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# Design, development of animal drawn multipurpose tool carrier suitable for non-descript breed of bullocks of Chhattisgarh

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■ **ABSTRACT :** MPT was developed to prepare seed bed in dry and wet soil condition and to perform various other agricultural operations. The average field capacity of above attachments *i.e.* cultivator (with Shovel) and seed drill for dry field was found to be 0.1385 and 0.1558 ha/h. It gave higher field capacity (1 ha/day) with additional saving in the cost of operation. The operational cost of MPT cultivator (with Shovel) and seed drill were found minimum 551.54 and 695.18 Rs. /ha, respectively in comparison to Tendua plough. The use of MPT was much economical than the traditional method the fabrication cost of MPT with attachments (Cultivator with shovel and seed -drill) was about Rs.7800.00.

■ **KEY WORDS :** Multipurpose tool carrier, Non-descript breed of bullocks

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In Chhattisgarh, on an average 80 per cent farmers belonging to marginal and small category, have less than 2 hectare land holding with low annual income resulting in low purchase capacity of improved costly machinery or tractor and therefore, they are dependent on the animals for tillage, sowing and weeding operations. Power developed by an average pair of bullocks is about 1 hp for usual farm work and the farmer has to use different implements matching to the draught capacity of animals for different farm operations. Changing implement for every specific operation causes inconvenience and investment of extra money. Multipurpose tool carrier is a good alternative for this problem. Various field operations can be performed with the help of a multipurpose tool carrier (MPT) without investing much amount and time. Preparation of seed bed is a specialised task, which requires skill, time, energy and labour in addition to different soil manipulating implements. Various animal drawn implements have been introduced in this region but, are not largely used by the farmers. Development of an animal drawn MPT could be a solution to low use of implements under animal farming system. Use of MPT may increase the quality of seedbed as well as efficiency of operation by saving time and labour. This may further increase the annual utilization of draught animals by performing various tasks on the farm. Different types of MPTs have been developed in many parts of the country based on localized requirements like type of soil, crop, climatic conditions and draught capacity of animals. The bullocks used for farm operations in Chhattisgarh are mostly of non- descript breed with small and medium size and hence, with low draught capacity. The MPTs developed in other parts may not be suitable for these bullocks. Hence, there is a need to develop a multipurpose tool carrier matching to the draught capacity of non-descript bullocks of this region and suiting to the local needs.

## ■ METHODOLOGY

The machine conceived consisted of a tool frame, tynes, furrow openers, hitching system and depth control system. Design of different components of the machine was prepared keeping in view the draught-ability of local bullocks, animal drawn implements being manufactured at the centre and used by the farmers in this region. In this implement, row to row distance can be adjusted according to crops requirements in all operations and two people can easily handled this implement. Performance of multipurpose tool carrier was evaluated for secondary tillage, sowing and weeding operation. Observation of pull, operating time and turning time in each bed were recorded for all operations. Pull was measured with a spring type dynamometer attached to the beam. The field performance of multipurpose tool carrier was compared on the basis of draft requirement, actual field capacity, field efficiency and travel speed of the bullock.