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Constraints in Conserving the Biodiversity of Rice in Wayanad district of Kerala

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ABSTRACT

Kerala is known for the cultivation of traditional rice varieties, which are noted for their medicinal, nutraceutical, and other special characteristics. They are exceptionally rich in genetic diversity and possess excellent traits, including better grain quality profile, health, nutritional values, and resistance to climate related stress, pests, and diseases. But now a days a drastic loss of these varieties occurring. As reported by the Kerala State Biodiversity Board, out of the nearly 160 rice varieties of Wayanad, 55 traditional varieties were now extinct. The study was conducted in Wayanad district during 2021-22 using descriptive research design. Four blocks were selected and from each block 3 villages were selected, from each village, 10 respondents were selected using simple random sampling procedure. Thus, making a total sample of 120 respondents. This study revealed that lack of institutional & government support (Rank I), followed by delay in payment of government assistance and incentives (Rank II), higher labour wage rates for farm operations (Rank III), bird damage in the field (Rank IV), lack of availability of indigenous rice variety seeds for cultivation (Rank V), non-availability of labour (Rank VI), lack of awareness about legal support and government schemes (Rank VII), delay in procurement by Govt. agencies (Rank VIII), wild boar damage in the field (Rank IX), lack of awareness in on modern production technologies (Rank X), lack of transportation facility (Rank XI), lack of milling facility (Rank XII), wild elephant damage in the field (Rank XIII) and low productivity of indigenous rice varieties (Rank XIV), were the major constraints perceived by the farmers in conserving the bio-diversity in rice.

Keywords*: Biodiversity, Conservation, Indigenous rice, Constraints and Traditional rice varieties*

Rice, known as 'the grain of life', is the world's most important grain crop, having its origin in India and being the second most important food crop in the world. As a result of centuries of cultivation, adaptation and cooking preferences have led to genetic diversity in rice varieties. India has one of the largest rice varieties in the world. Landrace diversity has benefits for future food security and should be maintained in order to develop future crops and address new production challenges. Kerala is known for growing traditional rice varieties. The genetic diversity of Kerala rice contains a number of different traditional varieties that are noted for their medicinal, nutritional, and other special features. Indigenous rice varieties are the one grown locally, which include rice that is colourful and fragrant, with excellent nutritional value. They have great potential for export, but the production and use of these varieties is limited (Blakeney *et al.*, 2020). They are extremely rich in genetic diversity and have excellent characteristics, including a better grain profile, health, nutritional values, and resistance to climate-related stress, pests and diseases. Planting these varieties is environmentally friendly as they improve food security and protect natural resources (Ahaljith, 2019).

The Wayanad region is "a hot spot of biodiversity" as part of the Western Ghats. Also, the region is home to many ethnic groups in Kerala, and as part of their culture, ethnic groups preserve many rice fields for generations. A total of 75 varieties of rice, including fragrant (Jeerakasala and Gandhakashala) and medicinal varieties, have been reported in the Wayanad region (Rekha *et al*., 2011). Indigenous races are important as they have a great genetic value, which is the basis for future diversity development programs. The importance of land tenure cannot be underestimated in the agricultural system, as the development of existing species depends on the desired genetic potential for land and wildlife species. Although they work as genetic suppliers that control certain factors such as pests, diseases, and drought resistance to improve yields (Rasheed *et al.,*2021). Due to changes in the varietal spectrum, the use of paddy fields for non-agricultural purposes, and the growing popularity of modern varieties in recent years, traditional varieties with desirable traits are ignored, and the region's important rice germplasm is rapidly disappearing. (Latha *et al.*, 2013). According to the Kerala State Biodiversity Board, of the approximately 160 varieties of Wayanad rice, 55 indigenous varieties are now extinct. Thus, there is an urgent need for the conservation of these traditional lands (Krishnankutty *et al.,* 2021).

MATERIAL AND METHODS

A "Descriptive" research design was used for the study along with cross sectional survey for data collection. The study was conducted in Wayanad district during 2021-22. The state of Kerala was selected purposively for the study as the researcher hails from this state and have enough familiarity with local language i.e., *Malayalam.* The Wayanad district was selected purposively because it has largest area under traditional rice cultivation in Kerala. The study was conducted in Wayanad district during 2021-22 using descriptive research design. Four blocks were selected and from each block 3 villages were selected, from each village, 10 respondents were selected using simple random sampling procedure. A Total of 120 respondents were sampled. For ascertaining the constraints, pretesting of the questionnaire was made and suitable changes were incorporated within the formation of things, Data were collected and statistical tools such as frequency, percentage and Garrett ranking were used. All the analysis was carried out using Microsoft Windows Excel.

RESULTS AND DISCUSSION

An attempt was made in the present investigation to obtain the constraints as experienced by the rice farmers in conserving the biodiversity in rice. Constraints means the problems faced by the farmers during conservation of indigenous. The constraints reported by the respondents are presented in Table 1 and the ranks were given according to the Garrett score.

It is evident from the Table 1 that the constraints as perceived by the farmers in conserving the bio-diversity in rice were the lack of institutional & government support (t mean score 80.40 & Rank I), followed by delay in payment of government assistance and incentives (mean score 77.20 & Rank II), higher labour wage rates for farm operations (mean score 68.40 & Rank III) (Kishore Kumar *et al.*, 2020), bird damage in the field (mean score 53.73 & Rank IV), lack of availability of indigenous rice variety seeds for cultivation (mean score 50.33 & Rank V), lack of labour availability (mean score 49.33 & Rank VI), lack of awareness about legal support and government schemes (mean score 46.27 & Rank VII), delay in procurement by government agencies (mean score 43.73 & Rank VIII), wild boar damage in the

field (mean score 42.53 & Rank IX), lack of awareness in on modern production technologies (mean score 41.47 & Rank X), lack of transportation facility (mean score 38.20 & Rank XI), lack of milling facility (mean score 37.67 & Rank XII), wild elephant damage in the field (mean score 37.13 & Rank XIII) and low productivity of indigenous rice varieties (mean score 32.40 & Rank XIV). Even though there were government programmes to encourage the growing of native rice types, the majority of farmers were not aware of them. Along with this, financial assistance and procurement payments to the farmers are also delayed. Challenges still exist in the training and improvement of farmers' skills in the cultivation (Jyothi *et al.*,2020). On addition to them, there is a serious issue with wild animal attacks in the fields. The government and extension agencies need to address these issues. The studies of Ahaljith (2019) and Krishnankutty *et al*. (2021) supported the present results.

Suggestions made by the rice farmers to overcome the problems in conservation of biodiversity in rice

The possible suggestions to overcome the constraints as perceived in conserving the biodiversity in rice are furnished from Table 2. It is evident from the results presented in the Table 2. Revealed that a large majority of farmers suggested that the government should provide continuous financial and technical support to farmers (91.67% & Rank I), followed by government should timely pay the assistance & incentives (88.33% & Rank II), government agencies should procure the paddy timely (84.17% & Rank III), measures should be taken for protection from bird and animal threats (81.67% & Rank IV), Department of Agriculture should supply adequate good quality seed (70.00% & Rank V), government should conduct regular training programmes on modern production technologies (65.83% & Rank VI), government should form 'Haritha Karma Sena'(Agriculture labour force) to overcome shortage of skilled labours and make them

Table 1. Distribution of the farmers according to their perceived constraints in conserving the biodiversity in rice. (n=120)

S.No.	Statements	Garret mean score	Rank
1	Lack of institutional & government support	80.40	I
2	Delay in payment of government assistance and incentives	77.20	II
3	Higher labour wage rates for farm operations	68.40	III
4	Bird damage in the field	53.73	IV
5	Lack of availability of indigenous rice variety seeds for cultivation	50.33	V
6	Lack of labour availability	49.53	VI
7	Lack of awareness about legal support and government schemes	46.27	VII
8	Delay in procurement by Govt. agencies	43.73	VIII
9	Wild boar damage in the field	42.53	IX
10	Lack of awareness in on modern production technologies	41.47	X
11	Lack of transportation facility	38.20	XI
12	Lack of milling facility	37.67	XII
13	Wild elephant damage in the field	37.13	XIII
14	Low productivity of indigenous rice varieties	32.40	XIV

* F=Frequency, %= Percentage

Table 2. Distribution of the farmers according to their perceived suggestions to overcome the constraints, perceived by farmers (n=120)

S. No.	Suggestions	F	%	Rank
1	Government should provide continuous financial and technical support to farmers	110	91.67	I
2	Government should timely pay the assistance & incentives	106	88.33	II
3	Government agencies should procure the paddy timely	101	84.17	III
4	Measures should be taken for protection from bird and animal threats	98	81.67	IV
5	Department of Agriculture should supply adequate good quality seed	84	70	V
6	Government should conduct regular training programmes on modern production technologies	79	65.83	VI
7	Government should form Agriculture labour force to overcome shortage of skilled labours and make them available for appropriate wage rate to farmers	64	53.33	VII
8	Improvement in transportation and marketing facilities	52	43.33	VIII
9	Providing milling facilities to farmers	48	40	IX
10	Facilitation of on farm storage facilities of seeds to farmers	41	34.17	X

* F=Frequency, %= Percentage

available for appropriate wage rate to farmers (53.33% & Rank VII), improvement in transportation and marketing facilities (43.33% & Rank VIII), providing of milling facilities to farmers (40.00% & Rank IX), facilitation of on farm storage facilities of seeds to farmers (34.17%& Rank X). The findings are in line with the studies by Ahaljith (2019), Jyothi *et al.,* (2020), Kishor Kumar *et al.,* (2020), Krishnankutty *et al.,* (2021) and Rasheed *et al.,*2021.

CONCLUSION

The results of the study revealed that, although there are government schemes for promotion of cultivation of indigenous rice varieties most of the farmers were unaware about the schemes. This is also coupled with delayed financial assistance, incentives and delayed procurement payments to the farmers. There are bottlenecks in training and updating skills of farmers in cultivation of traditional varieties. Apart from these there is an intense problem of wild animal's attack in the fields. These problems need to be addressed by the extension agencies and the government. Therefore, future conservation programs can be promoted by environmental compensation and payments. Both methods of ex situ and in situ conservation are important and need to be integrated to maintain agrobiodiversity. Therefore, there is a need for strong institutional intervention in the conservation of traditional rice varieties worldwide.

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