

Original Research Article

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## Status of Farm Mechanization under Animal Farming in Northern Hills Agro-Climatic Zone of Chhattisgarh, India

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### ABSTRACT

This study was conducted in two district of Northern hills agro-climatic zone of Chhattisgarh State. In which two blocks were selected from each district purposely (based on draught animal population and animal drawn implements). Three villages were selected from each block and ten respondents randomly selected from each village Total of 120. The purpose of this study was to analyze the status of farm mechanization under the animal farming system, availability of draught animal population, identification of animal drawn and other farm implements and their utilization for agricultural production. The required data of the study were collected with the help of a detailed proforma which was developed prior to survey, after consulting the literature available as suggested by the different researchers. It was found that the Northern hills cover about 21% of the total geographical area and also covers about 21% of the total draught animal population. Average draught animal power in Northern hills was found that 0.37 kW/ha. Northern hills have the highest utilization of animal power was 284 h/ha. The study reveals that the majority of the respondents about 96 per cent used country plough as a primary tillage implement, 99 per cent used wooden plank as a secondary tillage implement in the zone. In case of traditional sowing methods majority of 98 per cent used broadcasting method for sowing and only 2 per cent of the respondents used seed drill as improved seeding implements.

### Keywords

Farm mechanization, Draught animal, animal drawn implements, Northern hills agro-climatic zone, Chhattisgarh

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### Introduction

Farm mechanization is the application of mechanical aids to agriculture in order to mechanize the agricultural operations. Mechanization facilitates the timeliness completion of agricultural operations with must ease. Farm mechanization is nothing but it is the implementation of improved agricultural tools and equipments to facilitate crop establishment, to increase the

productivity of agricultural land and to reduce drudgery of farm labour. Farm mechanization also helps in increasing the socio-economic level of the farmers by reducing the cost of cultivation and minimization of farm losses. Agricultural mechanization has been helpful to improve the quality of field operation and providing better soil environment for seed germination and plant growth. 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 significance in obtaining optimal yields from different crops, which has been possible by way of mechanization (Singh, 2002).

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 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. The average operational land holding in India has declined from 2-7 ha in 1960-61 to just half today. Most of farmers have small holdings and can hardly opt for complete mechanization. Therefore the use of draft animal power is going to be continued in India for many more years, especially in a state like Chhattisgarh.

## **Materials and Methods**

Chhattisgarh state consists of three zones i.e. Northern hills, Bastar Plateau, Northern hills zones. For this particular study Northern hills zone was selected. For this particular study two districts were selected from the zone i.e. Surguja and Balrampur were selected (Fig. 1). From Surguja district Ambikapur and Lundra block were selected and from Balrampur district Ramanujanj and Vadrafnagar block were selected for the survey work. In case of village selection, in Surguja district, from Ambikapur block Khairwara, Bada damali and Pondikala villages and from Lundra block, Bilhama, Kot and Udari villages were selected. Similarly, in Balrampur district from Ramanujanj block, Nagra, Vijaynagar and Mahavirganj villages and from Vadrafnagar block, Kotrahi, Pandari and Basantpur villages were selected. Ten farmers from each

of the selected village will be considered to collect the required information. To collect information leading to fulfil the objectives of this study each farmer was interviewed separately on the pre- tested Proforma. Enquiry method was adopted for obtaining the information from selected farmers falling in different categories.

The time (in hours) required for various farm operations mainly field preparation, sowing, weeding, harvesting, threshing, and transportation etc. through draught animal were recorded for each crop on the basis of the verbal interview of the farmers. The secondary data related to Chhattisgarh state is collected from the Commissioner, Land Records, Directorate of Animal Husbandry, Statistical handbook of Chhattisgarh. 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. To identify the location of survey sites in the selected district of the zone, villages were grouped block –wise. The farmers were selected randomly.. Data were analyzed for the most part by using tabular form as for its inherent quality in portraying the true picture of draught animal and farmer involvement in agriculture and allied activities in the state of Chhattisgarh.

## **Results and Discussion**

### **Status of draught animals in Northern hills**

District wise draught animal population is presented in Table 1. It was found that, draught animals used in the zone comprise of Bullocks. Out of total draught animal population in Northern hills, Surguja has a major share as 30.14 per cent and minimum share of Jashpur district of 5.9 per cent. It shows the general information about the draught animal population in Northern hills.

**Availability of draught animal power and farm implements in Northern hills**

In Northern hills agro-climatic zone the draught animal power available is shown in Table 2. It shows that Koriya district has maximum power availability as 0.74 kW/ha and minimum was found in Jashpur district as 0.232 kW/ha. The average draught animal power found in Northern hills was 0.37 kW/ha and Table 3 shows availability of farm Implements and bullock cart in different districts of Northern hills. It shows that Jashpur district of Northern hills has maximum numbers of wooden plough as 119258 and Koriya district has minimum as 65358. Again Jashpur district has maximum numbers of iron plough as 1216 and Surajpur has minimum as 296, but in case of bullock cart, again Surajpur district has minimum 178 and Koriya has maximum 1431 number of bullock carts.

**Average utilization of animal power in Chhattisgarh**

To collect information on extent of animal power utilization in the state primary data was collected from the respondents by asking

them questions on different farm operations carried out using animal power, approximate duration of utilization for each operation and implement owned by them. Table 4 shows the average utilization of animal power for different operations in the selected villages of Northern hills agro-climatic zone. Pandari village had the highest utilization of 284 h/ha and lowest utilization was in Khairwara village 203 h/ha. The draught animals are used for ploughing, planking, threshing and carting operations mainly. Table 4 also reveals that, the ploughing operation requires the highest number of hours among all the field operations followed by threshing and carting. Ploughing has a share ranging between 30-50 % of total usage of draught animals for different operations.

**Month wise utilization of draught animal**

The average monthly utilization of draught animals in Chhattisgarh plains has been shown in Table 5. The highest utilization of draught animals was in the month of June mainly due to ploughing and seed bed preparation. December showed the use of draught animals for threshing operation.

**Table.1** Draught animal population in districts of Northern hills (2013-14)

S.No	Zone	District	Bullocks	He-buffalos	Total
1.	<b>NORTHERN HILLS</b>	Surguja	185203	36983	222186
2.		Balrampur	145766	38897	184663
3.		Surajpur	143114	28216	171330
4.		Koriya	93914	21881	115795
5.		Jashpur	21763	21352	43115
<b>Total</b>					<b>737089</b>

**Table.2** Draught animal power in Northern hills agro-climatic zone of Chhattisgarh

Agro- climatic zone	Name of District	Availability of draught animal power, kW/ha	Average draught animal power, kW/ha
Northern Hills	Surguja	0.33	
	Surajpur	0.26	
	Balrampur	0.29	0.37
	Koriya	0.74	
	Jashpur	0.232	

**Table.3** Availability of farm implements, machines in districts of Northern hills zone

S. No.	District	Wooden Plough	Iron Plough	Bullock Cart
1	Surguja	97246	515	206
2	Balrampur	103313	296	266
3	Surajpur	85442	255	178
4	Koriya	65358	396	1431
5	Jashpur	119258	1216	553

**Table.4** Average utilization of animal power in selected villages of districts in Northern hills agro-climatic zone

S. N.	District/ Block	Village	Area (ha)	No. of Draught Pair	Implement wise Utilization (hrs)				Total Utilization	Utilization Pair (hrs)	Use h/ha
					Plough	Wooden Plank/Kopar	Threshing	Carting			
<b>Northern Hills (Agro- climatic Zone)</b>											
<b>A Surguja District</b>											
	Ambikapur	Khairwara	13.95	10	1310	720	650	160	2840	284	203
		BadaDamali	10.2	10	970	590	748	242	2550	255	250
		Pondikala	10.625	10	1020	610	681	346	2657	265	250
	Lunda	Bilhama	15.08	11	1590	730	982	432	3734	339	247
		Kot	14.37	12	1420	750	874	321	3365	280	234
		Udari	11.66	10	1080	640	780	220	2720	272	233
<b>B Balrampur District</b>											
	Ramanujanj	Nagra	21.2	13	1920	1090	1030	342	4382	337	206
		Vijaynagar	16.58	12	1550	860	920	248	3578	298	215
		Mahavirganj	15.37	10	1610	540	941	266	3357	335	218
	Vadrafanagar	Kotrahi	14.16	11	1370	700	782	244	3096	281	218
		Pandari	15.91	13	1630	790	1120	981	4521	347	284
		Basantpur	15.2	12	1560	710	924	894	4088	340	268

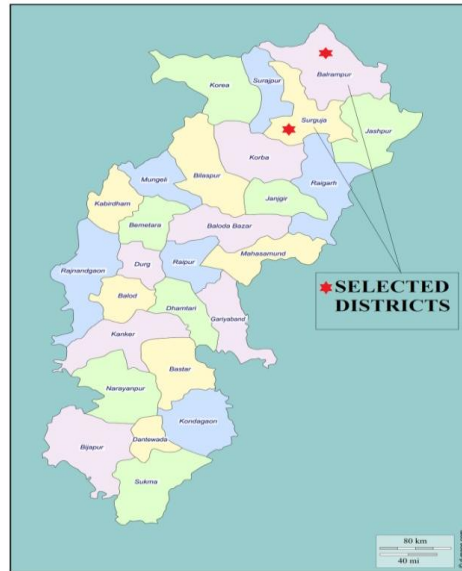
**Table.5** Month wise utilization of draught animals

S. No	Month	Utilization, hrs
1	May	17
2	June	12013
3	July	5138
4	August	0
5	September	0
6	October	31
7	November	6401
8	December	4600
9	January	0
10	February	0
11	March	0
12	April	0

**Table.6** Available farm implements in the selected villages

S. No.	Farm implements	Northern hills
1	Tractor	2
2	Desi plough	127
3	M.B. plough	2
4	Biasi plough	104
5	Disc harrow	0
6	Cultivator	2
7	Wooden plank	64
8	Koper	50
9	Seed drill	0
10	Rice transplanter	0
11	Weeder	0
12	Reaper/harvester	0
13	Thresher	0
14	Cage wheel	4
15	others	0

**Fig.1** Pictorial view of selected districts



### **Availability of farm implements in the selected villages**

The following farm implements were found during survey in the selected villages in which 2 tractors, desi plough 127, 2 mould board plough found in the selected villages, 104 biasi plough, 2 cultivator and there is no disc harrow found in the villages, 64 wooden plank, 50 kopar were found, 4 cage wheel. It also showed that the selected villages were depended on draught animal for farm operations (Table 6).

On the basis of this study it was found that,

The month wise bullock power utilization for different category, it was observed that June and July is the peak period.

The highest utilization of bullocks power use/ha was noted in village Pandari of Northern hills agro-climatic zone and it was 284 h/ha.

Average farm power availability in the selected villages were found as 0.37 kW/ha as

compared to the average of State i.e. 1.098 kW/ha.

Based on the opinion of the respondents, rice transplanting and harvesting operations and winnowing/threshing involved heavy level of drudgery followed by medium to medium-heavy level of drudgeries in FYM application, preparatory work during seed-bed, intercultural operations. The rest of the operations involved light and medium level of drudgery.

Most of the respondents used traditional farm tools/equipment for various farm operations.

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