

**A COMMUNITY BASED PHENOMENOLOGICAL  
STUDY ON THE IMPACT OF COAL ASH ON HUMAN  
HEALTH IN SEPPAKKAM VILLAGE, THIRUVALLUR  
DISTRICT, TAMILNADU**

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## **EXECUTIVE SUMMARY**

A community based phenomenological study was undertaken at Seppakkam, Thiruvallur District by doctors at Healthy Energy Initiative - India<sup>1</sup> on request by the community. Seppakkam is a village of approximately 60 homes located in the shadows of the 1000 acre ash pond operated by TANGEDCO owned North Chennai Thermal Power Station (NCTPS). Houses have been invaded by ash slurry from leaking pipelines and seepage from the unlined dykes and residents face extremely high levels of ash in the air as dust. This affects peoples health, contaminates stored water and food and damages clothes, utensils and household goods.

This study was carried out to look into the impacts of coal ash pollution on Ennore Creek and surrounding areas of NCTPS. This study was conducted using an interview guide among seven residents of Seppakkam village selected using purposive sampling.

### **FINDINGS:**

- 1.Residents in the village face severe illnesses due to the presence of the coal ash ponds and thermal power plants in the vicinity.
- 2.Air, water and land has been contaminated by flyash dust and slurry from coal ash pond and this has resulted in the decline of health status among the residents
- 3.Many individuals work in industries around the village bear additional burden of occupational exposure.
- 4.There are no basic facilities such as public transportation, drinking water, schools, health care facilities, in the village or in the 3-5 Km radius., People travel at least 5 to 6 kilometres to access these facilities..
- 5.The prevalence of intense health problems in the region necessitates frequent visits to the doctors. The residents spend major portion of their monthly income on the health related expenditures and often incur financial debts.

### **RECOMMENDATIONS:**

Based on the findings we would recommend the following actions to be undertaken by Tamil Nadu Government and TANGEDCO immediately:

- 1.Relocate the affected residents of Seppakkam to a safe environment in consultation with the community..

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<sup>1</sup> Healthy Energy Initiative - India is a collaboration between Community Environmental Monitoring Programme of The Other Media and Health Care Without Harm

2. Make provisions for health care infrastructure operated by the Government health department at polluters' cost to cater to pollution-impacted Seppakkam residents and factory workers and others in the region.

3. Provide long-term health monitoring by initiating health studies among the residents of villages and workers in and around thermal power plants and ash ponds.

4. Direct all the operational industries to provide protective equipment for all their workers (contract or casual) engaged in handling coal and coal ash within its premises, in order to protect them from occupational hazards.

5. Set up an oversight committee comprising of government officials from various departments (including the pollution control board, health and local administration) and local residents to oversee the time-bound execution and implementation of the above-mentioned recommendations.

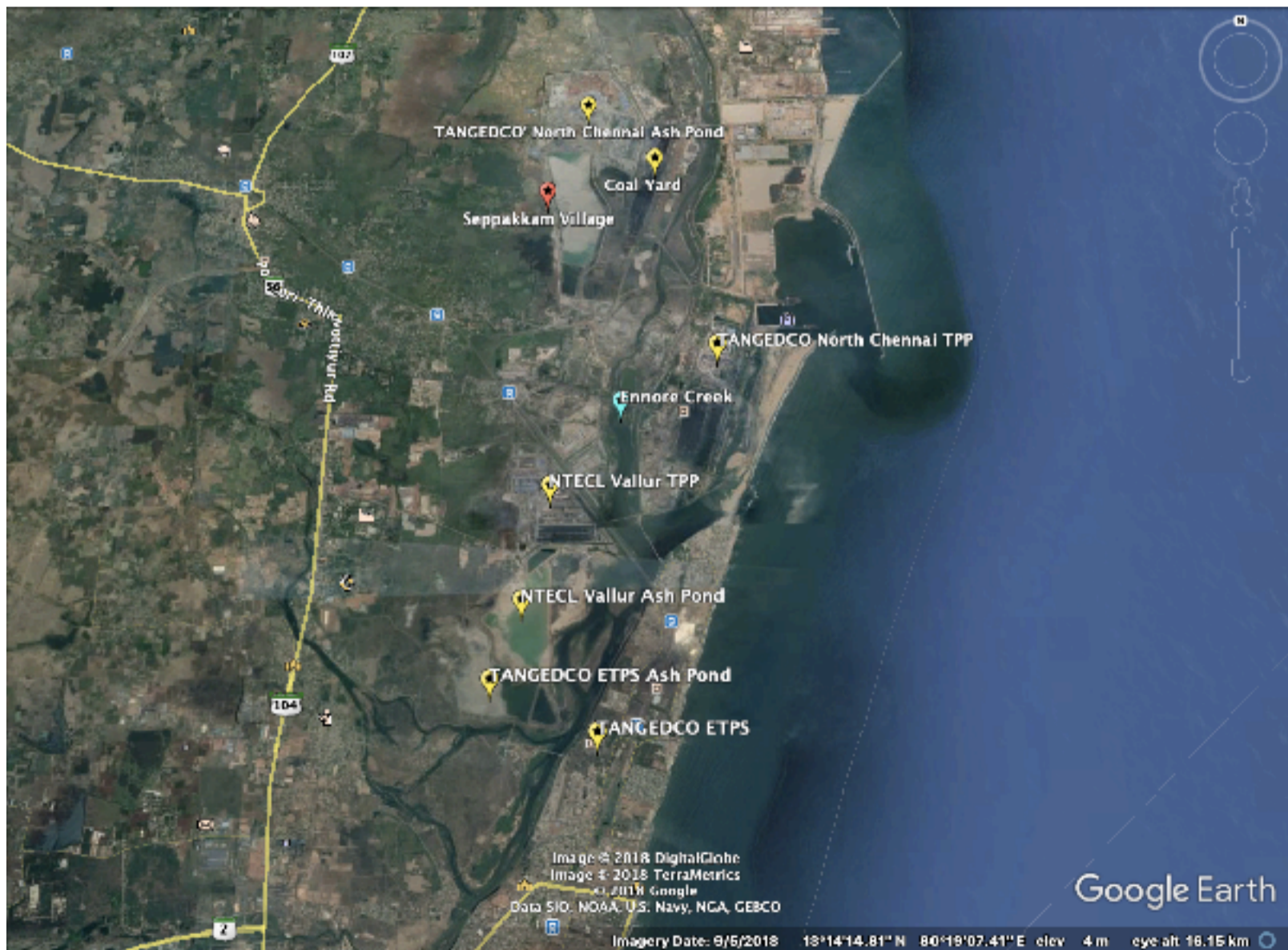
# INTRODUCTION

The Ennore region is home to two operational coal-fired thermal power plants. The plants dispose the coal ash generated as by-product of power generation in large captive coal ash dykes around the vicinity of the power plants. One such coal ash dyke/pond operated by TANGEDCO receives ash from the 1830 MW North Chennai Thermal Power Station. Spread over 1000 acres , this dyke is located in Seppakkam village, Thiruvallur District. Coal ash is pumped through pipelines to the dyke in the form of slurry. Owing to poorly maintained, old pipelines, coal ash slurry has contaminated approximately 344 Ha of land and waterbodies outside the ash pond. Coal Ash contains trace quantities of several toxic heavy metals, and also contains respiratory irritants including silica. Dry coal ash is easily air borne as dust/particulate matter and could contribute to high levels of PM2.5 within the air sheds circulating in the region. As the fly-ash particles are very fine, the individuals can easily inhale it. Fly ash when inhaled is proven to be harmful to human health as its components are known to be carcinogens, neurotoxins and other toxins. Fly ash is found to be the major contributor to PM 2.5 ranging from 15% to 58%. This gets accumulated in the respiratory pathway and reach till the lungs and causes respiratory distress and other systemic illnesses when absorbed in the blood stream.

The following study is a '*Phenomenological Study*' conducted using *In-Depth Interview*. The depth of the interview makes up for the small sample size of interviewees. Phenomenology is a qualitative research method that is used to describe how human beings experience a certain phenomenon. A **phenomenological study** attempts to set aside biases and preconceived assumptions about human experiences, feelings, and responses to a particular situation.



Map Showing Location of Seppakkam Village  
 Source : Google Earth



Map Showing Location of all Coal Fired Thermal Power Plans and Ash Ponds in the Ennore region  
 Source : Google Earth

# METHODOLOGY

## Study Design:

A community based phenomenological study using *In-Depth Interview* (IDI) was carried out in Seppakkam. Respondents were residents aged above 18 years. The individuals with history of tobacco use (smoking and/or smokeless) and alcohol consumption were excluded from the study. IDI was conducted among seven individuals residing in Seppakkam village using an interview guide (Annexure I). The study participants were selected using purposive sampling. The respondents were identified and their verbal informed consent for participation obtained. The timing of the interviews ranged between 25 minutes to 45 minutes at a place comfortable for them. The recordings of the IDIs were then transcribed and important themes and statements were derived. The data collection was done for over a period of one month. Independent variables such as age, gender, education, occupation, personal history, medical history, duration of stay in the village, source of water and type of cooking fuel were collected in addition to the interview



*View of Homes Flooded by Ash Slurry from NCTPS .  
Photo : Rathnavel Pandian*

## Study sample:

Present population of Seppakkam village is approximately 170 individuals and of them 7 individuals were selected using purposive sampling. A Limitation to sample selection was that all 7 participants were women as the study was conducted during weekdays. Male participants were difficult to identify as majority of them were employed and unavailable in the village during day-time

## Ethical Considerations:

The study was carried out on request by the residents of Seppakkam Village, Thiruvallur District, Tamilnadu

## RESULTS AND ANALYSIS

### Air:

After TANGEDCO acquired farmlands and salt farms for the construction of the ash pond, the residents of Seppakkam have witnessed a dramatic transformation to the landscape. Large parts of the residential area is now perpetually inundated by coal ash dust and ash slurry leakages from the pipelines.



*Ash Carrying Lorries Leaving a Dusty Trail  
Photo : Vishvaja Sambath*

Interviewees expressed the changes that have brought the transformation of the village from a scenic place to a toxic place over the decades:

“The village was very nice until the coal ash pond construction started. Later on, the coal ash started coming into the village” (Respondent 1),

“Earlier we used to farm on this land but now we are not able to grow a single plant because of the impure soil” (Respondent 1),

“We used to grow crops here and use the produced crops for consumption. But now the entire cultivable land has turned into coal ash pond” (Respondent 4)

“We used to cultivate crops here for 6 months a year and rest 6 months we will be free. The water used to taste like coconut water and use for all purposes from drinking to feeding our cattle. Now after these people from electricity board came everything in this village has spoiled” (Respondent 5).

The fly ash from the ash pond and the dusts from trucks carrying coal ash get carried in the wind and causes ambient air contamination. As a result many residents complain of respiratory problems:

“I get breathlessness regularly and my two children (boys) fall sick frequently because of the pollution in the village. Often their eyes become reddened with irritation and they get skin allergies on hands and legs” (Respondent 1);

“My sons are getting skin diseases. These skin problems do not get cured easily. Kids are the ones who go and play out in the contaminated soil and hence, kids in the village usually get sick” (Respondent 3);

“Almost every month we visit a doctor because of our ailments” (Respondent 1),



*Skin lesions on Children and Adults  
due to exposure to ash  
contaminated soil in the area  
Photo : Vishvaja Sambath*



“If we dry anything outside it will get covered with ash and dust in no time. If we go and stand on the road for even a short while, we will get covered with ash and dust” (Respondent 3);

and “The trucks carrying fly ash from the coal ash pond originates from here and these trucks pass by our village round the clock resulting in constant dust pollution” (Respondent 1).

## **Water:**

Residents of Seppakkam spend a large portion of their income on buying potable drinking water. The water supplied through the local Panchayat pipelines was unpalatable as they are contaminated with the coal ash slurry. Hence, families buy bottled water in cans for drinking, cooking and other essential day-to-day activities: “The water we get in corporation pipelines is salty. So we get bottled water for drinking purpose” (Respondent 1); “

“We get water from local panchayat tap. The water tastes bad, it is salty. We use that water for basic household needs like cleaning but not for drinking purposes. For drinking purposes we buy bottled water from outside” (Respondent 2),



*Coal Ash Slurry Pipelines leaking ash slurry in Seppakkam Village  
Photo : Vishvaja Sambath*

“We spend anything between Rs 500 to Rs 1000 on water every month. We use the bottled water for boiling milk or cooking pulses. If we use the corporation water for boiling milk, it will get spoiled and the pulses will not get cooked. We use at least one can of water per day” (Respondent 3) and

“If I use this water for boiling vegetables and cereals, they won’t get cooked. So for boiling those, I use canned water” (Respondent 4).

The respondents also shared their concerns over the erratic water supply through the local panchayat pipelines. They depend on the this water for their basic daily activities of washing and cleaning:

“The local panchayat water is supplied once in three days. Both men and women go to fetch water for our household needs” (Respondent 2).

The residents also get injured because of the spillage of ash slurry from the pipeline: “Hot water along with coal ash leaks from the pipelines nearby.. This slurry water even affects our houses” (Respondent 1).

The residents also face dermatological problems in using corporation water for their domestic purposes: “If we wash our face with local panchayat water, it becomes dry and white spots start appearing on the skin. I get frequent boils (like pimples) on skin because of the water” (Respondent 2 and 6).

## Seasonal variations:

In addition to the perpetual pollution throughout the year, the seasonal variations pose serious threats to the residents in the village:

“During winter season, the visibility is very poor due to air pollution. In rainy season, water stagnates nesting all sorts of insects and snakes” (Respondent 2),

“During winter our respiratory and skin problems increases” (Respondent 3)

“In rainy season, water will stagnate till knee level and get mixed with bund (ash slurry water) water. Kids will see fishes in bund water, get excited and few kids have fallen inside that bund water” (Respondent 6).



*Coal Ash dust suspended in the air reduces visibility in the area  
Photo : Vishvaja Sambath*

## Occupational hazard:

The individuals in the community are employed in the industries located around the village. People who work in the industries are additionally exposed to the pollutants at their workplace. The additional burden experienced by the employed individuals was described by their spouses in the interviews:

“My husband used to work in a coal company (Chettinad Coal Company). Currently he is unemployed and looking for another job. He left his job at the coal company because he used to get chronic stomach pain. When we consulted the doctor, they asked him to get scan done and to intake more fibrous food. Doctors said that there were black deposits inside his stomach. Fearing ill-health he left the job. His stomach pains have stopped after he quit” (Respondent 1).

“He (respondent’s husband) is working in Chettinad Coal Yard. He works there in fire extinguisher division. “My husband gets stomach pain frequently and on consulting doctor for the same, doctor told it may be because of the work my husband is doing” (Respondent 3).

## Basic amenities:

The residents travel a minimum of 5 - 6 km to avail basic amenities like drinking water, schools, transportation, health care facilities, markets etc.

“We don’t have any basic facilities such as water supply, transport facility, school or hospitals here. And few emergency medical cases have died before reaching health care centers” (Respondent 1);

“We go to Minjur, which is about 5-6 kms from here, for accessing our basic facilities and we rarely go to Athipattu. Even for grocery shopping we have to go to Minjur. People who have bike do not face a problem to access facilities but people who don’t have vehicles suffer a lot” (Respondent 3)

“In this village the maximum educational qualification of a person is only up to 10<sup>th</sup> standard, because if they have to proceed with higher studies they will have to travel far for which there is no transportation facilities as of now. If someone gets fever, we have to look for a private transport or seek favors from anyone who has a bike to take the patient to the hospital” (Respondent 2).



*View of an abandoned house in Seppakkam Village  
Photo : Rathnavel Pandian*



*There is a lack of basic facilities like roads and housing in Seppakkam  
Photo : Vishvaja Sambath*

This has clearly added to the stress of the people in addition to the pollution and related illnesses. They find it challenging at the time of emergencies: “We do not have any health facility in our village; either we have to go to Athipattu or Minjur. In Athipattu, Doctor will be available only till 12 pm in outpatients department. So we prefer to go to Minjur, which is approximately 5 to 6 kms away from Seppakkam. And, if someone has an emergency we have to wait until a person with vehicle is available” (Respondent 1).

## Financial burden:

Pollution, lack of basic facilities and pollution-related illness has left the people with the burden of financial crisis. People spend a major portion of their monthly income on health expenditures in order to deal with the health problems due to pollution.

“We visit a doctor at least once a month and for each visit we spend around 200 rupees for travel alone, which is in addition to doctor’s consultation and medications” (Respondent 1)

“We visit the doctor quite frequently and every visit, we spend around 700 to 800 rupees. Apart from this, we spend on petrol for the vehicle, so altogether we spend around 1000 rupees per visit. We scrape along and manage finances for the medical expenses. At times we keep our jewels in pawn shop and get money for medical expenses” (Respondent 4).



*Living in the shadows of the power plant has made life difficult for the residents of Seppakkam*

Consequently, people are left with empty accounts and debts:

“We make around 7000 to 8000 rupees as wages every month, and that too if he (husband) goes to work regularly without taking leaves of absence. If he takes leave due to any illness like fever, headache, etc., they will not pay us wages for that day. So whatever we earn goes mainly on buying drinking water and paying for hospital expenses” (Respondent 3)

“We all have bank accounts but it is empty. There is no way for us to save any money” (Respondent 4);

“My family gets money from rearing cows. That money is entirely spent for water and medicines. It is very difficult for us to survive here” (Respondent 2).

## Demands by the people:

Residents of Seppakkam feel destitute and completely neglected by the government. Their lives have been severely affected by the thermal power plants and the associated coal ash ponds in the region: “We have gone to the Collector. News channels and all have come here. They have taken interviews from us but nothing has happened” (Respondent 1). Their main demand to the government is relocation of their settlement to a better place: “Either the TNEB should not be here dumping the ash or they must give us some other place to live” (Respondent 4). “I want our village to be relocated. If you ask anyone in this

village, they will say the same because we have suffered a lot here. While the trucks pass by, the entire house vibrates a lot. We are not able to live or do anything here” (Respondent 3).

## **CONCLUSION**

The interviews conducted with Seppakkam residents revealed the problems and illnesses faced by the community due to the presence of TANGEDCO coal based thermal power plants and coal ash pond near the village. It has been concluded that air, water and land had been severely polluted because of the flyash dust and ash slurry from NCTPS’s ash pond. A visible decline in health status has been reported by the residents. Individuals employed in the industries around the village bear additional burden of occupational exposure.

There are no basic facilities such as transportation, drinking water, schools, health care facilities, in the village or nearby. Hence, if people have to access the facilities, they have to travel at least 5 to 6 kilometres out of the village. The prevalence of intense health problems in the region necessitates a minimum of one visit a month to the doctors. Consequently, residents spend major portion of their monthly income on health related expenditures and often incur financial debt.

To sum up, the lives and properties of the residents in Seppakkam can certainly be protected by quick and just relocation in consultation and to the satisfaction of the affected families

## **RECOMMENDATIONS**

Based on the above findings and observations, it is recommended that the Tamil Nadu Government should immediately:

1. Relocate the affected residents of Seppakkam to a safe environment in consultation with and satisfaction of present residents.
2. Make provisions for health care infrastructure operated by the Government health department at polluters' cost to cater to pollution-impacted Seppakkam residents and factory workers and others in the region.
3. Provide long-term health monitoring by initiating health studies among the residents of villages and workers in and around thermal power plants and ash ponds.
4. Direct all the operational industries to provide protective equipment for all their workers (contract or casual) engaged in handling coal and coal ash within its premises, in order to protect them from occupational hazards.
5. Direct TNPCB to ensure compliance of all environmental license conditions of the TANGEDCO owned and operated NCTPS.
6. Set up an oversight committee comprising of government officials from various departments (including the pollution control board, health and local administration) and local residents from various villages to oversee the time-bound execution and implementation of the above-mentioned recommendations.

# ANNEXURE 1

## Interview guide for In-Depth Interview

### **Introduction:**

I am Dr. Vishvaja Sambath, MPH Trainee. I am here to conduct In-Depth Interview with you on the topic "Impact of fly ash from TANGEDCO coal ash pond on health status of the residents of Seppakkam Village, North Chennai – A community based qualitative study". We will be discussing on the above mentioned topic for a maximum period of one hour. For the reliability of the finding audio and video recording of the interview will be taken for the purpose of analysis. This recording is a part of the In-Depth Interview. I will be having the record for a period of three years. Through this study we will be able to know the health status of the individuals residing near coal ash pond of TANGEDCO. Through which the policy makers can make strategies to improve the health status and air quality of the locality.

Are you willing to participate in this study? If so, can you please sign the consent form? You can also withdraw from the study whenever you feel to do so.

Socio-demography: 1)                      2)                      3)                      4)

### **Questions to be discussed:**

1. What is your perception about the TANGEDCO coal ash pond in your village?
2. What are the challenges you are facing due to the fly ash?
  - a. What are the common health problems do you experience?
  - b. Had anyone in the village experienced severe health problems due to the pollution?
  - c. Is there any health facility near the village and the accessibility to it?
  - d. What are the health care services available in the health facility?
  - e. How much do you spend for your health care?
  - f. What do you think about your health status? Do you have any illnesses?
  - g. How frequently do you fall sick?
  - h. When did you fall sick last time?
  - i. What are the effects you face during seasonal variations?
  - j. What do you suggest to be done to improve the air quality and health status of you?

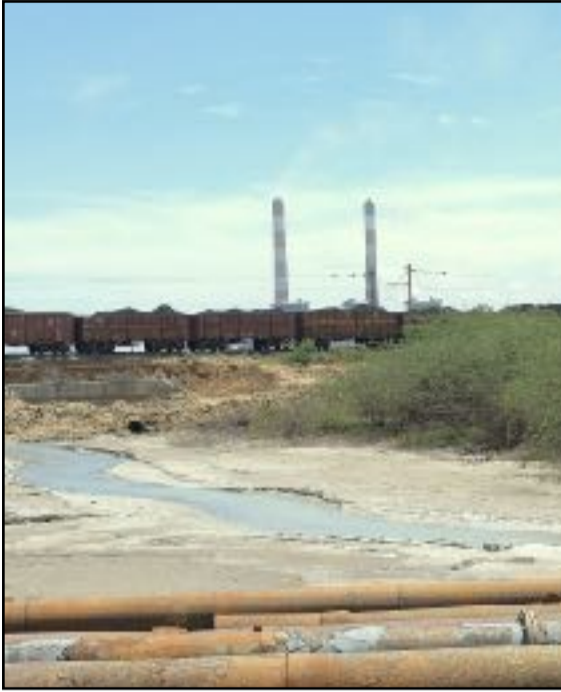
### **Probes:**

- a. Can you give me an example?
- b. Would you explain that further?
- c. Is there anything else that you feel you want to add?
- d. In terms of timeline probes - before power plant or after power plant etc.

### **Conclusion:**

Thank you for spending your precious time with me for this In-Depth Interview. This recording will be with me confidentially for a period of three years. I will be transcribing the audio recordings and use it for the analysis. Once again thank you for your contribution.

Have a good day



**“Visiting the doctor has become a monthly routine”  
- Resident, Aged 28**



**“We all have bank accounts, but they are always empty. There is no way to save money living here.”  
- Resident, Aged 36**

**“Either TANGEDCO has to leave this place, or we have to leave this place.”  
- Resident, Aged 28**

