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Women in Agriculture and Natural Resource Management (NRM) in Andhra Pradesh –A Status Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

In the present paper an attempt has been made to examine the role of women in Andhra Pradesh Agriculture especially in natural resource management. The study focused on studying participation of women in crop management, wage discrimination, ownership, access to economic resources and economic decision making and natural resources management at micro level and macro level. The study revealed that about 22% of cost of cultivation and 56% of the labour cost is incurred towards female labour accounting to Rs 3424 out of cost of cultivation Rs. 19725/ha in case of paddy cultivation. The economic value of women's participation was accounting to be Rs. 2558 of the total cost of cultivation (Rs. 13567/- per ha) of sorghum. There was a glaring difference in wage rates revealing discrimination between men and women wage rates. The year to year (y-t-y) wage difference was only 12.73 during 2000-01 a decade ago, later grew to 35.13 during 2010-11. The

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lower wage rates to women were because female labour is available in plenty than male labour. Policy initiatives such as identify women as a key player in NRM both at micro and macro level, when the Govt. distributes surplus land, it has to consider the possibility of transferring the ownership of land to women encourage leasing out fallow land for cultivation of food crops through women SHGs, train the tribal women on how to make use of NFTP and other MFP without disturbing forest cover.

Keywords: Agriculture; Andhra Pradesh; natural resource management; paddy; sorghum; women.

1. INTRODUCTION

Inclusive growth has to start with inclusion of women not only in production and distribution of output but also in natural resource management, along with all categories of people. Contribution of women in crop production, animal husbandry and in natural resource management at macro level and her multifaceted role in the wellbeing of the family and NRM at micro level is accepted worldwide. All the developing and least developed nations have the component of women as farm owners and farm labour. The proportion of women in agricultural production and postharvest activities ranges from 40 to 70%, their involvement is increasing in many developing countries, particularly in the wake of export-oriented agriculture, irrigated farming, which is associated with a growing demand for specialized female labor, including migrant workers.

The participation of women in Agriculture has in some ways brought farm income benefits, but, the largest proportion of economically poor rural women worldwide continue to face deteriorating health and work conditions, no access and control over natural resources, limited access to education and health, insecure employment, malnutrition and low income. Women have extensive work load with dual responsibility for farm including animal care and household. In this context balancing the role of women in NRM becomes important to sustain agriculture. In the present paper an attempt has been made to examine the role of women in Andhra Pradesh Agriculture and their role in natural resource management.

2. MATERIALS AND METHODS

In Andhra Pradesh, The study was conducted considering field level survey in Nalgonda district, Mahaboobnagar and Prakasam districts. Among the agricultural operational households from the districts about 65 to 70 per cent of the households are under small and marginal category where participation of women in agriculture as agriculture woman labour is found. Further the selected sample size is as follows. 200 in Mahaboobnagar district, 185 in Nalgonda district and 175 in Prakasam district. In this the paddy and jowar households in irrigation and rainfed systems who fall into small and marginal farmer category is considered for the survey. The specific objectives of the study are, participation of women in irrigated and rain fed crop enterprise, wage discrimination in agriculture labour, ownership, access to resources and economic decision making and Natural Resources Management at village and farm level.

3. RESULTS AND DISCUSSION

The results obtained from primary data survey, group discussions and secondary data were presented. The data collected were analysed for knowing the extent of participation of women in cultivation of an irrigated crop enterprise i.e paddy and a rainfed crop i.e jowar.

Farm women acting as manager in the absence of the farmer cannot take any decision related to production and marketing. It is because women are regarded that they do not have awareness and knowledge hence not involved in decision making.

This is partially true due to lack of access to knowledge, education, information, political institutions and financial institutions they are not taking initiative in decision making but does all the farm work without any hesitation.

The wage rates increased drastically every year particularly 2008-09 onwards as men are migrating to nonfarm sector and demand for female labour is increasing. But when the wage difference between male and female is examined, it ranged from 18 per cent to 29 per cent as a per cent to male wage rate, which less to that of male farm labour. The study confirms even though participation of women labour is

increasing in farm activities the wage discrimination is increasing as shown in Fig. 1. The gap is widening, this might discourage the acquisition of skills by female labour. Their contribution while transplanting paddy, seed storage and postharvest management is critical in the yield enhancement and production of quality grain. Therefore the study strongly suggested implementation of equal wage rates and improvement of productivity of female labour.

The data also revealed that in livestock management, indoor jobs like milking, feeding, cleaning, etc. are done by women in 90% of families while management of male animals and fodder production are done by men.

Even though women's participation in production is compulsory in farm production certain activities are exclusively done by women only, when it comes to the payment of wage rates there is a visible discrimination between wage rates offered to men and women labour as shown in Table 1 and Fig. 1. Primary data revealed that the wages offered to men labour ranged from Rs 200 to Rs 250 per day while women received only Rs 125 to 150 per day. The secondary data as shown in Table 1 revealed that women labour received less wages compared to men labour. There was a glaring difference in wage rates unveiling the discrimination between men and women wage rates [1]. The year to year (y-t-y) difference in wages was only Rs. 12.73 per head during 2000-01 a decade ago, later has shown increasing trend and difference in wage rates has tripled to Rs. 35.13 per head during 2010-11. The lower wage rates to women were because female labour is available in plenty than male labour. The women labour has no other option except farm work, whereas men labour have better opportunities of alternate employment in industry, real estate and they can migrate to other places easily leaving the family behind. So yet times under employment is noted in case of female agricultural labour as they are prepared to work at lower wages comparatively as depicted in the Fig. 1. Developing skills by training them and imparting organizational skills will help them giving better bargaining power. Training women to handle machinery will reduce their drudgery. For farm operations such as harvesting contract labour system is already practiced, where women labour take work contracts and finish the work in a group there by efficiency as well as wage rates improve.

Therefore we can say that women's key role in the production of major grains and minor millets illustrates their invaluable contribution to the food security. In addition, women play a crucial role in ensuring supply of food as food vendors and post-harvest processors of livestock and fishery products. As major buyers of family food and meal-makers, women ensure adequate food security. As primary providers of nutrition to the young children, women are the major decision-makers in ensuring nutrition to the next generation [3,4].

In case of paddy cultivation women's contribution as family labour and as agricultural labour in others fields does exist in all the major operations starting from ploughing to harvesting, threshing and bagging. Among all activities the major operations where women's role and participation is relatively more compared to men are in seed selection, nursery preparation, transplanting, weeding, harvesting and threshing as presented in Table 2.

About 22% of cost of cultivation and 56% of the labour cost were incurred towards female labour accounting to Rs 3424 out of average cost of cultivation Rs. 19725 /ha in case of paddy cultivation. The farm woman participates in all the important operations along with women labour and sometimes only supervises the labour based on the need. But their participation in marketing of the produce is nil. The primary field survey indicated that women do participate in production activities taking heavy loads of work but there is minimal participation in marketing activities. The decision of selling the produce is exclusively the decision of the male head of the family. Except in one or two cases, where the lands given to women by their parents at the time of marriage, the sampled women do not possess the ownership of land. Ownership rights of land are not enjoyed by women in many parts and Andhra. The field survey indicated that in more than 95 percent of the cases the land ownership belonged to men [5].

As per Table 3 which revealed that in case of sorghum cultivation also significant contribution of women was noticed. The economic value of participation was accounting to Rs 2558 of the total cost of cultivation (Rs. 13567/- per ha). The major activities taken up by women labour were sowing, weeding, harvesting, winnowing and cleaning. Irrigated crops are more labour intensive. [6] The findings of field survey are comparable findings of [7], found that nature and extent of women's involvement differs with crop

enterprise. The mode of female participation in agricultural production varies with the land-owning status of farm units. Their roles range from managers to landless labourers. In overall farm production, women's average contribution is estimated at 55% to 66% of the total labour with percentages much higher in certain regions [7], [8].

High Tec agriculture is more labour intensive so the workloads and wage rate become crucial to have efficiency of women labour.

Table 1. Comparison of wages paid to men and women labour over last decade

Years	Male (Rs)	% change over the previous year	Female (Rs)	% change over the previous year	Difference between male and female wages	%difference of female wage to male wage
2000-01	45.93	-	33.2	-	12.73	27.72
2001-02	48.77	6.18	35.91	8.16	12.86	26.37
2002-03	49.14	0.75	36.10	0.52	13.04	26.54
2003-04	52.41	6.60	38.30	6.03	14.11	26.92
2004-05	55.75	6.30	40.40	5.53	15.35	27.53
2005-06	59.35	6.40	42.25	4.57	17.10	28.81
2006-07	66.79	12.50	48.63	15.10	18.16	27.19
2007-08	66.79	0	48.63	0	18.16	27.19
2008-09	99.21	48.50	74.73	52.23	24.48	24.67
2009-10	119.64	20.60	90.11	21.70	29.53	24.68
2010-11	150.43	25.70	115.3	27.90	35.13	23.35
2011-12	193.73	0.26	140.71	22.04	35.13	18.13
2012-13	227.14	28.78	159.02	13.01	53.02	23.34
2013-14	245.42	17.25	178.64	12.34	68.12	27.75
2014-15	277.00	8.05	195.00	9.16	66.78	24.1
2015-16	295.35	12.87	199.82	2.47	82.00	27.767
2016-17	321.00	6.62	224.00	12.10	95.53	29.76
2017-18	331.00	8.68	239.00	6.69	97.00	29.30

Source: Department of economics and statistics, government of Andhra Pradesh [2]; Note: Figures in parenthesis is the percentage of difference of female wage to the male wage

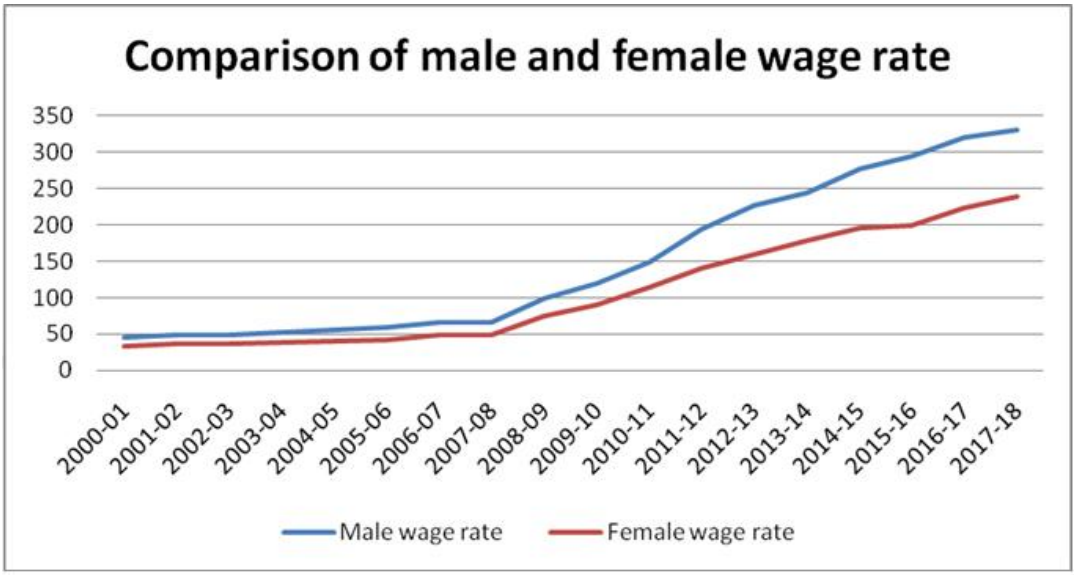

Fig. 1. Comparative wage rate for men and women

Table 2. Participation of women in paddy cultivation in Nalgonda district of Andhra Pradesh

Activities	Female		Male	
	Extent of involvement	No of days per hectare	Extent of involvement	No of days per hectare
Land preparation	X	1	X	1
Ploughing	X	1	XX	2
Applying manure	X	1	X	1
Puddling	X	1	XX	2
Seed selection/nursery preparation	XX	1	-	0
Transplanting	XX	2	X	1
Weeding	XX	8	-	1
Fertiliser Application	X	3	XX	6
Pesticide application	XX	3	X	6
Harvesting	XX	10	X	3
Threshing and bagging	XX	8	X	4
Post-harvest	X	1	X	4
Total no of days / ha	-	40	-	31
Economic value of labour Rs/ha	-	3424		2608

Note: XX: Relatively more participation and X: Relatively less contribution; Source: Field survey

Table 3. Farm activities attended by men and women - Sorghum cultivation in Mahaboobnagar district of Andhra Pradesh

Activity	Female		Male	
	(Relative participation)	No of days per hectare	(Relative Participation)	No of days per hectare
Preservation / storage of seed	X	1	-	-
Land preparation	X	1	XX	2
Cleaning the field	X	1	-	-
Sowing	XX	3	X	1
Weeding	XX	12	-	-
Fertiliser Application	X	1	X	1
Pesticide Application	X	1	X	1
Harvesting	XXX	8	X	1
Threshing	X	2	XX	4
Winnowing	XX	2	X	1
Cleaning the produce	XX	2	X	1
Bagging	X	1	XX	2
Transport	-	-	XX	2
Total number of days /h		35		16
Economic value Rs/h		2558		1382

Note: XX: relatively more participation and X: relatively less contribution

3.1 Women's Access and Economic Decision Making

The study also focused on knowing women's status in access to resources and decision making power in resource management and disposal. Their responses were presented in Table 4.

The table revealed facts about the relative involvement of women in management, access decision making power.

The decisions on what seeds to be used, fertilizers, pesticides and when to be applied are taken by men [9]. In Andhra Pradesh livestock is a women's enterprise studies also found that women accounted for 93% of total employment in dairy production [10]. Depending upon the economic status, women perform the tasks of collecting fodder, collecting and processing dung. Dung composting and carrying to the fields is undertaken by women. Women also prepare cooking fuel by mixing dung with twigs and crop residues. Though women play a significant role

Table 4. Access and involvement in economic decision making of socioeconomic parameters

Name of the operation	Access		Involved economic decision making	
Farm Production	**Female**	**Male**	**Female**	**Male**
Seed	Yes	Yes	Yes	Yes
Fertilizers	No	Yes	No	Yes
Pesticides	No	Yes	No	Yes
Water	No	Yes	No	Yes
Livestock	Yes	Yes	Partially Yes	Yes
Poultry	Yes	Yes	Yes	Yes
Finance	No	Yes	No	Yes
Land	No	Yes	No	Yes
Market	No	Yes	No	Yes
Education	Partially Yes	Yes	No	Yes
Household	Yes	Yes	Yes	Yes
Food and Nutrition	Partially Yes	Yes	Yes	Yes

in livestock management and production, women's control over livestock and its products is negligible. The vast majority of the dairy cooperative membership is assumed by men, leaving only 14% to women [11].

Livestock is a women's enterprise in Andhra Pradesh. Similarly seed is under the control of women as it needs to be protected safe to be used in the next season. The responses of access and economic decision making were presented in the Table 4, that access to many natural resources is not reported by the women members of the farm family, similarly their involvement in economic decisions was not observed except for family decisions and food and nutrition decisions

3.2 Women and Natural Resource Management (NRM)

3.2.1 Natural resources ownership and management

Natural resources (land, water, biodiversity and genetic resources, biomass resources, forests, livestock and fisheries) – the very foundation of human survival, progress and prosperity, have been degrading fast, and the unprecedented pace of their erosion is one of the root causes of the agrarian crisis that the country is facing. The natural resources have bearing with sustainable agriculture are land, water and common grazing lands and forestry or other vegetation [12].

Although women work in farm land, but their rate of land possession is still very low; in addition, they don't own transportation means and agricultural wells. At farm level Management of land, water, farm inputs, trees and livestock are managed by women. In Nalgonda and Mahaboobnagar district women are those who fetch water from more than 2 km in the interior tribal areas. Domestic water is used for processing and preparing food, drinking, bathing and washing, irrigating home gardens and watering livestock. The time spent in walking, collecting, and transporting sufficient quantities of water for household use is one of the most critical and time consuming daily activities for women and girls [13].

Rural Indian women's interface with the forests is varying - gathering, wage employment, production in farm forestry and management of afforested areas in the community plantation [14]. In India, women are the major gatherers and users of a much more diverse range of forest products than men. Depending upon the sociocultural variations among different communities, primarily Non-Timber Forest Products (NTFP) are collected by women and timber by men. Just like several parts of India, in Andhra Pradesh, Mahaboobnagar district, large proportions of the population depend on NTFP as their main source of livelihood from Nallamala forest. Apart from fodder and fuel, women collect food, medicinal plants, building materials, material for household items and farm implements. Sal and Tendu leaves are primarily collected by women. As women are the ones who have traditionally been collecting forest products, they possess the knowledge of properties and potential uses of these products [15].

At village level the identified resources are common grazing lands which are deteriorating, water bodies and forest even though gram

panchayaths are responsible for the management of these resources they neither play significant role nor entrust the same to some capable body such as women groups, NGOs and any other development institutions. The field study revealed that the participation of women in management of natural resources was not found in the study area. Nevertheless it is found to have some negative effects on women if women are excluded from natural resources management and they become more marginalized in use of physical assets such as irrigation water or forest products; and human assets, such as training, credit or other benefits earmarked only for the group or organization members. Women are not involved in water user associations as revealed by the field survey. Wherever watershed management is there women are partially involved. Studies have found that in Nepal and Gujarat, forest cover is increased by 75% when women are included in the process of protecting forests.

4. CONCLUSION AND POLICY IMPLICATIONS

To have women included in growth special attention should be paid towards inclusiveness and gender mainstreaming within the context of farm household and natural resource management at farm and village level.

- Institution and capacity building at different levels,
- Encourage women's participation in local bodies to help themselves Creating awareness on CPR to rural women and make them responsible for its maintenance through Panchayats
- Involving women groups in maintaining and preserving bio diversity and encourage leasing out fallow land for cultivation of food crops through women SHGs
- Create awareness on wage discrimination and formation of organizations to fight against wage discrimination to get a proper wage rate and improvement in their productivity.
- Identify women as a key player in NRM both at micro and macro level and involve them in management of natural resources and not merely development of natural resources. Diversification and intensification of farming system as an integral part of natural resource management programme.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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