



A STUDY ON ECONOMIC IMPLICATIONS OF DYEING INDUSTRIES IN THE LIVELIHOOD OF FARMERS IN THE TIRUPPUR DISTRICT, TAMILNADU

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Abstract

Tiruppur is the head quarters of the Tiruppur District, which is located at the distance of 50kms from the Coimbatore District of Tamil Nadu. It has emerged as a leading cotton knitwear industrial cluster in South India both for the overseas market, and the domestic market, primarily because the climate conditions facilitate easy processing yarn. In addition, availability of raw material and cheap labour has ensured that the textile industry activities here experienced rapid growth in the last two decades. Today, almost 80% of India's cotton knitwear exports happen from Tiruppur. In this we have note that, one of the most important problems from the Tiruppur textile industries was polluting the ground water. The bleaching and dyeing units use large quantities of water, but most of the water used by these units is discharged as effluents containing a variety of dyes and chemicals to the Noyyal river. Its spoils the environmental quality and creates the economic implications on the farmers.

Key words: Tiruppur Dyeing Industries, water pollutions, Noyyal river, economic implications, farmer life.

1.1 Introduction

Tiruppur has entered into the international trade in 1980s with the manufacture of cardigans, jersey, innerwear's, T-Shirts, dresses and skirts, trousers, sportswear and industrial wear. Small scale garment manufacturing for export has developed in Tiruppur rapidly in the 1980s and 1990s, using locally grown cotton in a small-scale textile centre, mostly from the informal sector. This growth was fuelled by a parallel decline in agriculture, whereby most of the farmers turned out for other opportunities which led them to invest in textile processing units. The main activities in industrial sector here are ginning, spinning, weaving, knitting, bleaching, dyeing, printing and allied works. There are essentially three types of firms in the industry viz., direct exporters, indirect exporters, and job-workers. Tiruppur contributes about 85% of hosiery and cotton knitwear produced in India. 75% of which is exported to Europe, America and other countries. At present there are 6,450 units involved in various operations of the textile industries here. It has 4900 knitting and stitching unit, around 760 textile dyeing and bleaching units, 320 printing units, around 120 embroidery units and 200 units catering to compacting and rising.

Thus this town annually contributes about INR 3000 crores in foreign exchange earnings to our country, besides an earning matching or surpassing the above figure to cater the domestic market. The export of knitted garments from Tiruppur started to grow very rapidly around 1985, and in the early 1990s the annual growth rate was above 50%.

1.2. Textile processing Industry-Environment Problems and Issues

The environmental problems of textile manufacturing are related to the bleaching and dyeing (textile processing) segment of the industry. In textile processing, bleaching and dyeing are the two major activities that require a large amount of water. However, these activities are non consumptive and most of the water used by these units is discharged as effluent after processing.

Issues

Energy Issues: Though Tiruppur textile cluster cases the modern technologies in some of the subsectors like knitting and dyeing, energy utilization is poor in most of the modern units. The operating efficiencies of modern equipments are low because of poor loading and scheduling. It was observed that the sizes of the equipments are



large in most of the units. Electrical energy, firewood, furnace oil. and high speed diesel are the primary sources used, while steam and hot thermal fluid are the secondary sources used in Tiruppur cluster for wet processing firewood is the main energy source.

Environmental Issues: In Tiruppur, as in other Indian cities, there is no separate zone for industrial / commercial activities. Therefore, many industries are located in residential areas. Urbanization, industrialization and associates activities increases pollution. Also, Tiruppur is facing a severe problem of water and land pollution because of primitive processing methods of dyeing.

1.3. Impact on Agriculture

Agriculture sector was major sector which bore the brunt of the impact of pollution in the form of decline in yields, it is necessary to study the impact on agriculture. Agricultural yields depends upon many factors like seeds, weather soil fertility irrigation, technology, manures, fertilizers, and pesticides used, capital invested and management practices. Other things are remaining the same, water pollution and soil pollution mainly caused a significant fall in crop yield.

Normally the entire water used in the process of dyeing and bleaching is discharged as the chemical effluents. The biggest pollutant in the effluent is heavy metals. This effluent from the dyeing and bleaching units from Tiruppur is let out into the open, without any treatment or semi treated. The effluents from the dyeing and bleaching form stagnant pools, and their stench is quite unbearable. The presence of metals in excess of tolerable limits results in the withering away of standing crops including full grown palm and coconut trees while seedling just do not germinate. The dyeing and bleaching industry has not only ravaged the land but has also upset the intricate biological food chain of the area.

1.4. Statement of the problem

One of the most important problems from the Tiruppur textile industries was polluting the ground water. The bleaching and dyeing units use large quantities of water, but most of the water used by these units is discharged as effluents containing a variety of dyes and chemicals to the Noyyal river. As a result, the industrial growth has led to the depletion of groundwater resources and a serious deterioration in environmental quality. The Noyyal river a tributary of the river Cauvery rises from the velliangiri hills in the Western Ghats in Tamilnadu South eastern India into the Cauvery river.

About 123 hectares of cultivable land have become un cultivable owing to soil pollution .The total cultivable area in the pollution affected zone was estimated to be 1,46,389 acres of which 36139 acres (24.9 percent) could be classified as injurious, 53,938 acres (36.8 Percent) as critical and 56,312 acres (38.5 Percent) as normal for cultivation. The area located on both the sides of the Noyyal between Tiruppur and Orathuppalayam was identified as the area affected by textile effluents from Tiruppur.

In this context it becomes necessary to analyze the following issues:

1. What is the significance and environmental issues relating to dyeing industries in the study area?
2. What type of impact do the dyeing industries make on the farmers?
3. What is the extent of loss incurred by farmers due to the existence of dyeing industries?
4. What are the problems faced by the farmers due to the existence of dyeing industries?

Finding answers to these and other pertinent issues, an empirical research is required. Hence the present study "A Study on Economic Implications of Dyeing Industries in the Livelihood of Farmers in the Tiruppur District, Tamilnadu".

1.5. Objectives of the study

1. To provide a theoretical perspective on dyeing industries in the study area and their significance.
2. To study the nature and extent of economic implications of dyeing industries on the livelihood or farmers.



3. To study the problems faced by the farmers due to the existence of dyeing industries.
4. To provide suitable suggestions and recommendations.

1.6.Data and Methodology

Field Survey Method and Personal Interview Techniques were used in collection of data. Primary Data have been collected from the farmers as respondents.

1.7. Tools of Data Collection

A Comprehensive schedule was used and administered for getting the empirical data from the farmer respondents.

1.8.Framework of Analysis

The collected data were screened and transcribed. Simple and multiple tables were prepared and used for analysis. Statistical tools viz Simple percentage analysis, Garrett Ranking Analysis, Correlation, ANOVA.

1.9.Limitations of the study

- 1.The study covered only six areas large proportion polluted areas in the Tiruppur district with special reference to Tiruppur district. Hence the findings may or may not be applicable to other regions.
- 2.The respondents were initially reluctant in providing the information required.

1.10.Negative Issues of Dyeing Industry Effluents-Its impact on Agriculture

The negative issues of these industries are leading to loss in crop and production and heavy loss in agricultural income, changes in cropping pattern, health problems and socio-economic imbalance in the region. Moreover, industrial pollution causes labour irrigation. Unemployment or changes in employment pattern and decrease in share of farm income to the total household income.

Agriculture sector was major sector which bore the brunt of the impact of pollution in the form of decline in yields, it is necessary to study the impact on agriculture. Agricultural yields depends upon many factors likes seeds, weather, soil fertility, irrigation, technology, manures, fertilizers, and pesticides used, partial invested and management practices. Other things are remaining the same, water pollution and soil pollution mainly caused a significant fall in crop yield.

Normally the entire water used in the process of dyeing and bleaching is discharged as the chemical effluents. The biggest pollutant in the effluent is heavy metals. This effluence from the dyeing and bleaching units from Tiruppur, is let out into the open, without any treatment or semi treated. The effluents from the dyeing and bleaching form staging pools, and their stench is quite unbearable. The presence of metals in excess of tolerable limits results in the withering away of standing crops including full grown palm and coconut trees, while seedling just do not germinate The dyeing and bleaching industry has not only ravaged the land but has also upset the intricate biological food chain of the area.

The present study undertaken to analyze the impact of dyeing effluents caused pollution on agricultural productivity, crop land value, income pattern and changes of socio-economic level of the farmers.

2.1. Results analysis

Table 1,Personal Profile of the Respondents

Classification	No of Respondents	Percentage
Age (Years)		
1. <30	06	4.0
2. 31-40	19	12.7
3. 41-50	46	30.7
4. Above 50	79	52.6



Gender		
1. Male	112	74.7
2. Female	38	25.3
Community		
1. OC	54	36.0
2. BC	74	49.3
3. MBC	15	10.0
4. SC/ST	07	4.7
Marital Status		
1. Married	124	82.7
2. Unmarried	26	17.3
Education		
1. School	85	56.7
2. College	42	28.0
3. Diploma	23	15.3
Total	150	100.0

Source: Primary Data

- Out of 150 sample selected nearly 52.6 percent of the Respondents were above 50 years of age, 30.7 percent were between the age group 41-50 years, 12.7 percent were between 31-40 years and respondents of age below 30 years only 4 percent.
- 74.7 percent of the respondents were Male respondents while 18 percent respondents were female.
- A high majority of the sample around 49.3 percent belonged to BC community, 36 percent of respondents belonged to OC community, 10 percent belonged to MBC community and only 4 percent of the respondents belonged to SC/ST community.
- 82.7 percent of the respondents were married and only 17.3 percent of the respondents were unmarried.
- It is observed that 56.7 percent of the respondents had completed upto School level (+2 level), 28 percent of the respondents had completed upto college education and only 3 percent of the respondents had completed diploma in education.

Table 2, Economic Profile of the Respondents

Classification	No of Respondents	Percentage
Occupation		
1. Agriculture	125	83.3
2. Business	25	16.7
Monthly Income of the Family		
1. <25,000	106	71.0
2. 25,000-30,000	25	16.7
3. Above 30,000	29	19.3
Monthly Expenditure of the Family		
1. <20,000	107	71.3
2. 21,000-25,000	39	26.0
3. Above 25,000	04	2.7
Monthly Savings		
1. <5,000	95	63.3
2. 5,000-10,000	51	34.0
3. Above 10,000	04	2.7
Total	150	100.0

Source: Primary Data



Economic Profile

Occupation determines the social standing of a family. Majority around 83.3 percent of the respondents were only agriculture and 16.7 percent of the respondents were doing business as occupation. The above table reveals that the farmers not only doing agriculture but also other business people also are engaged in agriculture.

Majority 71 percent of the Respondents had monthly income which below Rs.25,000 and 19.3 percent of the respondents income ranged above Rs.30,000. 16.7 percent of the respondents income ranged between Rs.25,000-30,000. It is evident that the main agriculture occupation serves the lower income segment of the population.

The table exhibits the monthly expenditure position of the Respondents. Majority of the Respondents (71.3 percent) incurred monthly expenditure below Rs.20,000 and 26 percent of the Respondents monthly expenditure ranging between Rs.20,000 to 30,000. Only 2.7 percent of the respondents monthly expenditure is above Rs.30,000.

Out of the total, around 63.3 percent of the respondents had monthly savings below Rs.5,000, 34 percent of the respondents had monthly savings between Rs.5,000 to 10,000 and only 2.7 percentage of the respondents had monthly savings above Rs.10,000.

Table 3,Acres of farm lands

	No. of Respondents		Acres
Farm Land Available	1-5	49	275
	6-10	62	156
	Above 10	39	132
	Total	150	563
Land used for cultivation	1-5	49	192
	6-10	60	150
	Above 10	41	82
	Total	150	424

Source: Primary Data

Its shows that the acres of farm land available and used for cultivation. 62 respondents have 6-10 acres of farm land, 49 respondents have 1-5 acres of farm land, 39 respondents have above 10 acres of farm land available, whereas, 60 respondents have used 6-10 acres of land for cultivation, 49 respondents used 1-5 acres for cultivation and 41 respondents used above 10 acres of land for cultivation.

Table 4,Acres of land affected

Land	No. of Respondents			Acres
	High	Moderate	Low	
1-3 Acres	78	69	96	410
4-6 Acres	37	48	25	147
Above 6 Acres	35	33	29	68
Total	150			625

Source: Primary Data

The above table portrays acres of farm land affected. 78 respondents have 1-3 acres of highly affected farm lands, 37 respondents have 4-6 acres of highly affected farm lands, 35 respondents have above 6 acres of highly affected farm lands, 69 respondents have 1-3 acres of moderately affected farm lands, 48 respondents have 4-6 acres of moderately affected farm lands, 33 respondents have above 6 acres of moderately affected farm lands, 96



respondents have 1-3 acres of less affected farm lands, 25 respondents have 4-6 acres of less affected farm lands and 29 respondents have above 6 acres of less affected farm lands.

Table 5, Water Quality

		No. of Respondents	Percentage
Change in Water Quality	Yes	116	77.3
	No	34	22.7
	Total	150	100.0
Quality of Water	Salty	85	56.7
	Acidic	35	23.3
	Safe	30	20.0
	Total	150	100.0
Construction of new wells after change in Water quality	Yes	35	23.3
	No	115	76.7
	Total	150	100.0
Change in crop growth	Yes	125	83.3
	No	25	16.7
	Total	150	100.0
Change in Soil Quality	Yes	135	90.0
	No	15	10.0
	Total	150	100.0
Source of Drinking Water	Panchayat Pipeline	112	74.7
	L&T Pipeline	38	25.3
	Corporation Pipeline	0	0.0
	Total	150	100.0

Source: Primary Data

The above table shows the change in water quality. 116 respondents have identified the change in water quality and 34 respondents have not identified any change in water quality. 85 respondents have found that the quality of water is salty, 35 respondents found that the quality of water is acidic, 30 respondents found that the quality of water is safe. 35 respondents have identified there has been construction of new wells after change in water quality, 115 respondents have identified that there has been no new wells has been constructed after change in water quality. 125 respondents have found that there is a change in crop growth, 25 respondents have found that there is no change in crop growth. 135 respondents have identified that there is a change in soil quality, 15 respondents have identified that there is no change in water quality. 112 respondents have found that their source of drinking water is from panchayat pipeline, 38 respondents have found that their source of drinking water is from L&T pipeline.

Table 6, Types of crops cultivated

Crops Cultivated	No. of Respondents	Acres
Banana	16	88
Coconut	72	197
Areca Nut	12	62
Jasmine	05	23
Curry Leaf	06	28
Tobacco	06	25
Maize	14	33
Chilli	06	06
Vegetables	09	48
Green Leaves	04	27
Total	150	537

Source: Primary Data



Its explains the types of crops cultivated. 72 respondents cultivated coconut, 16 respondents cultivated banana, 14 respondents cultivated Maize, 12 respondents cultivated Areca nut, 9 respondents cultivated vegetables, 6 respondents cultivated Curry Leaf, Tobacco, Chilli, 5 respondents cultivated Jasmine and 4 respondents cultivated Green Leaves.

Table 7,Income earned before pollution

	Long Term	Medium Term	Short Term	Yield per Acre Rs.
Rs. 25,000-50,000	48	50	94	45,000
Rs. 50,001 – 1,00,000	42	62	28	86,000
Above 1,00,000	60	38	22	1,45,000
Total	150			2,76,000

Source: Primary Data

The table explains the income earned before pollution. 60 respondents have earned a long term income of above Rs.1,00,000, 62 respondents have earned a medium term income ranging between Rs.50,001- 1,00,000, 94 respondents have earned a short term income ranging between Rs. 25,000-50,000. 48 respondents have earned a long term income ranging between Rs. 25,000-50,000, 50 percent of the respondents have earned a medium term income ranging between Rs.25,000 – 50,000, 28 respondents have earned an agriculture income ranging between Rs.50,001- 1,00,000. 42 respondents have long term income ranging between Rs.50,001-1,00,000, 38 percent earned above Rs.1,00,000 and 22 respondents have earned above Rs.1,00,000.

Table 8,Income earned after pollution (decrease in yield)

	Long Term	Medium Term	Short Term	Yield per Acre Rs.
Rs. 10,000-25,000	48	50	94	23,000
Rs. 25,001 – 50,000	42	62	28	46,000
Above 50,000	60	38	22	75,000
Total	150			1,44,000

Source: Primary Data

The table explains the income earned before pollution. 60 respondents have earned a long term income of above Rs.1,00,000, 62 respondents have earned a medium term income ranging between Rs.50,001- 1,00,000, 94 respondents have earned a short term income ranging between Rs. 25,000-50,000. 48 respondents have earned a long term income ranging between Rs. 25,000-50,000, 50 percent of the respondents have earned a medium term income ranging between Rs.25,000 – 50,000, 28 respondents have earned an agriculture income ranging between Rs.50,001- 1,00,000. 42 respondents have long term income ranging between Rs.50,001-1,00,000, 38 percent earned above Rs.1,00,000 and 22 respondents have earned above Rs.1,00,000.

Problems Faced due to the existence of Dyeing Industries

Table 9,Garrett Ranking Analysis on Problems Faced due to the existence of Dyeing Industries

S. No	Reasons	Garrett's Mean score	Rank
1	Change in ground water level	41.73	2
2	Change in water quality and its colour	41.53	4
3	Environment is fully affected	41.88	1
4	New type of water borne diseases are found	38.38	8
5	No proper cultivation	41.29	6
6	Change in quality of crops	41.47	5
7	Change in soil quality	41.68	3
8	Cattle farming is affected	39.50	7

Source: Primary Data



The result from above table indicates the various problems faced due to the existence of dyeing industries in Tiruppur District. The study revealed that the environment is fully affected was ranked first, then change in groundwater level was ranked second and change in soil quality was ranked third, pointing out that these are the major problems faced due to the existence of dyeing industries whereas no proper cultivation was ranked sixth, cattle farming is affected was ranked seventh and new type of water borne diseases are found was ranked last, pointing out that these are the least factors are the problems faced due to the existence of dyeing industries.

H_0 – There is no significant difference between the problems faced due to the existence of dyeing industries in Tiruppur District

Table 10, ANOVA on Agriculture Value Loss and Monthly Income of the Respondents

		Sum of Squares	df	Mean Square	F	Sig.
Before Pollution	Between Groups	2.935	2	1.468	1.178	.011
	Within Groups	181.817	146	1.245		
	Total	184.752	148			
After Pollution	Between Groups	.352	2	1.176	2.123	.024
	Within Groups	208.869	146	1.431		
	Total	209.221	148			
Yield Loss	Between Groups	1.652	2	3.826	2.554	.006
	Within Groups	217.597	146	1.490		
	Total	219.248	148			
Pollution Aversion Expense	Between Groups	.283	2	2.141	1.145	.035
	Within Groups	141.878	146	1.972		
	Total	142.161	148			

Source: Primary Data

The Anova table explains the Analysis of Variance on Agriculture Land Value Loss and Monthly Income of the respondents has been carried out. These analyses shows that all the variables namely Before Pollution, After Pollution, Yield Loss and Pollution Aversion Expenditure are significantly differ between the Monthly Income of the respondents.

Findings, Suggestions and Conclusion

- The study found that majority of the agricultural communities were not depending on the well and fore well water for drinking, washing the cloths, bathing and live struck.
- The farmer's potential yield of sorghum, coconut, vegetables productivity in the Noyyal river effluent affected area. In Noyyal river basin the crop sorghum does not produce any yield, farmers cultivated because of domestic animal fodder.
- The effects of this pollution were on coconut cultivation that has slumped because of high, saline, sodium nature waste that hardens irrigation water.
- The farmers have incurred pollution averting expenditure as additional cost of production. As the value of lands and their productivity have already dipped to low level, the farmers could not depend from their farms income.
- The farmers are not interested to cultivate the corps in their lands because the groundwater is completely affected.
- The farmers procure water from outside source (Tanker lorry) and used to milk animals for household purpose.
- The study revealed that the environment is fully affected was ranked first, then change in groundwater level was ranked second and change in soil quality was ranked third, pointing out that these are the major



problems faced due to the existence of dyeing industries / whereas no proper cultivation was ranked sixth, cattle farming is affected was ranked seventh and new type of water borne diseases are found was ranked last, pointing out that these are the least factors are the problems faced due to the existence of dyeing industries.

- 125 respondents has not received any sort of financial assistance from the Government, 18 respondents received the assistance of Rs. 10,000-25,000 and 125 respondents has not received any sort of financial assistance from the NGO.
- The study revealed that shifting of dyeing and bleaching industries to some other places was ranked first, then dyeing industries should recycle the water fully was ranked second and Acidic/ Salty/No groundwater was ranked third, pointing out that these are the major future perspectives of farming whereas Government may provide financial support was ranked fourth and no idea on continuing agriculture was ranked last, pointing out that these are the least factors of future perspective of farming.

Suggestions/ Recommendations

- Tamil Nadu Pollution Control Board (TNPCB) constituted a local area environmental committee to monitor the polluting industries located in Tiruppur District should be made permanent to monitor the operation of the effluent treatment plants of the industrial units and their level of compliance with the prescribed standards, and suitably advise the Pollution Control Board to take the necessary action.
- The Pollution Control Board should regularly monitor the drains the join to the Noyyal River to trace any illegal discharge of effluent from dyeing industries.
- To take proper steps for ground water remedial measures through recognized organization to reclaim the ground water quality along the Noyyal river in Tiruppur.
- Tamil Nadu State Pollution Control Board should strongly insist all CETPs/ IETPs to maintain proper records of sludge generated and disposed.
- There is need to introduce cleaner technology to reduce the pollution load.
- Reverse Osmosis has been identified as a technology suitable option for treating textile industry affluent from large and medium sized units.
- Government has started to clean river which is good sign to the city meanwhile it has to be done faster.

Conclusion

In Tiruppur area, farmers had already changed their cropping pattern from short term crops to long term crops, after the impact of pollution occurred. In some areas, they were able to use river water directly or by mixing it with groundwater. Since these options may not be possible exist in other areas, the impact on livelihoods in these areas may be more serious. If this situation will continue, then it may lead to water scarcity and in turn will seriously affect the agriculture. This is the right time to protect our agriculture and farmers from the industrial pollution. No other sectors will grow and develop without agriculture, because they are the backbone of the nation.

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