

Status of farm mechanization in Durg district of Chhattisgarh

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■ **ABSTRACT** : This study was conducted in 40 selected villages of Durg district of Chhattisgarh during year 2011. A total of 600 farmers were selected randomly from all the 40 villages (15 farmers from each village) as respondents for this study. The aim of the study was to analyze the status of farm mechanization for the farmers and availability of animal drawn implements in the farmer's fields for the improvement of agricultural production. The data were collected with the help of pre-structured interview schedule through personal interview and analyzed with the help of suitable statistical methods. The study reveals that the majority (57.43%) of the respondents used country plough as a primary tillage implement, 75.56 per cent used cultivator as a secondary tillage implement in the district. In case of traditional sowing methods majority (57.43%) used broadcasting method for sowing and in case of improved seed sowing implements majority of the respondents used seed drill. The bottleneck except in mechanization and the traditional practices was due to lack of extension programme, availability of equipment, knowledge about new technology, farm roads and small land holding with fragmented field.

■ **KEY WORDS** : Farm mechanization, Implements, Tillage, Durg, Chhattisgarh

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Farm mechanization is the application of engineering and technology in agriculture operation to do a job a better way to improve productivity. This includes development, application and management of all mechanical aids for field production, water control, material handling, storing and processing. Mechanical aids include hand tools, animal drawn equipments, power tiller, tractor, oil engines, electric motors and hauling equipments. Mechanization is a need based process which provides sufficient time gap for self adjustment of various inputs without causing sudden impact of changes. Farm mechanization is based on a total agricultural system, which is deeply connected to socio-economic environment of each country. Mechanical equipments for various farm operations like tillage, sowing, irrigation, plant protection and threshing etc are generally being used by the farming community. The package of modern technology includes the use of more efficient and economical farm implements and machinery and suitable forms of farm power.

Farm mechanization is a different area of fully mechanized, in which modern machines are being put to uses for land preparation, land development, inter culture operations, sowing, transplanting, harvesting and threshing. Simply it means the use of machinery and improved implement and tools for farm operations in the place of human and animal. Farm

mechanization has been helpful to bring about a significant improvement in agricultural productivity. Thus, there is strong need for mechanization of agriculture operations (Starkey, 1998).

Tools, implements and powered machinery are essential and major inputs to agriculture. The term mechanization is generally used as an overall description of the application of these inputs (Clarke, 2000). Din *et al.* (2007) describes the status of constraints in amenability to agricultural mechanization with respect to cropping pattern, labour availability and manufacturers of implements then reported that the farm mechanization is very poor in terms of mechanical power, matching and efficient implements and equipment drawn by draft animal power, power tiller and tractor, water management, renewable energy and post harvest activities. Topography, location and proper input non-availability are constraints. Singh (1999) reported that the modernization of agriculture, the use of mechanical power in agriculture has increased but draught animal power (DAP) continues to be used on Indian farms due to small holdings and hill agriculture. More than 55 per cent of the total cultivated area is still being managed by using draught animals as against about 20 per cent by tractors. Ray (1993) studied the status of farm mechanization and constraints. He reported that the use of

traditional implements were more popular than the improved implement and machinery. He also reported that the majority of farmers were small and could rarely afford to purchase huge and costly agricultural implements and machinery.

Mechanization in Chhattisgarh is needed to mechanize tillage operations in all crops (except paddy) through introducing animal improved blade and animal disc harrow. The use of animal drawn puddler, manual cono weeder manual rice transplanter, manual pregerminated rice seeder, self propelled rice transplanter and multicrop thresher have tremendous scope for mechanizing different agricultural operations for paddy cultivation in State. The use of animal drawn seed cum fertilizer drill and animal drawn inclined plate planter, have good scope for promotion in the pulses and oilseeds-growing region of Chhattisgarh. Mostly farmers in the region are small and marginal category because of poor economical ground they are used animal as a main farm power source

Keeping this in the view, the present study was undertaken with main objectives of to analyze the status of farm mechanization for small, medium and large farmers and availability of animal drawn implements in the farmer's fields for the improvement of agricultural production.

■ METHODOLOGY

The present study was conducted in the Durg district of Chhattisgarh in the year 2011. Durg district occupies the south western part of Chhattisgarh plains and possesses belts of hilly country in the south, southwest and northwest, with various mineral resources and forests. Durg lies between the 20° 23' N and 22° 02' N and the longitudes 80° 48' E. The altitude of the district is 317 Meters from sea level. The district consists of 12 blocks *i.e.*, Balod, Bemetara, Berla, Dhamdha, Dondi, Dondi-Lohara, Durg, Gunderdehi, Gurur, Navagarh, Patan and Saja from which only Durg block was selected purposively, as it covers more area under farm mechanization and availability of animal drawn implements. For this study 40 sample villages were selected around the Durg, these were namely Dhanora, Chandkhuri, Purai, Kolihapuri, Borai, Malud, Ganiyari, Anjora, Silaud, Mohlai, Nandkhathi, Piperchhedi, Jevra, Arasnara, Karanja, Ravelidih, Khapri, Chikhli, Khopli, Borigarika, Pauwara, Anda, Janjgiri, Bodegaon, Hanoda, Kothrel, Matrodih, Thanoud, Risama, Tirga, Urla, Birejhar, Joratarai, Bharada, Konari, Achholi, Umarpoti, Khamhariya, Kodiya and Birejhar.

At least 15 farmers were chosen as sample farmers in each village. In this way total 600 (40 x 15) sample farmers were considered as respondents for this study. An interview schedule was prepared in view of the objectives of the study and data were collected by personal interview of the selected farmers by stratified random sampling method. Collected data were analyzed by the using suitable statistical methods like

frequency, percentage, mean and standard deviation etc.

■ RESULTS AND DISCUSSION

The results of the present study as well as relevant discussion have been summarized under following heads:

Status of improved implements/ machine used for tillage and sowing:

The purpose of this study, information regarding availability of improved implements and machineries operated by various power sources in the Durg district were collected and presented in Table 1. Soil found in Durg block was mainly sandy-loam, therefore, the uses of the M.B. plough was much lower than cultivator and country plough. In case of primary tillage implements, majority (57.43 %) of the respondents were used country plough for primary tillage followed by 3.25 per cent and 2.05 per cent of the respondents used M.B. plough and disc plough, respectively. In case of secondary tillage implements, majority (75.56%) of the respondents used cultivators for secondary tillage while 23.25 per cent used rotavator and only 0.51 per cent of respondents used harrow for secondary tillage. The main reason for adopting the country plough and tractor drawn cultivator is due to light soil found in Chhattisgarh, while M.B. plough and disc plough are not popular.

In Durg block farmers adopted broadcasting and transplanting method for sowing. Some farmers adopted seed drill and seed cum fertilizer drill but transplanter and planter were not adopted in Durg block. Many farmers used both broadcasting and transplanting methods for sowing according to the crop. The percentage of seed drill was about 7.35 per cent and seed-cum-fertilizer drill about 2.73 per cent. Dibbler and planter were not found in the study area. Mainly farmers practiced in rainfed condition by adopting biasi methods for rice cultivation due to this transplanter were not popular in cultivation practices.

Intercultural and plant protection equipment:

In Durg block, intercultural operations mainly performed by spades, hoe, khurpi etc. The intercultural operation are weed control, compaction to improve the soil condition for growth of plant along with crop for moisture, light and nutrients, it is essential to remove ham among the traditional hand tools, the khurpi was not popular tool, Spade and manually power generally employed for intercultural operation. Most of the farmers can do biasi operation with the help of country plough. Percentages use of different intercultural equipment were khurpi 49.4 per cent, hoe 20.05 per cent and any other equipment 29.5 per cent.

Knapsack sprayers were generally used as plant protection equipment as compared to duster, mainly 16 litres Knapsack sprayer was used in Durg block. Power operated

Table 1 : Distribution of respondents according to their availability and use of farm implements (n=600)

Particulars	Frequency*	Percentage
Primary tillage implements		
Country plough	336	57.43
M.B. plough	20	3.25
Disc plough	12	2.05
Secondary tillage implements		
Cultivator	442	75.56
Rotavator	136	23.25
Harrow	03	00.51
Puddler	10	
Different traditional sowing methods		
Broadcasting	336	57.43
Transplanting	178	30.46
Improve sowing implements		
Seed – drill	43	7.35
Seed-cum-fertilizer drill	16	2.73
Transplanter	07	1.2
Dibbler	00	00.00
Different intercultural implements		
Khurpi	289	49.40
Hoe	120	20.05
Spade	583	
Any-other (Kudali, Axe, etc.)	172	29.50
Different plant protection equipment		
Knapsack sprayer	369	63.01
Power operated sprayer	86	14.76
Hand Duster	45	7.69
Different traditional method of harvesting		
Plain sickle	447	76.43
Serrated sickle	65	11.11
Different improve method of harvesting		
Combine harvester	46	7.86
Reaper	20	3.42
Different traditional threshing method		
Tractor treading	323	55.25
Bullock treading	98	16.79
Threshing by PTO	85	14.53
Threshing by motor	75	12.82
Tractor and power tiller availability		
Tractor	146	24.95
Power tiller	30	5.12

* Frequency based on multiple responses

sprayer and rotary duster were rarely used in farm. The percentage of plant protection equipment used in Durg block, Knapsack sprayer (63.01 %), power operated sprayer (14.76 %) and Hand duster (7.69 %).

Harvesting and threshing:

In Durg block, harvesting was mainly done traditionally by the sickle as compared to the mechanical harvesting like reaper, combine etc. Plain sickle was highly adopted as compared to the serrated sickle. Percentage of adoptability of plain sickle was about 76.43 per cent and serrated sickle was used about 11.11 per cent. Mechanical harvesting done by reaper was about 3.43 per cent. The percentage used of reaper was 3.42 per cent and combine 7.86 per cent. The scope of combine harvester is very good in harvesting because off traditional practices is very time consuming and farm labours are not easily available in peak season.

In Durg block the threshing was accomplished by traditional treading by tractor as compared to bullock treading, hand beating or by roller. Thresher adopted now a days, frequently reduce the time of processing. This figure shows that the tractor treading was comparatively higher than bullock treading. In Durg block most of the farmers used tractor for threshing (55.25 %). Mechanical thresher utilization was about 27.41 per cent. The average capacities of various threshing methods are hand beating 17-20kg/hr, treading with bullock 140 kg/hr, multi-crop thresher 300-400 kg/hr. The percentage of threshing by PTO was 14.53 per cent and threshing by motor was 12.82 per cent used in Durg block.

Tractor and power tiller availability:

By virtue of its work capacity and versatility, tractor is the major sources of farm power for agriculture. Tractor power is employed for agricultural operation such as tillage operation, sowing operation, threshing operation by PTO shaft attachment to reducing working operation time and labour cost. Demand of tractor is dependent on a large number of factors like requirement of increase work capacity, preference of better work environment, resource availability, available credit facilities and increase rate, a part of farmer other factor like intensity and accuracy of monsoon, cropping intensity ownership pride etc.

Power Tiller used in Durg block has been mainly in areas where wetland paddy cultivation has been the major crop production system in small land holding tractor use in such, farm holding where not found to be very feasible. Farm power availability farm power tiller has consequently been meager. Most of the farmers were using power tiller (5.12 %) and tractor about (24.59 %) in Durg block.

Conclusion:

On the basis of this study it was found that, the use of animal drawn implements like indigenous plough and the traditional practices were adopted by the farmers and its percentage is high for tillage, sowing, intercultural operation, harvesting and threshing etc. Some farmers had not animal and tractor but they hired the animal and tractor for farm

practices. It was observed from the study that there is great scope of tractor and stationary machineries for farm practices on the hire basis. The main constraints in farm mechanization were lack of extension programme, lack of knowledge about new technology, unavailability good farm roads, small land holding and unavailability of farm implements.

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