

The Impact of Earthmoving Equipment Specifically Backhoe Loaders on Farm Productivity in Vidarbha

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Abstract: *Vidarbha is been lagging in terms of infrastructure development. In the region of Vidarbha, inadequate irrigation facilities are becoming a hurdle for the overall development of the region. Lack of irrigation has also deprived the farmers of this region in availing the consequential benefits like subsidies on fertilizers, pump sets, etc. Hence newer and advanced machineries are used to improve the overall productivity. Backhoe loaders are used for multipurpose applications like digging, dozing, canal work and land development etc. The research paper aims to understand the impact of earthmoving equipment specifically backhoe loaders on farm productivity in Vidarbha.*

Keywords: Backhoe loaders, farm productivity

I. INTRODUCTION

Farmers in Vidarbha face lot of challenges related to improving farming productivity. This includes time taken to develop land for farming, availability of adequate water. They are always in look for advanced machineries which can help them in doing work faster and in more effective ways. Hence usage of backhoe loaders is gaining popularity owing to their multipurpose usage and applications. Backhoe loaders are used for multipurpose activities like development of land by using loader, trenching work using backhoe bucket which is used for canal work, use of various attachments on Backhoe loaders like diggers, seed planters etc. The research is an attempt to understand the impact of backhoe loaders in improving farm productivity, which will in turn help in improving economic growth of Vidarbha.

II. OBJECTIVES

1. To study the various Earthmoving products and their usage in various fields.
2. To study and analyze the effect of backhoe loader on agricultural output in Vidarbha region.

III. RESEARCH METHODOLOGY

This research is an “Empirical or Survey Research”. It is based on survey conducted and questionnaires filled by various respondents. Thus, fresh and first-hand primary data to be collected, organized, studied and analysed in this type of research.

3.1 Sampling

Method used for sampling is multistage probability sampling with first stage as stratified sampling and second stage as simple random sampling. In this case for survey of strata are different districts in Vidharba.

3.2 Units of Analysis for Survey

The retail customers from across all the districts of Vidharba were interviewed for a holistic analysis. Total of 203 first time users and 152 operators were interviewed.

3.3 Hypothesis

- H0: Usage of earthmoving equipment's does not enhance farm productivity.
- H1: Usage of earthmoving equipment's enhances farm productivity



3.4 Design of Questionnaire and Survey

In order to obtain good result from research, the questionnaire was designed and response was taken from First time users of equipment-203 and Operators of the equipment-152 numbers. And their response was taken on usage of earthmoving equipment in various farming activities and whether use of BHL helps in improving farm productivity?

IV. DATA ANALYSIS

4.1 Response from First Time Users/Buyers

The table shows the summary of response from First time users/buyers

	Frequency	Percent	Valid Percent	Cumulative Percentage
Yes	138	68%	68%	
No	62	31%	31%	99%
No response	3	1%	1%	100%
Total	203	100%	100%	

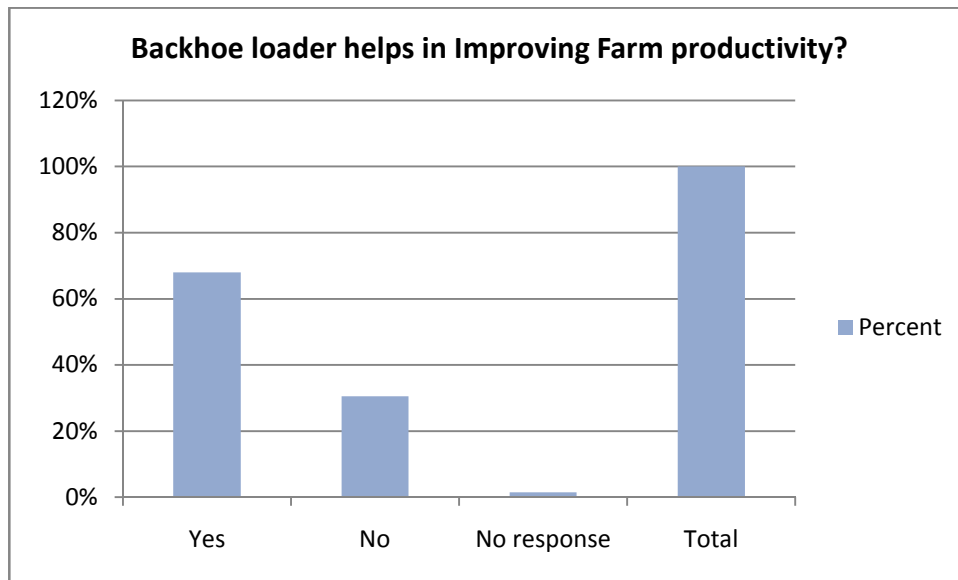


Fig 4.1 Response from First time users/buyers

Fig 4.1 shows that 68% of respondents agree that use of BHL enhances farm productivity, 31% says that it does not have any impact on farm productivity where as 1% not responded.

4.2 Response from Operators

The table shows the summary of response from operators

	Frequency	Percent	Valid Percent	Cumulative Percentage
Yes	83	55%	55%	
No	9	6%	6%	61%
No response	60	39%	39%	100%
Total	152	100%	100%	

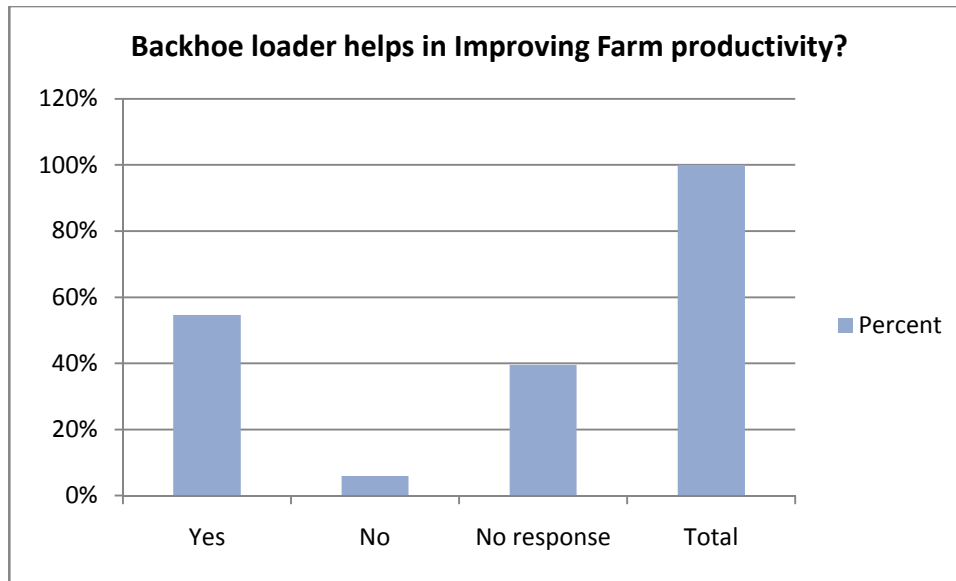


Fig 4.2 Response from operators

Fig 4.2 shows that 55% of respondents agrees that use of BHL enhances farm productivity, 6% says that it does not have any impact on farm productivity where as 39% have not responded.

V. HYPOTHESIS TESTING

To revalidate the hypothesis statistically, the hypothesis was tested using Chi-square Goodness of fit test. This chi-square test can give answer to the assumption made. If the calculated value of chi-square is less than the table value at a certain level of significance, the fit is considered to be a good one which means the divergence between the observed and expected frequencies is attributable to fluctuations of sampling. But if the calculated value of chi-square is greater than its table value, the fit is not considered to be a good one.

The expected frequency in this case is assumed to be 80% of total sample population.

Sample size	Type of User	Response (Yes)	Response (No)	No response
203	First time user	138	62	3
152	Operators	83	9	60

Frequency Table

Type of User	Observed frequency	Expected frequency	O _i - E _i	(O _i - E _i) ²	(O _i - E _i) ² /E _i
First time user	138	162	16	576	3.5556
Operators	83	122	-39	1521	12.4672

$$\begin{aligned}
 X^2 &= \sum(O_i - E_i)^2 / E_i \\
 &= 3.5556 + 12.4672 \\
 &= 16.0228
 \end{aligned}$$

Degree of freedom (df) = n-1 = 2-1 = 1

Table value of X² for df = 2 @ 5% level of significance is 3.841

Calculated value of X² = 16.0228 which is more than table value hence null hypothesis is rejected and alternate hypothesis is accepted.

Hence, we can conclude that Usage of earthmoving equipments enhances farm productivity.

VI. CONCLUSION

From the above research work it can be concluded that backhoe loaders are used for multipurpose activities in farming in Vidarbha. Also, majority of farmers agree that the work done by backhoe loaders cannot be done by other machineries. Also, usage of backhoe loaders definitely helps in improving the farm productivity/



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