



## Status of Women in Agriculture in the Coastal Districts of Odisha

ANIL KUMAR\*, J.C. JEEVA, B. SAHOO, TANUJA, S. and D.N. SARANGI

ICAR-Central Institute for Women in Agriculture  
Bhubaneswar - 751 003, Odisha

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**Socio-economic profile of women in agriculture in the seven coastal districts of Odisha was studied, and the livelihood avenues available for them were analyzed. The socio-economic status were analyzed for the coastal districts as a whole and in rural areas separately and compared with the state average using a set of parameters. The coastal districts of Odisha have 16% of the geographical area and 33% of the human population (2011) of the state. In the coastal districts, the overall work participation ratio (WPR) was lower than the state average (37.9% vs 43.2%). In the coastal districts, 25.8% of the population were engaged in agriculture for employment which is lesser than the state average (31.5%). Female Agricultural WPR (FAWPR) was lower in the coastal districts by 9.2% (13.4 vs 22.6%) when compared with the state average. In the coastal districts, the female literacy was above 60% being as high as 80.6% in Jagatsinghpur. The gender gap in literacy in the coastal districts was 14.5% against the state average of 17.6%. Nutritional status of children in the coastal districts was better than the state average in all the three indicators (stunting, wasting and underweight) as compared to the state average. The household ownership of different livestock species was lower than the average for the state. A vast majority (82.3%) of the households in coastal areas drew a monthly income of less than ₹ 5,000 followed by 11.5% in 5,000-10,000 category and 6.1% of the households drew more than 10,000 as monthly income. This calls for concerted efforts for gender mainstreaming through better livelihood options. A better understanding of the present status of women can help in identifying the points of intervention and devising methodologies for better outcome of the projects.**

*(Key words: Coastal districts, Gender gap, Livelihood, Odisha, Women in agriculture, Work participation)*

Coastal areas have their distinct ecology which determines the livelihood strategies of the people. The economic development of women and men depends on the availability of income generating activities, their formation as groups, rewarding of their efforts and skills and their ability to participate equally. In spite of the spectacular economic development over the last few decades, India is still home to the largest number of poor people. According to a recent World Bank report (2018), half of the world's 736 million extreme poor in 2015 *i.e.*, 368 million live in just five countries, namely India, Nigeria, DR Congo, Ethiopia and Bangladesh. In India alone, there were 175.7 million people living under extreme poverty (those living on less than \$1.90 a day) with a poverty rate of 17.7 per cent. Therefore, to achieve the global target of reducing extreme poverty to less than 3 per cent by 2030, a focussed attention is required especially in India. For all people to share the benefits of economic development equally, several efforts have been made to identify the pockets of under development and make plans to bring them to the national mainstream.

Globally, farm women suffer from poor access to various kinds of productive resources and services, most importantly access to inputs, extension and market services, which is an important cause of their low productivity. According to a FAO (2011) study, had they enjoyed the same access to productive resources as men, women could boost yield by 20-30%; raising the overall agricultural output in developing countries by 2.5 to 4%. This gain in production could lessen the number of hungry people in the world by 12-17%, besides increasing women's income. The results of gender researches reveal that despite the important role women play in agricultural production, they remain disadvantaged in numerous respects. On one hand, women have limited access to a wide range of agricultural inputs including seeds and fertilizers, technological resources, equipments, land and so forth. In addition, women often lack the capacity needed to deploy these resources. For example, women may have access to land but lack the capacity needed to deploy these resources. They may have access to land but lack of access to the

\*Corresponding author: E-mail: anil.ciwa@gmail.com

fertilizer needed to farm the land productively or lack of knowledge of how to properly apply fertilizer. Illiteracy, neo-literacy and lack of scientific knowledge are the major impediments in their growth. Furthermore, many non-tangible assets, such as social capital, human capital, rights and decision-making power, are more difficult for women to access.

There are a large number of studies that have analysed female decision making autonomy on different aspects like health, fertility decisions and well-being, and most of them found males taking the decisions (Banerjee and Roy, 2015; Dyson and Moore, 1983). Routray *et al.* (2017) revealed that women's non-involvement in sanitation related decision making is attributed to their low socio-economic status and inability to influence the household's financial decisions. Female heads lacked confidence to take decisions independently, and were dependent on their spouse or other male family members for most decisions. The study revealed the existence of power hierarchies and dynamics within households, which constrained female's participation in decision-making processes. It is also important to know the gendered economic strategies situated in diverse cultural and geographical contexts (Ann *et al.*, 2004).

Making enabling policies for women in agriculture requires an understanding of their socio-economic status, work participation, the ownership of land and livestock, nutritional status of the population, etc. In this context, this paper reviews the status of women in agriculture in coastal districts of Odisha and the livelihood avenues available for them.

## MATERIALS AND METHODS

The present study primarily focused on the scenario of workers in agriculture. The state of Odisha has 30 districts and 314 blocks. Seven coastal districts of Odisha namely, Baleshwar, Bhadrak, Kendrapara, Jagatsinghpur, Puri, Khordha and Ganjam have been taken for this study. District wise (rural area and total) data for the coastal districts of Odisha were collected with respect to socio-economic indicators including total workers, agricultural workers, cultivators as well as agricultural production and livestock situation. The socio-economic data were taken from Census of India (Census, 2011). Area, production and productivity of rice were taken from National Food Security Mission (NFSM, 2018). The data for rice production and

acreage were taken for three years (2010-11, 2011-12 and 2012-13) and the average was taken for the study. The livestock population was taken from 19<sup>th</sup> Livestock Census 2012 and density, ownership (number per 1000 human beings), household engaged in rearing different kind of livestock species were analyzed. Similarly, the nutritional status in the districts was analyzed by taking data from National Family Health Survey-4 (NFHS-4, 2018).

## RESULTS AND DISCUSSIONS

### Area, population and other socio-economic indicators

The secondary data pertaining to area, population and other socio-economic indicators in Coastal Odisha are presented in Table 1. The total population of the seven coastal districts was 13.88 m (33.1% of Odisha) of which the rural population was 80.2%. The districts are spread over an area of 25.1 thousand km<sup>2</sup> (16% of the State). In terms of geographical area, Ganjam (8.2 thousand km<sup>2</sup>) is the largest among the coastal districts and the smallest district is Jagatsinghpur (1.7 thousand km<sup>2</sup>). Ganjam district has the highest population (3.5 m) and the lowest population is in Jagatsinghpur (1.1 m). The population density (persons per km<sup>2</sup>) in the coastal districts was 553 which is higher than the state average (270). The population density in Khordha (800) was higher than the state average and in other coastal districts, it ranged between 430 (Ganjam) to 682 (Jagatsinghpur). The sex ratio in Kandrapara was 1007. The scheduled tribe population was highest (11.9%) in Baleshwar. The percentage of scheduled caste population was between 13.2% (Khordha) to 22.2% (Bhadrak). The corresponding data in the rural areas of the coastal districts are also given in Table 1. Regarding family size of the respondents, Lipishree (2015) based on her study in a coastal district of Odisha, named Bhadrak found that majority of them *i.e.*, 57.95 % are having large families (6 and above family members), 34.09% have medium families and 7.95 % have small families.

### Agricultural work participation

The work participation rate (WPR) defined as number of persons working per 100 persons in a population and it is an indicator of employment scenario. In the coastal districts, the overall WPR was lower than the state average (37.9% vs 43.2%). The WPR was highest in Ganjam (44.6%) and lowest in Bhadrak (31.1%). The coastal districts had lower WPR

**Table 1.** Area, population and other socio-economic indicators in the coastal Odisha

| District       | Overall                                            |                                   |                       |                                          |              |                      |                      | Rural areas                              |              |                      |                      |
|----------------|----------------------------------------------------|-----------------------------------|-----------------------|------------------------------------------|--------------|----------------------|----------------------|------------------------------------------|--------------|----------------------|----------------------|
|                | Total area<br>( <sup>'</sup> 000 km <sup>2</sup> ) | Population<br>( <sup>'</sup> 000) | % Rural<br>population | Density<br>(persons<br>km <sup>2</sup> ) | Sex<br>ratio | Sch.<br>Tribe<br>(%) | Sch.<br>Caste<br>(%) | Density<br>(persons<br>km <sup>2</sup> ) | Sex<br>ratio | Sch.<br>Tribe<br>(%) | Sch.<br>Caste<br>(%) |
| Baleshwar      | 3.8                                                | 2321                              | 89.1                  | 610                                      | 957          | 11.9                 | 20.6                 | 562                                      | 957          | 12.3                 | 21.7                 |
| Bhadrak        | 2.5                                                | 1506                              | 87.7                  | 601                                      | 981          | 2.0                  | 22.2                 | 553                                      | 985          | 1.8                  | 23.9                 |
| Kendrapara     | 2.6                                                | 1440                              | 94.2                  | 545                                      | 1007         | 0.7                  | 21.5                 | 516                                      | 1010         | 0.7                  | 21.6                 |
| Jagatsinghpur  | 1.7                                                | 1137                              | 89.8                  | 682                                      | 968          | 0.7                  | 21.8                 | 630                                      | 976          | 0.4                  | 22.7                 |
| Puri           | 3.5                                                | 1699                              | 84.4                  | 488                                      | 963          | 0.4                  | 19.1                 | 423                                      | 969          | 0.3                  | 20.7                 |
| Khordha        | 2.8                                                | 2252                              | 51.8                  | 800                                      | 929          | 5.1                  | 13.2                 | 461                                      | 959          | 5.8                  | 16.2                 |
| Ganjam         | 8.2                                                | 3529                              | 78.2                  | 430                                      | 983          | 3.4                  | 19.5                 | 352                                      | 995          | 4.1                  | 20.5                 |
| Coastal Odisha | 25.1                                               | 13884                             | 80.2                  | 553                                      | 968          | 4.1                  | 19.3                 | 462                                      | 980          | 4.3                  | 21.1                 |
| Odisha         | 155.7                                              | 41974                             | 83.3                  | 270                                      | 979          | 22.8                 | 17.1                 | 230                                      | 989          | 25.7                 | 17.8                 |

Source: Calculated from Census, 2011

than the state average (43.2%) except Ganjam (44.6%). The female WPR in all districts except Ganjam (32.9%) was less than the state average (29.7%) (Table 2).

Agricultural work participation rate (Ag.WPR) is defined as percentage of working population engaged in agriculture and is an indicator of the dependence of population on agriculture sector. In the coastal districts, 25.8% of the population were engaged in agriculture for employment which is lesser than the state average (31.5%). The highest Ag.WPR was observed in Baleshwar (32.2%) and the lowest in Khordha (16.9%). Similarly, the female Ag.WPR (FAWPR) was lower in the coastal districts by 9.2% (13.4 vs 22.6%) when compared with the state average.

When agricultural workers as proportion of total workers were taken into consideration, it was found that 65.8% of the total workers in the coastal districts were engaged in agriculture as against the state average of 70.5% (Table 3). Two districts had more than 70 per cent workers in agriculture, the highest being 74.5% in Baleshwar. On the other hand, the lowest percent of workers in agriculture was in Khordha (48.5%). In case of female agricultural worker (FAW), 69.6% of the total were engaged in agriculture compared to the state average of 76.2. Of the total workers, 29.0% were cultivators (persons) and only 14.5% were female cultivators in the coastal districts. However, the % female cultivators as % of total workers varied widely

**Table 2.** Characteristics of labour force in the rural areas of the coastal Odisha

| District       | Work participation rate (WPR, %) |            |              |                 |                |                  |
|----------------|----------------------------------|------------|--------------|-----------------|----------------|------------------|
|                | WPR - Total                      | WPR - Male | WPR - Female | Ag. WPR - Total | Ag. WPR - Male | Ag. WPR - Female |
| Baleshwar      | 41.0                             | 58.0       | 23.2         | 32.2            | 45.9           | 18.0             |
| Bhadrak        | 31.1                             | 54.1       | 7.8          | 22.5            | 40.5           | 4.3              |
| Kendrapara     | 32.4                             | 53.8       | 11.2         | 21.9            | 38.0           | 6.0              |
| Jagatsinghpur  | 35.7                             | 56.5       | 14.4         | 22.2            | 36.0           | 7.9              |
| Puri           | 36.8                             | 57.9       | 15.1         | 23.7            | 38.4           | 8.5              |
| Khordha        | 34.2                             | 55.8       | 11.7         | 16.9            | 28.0           | 5.2              |
| Ganjam         | 44.6                             | 56.3       | 32.9         | 30.6            | 35.2           | 25.9             |
| Coastal Odisha | 37.9                             | 56.2       | 19.3         | 25.8            | 37.9           | 13.4             |
| Odisha         | 43.2                             | 56.5       | 29.7         | 31.5            | 40.3           | 22.6             |

WPR: Work participation rate; Source: Calculated from Census, 2011

between the coastal districts. It was lowest in Khordha (9.0%) and highest in Baleshwar (19.6%). About 37% of the total workers were agricultural labourers in the coastal districts whereas for females, it was 55.2%. The highest proportion of female workers as agricultural labourers was in Ganjam (67.2%) and the lowest in Khordha (35.6%).

Lipishree (2015) reported that in India, women have played and continue to play a significant and crucial role in agricultural development and allied fields. They are involved in main crop production, agro/social forestry, fisheries, etc. Women's contribution to agriculture, whether it is in subsistence farming or commercial agriculture, when measured in number of tasks performed and time spent is greater than that of men. In the plantation sector, women are the crucial labourers (Shivaram, 1988). As men abandon agriculture in favour of more remunerative work in other sectors, women farmers are increasingly taking up agriculture (Shiva, 1991). Depending on the region and crops, women's contributions vary but they provide crucial labour from planting to harvesting and post-harvest operations.

From Census data 2001 and 2011, it is evident that the number of agricultural labourers has increased and the number of cultivators has decreased in India. In 2001, 31.7% of workforce was cultivators and 26.5% were working as agricultural labourers, whereas in 2011, they were 24.6% and 30% respectively. This shows a decline in number of cultivators by 7.1% and increase in number of agricultural labourers by 3.5%. One

of the worrying trends is that, during the past several decades, there has been a constantly increasing trend in the number of landless labourers. Factors like rapid growth of population, law of inheritance, rise in cost of agricultural inputs and decline in small-scale industries have been responsible for this increase (Sajjad, 1998).

### *Scenario of literacy in coastal Odisha*

The overall literacy rate in the coastal districts was 80.8% against the state average of 72.9%. Female literacy percentage was also higher than the state average being 73.5% against the state average of 64.0%. No coastal district had female literacy below 60%. The gender gap in literacy in the coastal districts was 14.5% against the state average of 17.6%. Similar trend was also observed in rural areas. Lipishree (2015) found that a few of women agricultural labourers were literate. Only 28.41 respondents were literate and that too very low education level. Out of them, only 11 respondents could read and write only, same number of respondents has primary level education and only three respondents had attended upto middle school. The study found that there was high level of illiteracy among the women agricultural labourers. About 71% of respondents did not have any education at all.

### *Nutritional status of children in coastal Odisha*

There is an intricate linkage between agriculture and nutrition which is manifested through various pathways which include access to food, securing income, demand-and-supply determining food prices (affordability),

**Table 3.** *Agricultural workers- cultivators and agricultural labourers in the rural areas of coastal Odisha*

| District       | Percent of total workers |      |        |            |      |        |            |      |        |
|----------------|--------------------------|------|--------|------------|------|--------|------------|------|--------|
|                | Ag. worker               |      |        | Cultivator |      |        | Ag. labour |      |        |
|                | Person                   | Male | Female | Person     | Male | Female | Person     | Male | Female |
| Baleshwar      | 74.5                     | 73.4 | 77.5   | 33.4       | 38.7 | 19.6   | 41.1       | 34.6 | 57.9   |
| Bhadrak        | 71.3                     | 73.5 | 55.6   | 36.5       | 39.3 | 16.5   | 34.8       | 34.2 | 39.0   |
| Kendrapara     | 65.4                     | 67.8 | 54.0   | 33.4       | 36.7 | 17.6   | 32.1       | 31.1 | 36.4   |
| Jagatsinghpur  | 60.0                     | 61.2 | 55.1   | 30.2       | 33.6 | 16.6   | 29.8       | 27.6 | 38.6   |
| Puri           | 62.6                     | 64.1 | 56.7   | 32.3       | 36.9 | 13.9   | 30.3       | 27.2 | 42.8   |
| Khordha        | 48.5                     | 49.3 | 44.6   | 21.9       | 24.5 | 9.0    | 26.7       | 24.8 | 35.6   |
| Ganjam         | 66.6                     | 59.5 | 78.9   | 22.4       | 28.6 | 11.7   | 44.3       | 31.0 | 67.2   |
| Coastal Odisha | 65.8                     | 64.5 | 69.6   | 29.0       | 33.9 | 14.5   | 36.8       | 30.6 | 55.2   |
| Odisha         | 70.5                     | 67.6 | 76.2   | 26.7       | 33.3 | 13.9   | 43.8       | 34.2 | 62.3   |

Source: Calculated from Census, 2011

**Table 4.** Scenario of literacy in the coastal Odisha – overall and in rural areas

| District       | Overall            |                   |                     |                            | Rural areas        |                   |                     |                            |
|----------------|--------------------|-------------------|---------------------|----------------------------|--------------------|-------------------|---------------------|----------------------------|
|                | Total literacy (%) | Male literacy (%) | Female literacy (%) | Gender gap in literacy (%) | Total literacy (%) | Male literacy (%) | Female literacy (%) | Gender gap in literacy (%) |
| Baleshwar      | 79.8               | 87.0              | 72.3                | 14.7                       | 79.2               | 86.7              | 71.3                | 15.4                       |
| Bhadrak        | 82.8               | 89.6              | 75.8                | 13.8                       | 83.2               | 90.3              | 76.1                | 14.2                       |
| Kendrapara     | 85.2               | 91.5              | 79.0                | 12.5                       | 85.0               | 91.4              | 78.7                | 12.7                       |
| Jagatsinghpur  | 86.6               | 92.4              | 80.6                | 11.8                       | 86.5               | 92.5              | 80.4                | 12.1                       |
| Puri           | 84.7               | 90.8              | 78.3                | 12.6                       | 84.2               | 90.8              | 77.3                | 13.5                       |
| Khordha        | 86.9               | 91.8              | 81.6                | 10.2                       | 83.0               | 89.4              | 76.3                | 13.1                       |
| Ganjam         | 71.1               | 81.0              | 61.1                | 19.9                       | 67.6               | 78.5              | 56.8                | 21.8                       |
| Coastal Odisha | 80.8               | 88.0              | 73.5                | 14.5                       | 79.3               | 87.1              | 71.3                | 15.8                       |
| Odisha         | 72.9               | 81.6              | 64.0                | 17.6                       | 70.2               | 79.6              | 60.7                | 18.9                       |

Source: Calculated from Census, 2011

empowerment of women in agriculture and women's health determining their participation in agricultural activities. Of late, the governments have initiated programmes and policies supporting nutrition-sensitive agriculture for achieving the developmental goals. Nutritional status of children is an important indicator which tells about the access to food. The nutritional status of children is measured as stunted, wasted and underweight. Table 5 gives the per cent of children in the category of stunted, wasted and underweight in the seven coastal districts of Odisha.

Nutritional status of children was better in the coastal districts as compared to the state average in

all the three indicators. In the coastal districts, 27.5% children were stunted against the state average of 34.4%, the highest being in Bhadrak (34.9%) and the lowest in Puri (16.1%). Similarly, in the coastal districts, there were 15.0% children who were in the category of 'wasted' *i.e.*, they had lower weight relative to height as compared to the state average of 20.5%. Baleshwar (18.0%) and Ganjam (16.4%) were the districts with higher prevalence of 'wasting' children. In Baleshwar district, 33.7% of children were underweight and in other six districts, 16.5 to 28.2% of children were undernourished. In coastal districts as a whole, there were 23.7% underweight children as compared to the

**Table 5.** Nutritional status of children in the coastal Odisha – overall and in rural areas

| District       | Overall                       |                                 |                                   | Rural areas                   |                                 |                                   |
|----------------|-------------------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|-----------------------------------|
|                | Stunted (height-for-age): HAZ | Wasted (weight-for-height): WHZ | Underweight (weight-for-age): WAZ | Stunted (height-for-age): HAZ | Wasted (weight-for-height): WHZ | Underweight (weight-for-age): WAZ |
| Baleshwar      | 33.2                          | 18.0                            | 33.7                              | 32.1                          | 18.4                            | 34.0                              |
| Bhadrak        | 34.9                          | 15.3                            | 28.2                              | 36.7                          | 16.3                            | 30.6                              |
| Kendrapara     | 26.9                          | 12.3                            | 24.1                              | 27.2                          | 12.5                            | 24.7                              |
| Jagatsinghpur  | 19.5                          | 12.6                            | 16.5                              | 19.4                          | 12.6                            | 16.8                              |
| Puri           | 16.1                          | 12.1                            | 17.2                              | 16.7                          | 11.2                            | 17.7                              |
| Khordha        | 24.7                          | 13.8                            | 20.3                              | 24.8                          | 12.7                            | 19.8                              |
| Ganjam         | 28.9                          | 16.4                            | 21.3                              | 31.2                          | 17.5                            | 23.0                              |
| Coastal Odisha | 27.5                          | 15.0                            | 23.7                              | 28.4                          | 15.4                            | 25.0                              |
| Odisha         | 34.4                          | 20.5                            | 34.7                              | 35.6                          | 21.1                            | 36.1                              |

Source: Calculated from NFHS-4, 2015-16



state average of 34.7%. In rural areas, the prevalence of stunted, wasted and underweight children was similar with the average of the district.

### ***Agriculture and livestock in the Coastal Districts***

From Table 6, it could be found that the average area (2010-2013) under rice cultivation in the coastal districts was 1119 thousand ha, the highest being Ganjam (266 thousand ha) and the lowest in Jagatsinghpur (84 thousand ha). The coastal districts had 27.2% of the total area under rice production in the state. The share of coastal districts was 26.5% of the total production of the state. The average productivity of rice was also lower in the coastal districts than the state average (1.76 vs 1.80 t ha<sup>-1</sup>) but it varied widely between the districts from 1.36 t ha<sup>-1</sup> in Ganjam to 2.21 t ha<sup>-1</sup> in Jagatsinghpur.

It is estimated that, rural women are responsible for production of more than 55% food grains and comprise 67% of total agricultural labour force (Shivaram, 1988). A recent estimation by FAO (2011) showed that women agricultural labour consists of 43% of total world agricultural labour force. The role of women in agriculture varies from country to country. Asian women contribute to about 50% of the food production while in Sub-Saharan Africa, women produce 60-80% of the supply of basic food stuffs. In Indian subcontinent, 70-80% basic food crops are grown and produced by women. In developing countries like India where agriculture is the backbone of livelihood, women contribute immensely in basic food crop productions.

**Table 6.** Area, production and productivity of rice (average of 2010-2013) in the coastal Odisha

| District       | Area under rice ('000 ha) | Production ('000 t) | Productivity (t ha <sup>-1</sup> ) |
|----------------|---------------------------|---------------------|------------------------------------|
| Baleshwar      | 227                       | 440                 | 1.94                               |
| Bhadrak        | 168                       | 323                 | 1.92                               |
| Kendrapara     | 137                       | 223                 | 1.63                               |
| Jagatsinghpur  | 84                        | 185                 | 2.21                               |
| Puri           | 141                       | 264                 | 1.87                               |
| Khordha        | 95                        | 172                 | 1.82                               |
| Ganjam         | 266                       | 361                 | 1.36                               |
| Coastal Odisha | 1119                      | 1968                | 1.76                               |
| Odisha         | 4108                      | 7406                | 1.81                               |

Source: Calculated from NFSM, 2018

The coastal districts are richly endowed with the livestock population as shown in Table 7. In the coastal districts there were 3287.7 thousand cattle, 127.1 thousand buffalo, 267.8 thousand sheep, 1175.3 thousand goat and 17.4 thousand pigs. The total livestock in the coastal districts were 4.87 million, which is 23.5% of the total population of livestock in the state (20.72 m). Percent households rearing different livestock species (Table 8) were cattle (35.0), buffalo (0.7), sheep (1.8), goat (7.2), pig (0.1) and backyard poultry (6.7). The household ownership of livestock was lower than the average for the state. In Baleshwar district, 52.7% of the households reared cattle and in Bhadrak, it was only 16.8%. The livestock species such as buffalo, sheep and pig were not the preferred species in the coastal districts. In case of goat, only 7.2% of the households in the coastal districts reared them as compared to 13.2% for the state. The household ownership of goat was highest in Baleshwar (16.0%) and Khordha had the lowest being only 2.4%. In case of backyard poultry also, similar trend was observed, as only 6.7% of the households in the coastal districts reared them as compared to 17.3% for the state. The household ownership of backyard poultry was highest in Baleshwar (17.9%) and Khordha had the lowest ownership of backyard poultry being only 1.8%. Rais *et al.* (2013) in their research paper have tried to assess the economic status of rural women involved in agriculture and livestock farming activities in Pakistan. He has showed that majority of the respondents have income from agriculture but a very few of them are employed. The research has revealed the strong participation of women in activities such as crop production, livestock husbandry, poultry keeping, and food grain processing and storage, home management and handicraft making. Choudhary (2004) reported that though women play an important role in livestock management, they do not make any decision regarding its purchase.

### ***Income distribution of households in the rural areas of coastal Odisha***

The number and per cent of households based on their monthly income distribution in the seven coastal districts are given in Table 9. It was found that more than eighty per cent (82.3%) of the households in coastal areas draw a monthly income of less than ₹ 5,000, followed by 11.5% in ₹ 5,000-10,000 category and 6.1% of the households draw more than ₹ 10,000 as monthly

**Table 7.** Livestock population in the coastal districts of Odisha

| District       | Population ('000) |                 |                 |                 |                |                  | Poultry          |
|----------------|-------------------|-----------------|-----------------|-----------------|----------------|------------------|------------------|
|                | Cattle            | Buffalo         | Sheep           | Goat            | Pig            | Total livestock  |                  |
| Baleshwar      | 764.9<br>(6.6)    | 3.9<br>(0.5)    | 2.5<br>(0.2)    | 382<br>(5.9)    | 4.3<br>(1.5)   | 1157.9<br>(5.6)  | 674.9<br>(5.5)   |
| Bhadrak        | 513<br>(4.4)      | 4.9<br>(0.7)    | 1.9<br>(0.1)    | 144.1<br>(2.2)  | 0.4<br>(0.2)   | 664.4 (3.2)      | 199.3<br>(1.6)   |
| Kendrapara     | 363.1<br>(3.1)    | 14<br>(1.9)     | 16.4<br>(1.0)   | 100.5<br>(1.5)  | 1.4<br>(0.5)   | 495.6<br>(2.4)   | 127.2<br>(1.0)   |
| Jagatsinghpur  | 296.9<br>(2.6)    | 11.2 (1.5)      | 14.4<br>(0.9)   | 115.3<br>(1.8)  | 2.2<br>(0.8)   | 440<br>(2.1)     | 72.5<br>(0.6)    |
| Puri           | 443.9<br>(3.8)    | 16.5 (2.3)      | 44.4<br>(2.8)   | 132.4<br>(2.0)  | 1.4<br>(0.5)   | 638.7 (3.1)      | 92<br>(0.8)      |
| Khordha        | 316.3<br>(2.7)    | 12.1 (1.7)      | 31.8<br>(2.0)   | 74<br>(1.1)     | 1.9<br>(0.7)   | 436.1<br>(2.1)   | 64.4<br>(0.5)    |
| Ganjam         | 589.6<br>(5.1)    | 64.4<br>(8.9)   | 156.4<br>(9.9)  | 227<br>(3.5)    | 5.7<br>(2.0)   | 1043.2<br>(5.0)  | 274.3<br>(2.2)   |
| Coastal Odisha | 3287.7<br>(28.3)  | 127.1<br>(17.5) | 267.8<br>(16.9) | 1175.3<br>(18)  | 17.4<br>(6.2)  | 4875.8<br>(23.5) | 1504.6<br>(12.3) |
| Odisha         | 11621.3<br>(100)  | 726.3<br>(100)  | 1581.1<br>(100) | 6513.1<br>(100) | 280.3<br>(100) | 20726.9<br>(100) | 12254.3<br>(100) |

Figures in parantheses indicate percent of the state total Source: Calculated from Livestock Census, 2012

**Table 8.** Household ownership of livestock species in the coastal Odisha

| District       | Percent households rearing livestock |         |       |      |     |                  |
|----------------|--------------------------------------|---------|-------|------|-----|------------------|
|                | Cattle                               | Buffalo | Sheep | Goat | Pig | Backyard Poultry |
| Baleshwar      | 52.7                                 | 0.2     | 0.1   | 16.0 | 0.3 | 17.9             |
| Bhadrak        | 16.8                                 | 1.4     | 3.5   | 5.2  | 0.0 | 4.9              |
| Kendrapara     | 49.5                                 | 0.6     | 1.3   | 8.4  | 0.1 | 7.0              |
| Jagatsinghpur  | 46.9                                 | 0.4     | 0.8   | 10.9 | 0.0 | 3.7              |
| Puri           | 44.0                                 | 0.3     | 2.2   | 8.7  | 0.0 | 3.1              |
| Khordha        | 20.7                                 | 0.4     | 0.8   | 2.4  | 0.0 | 1.8              |
| Ganjam         | 24.5                                 | 1.5     | 3.3   | 2.7  | 0.1 | 5.4              |
| Coastal Odisha | 35.0                                 | 0.7     | 1.8   | 7.2  | 0.1 | 6.7              |
| Odisha         | 39.1                                 | 1.8     | 2.5   | 13.2 | 0.6 | 17.3             |

Source: Calculated from Livestock Census, 2012

income. The percent of households drawing more than 10,000 as monthly income was highest in Jagatsinghpur (9.3%) and least in Ganjam (3.9%), whereas the state average was 4.8%. The percent of households in the lower income category (< ₹ 5,000) was highest in Puri and Ganjam districts (86.5%), which is nearer to the state average (87.9%).

The annual family income from all sources is very low in case of women agricultural labours. It was found that only 3.41% of them have annual family income above ₹ 36,000 (Lipishree, 2015). About 45% have family income that ranges between ₹ 20,001 and ₹ 28,000. Nearly, 30% respondents had family income between ₹ 10,001 and ₹ 20,000, and 21.59% respondents had family income between ₹ 28,001-36000.

**Table 9.** Income (monthly) distribution of households in the rural areas of the coastal Odisha

| District       | Number of Households |                       |                  | Percent Households |                       |                  |
|----------------|----------------------|-----------------------|------------------|--------------------|-----------------------|------------------|
|                | Income < ₹ 5,000     | Income ₹ 5,000-10,000 | Income > ₹10,000 | Income < ₹ 5,000   | Income ₹ 5,000-10,000 | Income > ₹10,000 |
| Baleshwar      | 386925               | 62041                 | 28468            | 81.0               | 13.0                  | 6.0              |
| Bhadrak        | 221163               | 29414                 | 20213            | 81.7               | 10.9                  | 7.5              |
| Kendrapara     | 236912               | 42700                 | 26256            | 77.5               | 14.0                  | 8.6              |
| Jagatsinghpur  | 179230               | 32769                 | 21627            | 76.7               | 14.0                  | 9.3              |
| Puri           | 270894               | 26608                 | 15686            | 86.5               | 8.5                   | 5.0              |
| Khordha        | 202236               | 30554                 | 14514            | 81.8               | 12.4                  | 5.9              |
| Ganjam         | 515498               | 57202                 | 23362            | 86.5               | 9.6                   | 3.9              |
| Coastal Odisha | 2012858              | 281289                | 150126           | 82.3               | 11.5                  | 6.1              |
| Odisha         | 7114652              | 591016                | 384318           | 87.9               | 7.3                   | 4.8              |

Source: Calculated from SECC, 2011

Lal and Khurana (2011) in their research article has tried to link the important role played by the women in agriculture and the gender discrimination and its negative impact on socio-economic status of women. They have opined that there is under estimation and under valuation of rural women's work in the space of development. Satyavathi *et al.* (2010) in their research paper on 'Role of Farm Women in Agriculture, Lesson Learned' have investigated that how the advent of green revolution and mechanization of agriculture in India has further deteriorated the condition of rural farm women. Though green revolution resulted in an increase in the cash incomes in rural households, but to cover the costs of technological inputs, women are forced to work as agricultural labourers and unpaid labourers that augmented women's high labour burden. Farid *et al.* (2009) have observed that, in case of agricultural activities, women labourers are mainly involved in homestead gardening, harvesting and post-harvesting operations. The most important factor for seeking employment or involvement in various activities by the women is to meet family needs followed by increasing family income. Regarding work and payment, Joshi (1999) reported that the productivity of female labour is very low in agriculture sector. At 1980-81 prices in 1950-51, the productivity per labour was ₹ 2,305 which increased to ₹ 2,794 and further increased to ₹ 3,157 in 1990. Whereas in the mining and mineral sector it was ₹ 13,417, in manufacturing sector it was ₹ 11,099, power, gas and water supply sector ₹ 14,608, construction sector of ₹ 16,210, commerce and business ₹ 13,136 and in

other service sector, it is ₹ 14,625. Thus, productivity of women agriculture labour is very low compared to other sectors. They largely do manual labour which is time consuming, very tiring in nature and increases women's workload. Ponnusamy and Sendhil (2015) reported that migration of labour is getting feminized especially in the developing countries like India in the recent past, and more so in Odisha state that face acute migration where farm women migrate for a better livelihood options. Highest percentage of women labour migrants were within the age group of 26-35 (40%) and lowest number was found within 56-65 age group (4%). 92% of the respondents were wage labourers and among them, a majority (52%) of women performed both construction and road work, and 40% performed only construction work. A majority of the respondents (42%) earned a monthly income ranging from ₹ 2,000 to ₹ 3,000 and their total monthly family income varied from ₹ 5,000 to ₹ 8,000. However, 68% of the respondents saved their income for the future requirements and 32% of the respondents were living hand-to-mouth life due to a large family size.

In the present study, the livestock ownership in the coastal districts indicates a clear preference for particular livestock species in cattle, goat and poultry. The nutritional status of children in the coastal districts points to better nutritional status of children in the coastal districts which could be due to the dietary inclusion of fish in this region being close to the water bodies. Efforts for gender mainstreaming need to be intensified through appropriate deployment of farm worthy technologies.



Women require capacity building programs for reducing drudgery and increasing their work output. Agricultural development programs are usually planned by men and aimed towards them. Our extension system is male dominated and the extension service given to women is very limited. Expanding the sphere of women extension workers is required who can better identify the women's needs and constraints, priorities and opportunities to meet their requirements. Adequate funds need to be provided to women extension functionaries for field activities and its recognition. For effective extension service, more number of change agents, training programs, infrastructural facilities, allocation of gender budgets, sensitization of extension functionaries, etc. should be made and need based extension models may be developed. Accumulating evidence shows that empowering women is not only important in its own right, but also often highly conducive to improving agricultural productivity, food security, and nutrition. Research and development of agricultural technologies and interventions should begin with an understanding of how men's and women's interests as producers and consumers and work to address the needs of both as equal partners. Only gender mainstreaming in agriculture can lead to productivity gains and improve developmental outcomes for the next generation. A concerted effort is required to improve the might of women in agriculture today for more productive and sustainable agriculture.

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