

**Health Problem in Tegal Taman Village
Near Indramayu Coal Power Plant I**



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Introduction

Air pollution is a big risk for health, ranked as number 4 after high blood pressure, dietary and smoking risk globally. Estimated, there are 6.5 million premature death due o air pollution.¹ Fine particle is the most dangerous along with sulfur dioxide, nitrogen oxide and above ground ozone that causing several illness.

Coal power plant is one of sources of these pollutants. This publication is exploring health problem related to air pollution in Tegal Taman Village, Indramayu District, West Java Province.

Near from Tegal Taman Village, less that 4 km eastward, exists Indramayu Coal Power Plant I. It has been in operation phase since 2010. Project construction started year 2007 by a consortium of China National Machinery Industry Corp (SINOMACH), China National Electric Equipment Corp (CNEEC) and PT. Penta Adi Samudra. The coal power plant is using low rank coal.

Financing for this project come from Consortium of China Construction Bank, PLN (Indonesia's state owned electric utility), and Indonesians bank. Indramayu Coal Power Plant I, located in previously active as 83 hectares agriculture land. Coal power plant has capacity 3x330 megawatt (MW).

Next to the existing coal power plant, another coal power plant with capacity 1000 MW is in the planning process, supported financially by JICA Japan.

¹ IEA, 2016, Energy and Air Pollution,

Air pollution and Coal Power Plant

Modern life can not be separated from electricity that used for charging laptop, refrigerator, television, to hair dryer. If a 2000 MW coal power plant burns a millions kilogram per hour of 4% ash coal, it would produce 40,000 kg dust per hour. Some would be captured by dust handling system, and some emitted along with gaseous substances from furnace. If 50% dust fly into stack, and ash fly collection with 99% efficiency, 200 kg dust every hour will be released into the air.²

Therefore, Indramayu Coal Power Plant I with capacity 990 MW (3 x 330 MW), approximately released at least 99 kg dust per hour.

Air pollutants from coal power plant mainly are SO_x, NO_x, particulate matter and mercury. Indonesia has weaker standard on air pollution compared to WHO standard. Indonesia regulate ambient air quality under Government Regulation No 41 Year 1999 on Air Pollution Control.

No	Parameter	Monitoring Duration	Indonesia Quality Standard (µg/Nm ³)	WHO
1	SO ₂	1 hour	900	-
		24 hour	365	20
		1 year	60	-
2	NO ₂	1 hour	400	-
		24 hour	150	50
		1 year	100	20
3	PM ₁₀	1 hour		-
		24 hour	150	50
		1 year		20
4	PM _{2.5}	1 hour		-
		24 hour	65	25
		1 year	15	10

² Daniel A Valero, 2008, Fundamental Air Pollution, 4th edition

Appendix of Environmental Ministry Regulation No 12 Year 2010 on Regional Air Pollution Control Implementation stated that:

Air pollution can cause health disturbances at different level and variation, depend on its kind, size, and chemistry composition. Health disturbance mainly occurred on physiology of body organ such as lung and blood vessel, irrigation on skin and eyes.

Air pollution due to dust usually causing respiratory illness such as bronchitis, asthma, lung cancer. Meanwhile pollutants gaseous dissolved in air could penetrate into lung and absorbed into blood vessel.³

Damage to health can arise from both short-term (a few hours or days) and long term (over months or years) exposure to air pollution. Particulate matter is linked to lung cancer, chronic obstructive pulmonary disease and heart disease. Air pollution can also contribute to low birth weight, tuberculosis, cataracts and throat cancers.⁴

Population of Tegal Taman Village

One of the village close to Indramayu Coal Power Plant is Tegal Taman Village. Number of population is 6,033 population (2015).⁵ Occupation in Tegal Taman Village are paddy rice field peasants, fishery folks, goat herding. In this communities, 76.9% categorized as poor family.⁶ Therefore, additional cost living such as health cost instantly become significant burden for family economy. Sickness on children in their early live contribute to worsening healthy condition for the next generation.

Living as migrant worker abroad practiced by many of villager to support family living.

³ Appendix I Environmental Ministry Regulation No 12 Year 2010 on Implementation of Regional Air Pollution Control

⁴ IEA, 2016, Energy and Air Pollution

⁵ BPS, 2015, Kabupaten Indramayu Dalam Angka 2015

⁶ L.S. Hasibuan, 2008, Poverty Spatial Pattern in Indramayu, IPB,



Photo 1 Drying fish catchment in community house yard.



Foto 2 Citizen with their goat.

Tegal Taman Location

Tegal Taman Village located in Sukra Sub district, Indramayu district, West Java Province, in north coast of Java Island.





Tegal Taman Village stretching from south to north, in less than 3.5 kilometer to Indramayu Coal Power Plant I. Coal power plant located in the east direction of the village. Therefore, when wind come from east to the west, pollution will fly to the direction of Tegal Taman Village.

Field Observation

In July 2017, activist from AEER (Ecological Action and People Emancipation) and West Java WALHI conducted field observation on community health related to air pollution. This observation trough interview and discussion with member of families which their children had experienced health problem. Observation conducted in three of blocks of Tegal Taman Village (Melandong, Tempel, and Mesjid).

We met 25 people which their family member has health problem related to respiratory system. We profile in this report 21 cases that have illness related to air pollution.

Generally, community explained that health condition has been worsening since the existence of coal power plant. “Before the existence of coal power plant, if our children got health problem, usually can get recover by just using medicine from *warung* (street shop). Nowadays we must send our children to hospital because suffer a prolong of sickness. Children here mainly suffered of lung spots,” Muntaman (single world name is common in Indonesia), a community member explained. Main source of air pollution in their neighborhood coal power plant (less than 3 kilometer). Several community members practiced open burning of their domestic waste. But health problem never before as bad as since the existence of the coal power plant, community explained.

Interview with Community

We did interviews and discussion in two different blocs of villages, located in Tempel Block and Masjid Block. And we did follow up discussion by coming home to home assisted by local contacts. All of community that we met has their children that passed thorax photo/roentgen, and received medical treatment in hospital. As air pollution also impacted other vulnerable group besides children such as elder people, people with heart and lung illness, our discussion in Tegal Taman also involving these groups.

Here the resume of of interview with communities:

1. Daryi (mother, 37 years old), has daughter, Rastinih (8 years old). Her daughter suffered asthma, lung spots since 3 years old, she. *“The impact of coal power plant we feel is dust and smog almost every day. My first child born and passed toddler age before the existence of power plant was healthy. We suspect coal power plant causing illness to my child. During 6 month I spent IDR 200,000 money for medical check up of my child. After that that, continue during one year and every doctor visit, cost me IDR 150,000.”*
2. Rasini (mother, 40 years old), has daughter, Silvi (9 years old). Her daughter started ill, coughing, fever, and convulsed at one years old,. *“What we know since the existence of coal power plant, dust or smog come out from coal power plant, therefore we feel difficult to take breath, and children coughing. We felt smog or dust in the morning and day time. Last month I still bring my child to doctor because coughing and fever. During 8 months I spent IDR 300,000. And after that I spent IDR 200,000 for medical check.”*

3. Kuripah (mother, 42 years old), has son, Giva Adi Mubarok (11 years old). *"Sometimes he still coughing and ill. He started suffered illness since five years old, coughing and fever. After the existence of coal power plant I feel the environment become hot, often time dusty and smog come from coal power plant. Before the existence of coal power plant, children were seldom got coughing."* During 9 months she took routinely her boy to hospital and every medical check cost her IDR 150,000.
4. Sartiyem (mother, 36 years old), has son, Muhammad Aliyudin, (7 years old). Started ill since two years old. Muhammad is her second child. *"My child has lung spots. I brought my child to doctor Ratnawati and child specialist doctor Tuty. In the last check up, it costs me IDR 150,000. Now he still suffers fever. I think this is because of the activity of coal power plant because my first child never got illness like this. Besides, we often saw dust in my terrace, and made us difficult to take breadth. And I also see coconut tree died. We feel the differences before and after coal power plant existence."*
5. Rowiti (mother, 27 years old), has daughter Revalina (6 years old). Her daughter diagnosed with lung spot at 4 years old. Only in last one year got recovered, although some times fell ill, like coughing. At the first doctor visit, cost her IDR 200,000. Then IDR 170,000 during six months. *"Since the existence of coal power plant, many children suffer lung spots. We see dust and smog from coal power plant, and it fell into our neighbour. If wind fly to the our village direction from coal power plants, our home are dusty."*
6. Samerih (mother, 36 years old), has son, Mushab Akbar Ilmani (8 years old). Her son suffered difficulties to breathing, and in 2013 took photo thorax/roentgen, later diagnosed with lung spots. During one year must received medical treatment routinely. In the first month, cost her IDR 300,000. And afterward, IDR 200,000. *"After the existence of coal power plant, illness frequently occur on children. Not just children, but also on elderly. We think this is because of coal power plant. Before the existence of coal power plant, there is no illness such these in the community. Now children and elder people coughing."*
7. Eti Ekasari (mother, 41 years old), has son, Dimas Supriatna (3 years old). At one year old, he suffered coughing, difficulties to breath. *"I always bring my child to doctor once a month, with cost IDR 50,000. Since the existence of coal power plant,*

we feel its effect, dust and smog that always fell into onto our neighbourhood, and our house.”

8. Kusniah (grandmother, 40 years old), has grandson, Khiar Syahrul Ramdhan (2 years old). Her grandson suffers coughing, breathing difficulties, and fever. *“I brought him to doctor Tuty, and diagnosed with lung spots. Doctor verbally said it was due to my home close to coal power plant. For medical check up, it cost me IDR 250,000. After the existence of coal power plant, my home dusty, and not easy to breath the air, many coconut trees died.”*
9. Eti Carwati (mother, 35 years old), has boy, Bintang Tri Ananda (2.5 years old). When he was 14 months, he suffered coughing, fever, thin, breathing difficulties. *“We brought our son routinely during one year to Dr. Guntur’s clinic.... We feel air more polluted. Smog come out from chimney in night time.”*
10. Rasminah (mother, 42 years old), has son, Farhatun Rosidaeni (2.5 years old). Doctor diagnosed him with lung spots. Every medical treatment cost her IDR 200,000. She has brought her boy to doctor 8 times. *“Air pollution in the form of smog and dust often time emitted day and night. We feel it, sometimes our terrace dusty.”*
11. Casyanti Usia (mother, 24 years old), has son, Maheza (2 years old). He diagnosed with lung spots when he was 7 months old. Hospitalised three days at Kasih Ibu Clinic, Pamanukan city. *“Before the existence of coal power plant, there were no children with lung spots. Since the existence of coal power plant, weather more hot, dusty, noisy. I saw often time in day time coal power plant emits smog. It depends on wind direction, when it fly to our village direction from coal power plant, we can feel dust.”* Medical treatment cost her IDR 100,000.
12. Oom Komariah (mother, 38 years old), has boy Akbar Maulana (1 year old). Her child suffered illness since four months old (coughing, cold).
13. Tarini (grandmother, 65 years old), has grandson, Silo Abdul Rohman (3 years old). He suffered illness (coughing, breathing difficulty, itchy) since 10 months old. She brought him to doctor once a month, each visit cost her IDR 60,000-100,000. *“After the existence of coal power plant, I feel many community, children got illness. Sometimes we smell odour released by coal power plant. Smog and dust emitted day and nigh, and our terrace dusty.”*

14. Tarinah (mother, 37 years old), has daughter, Talita (2 years old). *“My child diagnosed with lung spots since 18 months old. I brought her to Doctor Ifan, and he said that my child has lung spots. Its causes can be dust or smog. I paid IDR 200,000 for every medical treatment. Now my child still suffering of fever and coughing, sometimes convulsed, and her weight does not increasing. Before the existence of coal power plant, I feel comfortable, because children free from lung spots. Pollution from coal power plant make me difficult to breath, and sometimes feel dizzy with sharp odour.”*
15. Tasimah (mother, 23 years old), has son Adi Mulyono (4 years old). Her son got illness since 3 years old (coughing, breath difficulties). *“Doctor said my child has lung spots...doctor asked to put my child away from everything smoky. Last time medical treatment cost me IDR 200,000. Before the existence of coal power plant, community burn domestic waste in yard, and there was brick maker activities. But our children never suffered lung spots. Now, after the existence of coal power plant, very large number our community members suffer lung spots, especially children. I feel breathing difficulties since the existence of coal power plant.”*
16. Ingkem (mother, 25 years old), has daughter Delisa Lestari (two years old). Doctor checked up her daughter when one year and two months old, diagnosed with lung spots. Every visiting doctor cost her IDR 200,000. *“Now my child still drink medicine because coughing and breathing difficulties. Her weight can not increases, and become thinner. Before the existence of coal power plant, our children did not suffer breathing difficulties and lung spots.”*
17. Eki (woman, 23 years old), has daughter Serlin Measya (1,5 years old). *“This months she got sick and doctor Ratna diagnosed her with lung spots. Her weight does not increasing.”*
18. Tania (girl, 3 years old). Interview conducted with her grandmother. (Her mother living abroad as migrant worker).
Got respiratory illness when 4 months old. Doctor diagnosed she has lung spots based on thorax photo (roentgen). Until now she suffers shortness of breath. Family covers all medial treatment cost. For blood test, they paid IDR 350,000. Hospitalized four days, costed them IDR 1,200,000 . Sickness recurrence when she was 2 years old and again took thorax photo/roentgen.

19. Mas Amah (grandmother, 43 years old), has son Fardan (5 years 6 month, boy). Fardan got medical treatment for 6 month. Coughing, and vomiting. Based on thorax photo/roentgen, medical doctor diagnosed him suffers lung spots. Every time visiting doctor the family spent IDR 150,000
20. Muntaman (mother 35 years old), has son, Faqih Ari Zamzami (16 month). He is still in sick condition (fever) during interview. After taking thorax photo/roentgen, medical doctor diagnosed him with lung spots. Roentgen cost IDR 100,000. For the first medical treatment paid IDR 275.000, And for the next medical treatments cost her in average IDR 200,000
21. Hasiroh (35 years old, woman). She is in tremor contition, and doctor diagnosed her with narrowing heart vein. She has been in ill condition for three years, and medical treatment has cost her IDR 1.800.000.



Foto 3 Mothers showed thorax photo/roentgen of their children that suffered respiratory system illness.



Photo 4 A Mother showed thorax photo/roentgen of her children (1)

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Photo 5 A Mother showed thorax photo/roentgen of her children (2)



Photo 6 Moms and their children with respiratory system illness.

Illness related to air pollution

Generally, community have their children took thorax photo/roentgen and diagnosed by medical doctor with lung spots. According to government institution on public health, lung spots is “abnormally appearance of lung based on thorax photo/roentgen that caused by several matters, such as: air pollution, smoking, tuberculosis, lung inflammatory, etc.”⁷

Field observation also found children that suffered bronchitis. This illness caused by bronchial inflammatory. Bronchial is pathways of air into and out from lungs.

Discussion

By visiting community member during there days from 15.00 clock to 17.00 o'clock adjusted to the community's time availability, we had discussion and interview 25 family, and we selected 21 cases of member of family suffer respiratory system illness and had hospitalized. Doctor made their diagnoses based on photo thorax/roentgen, and some of them also based on blood test.

⁷ Direktorat General Illness and Sanitation Control, Health Department of Republic of Indonesia, 2009

The number of cases is significant taking account Tegal Taman is a coastal rural area, not exposed closely to air pollution from road system transportation. The main source of air pollution close to the community houses (less than 3 km) is Indramayu Coal Power Plant I.

Although community practice burning their domestic waste in community neighborhood yard, this practice has been conducted for generations. Community explained that the number and the respiratory illness in community has been higher since PLTU Indramayu I started its operation in 2010. When moms compared the health situation of their elder children that born and passed their toddler age before the existence of coal power plant, moms have opinion that their older children have better health conditions.

Medical cost is a significant burden for Tegal Taman rural communities. Taking account, based on a research, this village is one of poor family spots in Indramayu⁸. One of the solution to tackle the poverty common in the community is one of member family to work as migrant worker abroad. Therefore, government that has priority to reduce poverty and inequality should consider solutions to mitigate effect of air pollution in Tegal Taman.

Suggestion and Recommendation

1. PLTU Indramayu I should apply the best available technology to reduce air pollution.
2. Government to ensure monitoring air pollution not to reach index that harmful for community health
3. Government and Indramayu Coal Power Plant I to set air pollution monitor equipment, and its result should be open to community periodically (daily, monthly) according to the monitor standard.
4. Coal Power Plant Indramayu and Government should giving free medical facility and treatment for community on respiratory illness related to air pollution.
5. Government and Coal Power Plant Indramayu should do cohort study for at least 5 years to assess community health related to air pollution from coal power plant.
6. Government and PLN should reconsider and cancel the building of new coal power plant (Indramayu Coal Power Plant II) to avoid more air pollution load to the ambient air in Tegal Taman.

⁸ L.S. Hasibuan, 2008. Poverty Spatial Pattern in Indramayu, IPB

7. Tegal Taman Village, Sukra Sub District, and Indramayu District Administration should do measure to stop or minimalized open burning waste in their neighborhood.

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