



# Constraints in Environmental Pollution Mitigation by Farmers in Kerala

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## ABSTRACT

India is predominantly an agricultural country with many rural habitations. Even though the application of fertilizers is low in our country, there is considerable runoff with fertilizer and pesticide residue into rural ponds and stagnant water bodies. Crop residue burning in Northern India is a major menace to environmental safety and WHO reports the Indo-Gangatic plains to have one of the poorest air qualities. The amount of post-harvest agricultural waste generated is 1.5 to 2.25 times as that of the actual crop quantities. The particulate matter visibility in New Delhi has shown a 60 per cent increase during post monsoon season, in 2016. In this regard, the awareness and efforts taken by the farmers, to mitigate the ill effects of environmental pollution are of utmost importance. To know the constraints faced by farmers in mitigating the ill effects of environmental pollution, so as to give suggestions and recommendations to them, the present study was carried out in Kerala Agricultural University, Thrissur. Thrissur and Palakkad districts of Kerala were purposively selected with 90 respondents, 30 each of paddy, banana and vegetable farmers. The major constraints were identified based on importance and ranked using Kendall's coefficient of concordance (W). Inadequacy of waste disposal and recycling was the major constraint as expressed by farmers. Increased emergence of pests and diseases were also major constraints as opined by the farmers. The lack of access to mass media was identified as a minor constraint. The study suggested some remedial measures to the farmers, which if implemented aptly by them can help them tide over the hazardous effects of environmental pollution on their farms.

**Key Words:** Constraints, Environment, Farmers, Pollution, Mitigation.

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## INTRODUCTION

Pollution is viewed to be necessary evil of development. There is an evident lack of a subculture that promotes the development of control measures and penalties against various kinds of pollution and the defaulters in environment. Most of the pollution is anthropogenic in nature, on the whole a by-product of the number activities of the people, especially of affluent nations. The brunt of chemical and fumes from farm automobiles put at greater perils of respiratory disorders, cancers, liver diseases, and unintended injuries, cognitive and emotional disorders. Farming is a stressful profession due to uncertain nature that can be aggravated due to environmental pollution. Many continue to work in heavily polluted conditions regardless of being plagued by health disorders

due to fear of losing their profit and productivity. At present, the solely preventive measures being observed on a sensible groundwork are some farm security initiatives and use of defensive private equipment. In this regard, consciousness regarding the constraints faced by farmers in mitigating the ill effects of environmental pollution is of primary importance to give suitable suggestions to them and the study was indispensable.

Agricultural environmental pollution refers to ecosystem degradation as an end result of biotic and abiotic byproducts. A contributor of agricultural pollution is the utilization of chemical herbicides and fertilizers which persist in the environment and prove to be poisonous to life. Organic contaminants containing pharmaceutical and personal care products (PPCPs) are also

**Table 1. Ranking for constraints among the farmers.**

Sr. No.	Constraint	Mean Rank	Rank
1	Inadequacy of waste disposal and recycling facilities	6.27	I
2	Increased emergence of pests and diseases	5.86	II
3	Lack of proper guidelines regarding pesticide and fertilizer application	5.79	III
4	Fluctuations in the seasons causing improper crop cultivation cycles	5.34	IV
5	Unavailability of insurance for crop losses due to pollution	4.07	V
6	High cost of carrying out organic farming	2.71	VI
7	Lack of access to mass media	1.44	VII
	<b>W- 0.72</b>		

\* Correlation is significant at the 0.05 level (2-tailed).

agricultural polluters. Heavy metals like lead, cadmium and arsenic, which are industrial by-products, are regularly recycled into fertilizers and can resort in downstream reservoirs that can be hazardous to plants, animals and human beings. Unless suitable measures are taken, modernization and mechanization in agriculture would always be a double edged sword. In this regard, the constraints or possible hurdles the farmers face in implementing environmental friendly approach to farming is of utmost importance to carry out further development to give them viable suggestions and recommendations.

## MATERIALS AND METHODS

In the present research, ex-post facto research design was used. Thrissur and Palakkad districts were purposively selected for the study as in these districts farming was highly promoted in Kerala. Paddy, banana and vegetable farmers who were functional for at least two years were selected. Puzhakkal, Alathur, Puthur, Pananchery, Nadathara and Madakkathara panchayaths were selected from Thrissur district and Alathur Panchayath was selected from Palakkad districts. Fifteen famers were purposively selected from each Panchayath to constitute a total of 90 farmers. A list of major seven constraints was prepared the farmer respondents

were made to rank. The statistical assessment and evaluation was done by using Kendall's coefficient of concordance (W) which was used to determine the association among K sets of rankings.

'W' the sum of ranks (R<sub>j</sub>) in each column of a K/N table is found out.

W is computed using the formula

$$W = \frac{12S}{K^2(N^3 - N)}$$

S = sum of squares of the observed deviations from the mean of R<sub>j</sub>.

$$\text{Where, } S = \sum (R_j - \frac{\sum R_j}{N})^2$$

K= Number of rankings; N= no of entities or objects ranked

## RESULTS AND DISCUSSION

The results showed that inadequacy of waste disposal and recycling was the major constraint faced by farmers, followed by increased emergence of pests and diseases making them resort to chemical pesticides and lack of proper guidelines regarding pesticide and fertilizer application. The minor constraints, according to the farmers were, the lack of access to mass media, indicating that the selected farmers made use of mass media in the form of newspapers, radio, television and farm literature. This was followed by other minor

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constraints high cost of carrying out organic farming and unavailability of insurance for crop losses due to pollution, which were considered as not so important constraints by farmers.

### **Suggestions and recommendations to the farmers to overcome the constraints faced**

Farmers must be given proper and timely suggestions and recommendations to help them be aware of and overcome the constraints faced by them in carrying out environmentally friendly approaches to farming. Some important suggestions and recommendations as noted by experts were as under

### **Strict enforcement of Pollution Acts and Rules on the farms by the farmers**

The necessary permits must be obtained by the farmers and the discharge levels from their farms should fall within the permitted range. Infringers should be penalized with fine.

### **Use of mass media to learn more about pollution hazards**

Since the selected farmers do not face any lack of access to any mass media, they can make use of several pollution campaigns and programmes like Swachchh Bharath Abhiyan to gain awareness about the detriments of pollution.

### **The farms and living surrounding must be properly sanitized**

The farmers must themselves be conscious as to not dump trash and agricultural wastes in the vicinity of their farms and sides of public roads. They must be made aware about the potential health hazards associated with faulty waste disposal.

### **Increase the use of bio-pesticides**

Proper training must be imparted to the farmers to teach them about the devastating consequences of chemical pesticides on the ecosystem and convince them to switch over to bio-pesticides that are environmental friendly and sustainable.

### **Wastes and by-products must be recycled**

The trash and waste generated from agricultural activities must be suitably recycled, and can be done by using the animal wastes and crop debris as crop feed as they have a high nutritional potential and can also prove to be means for sustainable agriculture. Crop debris mulching can also be an eco-friendly substitute for plastic mulching. The other important suggestions and recommendations that could be imparted to farmers were, large scale plantation of trees must be carried out near farms, adoption of Integrated Pest Management techniques along with insecticides, encouraging more of agroforestry farming systems and making use of vermiculture biotechnology.

## CONCLUSION

It can be concluded from the study that the major constraints faced by farmers were due to external factors, and not a result of their inadequacy in carrying out agricultural operations properly. This could be resolved to an extent by adequate categorization and disposal of solid and other waste by providing disposal sites and proper waste recycling in each Panchayath by the concerned authorities. Farmers must be made aware and given trainings on controlling pests by biological means and natural predators rather than chemical pesticides and distribution of bio-pesticides to the farmers must also be made. Proper guidelines must also be given to farmers regarding the dosage and application of chemical fertilizers to the farmers.

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