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Status of Farm Mechanization and Women Participation in Agriculture in Balod District, India

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A B S T R A C T

Farm mechanization means the introduction and use of non-biological power in carrying out various operations. The mechanization in the farm sector has to take several factors into considerations; it facilitates the speedy completion of farm operations with much ease. Farm mechanization is a different area of high-tech agriculture, in which modern machine are being put to use for land preparation, land development, inter culture operations, sowing transplanting harvesting threshing etc. The contribution of draught animal power in India has witnessed the most prominent change through decrease from 45.3 % in 1971 to 8.02 % in 2012.

Introduction

Farm mechanization has been helpful to bring about a significant improvement in agricultural productivity. Thus, there is strong need for mechanization of agricultural operations. The factors that justify the strengthening of farm mechanization in the country can be numerous. The timeliness of operations has assumed greater significant in obtaining optimal yields from different crops, which has been possible by way of mechanization. However draft animals, particularly bullocks/he buffaloes/camel; still continue to be a predominant source of energy for traction and rural transport in different parts of India. Today draft cattle provide about 50 million hp or about 35 million kW of energy in a year. More than 65 per cent of this energy is used for agriculture and the rest for transport. Over 150 Mha of land, farming about 65 per cent of the area sown, is cultivated through the use of draft animals every year. Chhattisgarh State is known as a rice bowl where rice culture is predominantly rain fed and approximately 85% of the rice

crop in this region is direct-seeded. Most of the area is under a single cropping system. Rural women contribute much of the labor for rice production and other agricultural activities. More than 50% of the farm work is done by women in India Contributions of farm women in agriculture cannot be ignored. The total agriculture workforce in India is 234,270,000 as per 2001 census, of which 38.99 % is contributed by female workforce and 60.93 % is male workforce. In agriculture sector, out of the total women engaged, more women are employed as agriculture laborers rather than as cultivators both in absolute terms and as proportionately.

The main objectives of this study to record the utilization of tractor and animal power utilization for agricultural operations.

The specific objectives of this study were

Power availability

Indian farms had only 0.295kW/ha in 1971, dominated power (45.26%). The power availability, however, increased over year at growth rates to 4.79, 4.89% in each ten year till 1991. The contribution of draught animal power has witnessed the most prominent change through decrease from 45.3% in 1971 to 8.02% in 2012. The increase in power has been mainly through introduction of tractors, whose contribution has increased from 7.5 % in 1971 to 46.7 % in 2012. Presently total power availability in Chhattisgarh is 1.09 kW/ha. and contribution of animal and human power is 27.4 % and 48.39% respectively however animal farming cover about 40% of cultivated area.

On an average 80 % farmers have land holding less than 2 hectare. The small and marginal farmers do not have the capacity to purchase improved costly machinery or tractor. So they are dependent on the animals only. Chhattisgarh agriculture continues to be dependent upon human and bovine population. Tractor, power tiller, diesel engine and electric motor have supplemented the animate power. Among draft animals, bullock and He-buffaloes are used for farming operations in Chhattisgarh.

Two villages were selected in each of 5 disparate areas, one with access to mechanized cultivation, the other without. Data were collected weekly over 15 months from a random sample of 36 farmers in each village on use of family and hired labour, draft animals and farm machinery (owned and hired), input levels, and production and disposal of output. The final conclusion is that, taking into account the full costs to society of deploying and using tractors, there must be serious doubt whether expanded mechanization is desirable; however, there is a strong case for developing animal power, associated equipment and techniques.

The present status and future trends of comparative demand and utilization of draft animals and tractors on Indian farms. Utilization of available farm power, economic and social restraints and economic aspects of hiring tractors, bullocks and power tillers are outlined and brief case studies of powered machinery use for cultivation are presented.

Materials and Methods

Chhattisgarh state has been divided into three Agro-climatic zone viz. Chhattisgarh plains, Bastar Plateau and Northern Hill zone, covering 51.0%, 28.0% and 21.0% of the geographical area, respectively. The district from the Chhattisgarh plains was selected. Out of which two blocks namely Gunderdehi and Gurur block has been identified for the purpose of study. Two villages from each block were selected for conduction of data

collection work. In this study 30 farmers including women from each of the village (total four) were interviewed personally for recording all necessary observation as per proforma developed.

The Normal rainfall is 1478 mm in the district. Total 889 km^2 area of the district is covered by forest. Agriculture is the main occupation of the district. Net sown area is 2645.59 km^2 (on 2000 data) with only 672.02 km^2 is double cropped area. Principal crop is rice sown in 2605.62 km^2 areas i.e. 98.34 % of total sown area. 99.66 % villages where provided with drinking water source. Almost 90 % of drinking water supply is from Ground Water in the district. Total hand pumps are 5776 whereas power pumps are 3153 tapping ground water in the district. 84 water supply schemes are running tapping ground water in the district.

Method of data collection

The data were collected through personal interview of the farmers and farmwomen on the pre – tested proforma (Appendix – A) by using recall method for all the selected farmers falling in different categories. The information about household activities was collected through interview of the counterparts of the farmers. Actual observations of some activities were also recorded during the field operations in a few villages. The time and labour required for various farm operations mainly field preparation, sowing, transplanting, irrigation, manuring, fertilizer application, weeding, plant protection, harvesting, threshing, drying and transportation were recorded for each crop under study on the basis of the verbal interview of the farmers. Thus the data in terms of time and labour required to accomplish different field operations and household activities along with other basic information were collected individually from all the selected farmers.

Data processing

Adopting standard techniques suggested by the research workers the data thus collected was processed. First of all the data for animal power utilization was arranged separately for different categories of respondents for each village. The values thus found were arranged in tabular form separately for each category of farmers.

Involvement of farm women in a operation

It indicates the per cent of the respondents involvements in the particular operation. If the involvement of farm women in intercultural operation was 89.96% means out of 100 respondents 89 respondent were involved in this operation.

Sampling procedure

The main focus of study was on the animal power utilization, tractor power utilization and farm women and their involvement in agriculture and allied activities in the state. Therefore, only the draught animal, farm women and male farmers were considered separately for the study. To identify the location of survey sites in the selected district of the zone villages were grouped block – wise. The farmers were selected randomly. After that population of the farmers were grouped under different categories for all the four villages. The categories viz. marginal (<1ha), small (1-2ha), semi-medium (2-4ha), medium (4-6ha) and large (>6ha) of farmers, selected in each of the village.

Results and Discussion

This chapter briefly presents the findings of the survey conducted in Durh Balod district of C.G. Plains region. To find out the animal power utilization and women's power contribution in agriculture and allied activity under existing farm practices, a detailed

survey of farm families comprising of different land holding sizes was conducted. Survey revealed that the respondents belong to different castes, and have education level from illiterate to college level. Many farmers, especially those who have their own irrigation sources, take summer paddy also.

General and social attributes

The population density of Chhattisgarh state is 154 and in the district it is 342 persons per km^2. The sex ratio of state and district is very similar to each other ranges between 989 and 999 female per thousand males. The main dialect of the district is chhattisgari. District has mainly backward class population and tribes like Satnami, Gond, Kanwar etc, are found in the district. District is well connected with the rest of the state through road and the two tehsils namely, Gunderdehi and Dondi are connected with railways. 98.15% villages of the district are electrified.

Table.1 Administrative Information

Subdivisions	02- (Balod, Durg,)
Tahsils	08-(Balod, Gurur, Dondi, Gunderdehi,Dondi Lohara ,Durg,Patan, Dhamdha)
R.I. Mandal	9- (Balod, Gunderdehi, Gurur, Dondi, Dondi Lohara, Arjunda, , Patan, Dhamdha, Bhilai)
Patwari Halka	Total- 232
Blocks/Janpad Panchayat	06 - (Gunderdehi, Gurur, Dondi, Dondi Lohara , Patan, Dhamdha)
Panchayats	Total – 522
Villages	(a) Revenue Villages- 913, (b) Forest Villages- 2,
	(c) Total Villages- 915
Municipality	- (Balod, Durg)
Nagar Panchayat	08-(Balod, Gurur, Dondi, Gunderdehi, Dondi Lohara, Durg, Patan, Dhamdha)

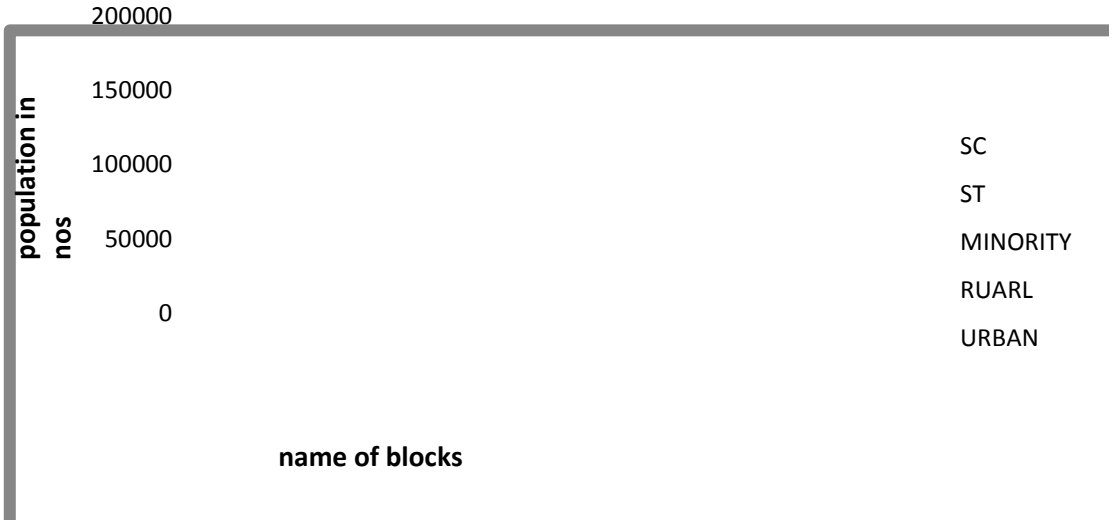
Table.2 Population of draught animal power and use of implements

S. No	Particulars	Gunderdehi Block		Dondilohara Block	
		Arjunda	**Sikosa**	**Lohara**	**Dewari**
1	Total Area (ha)	537.452	569.398	586.621	687.907
2	Cultivable Area (ha)	409.314	422.153	439.900	542.923
3	Irrigated Area (ha)	409.314	422.000	427.000	405.000
4	Major Crop Grown				
	(a) Kharif	Paddy, Arhar			
	(b) Rabi	Wheat, Bengal Gram, Sarso, Tiwra, Alsi			
5	Major Crop Rotation	Paddy, Wheat, Moong			
6	No. of Farm families	342	408	482	805
7	Bullocks (Nos.)	10	16	138	193
8	He-buffaloes (Nos.)	200	250	240	316
9	Tractors (Nos.)	9	14	22	9
10	Power Tiller Reaper (Nos.)	2	3	3	0
11	Country Plough (Nos.)	105	256	327	342
12	Bollock Cart (Nos.)	104	254	322	340
13	Gobar Gas Plant (Nos.)	8	0	7	36
14	Vermi Compost (Nos.)	10	0	0	0
15	Tube Well (Nos.)	7	2	6	4
16	Electric Motor (Nos.)	20	30	11	5
17	Diesel Engines (Nos.)	30	70	9	16

Table.3

	Tractor use in different agricultural operation	Average annual agril. use of tractor for personal land (h) (%)	Average annual agril. use of tractor for custom service land (h) (%)	Average annual other use of tractor for custom Service (h) (%)
1.	Tillage	56	42	-----
		(14.66%)	(10.99%)	
2.	Sowing	30	37	-----
		(7.85%)	(9.69%)	
3.	Leveling	4	9	-----
		(1.05%)	(2.36%)	
4.	Threshing	20	37	-----
		(5.24%)	(9.69%)	
5.	Transportation	32	39	-----
		(8.38%)	(10.21%)	
6.	Irrigation	-----	3	-----
			(0.79%)	
7.	Annual	14	-----	59
	miscellaneous use	(3.66%)		(15.45%)
	Total	156	167	59
		(40.85%)	(43.72%)	(15.45%)

Fig.1 Category wise population in different blocks



As per 2011 census the male, female and total literacy is 82.21%, 50.41% and 66.26%, respectively. Details of general information of the district and surveyed villages are summarized and shown in Fig.

In conclusion, this study undertaken in investing the effect of status of farm mechanization in agriculture utilization pattern of farm tractors in different agricultural operations for own land and for custom service in rabi and Kharif season , which revealed that the average annual use of the tractors was 382 h only in the district out of which for 59.16% of the time, the tractors were used for custom work and that of 40.85% of the time, for own work.

Maximum use of the tractor for 98 h (25.65%) was recorded in tillage operation, followed by threshing operation 57 h (14.92%) and sowing operation 67 h (17.53%).In the custom work, the maximum use of the tractors was found in tillage and transportation operations 42 h (10.99%) and 39 h (10.21%), where as for own work, maximum use of the tractor was found was found in tillage operation (14.66%).

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