

*Project Brief*

# SAHIWAL COAL-FIRED POWER PROJECT

RURAL DEVELOPMENT POLICY INSTITUTE

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## INTRODUCTION

As the 76<sup>th</sup> session of United Nations General Assembly commenced in New York, China announced its pledge to extend support to green and low carbon energy projects and end building coal-fired power projects abroad.<sup>1</sup> This was the most-awaited announcement from one of the world's largest greenhouse gases (GHGs) emitter. However, the power projects it has undertaken in the recent past in Pakistan are nothing more than a story of environmental disaster. Sahiwal Coal-fired Power Project is one of the projects initiated under the China Pakistan Economic Corridor (CPEC), which has an installed capacity of the 1320 MW and located amid the heart of agricultural plains of Punjab, in the proximity of Sahiwal city. The project is operational since 2017 providing 6%<sup>2</sup> of the electricity supply in the country. However, for the locals, the project has not been a good tide since its inception — and for the right reasons.

First, the locals were forced to sell their productive agricultural land. They were then not appropriately compensated for their land that was bought from them. Making things worse, whoever resisted were taken by the police and cases of terrorisms were filed against them. After the locals gave up their traditional source of livelihoods — their land, their traditional routes to the markets, hospitals, schools and colleges were impacted. Then, again when they protested for retention of their familiar roads and routes, they were put up in jails with terrorism charges laid against them. The list continues with the horrendous environmental and public health concerns, along with a severe impact on the water quality and availability in the area.

Furthermore, the power plant is misleadingly hailed as being 'eco-friendly'<sup>3</sup>, due to the use of advanced technologies that only minimally reduce the GHG emissions. What is not being brought to light is that the plant, which is built using supercritical technology<sup>1</sup>, only scarcely reduces the carbon footprint and that too only compared to a traditional coal power plant - the worse pollutants in energy sector. Even if a coal-fired power plant has supercritical technology, it is only around 11% more efficient than a traditional coal power plant which has thermal efficiency of around 33%.<sup>4</sup> Hence, relying on a fuel which produces carbon footprint at a less or high magnitude and causes severe adverse impacts on the environment, is not a

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<sup>1</sup> In **supercritical plants**, the water running through works as a supercritical fluid, meaning it is neither a liquid nor a gas. This occurs when water reaches its critical point under high pressures and temperatures, specifically at 22 MPa and 374°C. A supercritical plant decreases waste heat by 25% and reduces emissions by around the same amount. [https://energyeducation.ca/encyclopedia/Supercritical\\_coal\\_plant](https://energyeducation.ca/encyclopedia/Supercritical_coal_plant)

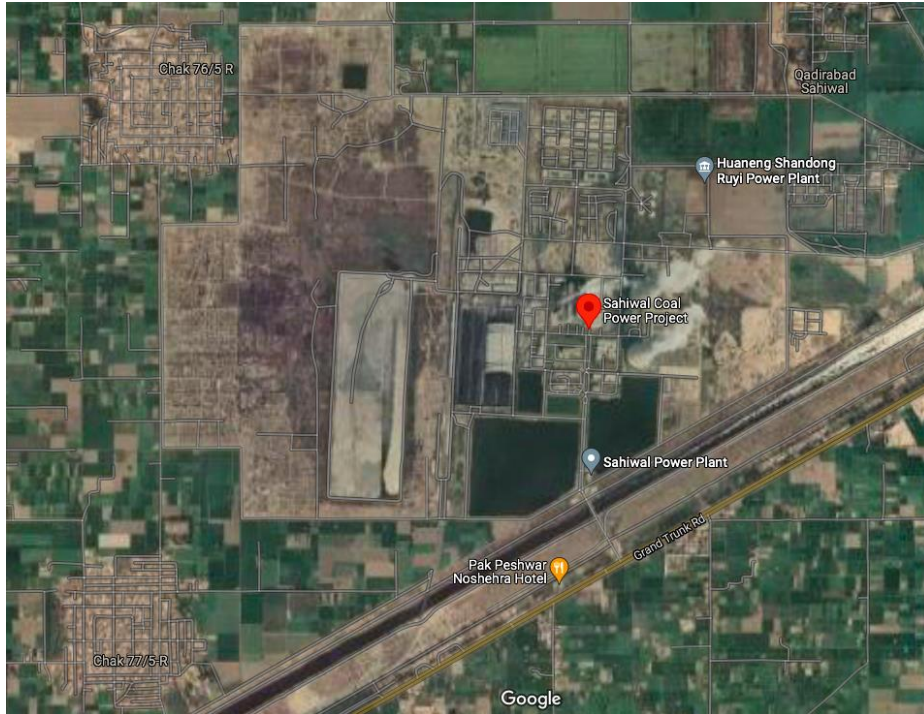
better alternative to available clean energy solutions such as wind and solar, which are also economically more feasible.

The emissions profile of the power plant also remains a mystery, which raises more questions about the plant being 'eco-friendly'. The company claims<sup>5</sup> that it has engaged a third-party environmental assessment consultancy, which takes readings on emissions on recurrent basis. The data was also claimed to be submitted with Environment Protection Department (EPD) of the Punjab government, to be made public. However, neither such information is available as public data on EPD website nor there is any official website of the power plant where this information could be found.

It has also been learnt that the company signed a Corporate Social Responsibility agreement and a technical training agreement in 2017 with the Punjab government, for the development of local communities and their technical capacity building. The benefits of the programs, if any, under these agreements have not reached the local communities and no information regarding any initiatives have come to our knowledge.

In this project brief, we will elaborate on these aspects of the power plant and how the lives of the local communities have been impacted from the operations of the power plant. This project brief is also an update of the previously prepared brief on Sahiwal Coal-fired Power Plant; therefore, it will also provide information on any recent developments since its last issue.

Figure 1 below is an aerial view of the Sahiwal Coal-fired Power Plant.



**Figure 1: Satellite view of the Sahiwal Coal-fired Power Plant (Source: Google Maps)**

From the aerial view we can see that the power plant is located amid the lush green agriculture land of Punjab. It is also adjacent to the Lower Bari Doab Canal (LBDC), which provides water for cooling requirements and heat generation purposes. There is grand trunk (GT) road running parallel to LBDC and in between the GT road and LBDC is a railway line which transports the imported coal from Karachi to the power plant. The transmission line is also in close proximity of the power plant. The choice of this location for power plant is stated to be made because of the immediate and easy access to railway line, water canal and transmission line.

## RECENT DEVELOPMENTS

### WORSENING WATER CONDITION IN SAHIWAL

Sahiwal District has agriculture rich landscape and produces wheat, maize, cotton and rice. However, over the last few years the harvesting patterns of the farmers have changed and instead of farming cotton as they used to, they are now cultivating a maize-rice-potato trio.<sup>6</sup> They sow maize in January and harvest it in April earning profit of Rs80,000/acre, followed by cultivating rice in May which they harvest in August, earning profit of Rs115,000/acre. Then from October to January they grow potatoes and earn profit of Rs280,000/acre.<sup>7</sup> Altogether, a profit of Rs. 475,000/acre as compared to Rs.50,000/acre profit is earned over farming of cotton. This financial benefit has led them to repeat the three crops one after the other, around the year, but considering the dampening availability of water it is not sustainable.

The water-supply condition from LBDC is also bleak and it has worsened especially after the operations of the power plant. LBDC, established in 1913 to initially serve 67% of the cropping intensity, is now only capable of fulfilling 40% of the current water needs for growing three crops, that too if the canal is running at its full capacity.<sup>8</sup> Thus, the pressure on alternate sources of water, such as groundwater through tube wells, has increased considerably.

A farmer living close to the power plant shared his despair saying, “The plant is hitting our lands in three ways; heating the climate and increasing water needs, drying available atmospheric moisture quickly and spraying ash around. All this has an agricultural and health cost for those falling within the radius of the plant impact.<sup>9</sup>” Low rainfall is also becoming a concern for farmers, as shared with us on our recent visit to the power plant’s surrounding villages. Therefore, in order to sustain farming in this district, it is critical to direct government’s attention towards deteriorating water condition in Sahiwal.

## ACCUMULATING RECEIVABLES OF THE POWER PLANT

The unsustainable financial position of our power sector is evident from our ballooning circular debt (see Figure 2). Sahiwal power project has also been hit by it. Multiple times, the government has fell short in paying the project company for the power supplied to the national grid. Back in 2018, the government could not pay PKR 16 billion to the power plant, agitating the power plant's investors.<sup>10</sup> Then, in 2019, owing to rupee depreciation, Sahiwal power plant along with other CPEC power projects, incurred losses on the import of coal, the price of which takes usually 80% of the production cost.<sup>11</sup> Now in 2021, payables of the power generation

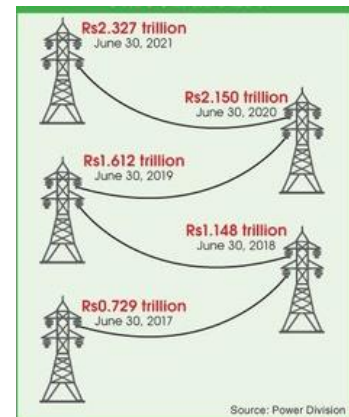


Figure 2: Power Sector Circular Debt

companies under CPEC have topped PKR 230 billion and the government is struggling to repay at least the partial payment.<sup>12</sup> Given Pakistan's dismal situation of the soaring power sector circular debt, which shot up to PKR 2.327 trillion<sup>13</sup> in June 2021, the future of these power projects and the economic repercussions are anticipated to be drastic.

As a necessary action, the government will be submitting a Circular Debt Management Plan to the World Bank and International Monetary Fund (IMF).<sup>14</sup> The proposed reforms include cessation of further coal power development and conversion of existing coal power plants, which run on imported coal, to indigenous coal.<sup>15</sup> The materialization of these proposed reforms is uncertain today, however, to turn the unsustainable financial conditions of the power sector, these reforms would be indispensable.

## DISRUPTING THE LOCALS

The Sahiwal power plant has left the local communities with various problems, causing adverse impacts to their lives and the environment. In the following sections, we will briefly discuss the concerning aspects of the plant and its various impacts on the local communities.

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### LAND ACQUIRED FOR THE PROJECT

Locals say that the land acquisition process for the project was coercive. The process resulted in protests by the locals, first information reports (FIRs) against the resisting farmers on grounds of terrorism<sup>2</sup> and farmer being forced into selling their agricultural lands. Locals shared that the compensation amount for land was also as per the company's choice. A local resident shared his experience of filing a lawsuit against the company for inappropriate compensation. He fought the case for three to four years, but all in vain, as at the end he was offered the same compensation. Today, no cases of litigation against the company are outstanding, but it cannot be said that the resolutions have benefitted the litigants.

The affected farmers and locals who sold their lands belong to the villages Chak 76/5-R, Chak<sup>3</sup> 77/5-R and Qadirabad. On a closer look, these can be seen on the map in Figure 1, adjacent to the plant's boundary wall. For this brief, we conversed with the residents of these villages along with the residents of Chak 78/5-R and Chak 67/5-L.

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### IMPACTS ON THE LIVELIHOODS

#### NO JOB OPPORTUNITIES FOR LOCALS

The promises of job creation for the local community were good only until the completion of the power plant's construction, as the locals were offered labor jobs only. In 2017, through their Corporate Social Responsibility agreement and technical training agreement signed<sup>16</sup> with the Government of Punjab, the company committed that it will aim for capacity building of the local community and provide them with relevant technical training.<sup>17</sup> Two years later in 2019, the company inaugurated Huaneng Ruyi Technical

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<sup>2</sup> In 2016, the chief minister of Punjab, stated that any protests or sit-ins creating hurdles against the energy sector projects are a national crime. (The News 2016)

<sup>3</sup> Chak (Village)

Training School within its premises. However, from the conversations that we had with the local residents, it appeared that they did not have any knowledge regarding the existence of such an institute. Currently, the institute is only conducting trainings for its employees, building its in-house capacity and information about its programs for the surrounding local communities is not available.

Moreover, due to Covid-19 pandemic, the protocols for entrance and exit became very strict for the employees. It is now mandatory for an employee to stay within the plant premises for a period of 6 months before they can take leave. Also, they do not allow employees to go on leave in between the six months period, even in the case of an emergency.

### **WATER SHORTAGE FOR CROPS**

The local farmers have been dealing with low water supplies for their crops, which they say is one of their most concerning issues emanating from the operations of power plant. Out of the three water distributaries from LBDC that used to be available to the farmers to water their crops, only one is functional since last seven to eight years. They, therefore, have to rely on other sources of water such as diesel-run tube wells and electric suction pumps, which are expensive as well as harmful for environment.

One of the farmers shared that the land near the plant boundary wall does not give as much produce as they used to, adding that he does not know the exact reason for this change. They are also not allowed to plant trees within 180-meter radius of plant boundary wall.

Furthermore, they also report the decreasing groundwater levels. One farmer from Chak 78/5-R shared that the available canal water is insufficient for 300 to 400 farmers in their village, especially from December till March, when the canal is seasonally closed. The power plant, during that period, also relies on the underground water and extracts it through the tube wells dug in its premises.<sup>18</sup> The villagers estimate that the groundwater level has gone down about 25 to 30 feet in the last four to five years. Another resident shared that now single pump does not lift water at all from the depth of 60 to 70 feet and they have to bore 100 feet further into the ground.<sup>4</sup>

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<sup>4</sup> These numbers are their own estimates and have not been verified.

## HEALTH CONCERNS FOR LIVESTOCK

Upon inquiring from the villagers about the effects on their livestock due to the power plant, they shared their concerns regarding the water that the animals drink. One responder from Chak 76/5-R also shared that urination and stomach issues have increased in his animals, adding that his animals are now more prone to allergies.

## ABSENCE OF BASIC FACILITIES FOR THE LOCAL COMMUNITY

After being forced to sell their lands, the local farmers, in response, demanded few basic facilities such as access to clean drinking water, free electricity, a small hospital, gas and a functioning sewerage system.<sup>19</sup> However, these facilities have still not been provided to the local communities. The recent visit to the plant's surrounding area revealed that there are no basic health units or hospitals and only a small dispensary is present. Figure 2 below depicts this situation as well, in which we see that there are numerous hospitals in Sahiwal city, but none in the vicinity of the power plant. Villagers share that they go to main city for their major health concerns and their travel time has increased by two to three hours on average.

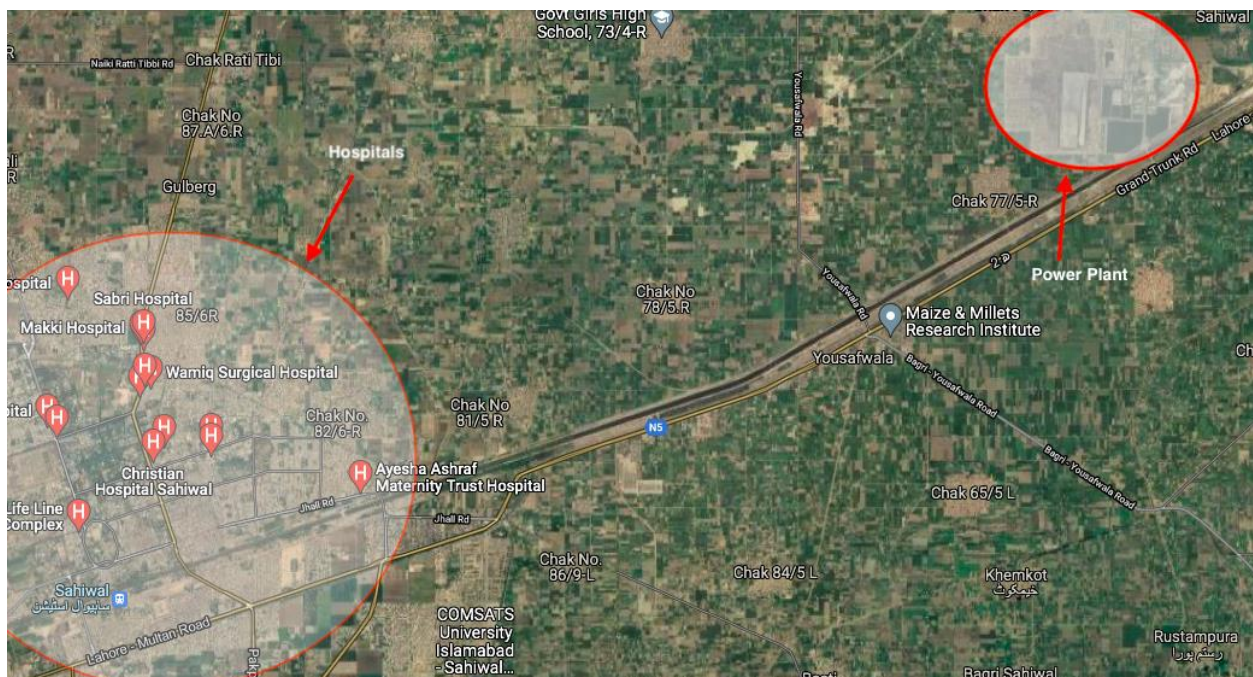


Figure 3: Hospitals in Sahiwal can be seen located far from power plant area (Source: Google Maps)

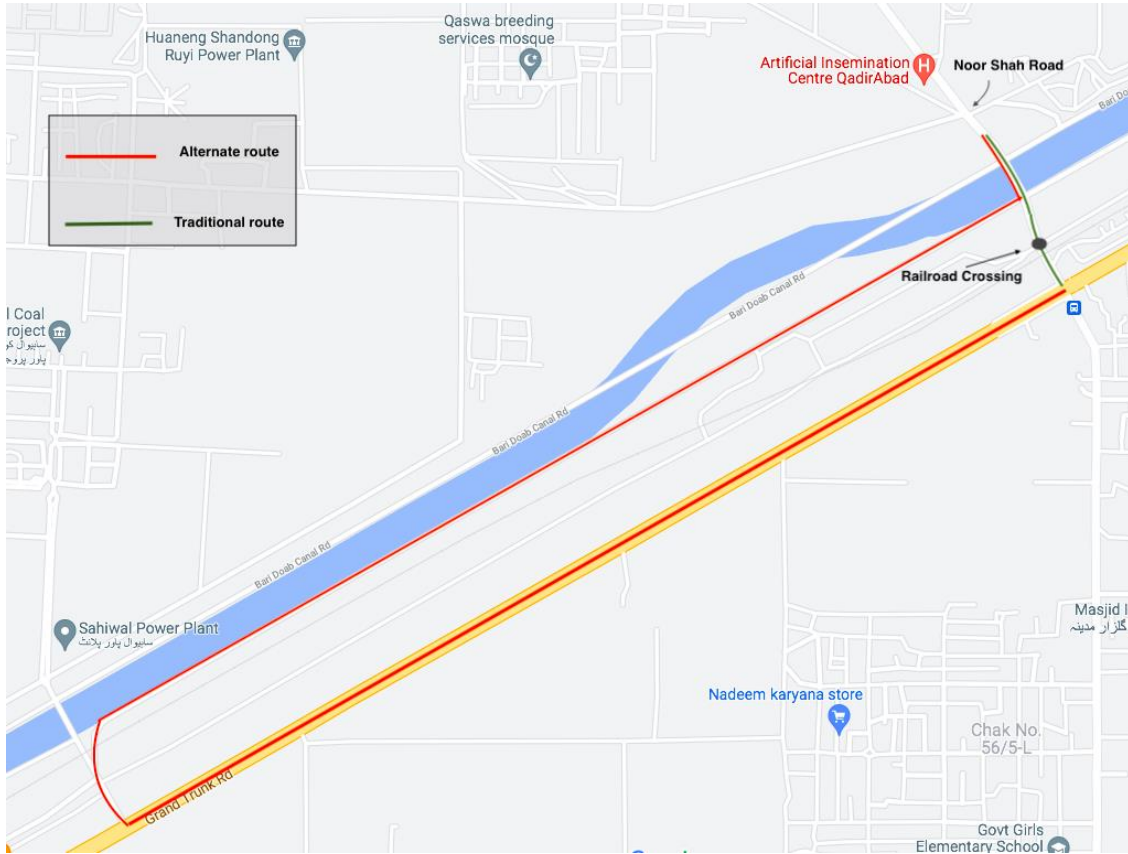
Moreover, the institute that the company has built for technical training, is within its own premises, where no villagers have been admitted since its inception in 2017. The company has also failed to build any schools in the area for the local communities. A retired school teacher informed that a government school for girls had to be closed due to security concerns and the 100 students from that school had to be admitted in other schools.

## **IMPACTS ON PHYSICAL MOBILITY**

The power plant is located near the city of Sahiwal and opposite to the power plant, across the LBDC, is a small town named Yousafwala. Before the installation of power plant, the villagers had quick access to the markets, health facilities and higher education institutes in Yousafwala. However, since the construction of the power plant began, the traditional three to four entry and exit points have been sealed and the alternative route has added two to three hours on average in their travel time (see Figure 5). Everyone we spoke to during our visit to the plant's surrounding localities, shared limited accessibility as a major concern which is affecting their daily lives.

Now for the residents of Chak 77/5-R, 76/5-R and 78/5-R, it takes an extra two to three hours to reach the nearest markets in Yousafwala, which following the traditional route, is right across the bridge over LBDC. Some residents find it more convenient to go to Sahiwal city for their market needs.

Moreover, access to educational institutes has also been affected. The travel time to access them has increased by two to three hours on average, the local say. Students of higher classes have been affected the most, who have to travel to higher educational institutes in Yousafwala, Sahiwal and Okara.



**Figure 4: Alternate route connecting Grand Trunk toad and Noor Shah Road**

In Figure 4, we can see both the traditional route and the alternate route. The railway crossing shown on the map is closed and whoever wants to visit the localities on the other side of the road has to take the alternation route, which is about 16KM in distance.



Figure 5: Closed railway crossing



Figure 6: Alternate road connecting to Noor Shah Road through bridge



Figure 7: Board of alternate route Noor Shah Road

The villagers now cannot access the Yousafwala railway station stop, because it has been dedicated for supply of coal to the power plant, and passengers have to take either railway station stop at Okara Cantonment or Sahiwal, if they have to travel by train.

The boat stop (Kashti Wala Pull stop) for the villages 77/5-R and 76/5-R is also closed since last five years. The stop was located at Lahore-Multan motorway, and villagers used to reach home in 10 to 12minutes. But now their travel time has also increased.

## INCREASED CRIMES ON ALTERNATE ROUTE

The residents have shared that crimes have also substantially increased after the construction of power plant in the area. This is primarily because of the new road on the alternate route that the villagers now take in order to access markets in Yousafwala, or to take GT Road. This new road is running parallel to the

LBDC and the railway line, and after sunset there are no street lights on this road. The villagers reported of increasing incidents of mobile phone, motorbike, cash and other valuables snatching on this road.

## IMPACTS ON PUBLIC HEALTH

Exposure to the pollutants caused by coal fired power plants tend to damage people's cardiovascular, respiratory and nervous system, which increases the risk of lung cancer, stroke, heart disease, chronic respiratory diseases and lethal respiratory infections.<sup>5</sup> Children, elderly, pregnant women and people with compromised immune system suffer the most.<sup>6</sup> In addition to pollution originating from the power plants, the disposal of coal ash waste can have significant impacts on human health.<sup>20</sup>

Sahiwal Coal-fired Power Plant has been disposing its coal ash waste within the plant premises. The locals, we spoke to, reported no incident of disposal outside the plant boundary, but they added that they have to bear a foul smell coming from closer to the plant. This is highly likely because of the food waste which is disposed within the plant boundary.

For the villagers, however, a major concern is the diminishing clean water. A resident of Chak 77/5-R shared that clean water is no more available at the depth of 70-75 feet in the ground. Clean water is now found at around 200-275 feet depth. A research scientist from University of Agriculture has investigated the rising levels of arsenic in the groundwater in Sahiwal and nearby villages.<sup>21</sup> Out of the 220 samples of water collected from electric and hand pumps around the villages, 45% of the samples were above the World Health Organization's safe limits in drinking water.<sup>22</sup> Another 30% of the samples were above the Pakistan's Environmental Protection Agency's safe limits in drinking water.<sup>23</sup> These findings show that there are serious health implications for the villagers who drink this water on a daily basis and also use it for their crops.

## IMPACTS ON ENVIRONMENT

The burning of fossil fuels results in emission of greenhouse gases, particulate matters, Nitrous and Sulphur oxides along with other toxic pollutants. The power plant is no exception in this regard, however, the company claims to emit ultra-low, near zero CO<sub>2</sub> emissions, and base this claim on their use of

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<sup>5</sup> From previous brief

<sup>6</sup> Ibid

advanced environmental protection technology. They have installed flue gas treatment technologies including low NO<sub>x</sub> burners, highly efficient electrostatic precipitators and lime-gypsum flue gas desulfurization with SO<sub>x</sub>.<sup>24</sup> Nonetheless, the residents of the surrounding villages still complain of feeling the smoke in the air.

Considering the potential negative environmental impacts of the coal power plant in the densely populated area, the current Advisor to the Prime Minister on Climate Change, Amin Aslam, termed this project as a “criminal neglect” saying, “The project has unfortunately locked us into an ecological challenge.”<sup>25</sup> The director of World Wide Fund for Nature Pakistan also criticized this project due to its negative consequences.<sup>26</sup> He said that the project will not only worsen the air quality but could also affect the fertility of agricultural plains.<sup>27</sup>

Upon inquiring from the villagers about any plantation drive conducted by the company, they informed of not witnessing any such drive. Instead, the villagers said, the plantation on the land acquired by the power company was uprooted. This is also evident from the close aerial view of the plant site in Figure 8. There are wide patches of brown plains within the plant boundary. The land acquired for the project appears to be in excess of the land required for the power plant.



Figure 8: Close view of the power plant (Source: Google Maps)

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<sup>5</sup> Company presentation on Sahiwal Coal Power Plant

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<sup>7</sup> Ibid

<sup>8</sup> Ibid

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