of the tribal people is agriculture and most of them engaged in various traditional occupations like mixed farming, hunting, *Jhoom* cultivation and shifting cultivation to settled agriculture. Tribal communities consume wild tubers, rhizomes and corms either in raw or baked or boiled or roasted form and they preserved these are using by crude method for processing of fruits as pickles or salting for preservation. They do minimal processing or drying which are necessary tasks before taking those products to market There is a need to give focus on processing of fruits, tubers etc., which is potential for market avenue (Joshi *et al*., 2013). Secondary agriculture is basically value addition to primary agriculture which also involves the tertiary processing where by-products and crops residues or even the main crop is used for extraction of high value bio-active compounds. Hence focus should be given to encourage tribal women through secondary agriculture to increase their income and livelihood status. Keeping these in view, a study was conducted in Ganjam district of Odisha and data were collected from 100 respondents on availability of agro produce in tribal areas and identified technological needs among tribal women for secondary agriculture. It was found that 95 percent women were actively participated in cleaning and drying with mean score (2.95) followed by ninety two percent tribal women actively participated in storage (2.92), 89 percent women actively participated in primary processing (2.89) and 72 percent women actively participated in sorting and grading of harvests from farm. It was also observed that there was huge post-harvest losses of fruits and vegetables which was perceived as very important problem with mean score 3.67 followed by lack of knowledge and skill in secondary agriculture (3.52), lack of post harvesting infrastructure (3.45), distress sale (3.34) and lack of institutional support (3.31). Therefore, it can be recommended that there is a need of introducing women friendly technologies for post harvest management and value addition. Capacity building of tribal women along with exposure of institutional supports and market linkages will be helpfull in increasing their participation in secondary agriculture and enhancing income.

**Keywords:** Tribal women, secondary agriculture, post-harvest management, value addition

## Introduction

Agriculture is the most primitive occupation of the tribal people. The people had changed their cultivation pattern from traveller's cultivation to settled cultivation, but some of the practices have remained unchanged among many groups of farmers. They are engaged in various traditional occupations like mixed farming, hunting, *Jhoom* cultivation and shifting cultivation to settled agriculture. The tribal people are practices traditional agricultural wisdom for their livelihood. Tribal women account for more than half of the work force by participating in different activities, either directly or indirectly. The gender division of labour varies from one society and culture to another, and within corresponding each culture external circumstances influence the level of activity (Nigist, 2004) [11]. Women are the unavoidable part of any development programmes whether it is for developed or developing country (Raksha *et al*, 2016) [12]. The tribal women work very hard, in some cases even more than the men. Women are not equal to men as such, but had higher status vis-a-vis non-tribal women. Both their relatively high status and children's upbringing depended on abundant resources and partial control that they exercised over them.

The concept of work participation of tribal women in agriculture sector growth is broad and multidimensional. The man represented the family in the society and woman as the main decision maker in the family economy, production, and social relations. Tribal women enjoy a greater social status with regard to control over resources. This ensures their active participation and decision-making with regard to land utilization, agriculture and powers over cash flow in a tribal economy. The fact that the woman controlled the family economy was the main reason why her status depended on abundant resources. Unlike other communities, among tribals there are no restrictions on women's participation in the cultivation process. A tribal woman can participate actively in all agricultural operations including, ploughing, digging, sowing, manuring, transplanting, weeding, harvesting, threshing, winnowing and different post harvest activities such as value addition and storing food grains. Processing of food grain is exclusively a woman's job. Every morning tribal women dehusk millet and paddy in husking levers and then clean the grains and cooks them. They not only save money, but also earn it, unlike females of other communities. From the past, edible wild fruits have played a very vital part in supplementing the diet of the tribal people. Some of them are preserved for use in dry period or sold in rural market. Apart from their traditional use of food, potentially they have many advantages. They are edible and having nutritional food

value, which provides the minerals like sodium, potassium, magnesium, iron, calcium, phosphorus etc. They are immune to many diseases and often used in different formulation of Ayurveda in Indian Folk- medicine. It is considered that special attention should be paid in order to maintain and improve this important source of food supply. Tribal communities consume wild tubers, rhizomes and corms either in raw or baked or boiled or roasted form. They are using crude method for processing of fruits as pickles or salting for preservation. There is a need to give focus on processing of fruits, tubers etc., which is potential for market avenue (Joshi *et al*., 2013). They do minimal processing or drying which are necessary tasks before taking those products to market. They play major roles in processing of goods. Traditionally women have been using a variety of methods in harvesting and post-harvest of different produces instead of tools and machinery. The reasons range from a critical gap in accessibility to information, lack of knowledge and skills, non-availability of women friendly tools & equipment, unaware of PPEs to check occupational hazards, unaffordable cost of operation and production leading to inefficient and cost intensive supply chain and dependence on powerful players like traders, transporters and distributors.

Secondary agriculture is basically value addition to primary agriculture which also involves the tertiary processing where by-products and crops residues or even the main crop is used for extraction of high value bio-active compounds. Hence focus should be given to encourage tribal women through secondary agriculture to increase their income and livelihood status. Therefore keeping these in view an attempt was made to study the technological needs and gaps and identifying suitable options for livelihood empowerment women farmers through secondary agriculture.

## Methodology

Descriptive research design has been adopted for this study. Field Survey was conducted with the help of structured interview schedule to acquire descriptive data. Structured Interview schedule was developed for identifying of prevailing status of gender issues and technological needs and gaps. Secondary data were collected on availability of surplus agro-produce in tribal areas. For successful implementation of the study, Ganjam district was selected and two villages from Jagannath Prasad block one were selected as locale of the study. Micro level studies conducted for identification of knowledge, attitude, and practices in secondary agriculture. Primary data were collected from 100 respondents on availability of agro produce in tribal areas and identified technological needs among tribal women for secondary agriculture. Information on major causes of post-harvest loss of fruits and vegetables, women's participation in post-harvest activities, technological needs, needs for physical facilities, need for access to support services and training needs were collected. Data were analyzed to find out demands, needs and gaps for suitable technological interventions. The data were given below in different sub headings.

## Personal profile of the tribal women

**Table 1:** Personal Information (n=100)

| | Ganjam | |
|---|---|---|
| **Parameters** | **Frequency** | **Percentage** |
| **Age** | | |
| 20-29 | 18 | 18.00 |
| 30-39 | 25 | 25.00 |
| 40-49 | 38 | 38.00 |
| 50 and above | 19 | 19.00 |
| **Education** | | |
| Illiterate | 6 | 6.00 |
| Functional Literate | 27 | 17.00 |
| Primary | 36 | 36.00 |
| Middle class | 19 | 29.00 |
| High School | 8 | 8.00 |
| Intermediate | 4 | 4.00 |
| **Marital Status** | | |
| Married | 97 | 97.00 |
| Unmarried | 3 | 3.00 |
| **Family Type** | | |
| Nuclear | 86 | 86.00 |
| Joint | 14 | 14.00 |
| **Occupation** | | |
| Agricultural labourer | 26 | 26.00 |
| Cultivator | 71 | 71.00 |
| Business (shop keeper | 2 | 2.00 |
| Job (Govt/ Private) | 1 | 1.00 |
| **Housing** | | |
| Kutcha | 26 | 26.00 |
| Semi Pucca | 58 | 58.00 |
| Pucca | 16 | 16.00 |
| **Land holding** | | |
| Less than 1 acre | 68 | 68.00 |
| 1-5 acre | 29 | 29.00 |
| 5-10 acre | 3 | 3.00 |
| Annual Income | | |
| Rs. 40000 / - to 60000/- | 57 | 57.00 |
| Rs.60 000 -/ to 80 000 | 39 | 39.00 |
| Rs 80000/- to 1,00,000/- | 4 | 4.00 |

The personal profiles of the tribal women were collected from Ganjam district. It was found that 38.00 percent women workers belonged to the age group of 40 to 49 years followed by 30 to 39 years (25.00%). 50 and above years (19.00%) and 20 to 29 years (18.00%). About 36 percent women workers had primary education, followed by middle school (29.00%), high school (8.00%), intermediate (4.00%) and 6.00 per cent women were illiterate and 17.00 were functionally literate. Most of them were married (97.00%). It was found that majority of the women workers were having nuclear family (82.67%). It was found that 71 percent of them were working as cultivator in their own land where as 26 percent of them were agricultural labourers. Only 2.00 percent of them were shopkeepers and one of them was doing private job. It was observed that more than half of them possessed semi puccca house where as 26 per cent of them were leaving in kutcha house and 16 per cent of them were leaving pucca house. The status on land holdings revealed that 68 per cent of the tribal women were having land less than 1 acre whereas 29 percent of them possessed 1-5 acres of land and only 3 percent of the had

more than 5 acres of land. There were very less number of women workers belonged to the small, medium and large farmers' category. The data pertaining to annual income revealed that 57.00 per cent of the women had annual income in between Rs. 40000 / - to 60000/-, followed by 39.00 per cent of the women had income about Rs.60 000 -/ to 80 000/- and only 4.00 percent of were having income about Rs 80000/- to Rs100000/-. Similar kind of results were revealed by the study on work participation of tribal women in India conducted by Naresh G (2014) [9].

**Participation of tribal women in post harvest activities and value addition of vegetables and fruits**

The information regarding participation of tribal women in post harvest activities and value addition of vegetables and fruits were collected. The activities were scored according to their repeated participation with score ranging from 1-3 such as active participation -3, moderate participation -2, less participation -1, and calculated mean scores and ranked the activities accordingly. It was found that 95 percent women were actively participated in cleaning and drying with mean score (2.95) followed by ninety two percent tribal women actively participated in storage (2.92), 89 percent women actively participated in primary processing (2.89) and 72 percent women actively participated in sorting and grading of harvests from farm. However, it was observed that they did not possess the scientific knowledge or technical skill for preservation and value addition. It was observed that there was less participation of tribal women farmers (74%) in insect and pest control activities (1.34) and 71 percent women less participated in marketing (1.31). None of the women famers in Ganjam district participated in transporting the produce to the market. Sharma (2017) [13] revealed that to increase the income and living standard of those farming families there is a vital need to provide occupation based training like preservation of seasonal fruits and vegetables to women in rural areas of India.

**Table 2:** Participation of women in Post harvest activities of vegetables and fruits(n=100)

| Sl. no | Post harvest activities | Active participation | Moderate participation | Less Involved | Mean score | Rank |
|---|---|---|---|---|---|---|
| 1. | Transport from field to home/ processing place | 57 (57.00) | 25(25.00) | 18(18.00) | 2.39 | V |
| 2. | Sorting and grading | 72(72.00) | 28(28.00) | 0(0.00) | 2.72 | IV |
| 3. | Cleaning and drying | 95 (95.00) | 5(5.00) | 0(0.00) | 2.95 | I |
| 4. | Insect and pest control | 8(8.00) | 18(18.00) | 74(74.00) | 1.34 | VII |
| 5. | Packaging | 28(28.00) | 53(53.00) | 19(19.00) | 2.09 | VI |
| 6. | Marketing | 2(2.00) | 27(27.00) | 71(71.00) | 1.31 | VII |
| 7. | Transporting | 0(0.00) | 0(0.00) | 0(0.00) | 0.00 | IX |
| 8. | Storage of vegetables | 92(92.00) | 8(8.00) | 0(0.00) | 2.92 | II |
| 9 | Processing | 89(86.00) | 11(11.00) | 0(0.00) | 2.89 | III |

* Data given in parenthesis depicts percentage and Mean Score: Ranging 3-1

**Problems perceived by the tribal women**

The problems related to production, processing, value addition such as secondary agriculture perceived by the tribal women were collected through participatory observations, discussions and documentations. The data were analyzed and mean score was calculated as per the importance ranging from 4-1 such as very important -4, important-3, less important -2, not important-1 and ranked the activities accordingly. It was observed that there was huge post-harvest losses of fruits and vegetables which was perceived as very important problem with mean score 3.67 followed by lack of knowledge and skill in secondary agriculture (3.52), lack of post harvesting infrastructure (3.45), distress sale (3.34) and lack of institutional support (3.31). Similar study was conducted by Das *et al* (2024) [4] found that the women's participation in dairy entrepreneurship was obstructed by various constraints, including limited access to resources such as land, finance, and technology, as well as cultural barriers and unequal work burdens

**Table 3:** Problems perceived by the tribal women (n=100)

| Sl. No. | Problems | Very Important | Important | Less Important | Not Important | Mean | Rank |
|---|---|---|---|---|---|---|---|
| 1 | Distress Sale | 39 (39.00) | 56(56.00) | 5(5.00) | 0(0.00) | 3.34 | IV |
| 2 | Huge post harvest losses | 67(67.00) | 33(33.00) | 0(0.00) | 0(0.00) | 3.67 | I |
| 3 | Lack of post harvesting infrastructure | 58(58.00) | 29(29.00) | 13(13.00) | 0(0.00) | 3.45 | III |
| 4 | Lack of knowledge and skill in in secondary agriculture | 52(52.00) | 48(48.00) | 0(0.00) | 0(0.00) | 3.52 | II |
| 6 | Lack of Institutional Support | 38(38.00) | 55(55.00) | 7(7.00) | 0(0.00) | 3.31 | V |

* Data given in parenthesis depict percentage and Mean Score: Ranging 4-1

**Major reasons of post-harvest loss of fruits and vegetables**

The major reasons of post-harvest loss of fruits and vegetables considered by the tribal women were collected through participatory observations, discussions and documentations. The data were scored as per their greenness ranging from 1-5 such as very strongly agree-5, agree-4, neutral-3, disagree -2, strongly disagree-1, calculated mean scores and ranked the activities accordingly. The data revealed that lack of storage facility (4.62) was perceived as strongly agree followed by marketing problem with mean score 4.59, improper harvesting (4.57), insect infestation (4.53) and nature of the produce (4.19). after harvesting of horticultural produce, most of the women carried out post harvest operations *viz*, sorting of immature, diseased and badly bruised vegetables and fruits, cleaning the produces before sending to market or home consumption.

**Table 4:** Major reasons of post-harvest loss of fruits and vegetables (n=100)

| Sl no | Reason | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree | Mean | Rank |
|---|---|---|---|---|---|---|---|---|
| 1 | Insect Infestation | 53(53.00) | 47(47.00) | 0(0.00) | 0(0.00) | 0(0.00) | 4.53 | IV |
| 2 | Nature of the produce | 31(31.00) | 57(57.00) | 12(12.00) | 0(0.00) | 0(0.00) | 4.19 | V |
| 3 | Improper harvesting | 57(57.00) | 43(43.00) | 0(0.00) | 0(0.00) | 0(0.00) | 4.57 | III |
| 4 | Lack of storage facility | 62(62.00) | 38(38.00) | 0(0.00) | 0(0.00) | 0(0.00) | 4.62 | I |
| 5 | Marketing problem | 59(59.00) | 41(41.00) | 0(0.00) | 0(0.00) | 0(0.00) | 4.59 | II |

* Data given in parenthesis depicts percentage and Mean Score: Ranging 5-1

**Need for access to technological support services**

The information related to need for access to technological support services were collected from survey and group discussion. The need parameters were scored according to their need and requirement were given mean score ranging from 4-1 such as actively highly needed, moderately needed, less needed and not needed and ranked accordingly. It was observed that the involvement of tribal women in secondary agriculture is meagre is due to lack of exposure, skills and knowledge. There is lack of post-harvest infrastructure facilities at village level, poor accessibility of women in institutional supports and inputs, lack of marketing facilities and mechanization. The information regarding access to technological needs revealed that all the tribal women highly needed their access to preservation technologies such as quality processing and value additions and also facilities such cold storage for storage, processing ground with mean score 4.00. Ninety percent of them highly needed for access to credit facilities for starting new ventures in secondary agriculture (3.90). Sixty four percent of tribal women expressed their need for access to marketing channel/facilities so that they can easily buy raw materials and sell their produces in the market (3.64). Sixty one of tribal women told that told that they need for access to transport facilities to supply the produce to market (3.68). The results are in line with the study conducted by Chauhan and Kshisagar (2013) [2].

**Table 5:** Need for access to technological support services and physical facilities (n=100)

| Sl no | Parameters | Extent of need (%) | | | | Mean score | Rank |
|---|---|---|---|---|---|---|---|
| | | Highly needed | Moderately needed | Less needed | Not needed | | |
| 1. | Preservation technologies | 100(100.00) | 0(0.00) | 0(0.00) | 0(0.00) | 4.00 | I |
| 2. | Physical facilities | 100(100.00) | 0(0.00) | 0(0.00) | 0(0.00) | 4.00 | I |
| 4. | Access to credit facilities | 90(90.00) | 10(10.00) | 0(0.00) | 0(0.00) | 3.90 | II |
| 5. | Transport | 68(68.00) | 32(32.00) | 0(0.00) | 0(0.00) | 3.68 | III |
| 3. | Marketing channel/facilities | 64(64.00) | 36(36.00) | 0(0.00) | 0(0.00) | 3.64 | IV |

*Data given in parenthesis depicts percentage and Mean Score: Ranging 4-1

**Technological needs**

The data regarding technological needs of the tribal women were collected through structured interview schedule and group discussion. The need parameters were scored according to their need and requirement were given mean score ranging from 4-1 such as actively highly needed, moderately needed, less needed and not needed and ranked accordingly. It was found that about all of them (98%) revealed that they need new knowledge, skills and technologies for value addition with mean score 3.98. Ninety per cent of them highly needed the technologies related to Post-harvest management (3.90). Eighty one per cent of them expressed that there was high need for women friendly technologies for harvesting and post harvest operation (3.77), which will help them in saving time and energy as well as increasing working efficiency of the tribal women and simultaneously it will decrease the drudgery and occupational health hazards of tribal women. Chatterjee et al (2017) [1] conducted similar study and reveled that to set up women based entrepreneurship, there are several needs such as orientation, awareness generation and constant motivation is required for updating knowledge regarding technical skills, availability of loans and managing the activities are the key to success.

**Table 6:** Technological needs (n=100)

| Sl no | Need for Knowledge/ technologies | Extent of need (%) | | | | Mean score | Rank |
|---|---|---|---|---|---|---|---|
| | | Not needed | Less needed | Moderately needed | Highly needed | | |
| 1. | New skill/ technologies for value addition | 0(0.00) | 0(0.00) | 2(2.00) | 98(98.00) | 3.98 | I |
| 2. | Post-harvest management | 0(0.00) | 0(0.00) | 10 (10.00) | 90(90.00) | 3.90 | II |
| 3. | Women friendly technologies for harvesting/ post harvest operation | 0(0.00) | 4 (4.00) | 15(10.00) | 81(86.00) | 3.77 | III |

*Data given in parenthesis depicts percentage and Mean Score: Ranging 4-1

**Conclusion**

It can be concluded that there was more participation or involvement of tribal women in post harvest activities such as sorting and grading, cleaning and primary processing at household level. The activities pertaining to secondary agriculture were meager due to lack of exposure, skills and knowledge. There is lack of post harvest infrastructure facilities at village level, poor accessibility of women in institutional supports and inputs, lack of marketing facilities and mechanization. There is a need of introducing women friendly technologies for post harvest management and value addition. Capacity building of tribal women along

with exposure of institutional supports and market linkages will enable in strengthening their participation in secondary agriculture and enhancing their income.

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