Farmer's Perception on the State of Agriculture in an Industrial Area: a Case Study

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Abstract:Industrial development has been regarded as an indicator of the country's development. The effects of industrialization on the growth and the level of development of any country is said to be remarkable. The current changes in the Indian political framework promote industrial development in the country. Moderate and favorable climatic conditions in India compliment the expanded extent of industrialization. With this expanding proliferation of industries in different regions within India, a variety of complex and diversified threats to the environment and living beings of those belts is observed. Patancheru is one of the major important industrial zone in the Telangana state of India. The indiscriminate release of effluents and dumping of solid wastes and has antagonistically affected the natural resources, health of the people and their livelihoods. Patancheru - Bollaram industrial cluster, was proclaimed as "critically polluted area" in 2009 by Central Pollution Control Board (CPCB). The air and groundwater contamination directly affected the crop yield and food cycle. The present study is an attempt to analyze the socio-economic status, characteristics of agriculture and changes therein and challenges faced by the farming community in Patancheru. The study is based on primary data collected through field survey carried out in July 2018 with a sample size of 47 farming community households based on convenience sampling.

Index Terms: Agriculture, Industrial area, Industrial Development, Patancheru.

I. INTRODUCTION

Theories such as modernization theory, the basic needs theory and similar others provide an insight of the different developmental strategies adopted by the countries for their development. The modernization theory of development has been widely adopted by many countries.

The theory emphasizes on industrialization of the country that eventually leads to the path of modernization. Industrialization and urbanization are considered to go hand in hand. The growth of industries has been regarded as a mark of urbanization of the country. In this context, industrial development has been regarded as an indicator of the country's development. The effects of industrialization on the growth and the level of development of the countryis said to be remarkable. It is because of this, that thecountries especially the developing and least developed countries opt for this model of development. The current changes in the Indian political framework promote industrial development in the country. Moderate and favourable climatic conditions in India compliment the expanded extent of industrialization.

The process of industrialization in India was propelled as a consistent and purposive policy in mid 1950's to enhance the pace of economic development in the country. Taking into account the benefits of industrialization, both central as well as state governments were in a hurry to industrialize their respective states in the initial days. The new state of Telangana, with ample availability of trace minerals, consistent power supply and favorable impetus ensured by the state government provided an opportunity for the set up and development of medium and large scale industries. As per the results of the Annual Survey of Industries 1981-1989 brought out by Government of India, the former united Andhra Pradesh positioned second in the number of registered factories.

Though industrialization has impressing results to look for, it has far more deteriorating impacts. This period can be considered to be an evolutionary period especially for developing economies like India, urging the countries to strike a balance between industrial growth and the environment in order to minimize the intensity of contamination. The positive monetary and communal results of development have been escorted by grave environmental degradation. As India progressed towards modernization of the industries in various fields, including agriculture, manufacturing, but what went unnoticed was the parasitic degradation of environment and its inhabitants posturing unavoidable long term risk to life span, ecological conditions, varied flora and fauna in and around the industrial belt.

II. STUDY AREA

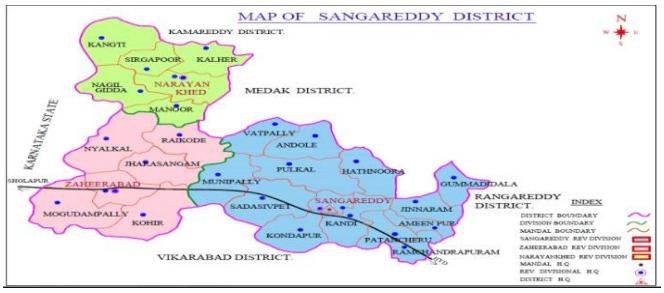

Image 1

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The newly formed state of Telangana, is a hub for development of various industries such as IT industries, pharmaceutical industries, textiles and apparels etc. Telangana is considered as one of the top IT exporting states of India. The state of Telangana is said to account for one third of pharma production in the country. The state ranks at eighth position among the contribution of state's to the GDP of the country. The GDP of the state is estimated to be Rs. 8.43 lakh crore (USD$130billion) according to nominal estimation for 2018-2019. The industrial sector accounts for almost 16% of the GDP of the state. The state has almost 68 Special Economic Zones which are the major contributors to the GDP of the state and also play the role of growth poles or development centers in the state.

Patancheru is one of the major important industrial zone in the state. The zone is located about 32km from the city center on the Hyderabad-Solapur highway (NH9). It is located at 17.530 N 78.270 E. The total population of the area, according to Census of India 2011, is 150,000. Taking into account various socio-economic factors, the process of industrialization in Patancheru started in late 1970's. The development phenomena in the region started during the reign of the late Prime Minister Ms. Indira Gandhi, who started the Patancheru Industrial Park, while serving as the Member of Parliament of Medak constituency. The strategic location of the area played an important role in determining the industrial development. The availability of infrastructural facilities such as unhampered supply of electricity, well-built roads and assured supply of water from Manjeera Reservoir were a major reason. But in course of time, the industrialization in Patancheru became a bane for the region, resulting in various socio-economic problems, instead of solving them.

The industrial discharge both treated and untreated were released far away from the industrial locality onto open lands, neighboring water bodies and underground wells, contaminating the natural ground water sources. Lack of proper facilities for the release of the industrial effluents, industrial waste has been piled up especially in the surrounding areas. Haphazard release of industrial discharges and deposition of solid wastes and reckless release of effluents has antagonistically affected the local environment, physical and mental health conditions of the local people and their livelihoods. Patancheru - Bollaram industrial area was proclaimed as "critically polluted area" in the year 2009 by Central Pollution Control Board (CPCB) (Times of India, July 20, 2018).

III. OBJECTIVES OF STUDY

i. To investigate the agricultural conditions in Pashamylaram village inPatancheru industrial area.
ii. To examine the impact of industrial establishments on the economic conditions of the farmers and surrounding environment.
iii. To suggest effective solutions to the problems faced in the agriculture, in the light of above investigation.

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IV. SOURCES OF DATA AND METHODOLOGY

The study is totally based on the primary data as there were no related secondary sources available for the study. For this purpose, a questionnaire was prepared and filled by 47 farmers of Pashamylaram village in Patancheru industrial area, selected on the basis of convenience sampling technique. Apart from this, people were also interviewed wherever there

was a requirement. The data, hence, collected has been processed, analyzed and interpreted using percentage method. The data has been represented by using tables, bar and pie diagrams.

V. DISCUSSION ON THE DEMOGRAPHY OF THE STUDY AREA

In the study area, more than three-fourth respondents were the owners of the land who were mainly males (97.87 per cent) while the remaining were females (2.12 per cent). Majority of the male respondents (44.68 per cent) belonged to the productive age group of 35-55 years, followed by the age group of above 55 years (42.55 per cent), while the remaining belonged to the age group of less than 35 years (12.8 per cent, Table 1). Amongst all the respondents, 78.7 per cent [37] had no educational background whereas only 19.2 per cent of the respondents [9] had completed their primary level education and only 2.1 per cent of them [1] had completed middle education.

Characteristics	No. of respondents	Percentage of respondents
Native Place		
Pashamylaram	47	100
Ownership of the land		
Owner of land	47	100
Gender		
Male	46	97.87
Female	1	2.12
Age		
<35	6	12.8
35-55	21	44.68
>55	20	42.55
Qualification		
No education	37	78.7
Primary education	9	19.2
Middle education	1	2.1

Table 1: **Demographics of Pashamylaram Village, 2018**

Source: Primary survey conducted in July 2018.

VI. INCOME AND EMPLOYMENT IN INDUSTRIES

As per the sample population, more than one-third of respondents [17] had an income of less than Rs. 70,000 per growing season, while another one-third of respondents [16] had an income of more than Rs. 90,000 per season and rest

of the 29.78 per cent of respondents [14] had income between Rs. 70,000-90,000. Excluding 29.78 per cent of respondents [14] who had no other source of income, more than half of the respondents [25] had income from cattle and poultry farming.Further, 10.64 per cent of them [5] were involved in various industrial jobs while only 6.38 per cent of them [3] owned shops and were involved in other local business. Out of 70.2 per cent of respondents [33] having sources of income other than agriculture such as industrial jobs, poultry business, shops and other local businesses, only 10.6 per cent of them [5] had their family member or members working in various industrial jobs whereasmore than three fourth respondents [42] had no family member employed in the industries (Table 2).

Income per season(in rupees)	No. of respondents	Percentage of respondents
<70,000	17	36.17
70,000-90,000	14	29.78
>90,000	16	34.05
Other sources of income		
Poultry/cattle rearing	25	53.19
Shops	3	6.38
Industrial workers	5	10.65
No other sources of income	14	29.78
Family members employed in industries		
Not employed	42	89.4
Employed	5	10.6

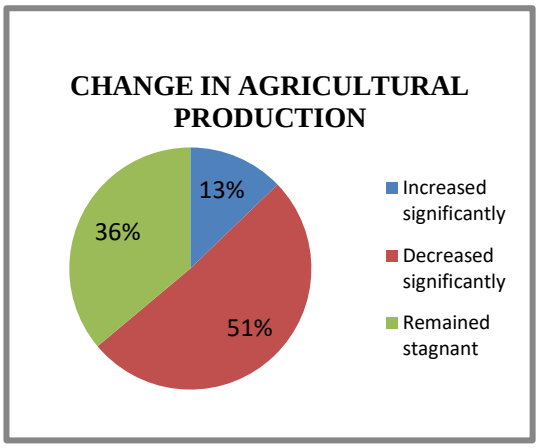
Table 2: Income Characteristics
Source: Primary survey conducted in July 2018

VII. CROPPING PATTERN

The hot and dry summer season, wet rainy season and mild and humid winters coupled with rich, deep soils allows the cultivation of diverse crops in the study area. Majority of the respondents (53.2 per cent) cultivated the land two times in a year while the remaining of them (46.8 per cent) cultivated three times in a year.The agriculture is commercial in nature and farmers grow cash crops like cotton, spices, turmeric, oilseeds, jute etc. As per the samples collected, more than half of the respondents [27] cultivated only commercial crops while 25.53 per cent of them [12] had cultivated only food crops and only 17.03 per cent of them[8] had cultivated both food and commercial crops.

VIII. TRENDS IN AGRICULTURAL PRODUCTIVITY

Agricultural productivity is usually affected by both natural and human factors. But in the study area artificial or human factors such as rapid industrialization of the area had adversely affected the agricultural productivity over the years. As per the samples collected, more than fifty per cent of the respondents [24] stated that there has been a significant reduction in the agricultural output from their land since last 50 years, while 36.1 per cent of them [17] stated the output to be the same whereas only 12.8 per cent of them [6] stated that the output had significantly increased (Fig. 1). In accordance to this, more than half of the respondents [25] reported that the industrial establishments in the region was the major cause of reduction in agricultural output, while 36.1 per cent of them [17] reported that both industries and drought conditions in the region had an impact on the output whereas the remaining 10.7 per cent [5] of them quoted drought as the major reason for the significant reduction in the out put (Fig. 2).



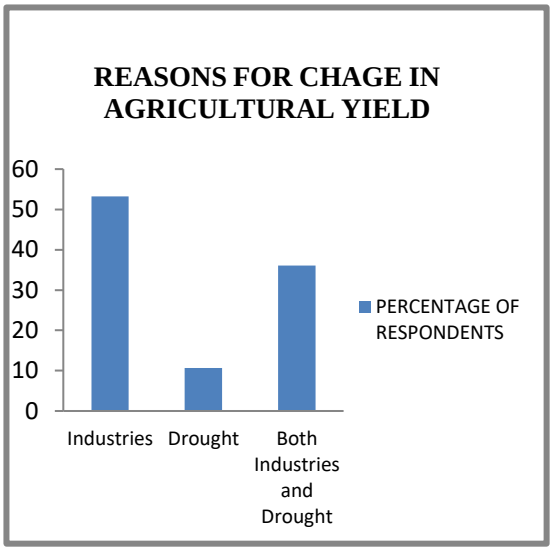


Fig.1Fig.2

IX. CHANGE IN THE DEMAND FOR CROPS AND INCOME IN LAST 30 YEARS

Demand for crops and income are highly inter-related. For the people with agriculture as the only source of income are majorly effected with the change in demand for crops. As per the data obtained, more than two-third respondents [34] supposed that there had been a significant decrease in the demand for crops since the last 30 years, 19.15 per cent [9] of them assumed the demand to be stagnant, while only

8.51 per cent [4] of them supposed that the demand had decreased significantly. Considering the change in income in last 30 years in relation to the change in demand for crops, almost two-third of the respondents [30] stated that the income from the agriculture had significantly decreased in the last 30 years, while 19.14 per cent of the respondents [9] reported that the income remained stagnant and the remaining 17.03 per cent of them [8] reported that the income has increased in the said time period.

Table 4: Change in demand for crop and income in last 30 years

Level of change	No. of respondents	Percentage of respondents
Change in demand for crops in last 30 years		
Increased significantly	4	8.51
Decreased significantly	34	72.34
Remained stagnant	9	19.15
Change in income in last 30 years		
Increased significantly	8	17.03
Decreased significantly	30	63.83
Remained stagnant	9	19.14

Source: Primary survey conducted in July 2018

X. EFFECT OF INDUSTRIES ON QUALITY OF CROP AND LAND

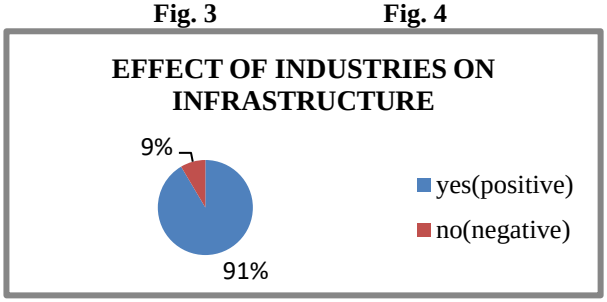
As per the study conducted in the area, more than two-third of the respondents [39], reported that there had been a negative impact on the quality of the agricultural land due to industrial dumping while the remaining 17 per cent of them [8] did not know if the effect of industrial dumping on the quality of the land. Out of the 83 per cent of respondents who felt that the industries had a negative impact on the quality of land, 89.4 per cent of the respondents [42], quoted that there had been a negative impact on the quality of the crop as well, where they found the crops being destroyed by the drug resistant superbugs, leading to a decrease in the overall output, while 2.1 per cent of them [1] reported that there had been a positive effect on the crop quality and the remaining 8.55 per cent of them [4], did not know if the industries had any impact on the crop quality.

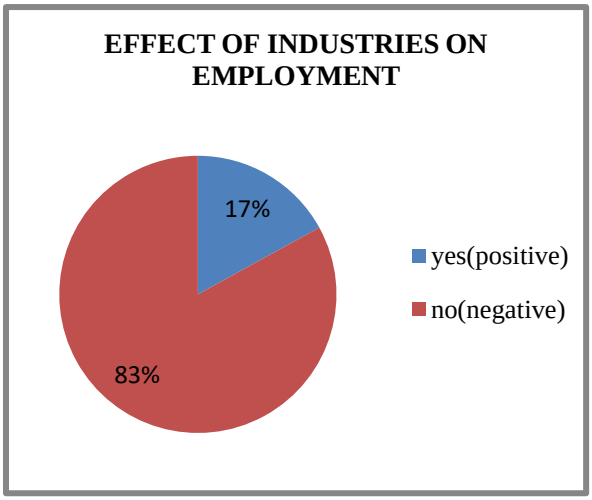
Further, more than half of the people, that is, 51.06 per cent of the respondents [24] acknowledged that the quality of river water had significantly declined and was not fit for irrigation purpose, in contrast 6.38 per cent of the respondents [3] agreed that the river water was fit for irrigational purposes and the remaining 42.56 per cent of them [20] did not respond to the question.

XI. EFFECT OF THE INDUSTRIAL ESTABLISHMENTS ON THE INFRASTRUCTURE AND EMPLOYMENT IN THE REGION

Establishment of industries usually have a positive effect on the infrastructure and employment opportunities in any region. In the same manner, in the study area, more than three-fourth of the sample population [43], reported that there had been an improvement in the infrastructural facilities since the industrialization of the region, while 8.52 per cent of them [4], reported that there was no improvement (Fig. 3). On the contrary, considering the impact of industrial development on the employment opportunities, more than two-third, that is, 83 per cent of the respondents [39] did not find any positive impact, while 17 per cent of them [8], reported that there had been an increase in the opportunities especially for the local people (Fig. 4).

Fig. 3 **Fig. 4**





Source: Primary survey conducted by the researcher, July 2018

According to the data obtained, more than two-third of the respondents [39] supposed the establishments to be a bane or hindrance in the developmental process of the region,while 10.6 per cent of the respondents [5] considered the industrial establishments as a boon for the region and its development and the remaining 6.38 per cent of them [3] did not reveal their opinion on the issue.

XII. CONCLUSION

The important observation of the study has been the trend of agricultural production since the industrialization of the region. More than 50 per cent, that is around 24 respondents reported that there has been significant reduction in the total agricultural output in the last 50 years, 17 of them reported that the output had remained same, while only 6 of them

reported that the agricultural output had significantly increased. One-fourth of the total respondents [25] reported that their livestock rearing business was affected by the release of industrial effluents that were released onto the open grounds and into the water bodies and the animals were forced to consume such pollution effected crops and water effecting their body and health.

Moreover, more than two-third respondents [42] further reported that the harmful effluents released from the industries affected the quality of the crops being cultivated that lead to various health problems such as cancer, gastrointestinal, leukemia, miscarriages, intestinal problems etc. among the people who consumed those crops, as reported by more majority of the respondents [40] ("Patancheru: water woes", Down To Earth, 28 June, 2015). Hence it can be concluded that the local people are not satisfied with the effect of industries on their life and environment. Most of the respondents when asked about their expectations from the government regarding the issue voiced out that further industrialization of the area should be controlled and the people affected should be compensated accordingly.

XIII. SUGGESTIONS

Taking into account the level of industrialization in the area, the fact that complete deindustrialization of the region cannot be assumed. But the village has the potential to become one of the progressive industrialized regions in the district, if right attention and focus is given to it. The following suggestions have been made in the light of this regard.

- The main challenge faced by the local people of the region is the indiscriminate release of untreated waste into the atmosphere, onto the open lands and water bodies. In this regard the government needs to ensure the installation of efficient industrial waste treatment plants in the region. Industries that release the untreated waste onto the open fields and water bodies should be heavily fined. This would help to restrict the indiscriminate release of waste that pollutes the surroundings of the local region.
- Further government should come up with stricter policies such as making it mandatory for the industries to submit the Environmental Impact Assessment (EIA) reports while applying for their license, so that the setup of industries with maximum impact can be halted even before their establishment.
- Similarly the industries should be forced to provide medical insurances to the people whose health conditions have been adversely affected by the industrial outlets. Moreover the farmers whose crops and their yield has been effected should also be adequately compensated by both the industries and the regional government.
- The farmers who have lost their lands to these industries should be provided with alternative jobs either in the industry or in some government related schemes and organizations.
- Though there has been an improvement in communication and transportation facilities in the region, the area still lacks in certain social infrastructural facilities such as schools and medical facilities. Hence both the government and industries can take an initiative to develop these facilities in the region.
- Further the industries can try to provide certain non-technical jobs for the locally unemployed youth that can help to improve the economic conditions of the people.

Therefore with the cooperation of government and local people, the village can set an example for the other villages that aim to take up the same route for the development, which can help in minimizing the backlash and criticisms for complete industrialization of rural villages, ensuring their progress.

XIV. LIMITATIONS OF STUDY

- The study was done on the basis of convenience sampling which restricts the generalization of the results obtained. In future, research can be done on the subject by random sampling technique by employing people to collect data from different sources. Further the local NGO's can also be involved in the process.
- Due to time restrictions, the study was only restricted to people's perception.

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Annexure I

Questionnaire

1. Name of the respondent
2. Age of the respondent
3. Gender of the respondent
4. Qualification
5. Income per annum
6. Native or migrant
7. Acres of land owned
8. Is respondent the owner of the land or is the land rented?
9. Other sources of income if any?

10. How long have you been in the cultivation business?
11. Types of crops being sown?
    a) Food crops
    b) Commercial crops
12. Production per hectare/acre of the land?
13. Growing seasons in a year (no. of crops grown in a year)?
14. Sources of irrigation of land?
    a) Rain water
    b) River water
    c) Ground water
    d) Any other sources
15. Please evaluate the production of your land for last 50 years?
    a) Increased significantly
    b) Decreased significantly
    c) Remained stagnant
16. What do you think is the main reason for change in the production of your land?
    a) Excess use of fertilizers
    b) Establishment of industries
    c) Drought conditions
    d) Any other reason
17. Is any of your family member employed in the industries established?
    a) Yes
    b) No
18. Do you own any poultry business or rearing any cattles?
    a) Yes
    b) No
19. Do you think the establishment of industries has affected your poultry business? If yes, specify how?
20. Do you agree that industrial development in the area has lead to the infrastructural development?
    a) Yes
    b) No
21. Is there any provision for the industrial waste treatment in the locality?
    a) Yes
    b) No
22. Do you think that the industrial pollution has affected the quality of the crop?
    a) Yes
    b) No
23. Is there any change in the number of labor employed in your farm since 20-30 years?
    a) Increased in number
    b) Decreased significantly
    c) Remained as it is
24. Did your income from the business increase in the past 50 years?
    a) Yes
    b) No
25. Is there any significant change in the demand for the crops in the recent years?
    a) Increased significantly
    b) Decreased significantly
    c) Remained same
26. Is there any change in the value of land since the development of industries in the region?
    a) Price of land has significantly increased.
    b) Price of land has decreased.
    c) Price of land has not changed.
27. Do you think the industries are properly disposing off their industrial waste? If no, specify.
28. What do you think of the quality of ground water?
    a) Quality of water has improved.
    b) Quality of water has deteriorated.
    c) Quality of water has remained unchanged.
29. Do you think the river water is fit for irrigational purpose?
    a) Yes
    b) No
30. Does the river still act as a potential fishing ground?
    a) Yes
    b) No
31. How has the industrial pollution affected the crops?
32. Has there been any effect of pollution on the farmers or the people cultivating the land?
33. Do you agree that people consuming these crops suffer from various types of diseases?
34. Has there been an in or out migration in the region after the establishment of the industries?
35. Do you agree with the fact that lands have become barren because of industrial dumping in the region?
    a) Yes
    b) No
36. Social benefits received by industrial setup? (Yes / No)
    - Better livelihood
    - Better environment

- Improved infrastructural facilities
- Better educational facilities
- Better health facilities
-

37. Do you think the establishment of industrial facilities has fulfilled the promise of providing enough employment opportunities?
    a) Yes
    b) No
38. Have you been provided with any kind of compensation from the industries for the loss? If yes, are you satisfied with the amount?
39. Did the local or state government take the responsibility to reduce the impact of pollution in the region?
40. Have you tried any alternative methods to increase the production of your land?
41. Are you satisfied with the industrial establishment in the region at the cost of the environmental degradation in the region?
42. Are you satisfied with the level of development in the region with the industrial developments?
43. Has industrial development been a boon or bane for the region?
44. Is government providing any incentive/compensation for the loss which has been borne by you? Please specify.
45.Is there any NGO/other body working for environmental protection in the area?
46. What are your expectations/requirements from the government/NGO/other body?