

Sociological Problems faced by Farmers due to Dyeing Industrial Effluents in the Noyyal River basin of Tamil Nadu

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Abstract

The study mainly focuses on sociological problems faced by farmers due to dyeing industrial pollution. The study was conducted in Tiruppur and Erode districts of Tamil Nadu during the year 2015. A sample size of 90 farmers from each category viz., affected and unaffected areas were considered for the study. Totally 180 farmers were selected as respondents for the study. The selection of affected and unaffected areas was based on their distance from industrial zones and their well water quality standards. In the affected area, all the respondents had experienced major problems such as 'hike in wages of agricultural labour' (100%), 'fear of pollution problems influenced the division of family land and its disposal for other purposes' (100%), 'contamination of drinking water source by industrial effluents' (100%), 'deterioration in quality of drinking water in its taste' (100%), reduced availability of labour for agricultural purpose' (95.55%), 'more prevalence of eye, nose and throat irritations, head ache and viral fever' (100%) and 'increased health care expenditure' (91.11%) were reported by farmers in the Noyyal river basin.

Keywords: Sociological problems, Dyeing pollution.

Introduction

In Tiruppur, around 727 units are engaged in dyeing and bleaching operations. These units are water intensive, and generate a large quantity of wastewater. Typical water consumption in Tiruppur is around 200 to 400 l/kg of finished product, compared with the international norm of 120 to 140 l/kg. Around, 281 small and medium scale textile units are connected to CETPs (Common Effluent Treatment Plants), and the remaining units either have individual effluent treatment plants or discharge directly into Noyyal River. The rapid growth of textile units in the last two decades in Tiruppur, has led to the depletion of groundwater resources and serious deterioration in environmental quality of both surface and ground water in the area (Nellyat, 2007).

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The dyeing industrial pollution might cause labour migration, unemployment or change in employment pattern and decrease in share of farm income to the total household income. Furn (2004) reported that the majority of the farmers in Noyyal river basin have shifted cropping pattern from food crops to fodder crops due to pollution. According to the survey conducted by Tamil Nadu Agricultural University, nearly 35,000 hectares of agricultural land in the bleaching and dyeing units' belt had turned out partially or totally unfit for cultivation (Srinivasan *et al.* 2014). The negative externalities of industries have led to loss in crop area, production changes in cropping pattern, health problems and socio-economic imbalance in these regions. Though there are several empirical studies on agriculture related environmental problems, such as soil degradation, wind and water erosion, only a few studies have dealt with sociological problems caused by dyeing industrial pollution. From the above findings, it is clearly seen that dyeing industrial pollution had caused many sociological problems in the Noyyal river basin of Tamil Nadu.

In Tamil Nadu, four districts were having major dyeing industries *viz.*, Coimbatore, Erode, Tiruppur and Karur. Among these districts, Erode and Tiruppur had maximum number of dyeing industries in Tamil Nadu. This affected the water sources, land, human and livestock in these four districts. This article focuses mainly on the sociological problems faced by farmers due to dyeing industrial pollution in the Noyyal river basin of Tamil Nadu. The inquiry into the sociological problems of dyeing industrial pollution and its consequences faced by the farming community will provide an exact and accurate picture about the quantity and magnitude of the problem in the society and will throw useful implications for policy makers and researchers.

Objectives

The objectives of the study were:

1. To explore the sociological problems faced by farmers due to dyeing industrial effluents
2. To propose suitable suggestions to overcome effects of dyeing industrial effluents.

Research Methodology

In the present study, it was contemplated to explore the possible impact of dyeing industrial effluents on agriculture and coping behaviour of farmers. Therefore, in consultation with the experts involved in environmental protection, Public Works

Department (PWD), Tamil Nadu Pollution Control Board (TNPCB), scientists involved in environmental research, officials of development departments *viz.*, Agriculture, Animal Husbandry, Fisheries and experts in the field of Agricultural Extension and Agricultural Economics, it was decided to select the study area where agriculture is the main occupation with more proneness towards dyeing industrial pollution. Tiruppur and Erode districts were selected purposively, because these districts had more number of dyeing industries which affected the human, livestock, land and water resources. Tiruppur South and Chennimalai blocks were selected from Tiruppur and Erode districts respectively. Accordingly, Tiruppur south block located upstream of Noyyal river and Chennimalai block of Erode district located downstream of Noyyal river near Orathupalayam dam were selected. Both the blocks were severely affected due to dyeing industrial effluents. Tiruppur South and Chennimalai blocks had 23 and 22 revenue villages respectively. Of these, three severely affected villages were selected from each block and hence a total of six revenue villages were selected based on the following criteria:

- Considering the Water quality parameters such as EC (Electrical Conductivity) and TDS (Total Dissolved Solids), top three villages were selected from each block.
- Considering the severity of pollution in those villages situated on the bank of Noyyal river within five km distance.

The villages that satisfied the above two criteria were selected for the study. The selected villages were Mangalam, Andipalayam, Mudalipalayam, Kodumanal, Orathupalayam and Pudhupalayam. The selection of affected and unaffected area was done based on its distance from industrial zones and well water quality standards. Samples of 90 farmers from each of the affected and unaffected categories were considered for the study. Totally 180 farmers were randomly selected. Based on the water quality standards, the selected respondents were classified as affected and unaffected. Farmers were randomly selected for the study from both affected and unaffected areas with similar social and natural conditions except pollution intervention. Nearly one-fifth (20%) of farmers were selected for the study. Proportionate random sampling procedure was employed to select the farm households. As the number of farmers varied across the villages, nearly one-fifth (20%) of the respondents were selected and studied for the purpose. Thus a sample of 90 farmers were selected from each category (affected and unaffected) for the study. Hence, a total

sample of 180 farmers were selected randomly from both categories of farmers (affected and unaffected) who were similar in social and ecological conditions except pollution intervention. The study was conducted during the year January, 2015. Data were collected through pre-tested interview schedule. The data were analyzed using appropriate statistical tools.

Farmers come across many problems in their locality due to dyeing industrial pollution and subsequent disturbances in their ecosystem. With a view to explore the environmental problems of pollution as perceived by the farmers, they were asked to freely express their specific problems of pollution. All the problems were documented. The statements were developed based on the review of literature, exposure gained during the preliminary visits and in consultation with specialists in the field of environmental science and sociology and extension workers. Accordingly, the problems were studied under three sub-heads namely, health and sanitation, drinking water and social aspects.

The test was developed and administered to two categories of respondents *viz.*, affected and not affected farmers. The respondents were asked to respond to each of the statements in the test against a three point continuum *viz.*, 'major problem', 'minor problem' and 'not at all a problem' for which the scores given were three, two and one respectively. The total score was obtained for each item/ statement and was taken into account for the purpose of calculations. Percentage analysis was used for grouping the responses recorded for the statements into major problem, minor problem and not at all a problem as given by the respondents.

Findings and Discussion

The results on the sociological problems of dyeing industrial pollution, as encountered by farmers of both affected and unaffected areas are discussed below.

I. Health and sanitation

With regard to health and sanitation, some major problems were identified by the farmers of affected areas. Among them, the problems such as 'more prevalence of eye, nose and throat irritations, headache and viral fever' (100%), 'increased health care expenditure' (91.10%), 'dental fluorosis' (63.35%), 'increased sterility among the younger generation' (50%) and 'sporadic stagnation of industrial effluents and subsequent breeding of harmful organisms' (45.55%) were expressed as major problems in the affected areas.

It is also obvious from Table 1 that in the unaffected area, a majority of the respondents expressed their problems such as 'increased health care expenditure' (78.90%), and 'more prevalence of eye, nose and throat irritations, headache and viral fever' (72.20%). Less than one-fifth of the respondents had experienced major problems with regard to health and sanitation such as 'dental fluorosis' (21.10%), 'sporadic stagnation of industrial effluents and subsequent breeding of harmful organisms' (13.30%) and 'increased sterility among the younger generation (13.30%)'.

It is also observed from Table 1 that in both the areas (affected and unaffected) some of the problems were expressed by the respondents at higher proportions such as 'increased health care expenditure' and 'more prevalence of eye, nose and throat irritations, headache and viral fever'. Now-a-days people are getting affected by health issues because of poor immunity system and changing food habits. This might be the possible reason for the findings.

Table 1. Health and sanitation problems faced by farmers due to dyeing industrial effluents

S. No.	Problems	Affected area (n=90)*			Unaffected area (n=90)*		
		Major problem	Minor problem	Not at all a problem	Major problem	Minor problem	Not at all a problem
I.	Health and sanitation						
1.	More prevalence of eye, nose and throat irritations, head ache and viral fever	90 (100.00%)	-	-	65 (72.20%)	16 (17.80%)	9 (10.00%)
2.	Excess concentration of fluoride causes dental fluorosis	57 (63.35%)	9 (10.00%)	24 (26.65%)	19 (21.10%)	26 (28.90%)	45 (50.00%)
3.	Sporadic stagnation of industrial effluents and subsequent breeding of harmful organisms	41 (45.55%)	9 (10.00%)	40 (44.45%)	12 (13.30%)	5 (5.60%)	73 (81.10%)
4.	Increased sterility among the younger generation	45 (50.00%)	5 (5.55%)	40 (44.45%)	12 (13.30%)	22 (24.45%)	56 (62.25%)
5.	Increased health care expenditure	82 (91.10%)	5 (5.55%)	3 (3.35%)	71 (78.90%)	11 (12.20%)	8 (8.90%)

II. Drinking water

It is perceptible from Table 2 that all the four identified major problems such as 'contamination of drinking water source by industrial effluents' (100%), 'deterioration in quality of drinking water in its taste' (100%), 'dependence on municipal water increased' (87.75%) and 'drinking water sources have become a source of spread of contagious diseases like typhoid, cholera and diarrhea' (67.80%) were faced in the affected areas.

On the other hand, the respondents of unaffected area had reported that 'dependence on municipal water increased' (80%), 'deterioration in quality of drinking water in its taste' (60%), 'contamination of drinking (well) water source by industrial effluents' (45.55%) and 'drinking water sources remained as a source of spread of contagious disease like typhoid, cholera and diarrhea' (14.45%).

It is clear from Table 2 that in both areas (affected and unaffected) the respondents expressed some common problems such as 'dependence on municipal water got increased' and 'deterioration in quality of drinking water in its taste' as the major problems in their locality with respect to drinking water. This might be due to scarcity of water, water resources got polluted due to industrial and municipal wastes, depletion of ground water table and low rainfall. Effluents discharged into open drains through pipeline and getting stagnated for a long time is the reason for deterioration in quality of drinking water.

Table 2. Drinking water problems faced by farmers due to dyeing industrial effluents

S. No.	Problems	Affected area (n=90)*			Unaffected area (n=90)*		
		Major problem	Minor problem	Not at all a problem	Major problem	Minor problem	Not at all a problem
II.	Drinking water						
1.	Contamination of drinking (well) water source by industrial effluents and sewage renders it unsafe for public use	90 (100.00%)	-	-	41 (45.55%)	9 (10.00%)	40 (44.45%)
2.	Drinking water sources become a source of spread of contagious diseases like typhoid, cholera and diarrhea	61 (67.80%)	9 (10.00%)	20 (22.20%)	13 (14.45%)	10 (11.10%)	67 (74.45%)
3.	Deterioration in quality of drinking water in its taste	90 (100.00%)	-	-	54 (60.00%)	30 (33.40%)	6 (6.60%)
4.	Dependance upon municipal water increased	79 (87.75%)	8 (8.90%)	3 (3.35%)	72 (80.00%)	13 (14.45%)	5 (5.55%)

III. Sociological problems

An analysis of Table 3 shows that the important problems perceived by more than two-thirds of the respondents of affected area under the category of social aspects were as follows: 'hike in wages of agricultural labour' (100%), 'fear of pollution problems influenced the division of family land and its disposal for other purposes' (100%), 'availability of labour for agricultural purpose got reduced' (95.55%), 'drastic increase in the cost of cultivation' (94.40%), 'conflicts between industry and agriculture warranted much political interference in turn led to social disharmony and divisions among the rural community' (88.90%), 'migration of people involved in agriculture to the nearby towns increased' (87.80%), 'unwillingness to rely on agriculture generally prevails among younger generations' (86.65%), 'getting community cooperation in solving environmental degradation hazards due to dyeing industry becomes hardly possible' (82.25%), 'tendency to prefer agriculture as a part time occupation is fast growing' (82.22%) and 'political and administrative influence by industrialists prevented the village people from getting importance to their concerns' (81.10%).

It is interesting to note from Table 3 that though some of the problems expressed by the respondents of unaffected area were considered as critical, as they were reported by nearly three-fourth of the respondents such as 'availability of labour for agricultural purpose reduced' (74.45%), 'tendency to prefer agriculture as a part time occupation' (71.10%), 'hike in wages of agricultural labour' (67.80%) and 'unwillingness to rely on agriculture generally prevailed among younger generations' (52.20%).

Table 3. Sociological problems faced by farmers due to dyeing industrial effluents

S. No.	Problems	Affected area (n=90)*			Unaffected area (n=90)*		
		Major problem	Minor problem	Not at all a problem	Major problem	Minor problem	Not at all a problem
III.	Social aspects						
1.	Migration of agricultural people to the nearby towns increased	79 (87.80%)	6 (6.65%)	5 (5.55%)	38 (42.20%)	18 (20.00%)	34 (37.80%)
2.	Hike in the wages of agricultural labour	90 (100.00%)	-	-	61 (67.80%)	29 (32.20%)	-
3.	Availability of labour for agricultural purpose got reduced	86 (95.55%)	4 (4.45%)	-	67 (74.45%)	23 (25.55%)	-
4.	Unwillingness to rely on agriculture generally prevails among younger generations	78 (86.65%)	6 (6.70%)	6 (6.65%)	47 (52.20%)	26 (28.90%)	17 (18.90%)