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B Ram Charan Teja
Department of Agricultural Economics, College of Agriculture, Professor Jaya Shanker Telangana State Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Dr. Md. Ali Baba
Department of Agricultural Economics, College of Agriculture, Professor Jaya Shanker Telangana State Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Dr. R Vijaya Kumari
Department of Agricultural Economics, College of Agriculture, Professor Jaya Shanker Telangana State Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Dr. A Meena
Department of Agricultural Economics, College of Agriculture, Professor Jaya Shanker Telangana State Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Corresponding Author:
B Ram Charan Teja
Department of Agricultural Economics, College of Agriculture, Professor Jaya Shanker Telangana State Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Constraints in adoption of mechanization in rice cultivation in Khammam district of Telangana state

B Ram Charan Teja, Dr. Md. Ali Baba, Dr. R Vijaya Kumari and Dr. A Meena

Abstract
Constraints in adoption of mechanization in rice cultivation in Khammam district of Telangana state, study examined the constraints in adoption of farm mechanization in rice cultivation. In total district 120 farmers are selected as sample size. Two mandals, Kalluru mandal and Nelakondapally mandal has been selected. Data collected through interview method. Farmers are categorized into different levels of mechanization like low, medium and high mechanized farms. The findings of this study revealed that in case of resources related constraints, lack of sufficient technical staff (78.34%), lack of awareness of technology (65.69%), poor research–extension–farm linkage (63.38%), inadequate and untimely availability of farm machinery and implements on hire basis, small size holdings were major constraints in adoption of farm mechanization in rice cultivation. So the conclusion is a standard farm machine bank should be made by the government at village level and systematic training programmes should be organize by the government for the maximum adoption of farm machineries for overcome these constraints.

Keywords: rice cultivation, constraints, farm mechanization and adoption

Introduction
Rice (*Oryza sativa* L.) is the most important and extensively grown food crop of India. It is staple food for more than half of the world's population and of paramount importance to Indian economy. In India, rice is grown in an area of 433.88 lakh ha with a production of 104.4 mt and in Telangana it is grown in an area of 104.6 lakh ha with a production of 304.7 mt tons (Ministry of Agriculture 2015-2016). To mitigate the needs of growing population, rice production should rise to 320 million tons by 2020. Agricultural mechanization is one of the critical inputs which not only facilitates timely completion of operations but also helps to combat labour scarcity, increases the production, productivity and profitability (Verma 2008).
Mechanization is the process of doing work with machinery. Mechanical aids, machinery, tools and implements are the components of mechanization, a technological improvement in agriculture. These technological improvements in Indian agriculture since mid-sixties have brought about revolutionary increase in agricultural production. In the context of increasing commercialization of agriculture, mechanization also took a lead role in increasing agricultural productivity. The increase in the requirement of human and bullock labour for agricultural activities, rising wage rates and maintenance cost of bullock and shortage of labour in agriculture has increased the demand for mechanization of various agricultural operations. Improved farm implements and machinery are used for different farm operations to increase productivity of land and labour through timeliness of operations and efficient use of inputs. Mechanization is also needed for good quality of work. It also imparts capacity to the farmer to carry out farm operations, with ease, being free from drudgery, making the farming agreeable vocation for educated youth as well.
Mechanized farms are those in which operations like land preparation, sowing, transplanting, harvesting, threshing are mechanized. Mechanization as it relates to agriculture requires the study, manufacture, utilization, maintenance and repair of all tools, implements, machines, equipment and structures which will enable the farmer to raise the productivity of human labour economically (Kamruzzaman, 2009)
Mechanization possibility is strongly influenced by the farm size, cost of farm labour, availability of machines and energy. The farming system continues to utilize manual power, animal power and tractor power. In order to bring more land under cultivation and to improve productivity per unit area, it is necessary to use all sources of power like tractors, power tillers,

oil engines, electric motors and renewable energy. In fact, the mechanization in India was driven by assured price to farmers for their produce (wheat and rice initially). The intensification of agriculture was assisted by higher inputs of farm power causing greater profitability of farming-generated surpluses that could be spent on capital equipment.

Due to rapid industrialization and large scale migration to urban areas labour is becoming increasingly scarce and also proving costly. This labour shortage during harvesting resulted in delayed harvest and consequent field grain losses. Mechanization of harvesting was the alternative solution (Manjunatha *et al.*, 2009).

Material and Methods
Khammam district will be purposively selected for the present study as there is large scale adoption of farm mechanization in major agricultural crop like rice. In this total district 120 farmers are selected as sample size. Two mandals, Kalluru mandal and Nelakondapally mandal has been selected in each mandal total 60 farmers are selected. Four villages from each selected mandal, in each village 15 farmers are selected by simple random sampling method. Primary data was collected using specifically designed and pretested questionnaires for farmers.

Constraint analysis
This technique will be used to evaluate the problems encountered in farm mechanization in rice cultivation. In this method, the farmers will be asked to rank the constraints according to the magnitude of the problem. The order of merit given by respondents will be converted into ranks by using the following formula.

Percentage position = 100 (Rij-0.5)/Nj

Where, Rij = Rank given for ith item by jth individual
Nj = Number of items ranked by jth individual

The percentage position of each rank thus obtained will be converted into scores by referring to the table given by Henry Garrett. Then for each factor, the scores of each individual are added and then total value of score and mean value of score is calculated. The factors having highest mean value is considered to be the most important factor.
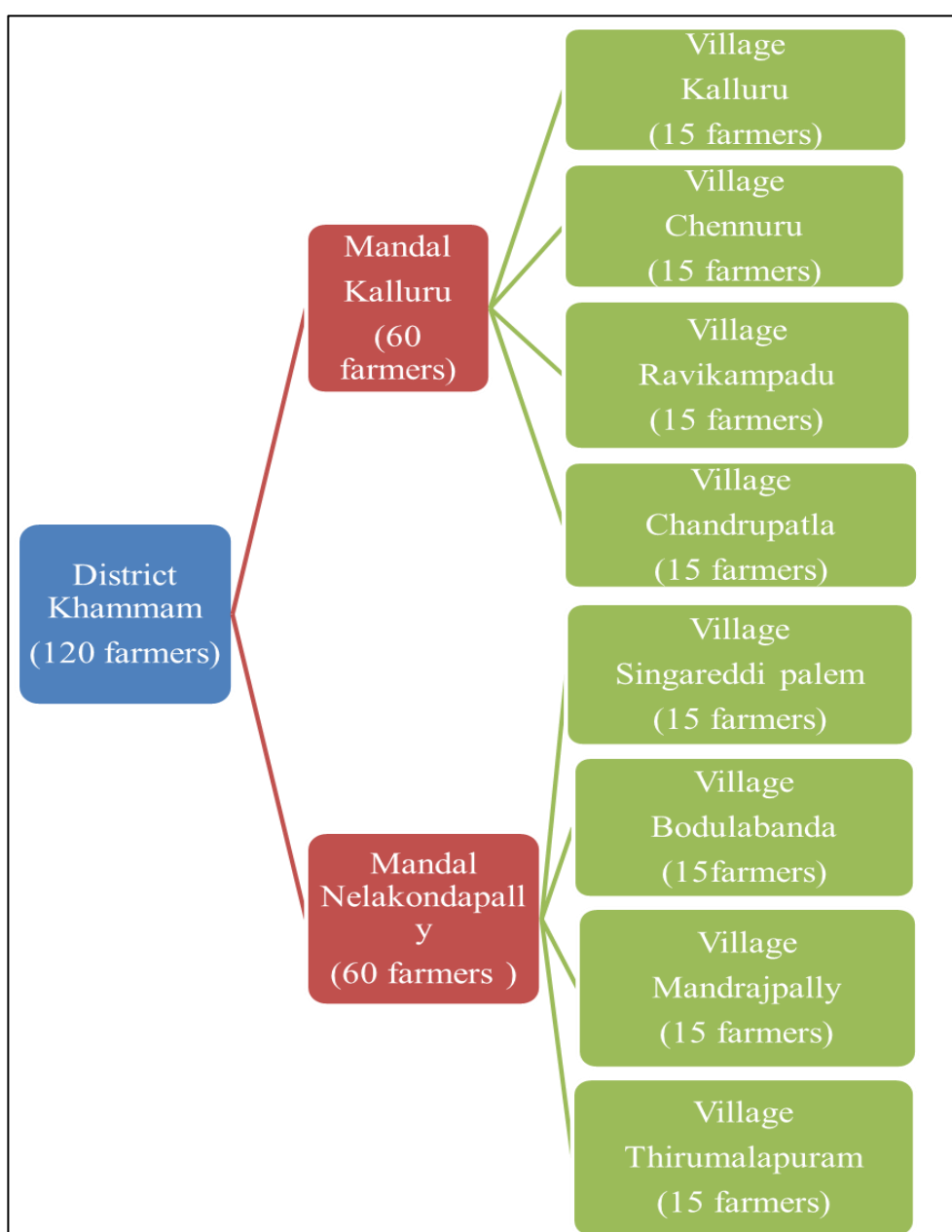

Chart showing sampling

Results and Discussion

Constraints in adoption of mechanization in rice cultivation

It has been mentioned earlier, though mechanization of farming operation has obvious advantages, it requires the initial investment on capital assets. Like machinery. At the same time there were other problems associated with the use of machinery in farming like maintenance of the machines, availability of spare parts, etc. The constraints faced by farmers in adoption of farm mechanization in rice cultivation are ranked using Garrett ranking technique and presented in Table 1.

Among the constraints, lack of sufficient technical staff, lack of awareness of technology, poor research–extension–farm linkage, inadequate and untimely availability of farm machinery and implements on hire basis, small size holdings were major constraints with above 60 per cent of Garrett's mean score.

These results were in conformity with study conducted by Singh (2005) on scope, progress and constraints of farm mechanization in India.

Table 1: Constraints in adoption of farm mechanization in rice cultivation

Particulars	Garrett mean score	Rank
Lack of sufficient technical staff	78.34	1
Lack of awareness of technology	65.69	2
Poor research–extension–farm linkage	63.38	3
Inadequate and untimely availability of farm machinery and implements on hire basis	62.33	4
Small size holdings	61.78	5
Low education levels	59.18	6
Lengthy procedure for acquisition of farm machinery on government subsidy	58.42	7
Lack of required training	54.50	8
Lack of credit facilities	47.17	9
Cost of purchasing and maintaining	43.21	10

Conclusions and Implications

The study focused on the opinion of the rice growers on the benefits of farm mechanization revealed that farm mechanization was beneficial to the rice growers in many aspects. The major benefits of farm mechanization as perceived by the respondents were that farm mechanization helped in operating agricultural works quickly, performing farm operations in time, overcoming labour shortage problem, minimizing work burden of labours and improving working condition of farmers. The study identified many constraints in farm mechanization. Majority of the respondents expressed lack of credit facilities, high fuel cost, high initial cost, low resale value for farm implements and machineries, high maintenance cost, lack of training on use of farm implements and machineries, Lack of skilled labourers for operating improved farm implements and machines, high tax rate, high hiring charges and inadequate hiring agencies as the major constraints in rice mechanization. Specific strategies should be evolved by the change agency to eliminate the constraints experienced by the rice growers for enhancing rice mechanization in Khammam district.

References

1. Amponsah SK, Oteng-Darko P, Kumi F. Potential and constraints of agricultural mechanization in Ghana-A review. International Agricultural Engineering Journal 2012;21(2):38-43.
2. Janardhan DS. A study on constraints as perceived by farmers in adoption of recommended cultivation practices of Paddy. International Journal of Science and Nature 2018;9(3):302-304.
3. Pillai GB. Constraints on diffusion and adoption of agro-mechanical technology in rice cultivation in Kerala. Kerala Research Programme on Local Level Development 2004, 59.
4. Shambhu VB, Jha SK. Problems and prospects of agricultural mechanization. AMA, Agricultural Mechanization in Asia, Africa and Latin America 2012;43(3):55-59.
5. Singh TV, Kumar RM, Viraktamath B. Selective mechanization in rice cultivation for energy saving and enhancing the profitability. Research themes, Rice Knowledge Management Portal (RKMP), Directorate of rice research, Rajendranagar, Hyderabad 2011, P1-14.