

**RESEARCH ARTICLE :**

# Application of a decision support system of farm implements and machinery for selected crops of Kerala

**■ A. PARVATHY, D. NANJAPPA AND M.T. LAKSHMINARAYAN****ARTICLE CHRONICLE :****Received :**

18.07.2017;

**Revised :**

29.08.2017;

**Accepted :**

15.09.2017

**SUMMARY :** The study was conducted during 2014 to find out the utility of the decision support system (DSS) developed in farm mechanization in selected crops for extension personnel and farmers of Kerala state. The application of the decision support system “farm mechanization” obtained a positive feedback from the end users. The most important utility of the system for extension personnel was as a ready reference material to refresh and enhance the knowledge on the subject and also as a training tool to enhance the learner participation. These two utilities were perceived by 90 per cent of the respondents. The most important use of the decision support system “*Karshika yanthravalkaranam*” for farmers was a tool to satisfy information need of farmers to take a decision on farm implement or machinery required for their crops as perceived by 83 per cent of the respondents.

**How to cite this article :** Parvathy, A., Nanjappa, D. and Lakshminarayan, M.T. (2017). Application of a decision support system of farm implements and machinery for selected crops of Kerala. *Agric. Update*, 12(4): 574-577; DOI : 10.15740/HAS/AU/12.4/574-577.

**KEY WORDS:**

Decision support system, Farm mechanization

**BACKGROUND AND OBJECTIVES**

As a part of artificial intelligence technology, information and decision support systems have been recognized as a powerful tool to store human knowledge in computers for the purpose of making expert's knowledge available to users. Decision support system is a general term for any computer application that enhances a person or group's ability to make decisions. During the last few decades scientists, farm engineers and manufacturing companies have developed a large number of agricultural equipments and technologies

which have led to rapid growth in agricultural mechanization in country. Dissemination of information about such technologies to farmers, manufacturers, research and extension workers and policy makers is essential for quick transfer of technology.

A bilingual decision support system (DSS) in farm mechanization in selected crops was developed for extension personnel and farmers of Kerala state. Farm implements and machinery having more than 25 per cent efficiency were selected to include in the Decision Support System. Ninety one implements or machinery used in rice,

**Author for correspondence :**

A. PARVATHY  
Department of  
Agricultural Extension  
Education, University  
of Agricultural Sciences,  
DHARWAD (KARNATAKA)  
INDIA

See end of the article for  
authors' affiliations

plantation crops and fruit and vegetable crops were included in the system.

Reddy *et al.* (2005) reported that the decision support system provided opportunity to provide agricultural expert advice to the farmers in a cost effective manner. Almost all the participants had convinced that delivering expert advice by getting the crop status through photographs and other data was viable. It was also very effective and more useful to the farmers.

Sunil (2006) based on an experimental study on agricultural expert system (AES) concluded that the most important uses of the information and decision support system for the farmers and extensionists were: as a tool for estimating the quantity and cost of manures, fertilizers and plant protection chemicals to diagnose pest and diseases and to prescribe remedial measures to use as reference material and diagnostic tool, as a tool for single-window extension counters distance education and tool in that order. He suggested more location and local language oriented software to enhance the decision support system.

Helen (2008) conducted a participatory assessment of the expert system entitled 'Diagnos-4' designed by Kerala Agricultural University addressing the transfer of technology on management of crop pests and diseases. The respondents were optimistic about the performance, settings, mode of presentation, practicability of information and serviceability of the system. The areas that needed refinement and modifications were retrievability and relevancy of information and content. The combination of decision support system (DSS) and human expertise provided better information efficiency and problem solving. Agricultural expert system (AES) and DSS cannot altogether supplant the human expertise but it can supplement and strengthen the advice and service of the extensionists.

Sivakamy and Karthikeyan (2008) studied the impact of using expert system on the performance and decision making skill of extension personnel. There was significant enhancement in the diagnostic perspective and decision making skill and work performance skill of the extensionists after using the expert system on maize.

Helen and Kaleel (2009) conducted a study on information efficiency of agricultural expert systems and concluded that the combination of agricultural expert system and human expertise showed higher degree of

information efficiency between the treatment groups of extension personnel. Extension personnel rated retrievability of information from the agricultural expert system was least and hence the path way of retrieving information required improvement. Extension personnel as prospective users needed an orientation in using the agricultural expert system before introducing it among them.

## RESOURCES AND METHODS

The present study was conducted in Kerala state in India. End user application of decision support system "farm mechanization" and the Malayalam version of the same, "*Karshika yanthravalkaranam*" was exploratory in nature. As extension personnel and farmers are the end users of Decision Support System, they were selected as respondents for the application of the developed Decision Support System. Since the system has to be demonstrated individually with respondents, it was decided to limit the sample size. Ten extension personnel were randomly selected from Thrissur district and 30 farmers were selected randomly from three central districts of Kerala, *viz.*, Eranakulam, Thrissur and Palakkad such that ten respondents from each district. The final validation of Decision Support System was done with these two groups of respondents.

## OBSERVATIONS AND ANALYSIS

The final application of the decision support system was done to identify the perceived utility of the system to the end users that is extension personnel and farmers. Application of the decision support system was done with ten extension personnel and thirty farmers. The respondents were asked to tell the most important five utilities they perceive in the decision support system. The responses obtained from extension personnel and farmers were categorized, content analyzed and ranked in the order of their importance.

The utilities of the decision support system in farm mechanization as perceived by extension personnel are presented in Table 1. The most important utilities of the system for extension personnel was as a ready reference material to refresh and enhance the knowledge on the subject and as a training tool to enhance the learner participation. These two utilities were perceived by 90 per cent of the respondents. The other uses of the system

as perceived by 80 per cent of the respondents included; as a digital library of farm implements and machinery; as a tool for distant education to computer literate progressive farmers; and as a reference material for manufactures or dealers of implements and machinery. Seventy per cent of the respondents perceived decision support system as a learning material for students of agriculture and allied subjects. Helen (2008) concluded that the respondents were optimistic about the performance, settings, mode of presentation, practicability of information and serviceability of the system. The areas that needed refinement and modifications were retrievability and relevancy of information and content. Helen and Kaleel (2009) also reported that the combination of agricultural expert system and human expertise showed higher degree of information efficiency between the treatment groups of extension personnel. Reddy *et al.* (2005) reported the use of the decision support system in providing agricultural expert advice to the farmers in a cost effective manner. Almost all the participants had convinced that delivering expert advice by getting the crop status through photographs and other data was viable. It was also found to be effective and more useful to the farmers.

It is evident from the result shown in Table 2 that the most important use of the decision support system in farm mechanization for farmers was as a tool to satisfy information need of farmers to take a decision on farm

implement or machinery for their crops as this was perceived by 83 per cent of the respondents. This was followed by utility as perceived by 70 per cent of farmers as a ready reference material to enhance the knowledge on the subject that is farm mechanization. The other important uses perceived by the farmers were; as an instructional material to teach students on the subject; as an instructional material for trainers on subject matter which were perceived by 66 per cent of respondents. Fifty per cent of the respondent farmers perceived the decision support system as a useful reference material for manufactures or dealers of agricultural implements and machinery.

Thus, based on the results it can be inferred that the two groups of respondents *viz.*, extension personnel and farmers find utility with the decision support system developed in farm mechanization. The varied perception on the utility of the system between two groups of respondents can be attributed to the diverse nature of their job.

Sunil (2006) reported a considerable overlap between the perception of utility of the system by farmers and extension personnel. The utilities perceived by them were as a tool in estimating quantity of chemicals and fertilizer, as reference material, as a diagnostic tool for plant protection problems, as a market informant and also as a training tool. Also there was a considerable difference in perception for the research scientists when compared with the other two groups. Research scientists

**Table 1 : Extension personnel's perception about utility of decision support system**

(n=10)

Sr. No.	Extension personnel's perception about utility of decision support system	No.	Percentage
1.	A ready reference material to refresh and enhance the knowledge on the subject	9	90
2.	As a training tool to enhance the learner participation	9	90
3.	As a digital library of farm implements and machinery	8	80
4.	As a tool for distant education to computer literate farmers	8	80
5.	As a reference material for manufactures or dealers of implements and machinery	8	80
6.	As a learning material for students	7	70
7.	As a tool to satisfy information need of farmers on the use of farm implements and machinery	7	70

\* Responses are not mutually exclusive

**Table 2 : Farmers' perception about utility of decision support system**

(n=30)

Sr. No.	Farmers' perception about utility of decision support system	No.	Percentage
1.	Satisfy information need of farmers to take a decision on the use of required farm implement or machinery	25	83
2.	A ready reference material to enhance the knowledge on the subject	21	70
3.	As an instructional material for trainers on the subject matter	20	66
4.	As a reference material for manufactures or dealers of implements and machinery	15	50

\* Responses are not mutually exclusive

perceived it as a tool to enhance learner participation, as a tool for the single window extension counters, as a material for reference purpose, as a tool for distance education and academic teaching and also as an idea to bring the efforts of different disciplines under a single umbrella.

### Conclusion :

The most important utility of the developed DSS “farm mechanization” for extension personnel was as a ready reference material to refresh and enhance the knowledge on the farm implements. Important use of DSS “*Karshika yanthravalkaranam*” to the farmers was a tool to satisfy information need of farmers to take a decision. The decision support system’ developed could be used by various user groups such as farmers, extension personnel, students etc. as a reference material to satisfy the information need on the use of farm implements and machinery in the selected crops.

---

Authors’ affiliations :

**D. NANJAPPA AND M.T. LAKSHMINARAYAN**, Department of Agricultural Extension Education, University of Agricultural Sciences, DHARWAD (KARNATAKA) INDIA

---

## REFERENCES

---

- Helen, S.** (2008). Agricultural expert system-A participatory assessment. Ph.D. Thesis, Kerala Agricultural University, Thrissur, pp. 130-138.
- Helen, S.** and Kaleel, F.M.H. (2009). Information efficiency of agricultural expert system. *Indian Res. J. Extn. Edu.*, **9**(3): 20-23.
- Reddy, P.K.,** Reddy, A.S., Venkateswar, R.B. and Reddy, G.S. (2005). In: Proceedings of E-sagu National workshop on IT based personalized agricultural extension systems (IT-PEAS 2005) 6<sup>th</sup> May, IIT, Hyderabad, India. Available: <http://agriculture.iiit.ac.in/it-paes2005/>.
- Sivakami, S.** and Karthikeyan, K. (2008). Evaluating effectiveness of expert system for performing agricultural extension service in India. *Expert Systems with Applications*, **36**(6): 9634-9636.
- Sunil, V.G.** (2006). Design and validation of an information and decision support system for banana cultivation. Ph.D Thesis, Indian Agricultural Research Institute, New Delhi. pp. 118-120.

★ ★ ★ ★ ★ of **12<sup>th</sup>** Year ★ ★ ★ ★ ★  
of Excellence