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RESEARCH ARTICLE

Farmers' Uptake of Oyster Mushroom Production Through ADOPT Model

Hem Prakash Verma[1], P. Mooventhan[2] and P.K. Pandey[3]

1.PhD Scholar,
3.Associate Professor,
Department of Agril. Extension, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh (India)
2.Sr. Scientist, ICAR-National Institute of Biotic Stress Management (ICAR-NIBSM), Baronda, Raipur, Chhattisgarh, India
Corresponding author e-mail: hemverma1996@gmail.com

ABSTRACT

Prediction of agricultural technology adoption is much more pertinent for researchers, extension personnel, and policy makers for planning and development to ensure livelihood. In the present study, we used ADOPT model (developed by CSIRO) to analyze and predict how an oyster mushroom production will be adopted for their livelihood by the growers in the Raipur and Dhamtari district of Chhattisgarh. Primary data were collected, during 2018-19, on 22 variables (to incorporate in ADOPT) from the multi stakeholders who were directly involved in FLD i.e. 15 researchers, 20 progressive growers, 15 business personnel and 10 self-help group of oyster mushroom production were selected, in this way the total 60 stakeholders were selected for the study with a total of 60 stakeholders. The prediction results indicated that the extent of adoption and diffusion in the districts, the time to near-peak adoption level has been estimated as 12 years, with the peak adoption reaching a maximum of 58 per cent. The possible reason for higher uptake in both the districts could be the higher level of awareness among the respondents due to conduction of FLDs. Further in 5 years from the start of an adoption programme, 27 per cent of the grower's population will adopt the oyster mushroom production, rising up to 55 per cent in over period in 10 years. The time to 50 per cent of the peak adoption is attained at 5.2 years. The possible reasons are linked to several variables in understanding the oyster mushroom, which is indirectly attributed to the farmers' socio-economic condition, psychology, etc., apart from external and internal factors.

***Key words**: ADOPT, Adoption, Diffusion and Oyster mushroom production.*

Mushroom production is playing a vital role in helping rural community make stronger their livelihoods. Mushrooms can grow successfully without land use, and also a source of additional income. The economic importance of the mushroom lies primarily in its use a food for human consumption. It is rich in vitamin C and B complex and the protein content varies between 1.6 to 2.5 per cent (*Kushwah, 2015*). In India, cultivation of mushrooms still has not been harvested as per their potential. Nutritional insecurity and Unemployment are major challenges in rural community. Adoption of recommended mushroom production technology may be of help to the growers in harvesting maximum potential and will also help the society to overcome the nutritional insecurity and unemployment problem in rural areas. Keeping this in view, the present investigation was carried out in Raipur and Dhamtari district of Chhattisgarh state with its specific objective i.e. prediction of farmers' uptake of oyster mushroom production technology through ADOPT model.

METHODOLOGY

The study was conducted in two districts namely Raipur and Dhamtari of Chhattisgarh state during the year 2019-20. There are 27 Districts in the state and the dissemination of mushroom technology is fast in all the districts of state. Out of 27 districts, Raipur and Dhamtari district was selected purposively for the study because of the fact that FLD (Front Line Demonstration) of oyster mushroom production was conducted in both districts by ICAR-National Mushroom production is playing a vital role in helping rural community make stronger their livelihoods.

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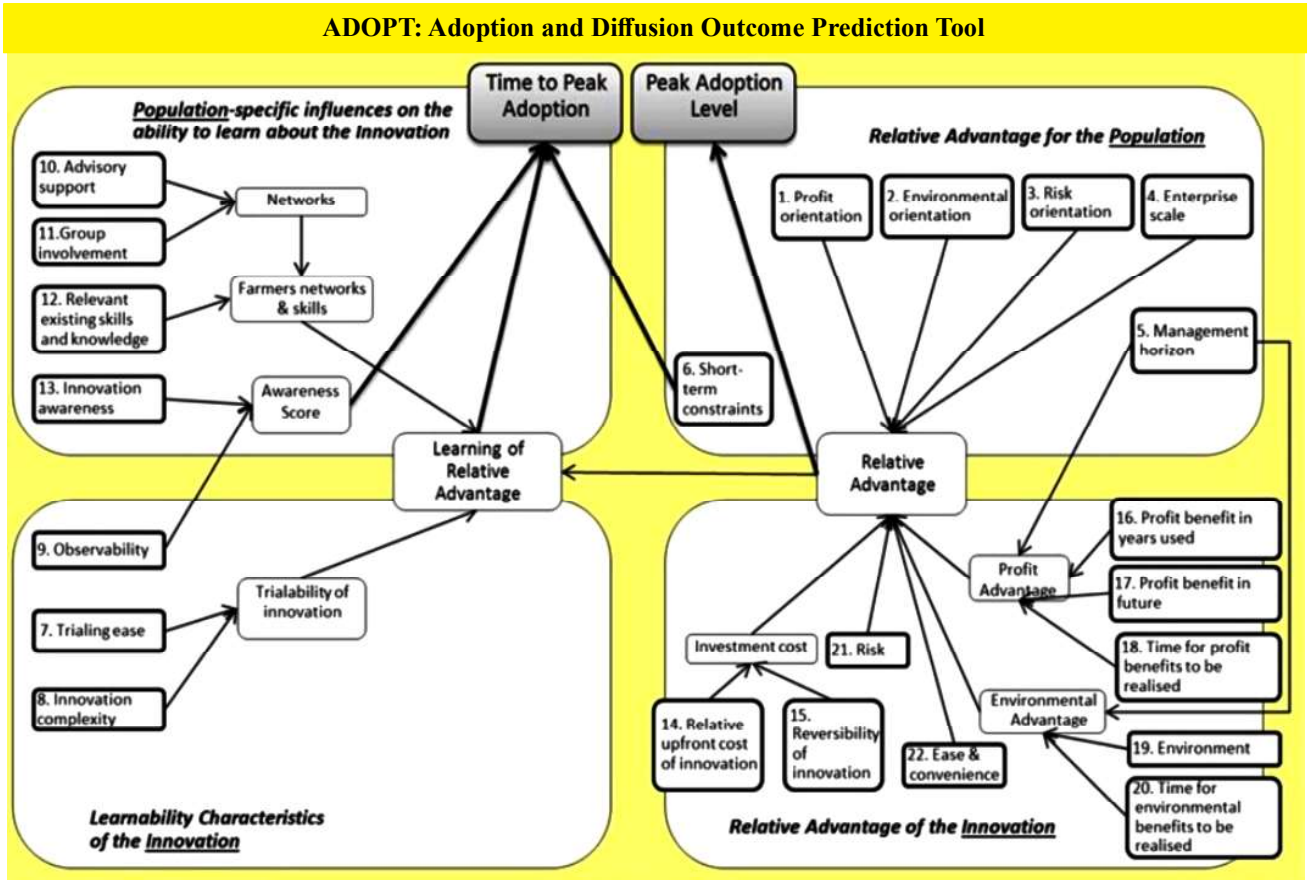


RESULTS AND DISCUSSION

The section deals with the results of the research were provided in this section under the following headings, taking into account the objectives of the research and assessing those using appropriate statistical instruments. Technology adoption and diffusion are influenced by several factors, *viz.,* socio-economic, psychological, internal, external, *etc. (Alcon et al., 2014; Kassie et al., 2013; Knowler and Bradshaw, 2007; Pannell et al., 2006; Feder and Umali, 1993).* Figure 1 shows the adoption level and peak adoption of the oyster mushroom production by the farmers in Dhamtari and Raipure district of Chhattisgarh. The period about the near-peak adoption level was estimated as twelve years, with the peak adoption reaching a maximum of 58% of the population. The predicted values concerning peak-adoption level and time to peak-adoption level are numeric results given by ADOPT to assist the researchers with a better insight and understanding. Similar to any other estimation, these predicted values of adoption level should be used carefully. In the results, the near peak-adoption denotes the time to achieve 99% of the maximum expected level with respect to technology adoption.

ADOPT also gives the predicted adoption rates for the intended technology (oyster mushroom production)

Fig. 1: Adoption level of oyster mushroom production

NOTES: The predictions of Peak Adoption Level and Time to Peak Adoption Level are numeric outputs that are provided to assist with insight and understanding and like any forecasts should be used with caution. Time to Near Peak Adoption represents the time to 99% of the maximum predicted adoption level.

Fig. 2. Predicted adoption levels of oyster mushroom production

for five years and ten years from the start, apart from the time to 50 per cent of the peak adoption (Figure 2). A perusal of Figure 2 indicates that the time to 50% of the peak adoption is attained at 5.2 years.

Fig. 2. Predicted adoption levels of oyster mushroom production.

The following Table 1 also shows detail timeline of adoption programme, that reflects a changing trend accordingly in respective years.

Table 1. Yearly adoption level of oyster mushroom production

Technology	Year-wise adoption level (%)											
	1	2	3	4	5	6	7	8	9	10	11	12
Oyster mushroom production	1	4	10	18	27	36	44	49	53	55	57	58

Sensitivity analysis : The following Figure shows the effects on peak adoption level and time to peak of oyster mushroom production of single step changes up and down for all questions.

The most sensitive question for changing the peak adoption level is the environmental costs and benefits, which asks the response for 'what extent would use of oyster mushroom have net environmental benefits or costs?' with 58% recorded response. The corresponding step-up and step-down response for the most sensitive question for changing the peak adoption level is also given.

Sensitivity analysis (SA), broadly defined, 'investigating the potential changes and errors and their impacts on conclusions drawn from the model *(Baird 1989)'.* So, sensitivity analysis was enumerated by using the ADOPT model software. Fig. 3 present the sensitivity analysis that shows the possible effects observed on the peak-adoption level and time to peak-adoption of single-step changes up and down for all the enlisted 22 questions.

Apart from sensitivity analysis, ADOPT also gives the S-curve sensitivity charts that show in what way the S-curve is foreseen to change when a single step alteration is made to the most sensitive question(s) concerning the peak-adoption level and time to near peak-adoption (Fig. 4).

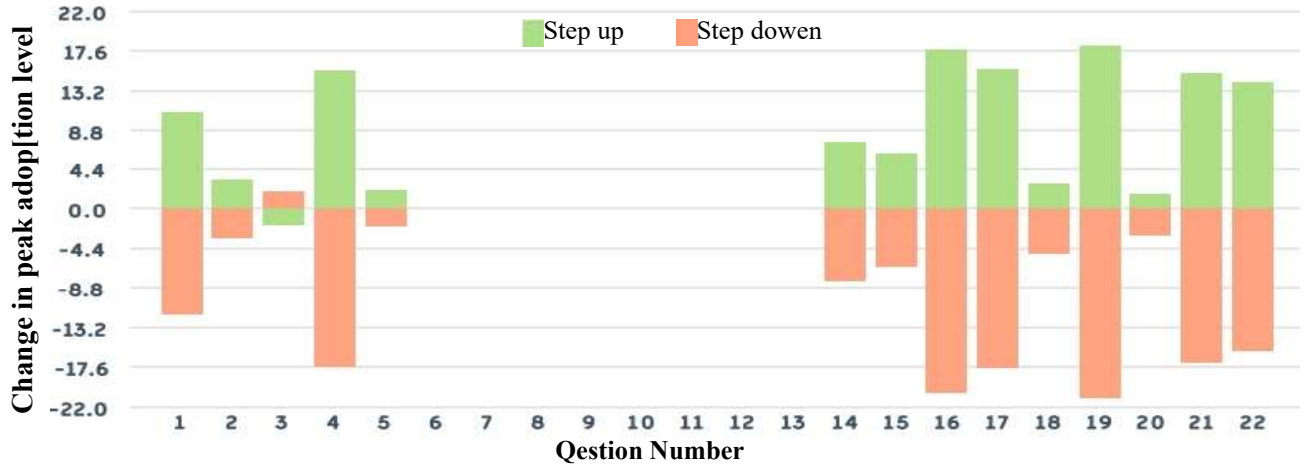
Fig. 4. S-curve sensitivity analysis for the adoption of oyster mushroom production

Similar to the earlier analysis on sensitivity, this analysis of the S-curve (Fig. 4) also indicated the regional differences. The differences in adoption and

Sensitivity Analysis

The following charts show the effects on Peak Adoption Level and Time to Peak Adoption of single step changes up and down for all questions.

Peak level, sensitivity analysis



Time to peak, sensitivity analysis

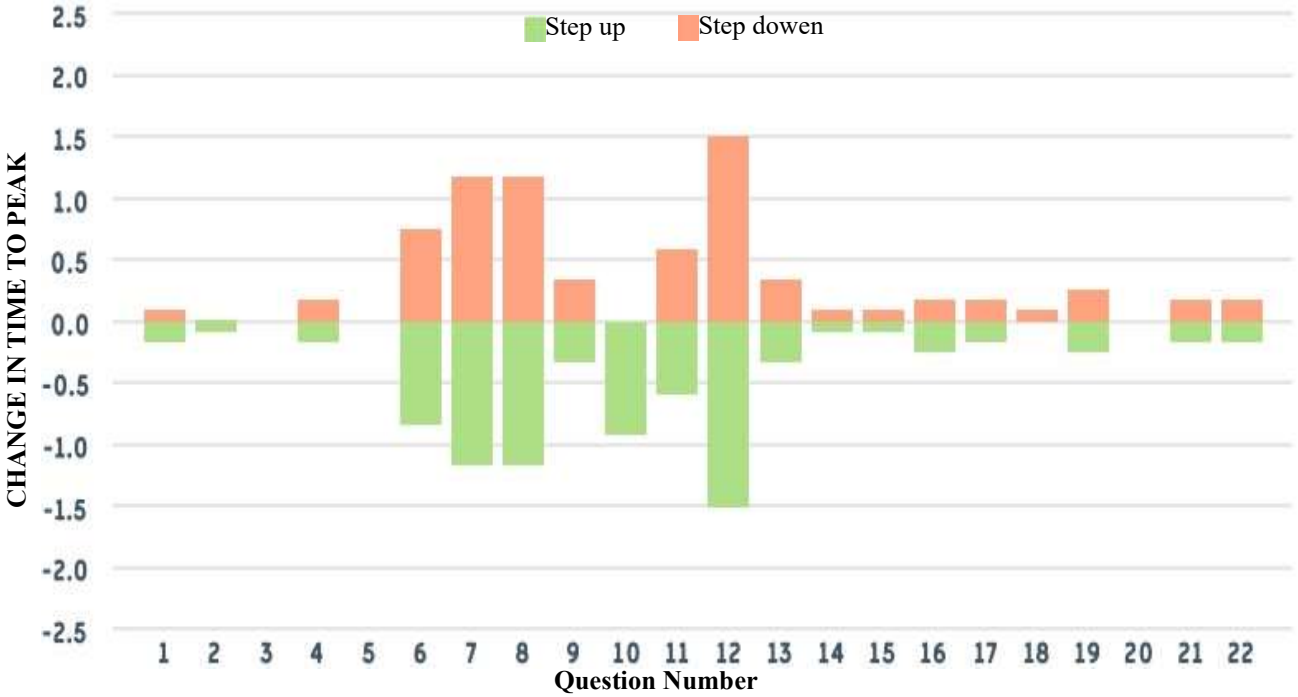
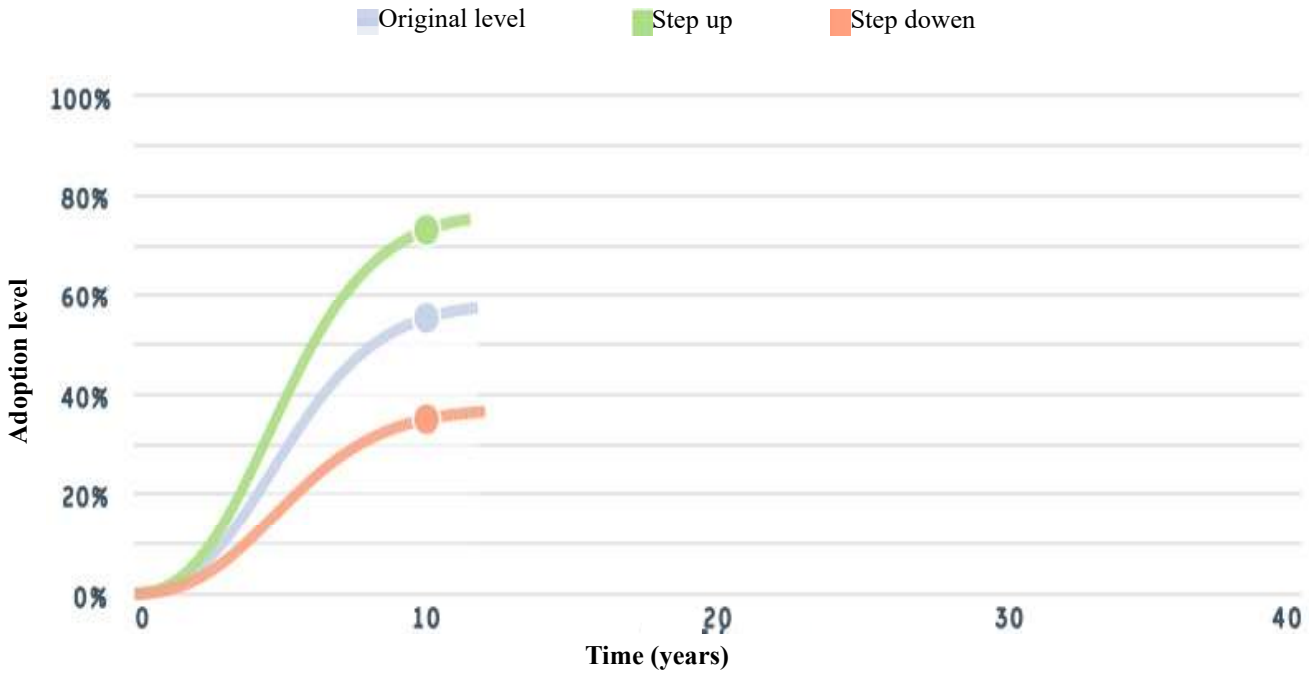


Fig. 3. Sensitivity analysis for the adoption of oyster mushroom production

S-Curve Sensitivity

The following chart shows how the S-Curve is predicted to change when a single step change is made to the most sensitive question(s) with respect to Peak Adoption Level



The following chart shows how the S-Curve is predicted to change when a single step change is made to the most sensitive question(s) with respect to Time to Near Peak Adoption

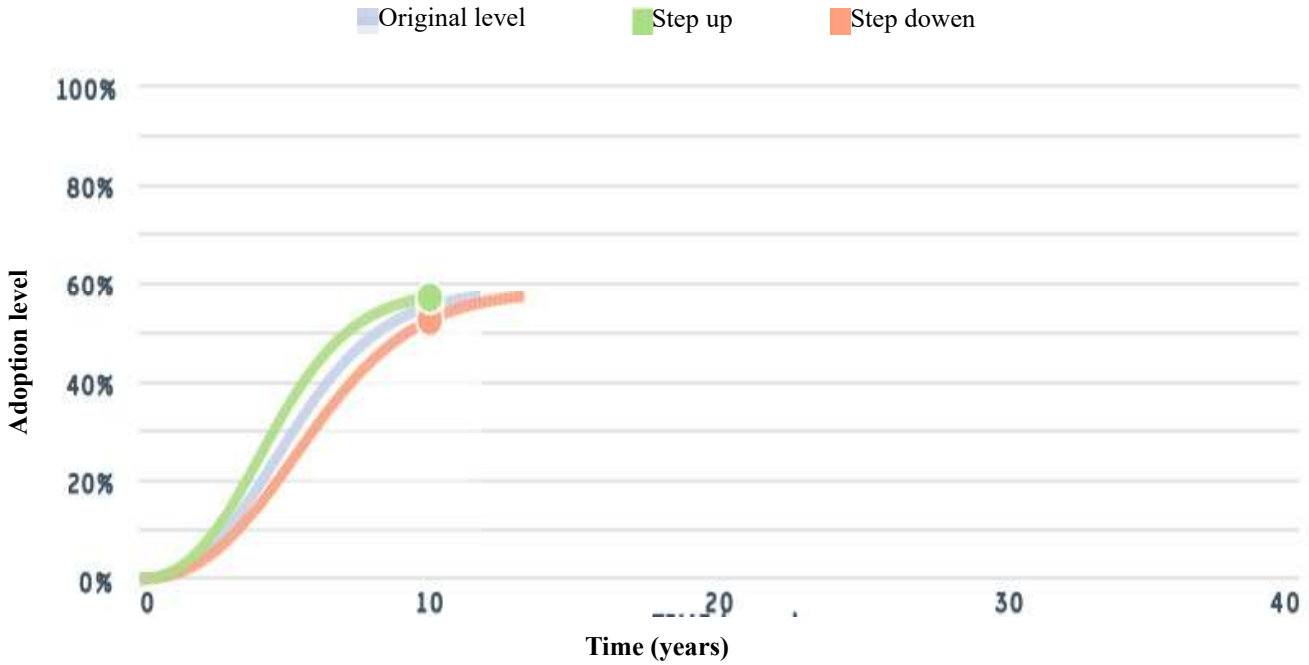


Fig. 4. S-curve sensitivity analysis for the adoption of oyster mushroom production

diffusion across regions are accounted for by several variables about the understanding of the innovation (oyster mushroom production), which is attributed to the farmers' socio-economic condition, psychology, and other conditions apart from external and internal factors *(Sendhil et al., 2022).*

CONCLUSION

The prediction of adopting oyster mushroom assumes a lot of significance for researchers, extension personnel, and policymakers to formulate strategies and frameworks for planning and development. ADOPT model was used to predict likelihood in adoption and diffusion of oyster mushroom among the stakeholders. The prediction results indicated that there was need of knowledge and skill up gradation of the respondents regarding spawn production and value addition of the mushroom. For up gradation of the knowledge and skills, imparting need based trainings and organized workshop will be more effective ways for the same. The possible reasons are linked to several variables in understanding the oyster mushroom, which is indirectly attributed to the farmers' socio-economic condition, psychology, etc., apart from external and internal factors.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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