

THAR'S LIVELIHOOD LOSS

Hope and despair in
the land of black gold



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Glossary of Local Terms ¹

Bajhar: Pearl millet.

Ber: A local species of berry. Its dried fruit is stored for use during the dry season.

Bu'i: A local bush. Some animals consume its leaves.

Bheel: A scheduled caste of the Hindu community in Tharparkar.

Chaunra: The cone-shaped hut conventionally used as a residence in Tharparkar. Rooted in the ecological sensibility of the Thar desert and environmentally friendly, these are built of straw, wood, bamboo, dry vegetation, earth etc.

Devi: A species of *keekar* (*Prosopis Juliflora*) "introduced by the British in 1877 and spread in Tharparkar and its adjoining areas on the other side of the border (Gujrat/ Rann of Khuchch) by successive governments through forest departments as an anti-desertification measure. The tree has proved an ecological disaster, taking over grasslands and depleting water tables. It cannot be used as fodder as it is toxic for most animals". ²

Dhanaar: A shepherd.

Ganwaar: Cluster bean.

Gaucher: Communally owned grazing land allocated to each village in Tharparkar since pre-modern times and used per local grazing customs.

Ghee: Locally produced refined churned butter.

Hari: A landed or landless cultivator.

Jar: A local tree that produces edible fruit, often dried for eating.

Kabooli: Privately owned land in Tharparkar.

Kandi: A local shady tree with edible beans, found all across Tharparkar. Its leaves and beans are also nutritious fodder for animals.

Khip: The local plant dried and used for thatching the roofs of *chaunra*. The plant is also consumed by camels, goats and sheep and is believed to augment the production of milk in animals.

Khulko: The local term for cough in humans as well as animals.

Kohli: A scheduled caste of the Hindu community in Tharparkar.

Koombhat: A tree indigenous to Thar.

Labara: The manual labour that members of scheduled castes of Kohli and Bheel offer to landowners in canal-irrigated districts to harvest wheat crops in March and April.

¹ Note: The definitions of formal/ legal terms (categories/ tenures/ kinds of occupants or tenants) have been taken from legal and policy documents of the State while usages/ meanings of local terms were acquired from residents of Tharparkar's villages.

² <https://femasiamagazine.com/learning-from-pastoral-lifeworlds/>

Lobia: Beans.

Makani/non-makani: "A person, who has resided in a *makani* for ten years or who has held the land in the said *makani* for twenty years, can be considered as a *makani*, whereas a person not falling within the definition of *makani*, is considered to be non-*makani*."³

Marho: A parcel of *kabooli* land not used for agriculture due to its nature, soil and surface and hence used as grazing land with the permission of the owner. It is a local category of land and is not formally recognized.

Maund: A local unit of weight equal to 40 kilograms

Meghwar: A scheduled caste of the Hindu community in Tharparkar.

Muhaga: *Muhaga* is a local category of land. The Land Grants Policy 2002 states "Any land situated within a distance of 10 chains, from *kabooli* field, should be considered as "*muhaga*" or frontage. The *muhagedar* can claim the *muhaga* right of the land less than the area of *kabooli* land."⁴

muhagedar: The person claiming such a frontage right is called *muhagedar*.

Mukhia: The village headman.

Pakka: A house or structure made of bricks baked in a kiln.

Para: Neighborhood in certain settlements, often constituted based on caste in Tharparkar

Peerhu'n: The fruit that grows on a *jar* tree.

Rohiro: A local tree of religious significance for the Hindu community. The community has protected it for decades, with no one allowed to cut the tree.

Singri: The edible beans of *kanditree*.

Sinr: A local bush with seeds and sprouts that are consumed by animals.

Suhanjro: A local tree with edible flowers and seeds widely cooked in Tharparkar.

Survey: A category of land that is privately owned.

Taluka: An administrative unit called sub-district.

Tarai: Natural land depressions that store rainwater locally used for animal consumption.

Tankaro: A local tree.

Tir: Sesame seeds.

Yaksala: The state-owned land in Tharparkar granted to small farmers as per successive land grant policies.

Wadda: The patriarch or male head of a household head.

Wanriya: A money-lending and trading caste of the Hindu community.

3 <https://www.dawn.com/news/51832/council-okays-desert-land-grant-policy>

4 *Ibid*

List of Abbreviations and Acronyms

CFPPs: Coal-fired Power Plants.

FGD: Focus Group Discussion.

LAA: Land Acquisition Act

MW: Megawatt

NTFPs: Non-Timber Forest Products.

PKR: Pakistani Rupee (currency)

RO: Reverse Osmosis

SECMS: Sindh Engro Coal Mining Company.

TCB: Thar Coalfield Block.

TCEB: Thar Coal and Energy Board.

Executive Summary

Under the 2015 Paris Agreement, Pakistan has pledged to reduce its carbon footprint by 30 per cent by the end of the decade, announcing a moratorium on new coal-based power plants in 2021. However, these voluntary commitments lack enforceability mechanisms, and the country's growing power sector's circular debt, reliance on fossil fuels, and increasing carbon footprint demand urgent government attention. As the fifth most climate-vulnerable country globally (Global Climate Risk Index), Pakistan's expansion of local coal utilisation substantially increases emissions, given the low-quality lignite coal used in current projects including the ones in Tharparkar, the country's most ambitious coal extraction and coal-power generation enterprise. Notably, Pakistan's Fossil CO₂ emissions surged by 9.13 per cent in 2016, significantly outpacing population growth (1.21 per cent). The increased use of lignite coal will escalate CO₂ emissions, while coal transportation will incur significant public health costs. A comprehensive overhaul of power policies is necessary, including reduced fossil fuel usage, increased renewable energy sources, and transparent accounting of externalised costs associated with fossil fuel extraction, such as those in Tharparkar, to ensure a sustainable energy future.

Coal mining and coal-fired power plants across Pakistan's Thar desert may be a boon for the State but for the Tharis, this enthusiasm for fossil fuel - even as a world ravaged by climate change scrambles to put an end to it - has been an utter bane. Hamlet after distraught hamlet, and their poor inhabitants who are mainly minority Hindus, now have more to worry about than mere survival in Tharparkar's harsh arid setting. A widespread livelihood crisis simmers across the region, in villages surrounding coal mines, coal-fired power plants (CFPPs) and their auxiliary infrastructure. An unfolding disaster marked by displacement, potential health risks and economic uncertainty, coal projects have distressed the Thar desert's fragile ecology to the point of an unmitigated crisis encompassing the very sources of survival: Land, water and environment.

Traditionally a pastoral economy sustained by rain-fed agriculture, Tharis live off the land. Rare as they are, livelihood opportunities stem from the land that the desert folk have traditionally cultivated for sustenance. This land now has a claimant whose aim is not to till the earth but to cut open its chest for coal. Vast acquisition of land in the coal-rich Thar by coal companies has caused drastic reversals in fortunes, by way of land and animal holdings, crop production, fodder, grazing spaces, timber and non-timber forest products. Dewatering necessitated by coal mining, and the disposal of polluted and toxic effluents from mines and power plants, have affected water quantity and quality in a water-scarce region, especially in villages surrounding the coal projects. For Tharis who depend on vegetation (especially *Khip* plant) dried to build the thatched **chaunra**, the cone-shaped huts conventionally used as a residence in Tharparkar, have been threatened with extinction. Plants and crops are now ash-laden, the air is bad and diseases like nausea, gastroenteritis, widespread incidence of cough and breathing issues now abound. Threatening both lives and livelihoods, coal projects have disrupted and endangered traditional communities that, far from benefitting from an industry that has plundered their natural resources, are the primary victims of the insidious ecological collapse that the pursuit of coal has triggered.

Primarily, these disruptions have been caused by the rigorous application of the Land Acquisition Act, of 1894, rapaciously acquiring precious lands previously used by the Thari people for cattle grazing and rain-fed agriculture. The Act falls short of recognizing the centuries-old established right of the Thari population to access land that has guaranteed sustainable livelihood for locals. Launched with promises of affordable energy and local prosperity,

coal projects have failed to deliver on these commitments after nearly a decade of mining and power generation.⁵

Thar's ecological and livelihood crisis comes at a time when the entire country is struggling with intensifying macroeconomic challenges. Pakistan has failed to pay power bills worth PKR. 487 billion⁶ to Chinese investors for the electricity procured in 2024. The country's spiraling economic crises, together with a myopic energy vision, have failed to realise alternative possibilities of renewables such as solar power generation, deemed 37 per cent⁷ cheaper than local coal.

Conducted in mid-2023, this study establishes that 88 households in 12 villages - around the Thar Coal Blocks I and II - lost 4900 acres of grazing and 354 acres of state-owned agricultural lands, cumulatively worth PKR 420 million. These losses exclude a decrease of PKR 206 million in their net worth, in terms of reduction in crops, construction materials, cattle farming, dairy products and additional expenses on food and health. When taken into account, these externalities easily inflate the total damages caused by coal development projects into billions of rupees.

To make matters worse, policymakers are now considering linking Thar's environmentally hazardous coal mines and power plants to other parts of Pakistan through a railway network.⁸ If implemented, such ill-advised initiatives would exacerbate Pakistan's acute air pollution and an enduring smog problem, raising public health expenditure and harming its nature-dependent peripheral populations such as those living in Tharparkar.

Key Findings:

Eighty-eight households in ten villages located in TCB-I and TCB-II experienced a decline in their owned and accessed assets worth PKR 600 million (including communal lands) within a decade of the inception of coal projects in Tharparkar district of Sindh. The total population of these villages (23,448) consists of 4,263 households, with an average household size of 5.50 persons in rural Tharparkar. Even if half of the households within these villages are affected on the same scale, the figure for unaccounted and externalized costs of coal mining and coal power generation for the Thari people runs into billions of rupees. This situation seriously implicates the national narrative around coal as an affordable energy resource for Pakistan, warranting an immediate halt to the intended expansion of the coal mining and coal market.

The losses estimated for 88 households were against five major assets: Land - private⁹, state-owned, and communal, comparative decrease in crops and fodder, loss of livestock, dairy products and that of the fuel and construction material traditionally secured from the lost grazing spaces and vegetation. The study does not take into account additional expenses to procure water, fodder, or increase in the commuting distances due to enclosures, roads or other forms of coal-enabling infrastructure.

5 *Experts contend that since many technical and fiscal aspects of these projects are linked to global interest, inflation and exchange rates, thereby putting into question the narrative that these resources are indigenous. For details see <https://www.thenews.com.pk/magazine/money-matters/1214241-understanding-the-bad-economics-of-thar-coal>*

6 *<https://tribune.com.pk/story/2462720/all-plants-to-shift-to-local-coal>*

7 *<https://renewablesfirst.org/wp-content/uploads/2024/03/BTM-CHAPTER-4-Coal.pdf>*

8 *<https://shorturl.at/gmtN7>*

9 *While Thari people were compensated for their private lands, no mitigation has been offered to compensate them for the loss of state-owned (yaksala) and communal (gauchar) lands that had been in their use for centuries.*

A significant majority (59 per cent) of those interviewed in the villages close to the coalfield blocks attributed the loss of livestock to the lack of grazing land and fodder. Other reasons included the consumption of coal-ash-laden grass, asthma, and inflation that has hiked up the cost of cattle keeping and farming.

These reasons might not be entirely unrelated to coal projects. Following the advent of coal power projects, the average per annum return on the production of conventional Thari crops - bajhar, ganwar, korarand mung - in surveyed villages amounted to PKR. 70,000, 189,494, PKR 71,089 and PKR 20,854 respectively. Consequently, the poorest Hindu minority castes of Bheel, Kohli and Meghwar have respectively experienced 57%, 45% and 97% increases in livestock after coal respectively.¹⁰ Largely dependent on communal grazing lands, food availability for these castes was extremely limited, to begin with in terms of dairy items. It has further shrunk by 63 per cent, 96 per cent and 23 per cent for Bheel, Kohli and Meghwar households respectively.

Little wonder, then, that the poorest of Thar's indigenous inhabitants have been forced to spend more on wheat procurement due to the coal-induced losses in the production of conventional home-grown grains. Bheel households were found to buy more wheat - 105 *maunds* per year compared to 81 *maunds* of the pre-coal days, spending more on a necessity at a time when their sources of income, dependent on land and cattle, have been squeezed. For the Kohli households, the amount went up from 16 to 22 *maunds*. The interviewed households were found to spend PKR 78,000 more on procuring construction materials that used to be freely available in the pre-coal days. Moreover, the figures for such expenses for scheduled castes were much higher compared to other castes.

The study revealed that households from the most impoverished castes of Bheel, Kohli, and Meghwar, allocate a significant portion of their income towards human and animal healthcare, with average monthly expenditures of PKR 5,000, PKR 11,166, and PKR 8,666, respectively. Further research is essential to explore the underlying causes of prevalent human and animal diseases in Tharparkar, informing strategies for their mitigation. The cumulative effects of these financial pressures and expenses render these landless castes exceedingly susceptible to the adverse impacts of inflation, disruptions to traditional food chains,

10 *As explained in the methodology section, the study engaged most the community members of scheduled Hindu castes like Bheel, Kohli and Meghwar which constitute a significant portion of the population in each village due to their greater geographical dispersion. They are also presumably the oldest inhabitants of the desert region, the poorest and most reliant on communal lands and forest resources of Tharparkar due to widespread landlessness among them.*



coal-induced health issues, and the consequences of adopting unconventional livelihoods alien to Thar to meet these expenses.

Many members of these castes complained about their exclusion from even menial labour opportunities and the blacklisting of their kith and kin in the hiring of workers by the coal industry. Instances of such blacklisting have been reported in villages of Thar, for example in the New Sehri Dars – a model village built to resettle communities displaced from the Old Sehri Dars due to coal mining. The coal companies do not cite any reason for doing this; at the security gate, they are just told they cannot enter the field for manual labour. The locals, however, say that they are denied jobs because of their resistance to coal projects, participation in rallies or protests against coal companies or demanding alternative grazing spaces for their livestock, among other reasons.

Caught between a disrupted livelihood system induced by large-scale land acquisitions and the absence of comprehensive rehabilitation and resettlement plans, the poorest of Tharis await a serious reappraisal of Pakistan's energy policies. The impact of coal projects on people and the ecosystem, and the consequent high human and environmental cost to the country, begs the question: "Is coal really a cheaper source of energy?" For the indigenous communities crushed under the seemingly unstoppable national pursuit of coal mining and coal power generation, the answer is a resounding 'No'.

The future trajectory of livelihood and environmental losses in Tharparkar due to coal extraction and burning presents a bleak picture. Residents of the villages around Gorano area, once known for its sweet water, fear the further contamination and deterioration of groundwater, erosion of soil and its fertility, and greater expense of time and money on potable water procurement. The residents of Thario Halepoto, a village located in TCB-II, are bracing for permanent displacement entailing physical dislocation and loss of grazing lands, agricultural lands, livelihood and social systems. The livelihood situation in New Sehri Dars Model Village is already marked by unemployment, closed pathways to grazing lands and conflicts over communal resources. Most members of the scheduled castes in the model village leave for several months to sell manual labour to landlords in canal-irrigated regions of Badin and Mirpurkhas. The water re-injection plant at Meghay Jo Tar has contaminated groundwater quality, prompting locals to get a reverse osmosis (RO) plant installed in the settlement. Coal-ash-related problems are slowly invading trees, plants and crops in other villages of TCB-II like Bitra and Jaman Sammu. Local testimonies of health, environment, water and land-related harms to ecologies caused by coal mining in Tharparkar are legion, with every household having a woeful story to tell.

For meaningful mitigation of this situation, the country's policymakers must honour Pakistan's declared moratorium on coal, halt expansion of coal mines and constitute a locally representative commission to probe coal-induced livelihood and environmental damages in Tharparkar. Such an exercise must be accompanied by meaningful changes in the colonial Land Acquisition Act (LAA), of 1894. Preferential allotment of state lands (e.g. *yaksala*) to the scheduled castes should also be instituted in the Thar Land Grant Policy. A comprehensive mitigation and restitution plan should be adopted to rehabilitate the livelihoods of people especially in and around the coal mining fields and power plants.

These measures must come about following a comprehensive dialogue with the representatives of Thari communities, civil society and independent experts. Any expansion in Thar coal mining and coal power generation risks further devastation of its natural resources, causing displacement while polluting the regional air quality.

Introduction

Tharparkar is the largest district in Pakistan's Sindh province, spanning more than 19,637 square kilometres.¹¹ It shares borders with the Indian state of Rajasthan (*Jaisalmir*) in the east and Gujrat (Cutch) in the south while Sindh's districts of Umerkot and Badin lie to its North and West respectively. Historical records suggest that before its desertification between 2000 and 1500 BC, Tharparkar was a fertile region, home to a tributary of the Indus River named Sarsvati, a mythologized river mentioned in the ancient text Rigveda.¹²

Before the British Raj, Tharparkar was governed by higher caste Muslim and Hindu Rajput satraps on behalf of the rulers of Umerkot, who held most of the land here and exercised authority through adjudicatory councils for resolving local disputes.¹³ The district is administratively divided into seven *talukas*, namely Mithi, Islamkot, Dahli, Nangarparkar, Kaloji, Diplo and Chachro. Its status evolved from being part of the Cutch agency and Hyderabad collectorate during the British period to becoming a district named Thar and Parkar in 1906. Later, it was split into Tharparkar and Mirpur Khas districts in 1990, with the Umerkot district carved out of it in 1993.¹⁴

Tharparkar's population grew at an average rate of 1.29 per cent, increasing from 1,647,036 in 2017¹⁵ to 1778,407 in 2023. According to the 2017 census, 92 per cent of its population lived in rural areas and only 8 per cent in urban localities. Mithi, the district headquarters, is the largest urban centre with a population of around 47,000.¹⁶ Tharparkar's population exhibits a communally diverse configuration with Hindus (around 40 per cent) and Muslims (60 per cent) coexisting harmoniously in a state of mutual dependency. However, this traditional pattern of coexistence is slowly eroding, threatened by forced marriages and conversions of Hindu girls to Islam, growing poverty among the landless Hindu scheduled castes like Kohli and Bheel¹⁷. An alarming rise in suicides, mainly among Hindus, has been witnessed especially in the aftermath of contemporary development projects in Tharparkar.¹⁸

Characterized by desert conditions and dunes, Tharparkar is paradoxically considered one of the world's green deserts due to its significant vegetation, particularly in the Islamkot sub-district. Islamkot is currently at the forefront of recent coal-related development initiatives including mining, thermal power plants, roads and possibly railways in the near future. With an average rainfall of less than 200 mm¹⁹, as recorded by the sole meteorological substation of Mithi, this highly arid region supports limited rain-fed agriculture. Rain-fed agriculture and livestock rearing²⁰ are the primary livelihood sources in Tharparkar.²¹ Apart from climatic conditions, social hierarchies have a bearing on the forms of livelihood, with caste status linked to the extent of property ownership. The upper Hindu and Muslim castes (e.g. Thakur, Rajput and Rana) own most of the land. Scheduled and largely landless castes of

11 <https://www.pbs.gov.pk/sites/default/files/population/2017/results/09901.pdf>

12 <https://iigeo.org/wp-content/uploads/2020/12/Transactions-Vol-42-No-2-P-4.pdf>

13 <https://www.priedpk.org/wp-content/uploads/2023/01/Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf> P.21

14 <https://www.graana.com/blog/tharparkar-sindh-a-tapestry-of-culture-history-and-harmony/>

15 <https://www.pbs.gov.pk/sites/default/files/population/2017/results/09901.pdf>

16 *Ibid*

17 See particularly the views of a local activist Ali Akbar Rahimoo in this news report: <https://www.dawn.com/news/amp/1153377>

18 <https://www.aljazeera.com/features/longform/2022/6/19/the-mystifying-rise-of-suicide-in-pakistans-thar-desert>.

19 https://www.preventionweb.net/files/41642_41642climatechangescenariosacasestu.pdf P. 6.

20 The livestock includes goats, sheep, cows, camels and beasts of burden like donkeys in most cases. However, some large landholders can also afford to retain buffaloes.

21 <https://www.priedpk.org/wp-content/uploads/2023/01/Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf> P.21.

Kohli and Bheel have historically served as tenants and agricultural labour. The Meghwar community comprises skilled workers, including iron smiths, carpenters and embroiders, with women being the primary practitioners of the latter. Lastly, Wanriya²² or Bania are traders settled in urban localities like Mithi for a few hundred years now²³.

In addition to the primary livelihood activities, scattered colonial records also mention supplementary trades such as selling dairy products like *ghee* or butter prevalent among rural residents. Locals cultivate a variety of crops, including *bajhar*, green beans, cluster beans, sesame, and pulses, These crops are grown in the monsoon season, sown in July and harvested in November.²⁴ The remainder of the year is typically marked by free grazing livestock in the village commons and consumption of grains and dry stalks of the crops by humans and animals respectively. Livestock plays a vital role²⁵ in the arid conditions of Tharparkar, serving as a primary source of daily food supplies like butter, yoghurt and milk-based drinks. Animals are sustained through free grazing in protected *gaucher*, feeding on various plants and trees²⁶, highlighting the importance of livestock in the region's ecosystem and livelihood strategies and sustenance.

1.1: Background

Coal mining and power generation in Tharparkar is part of China Pakistan Economic Corridor (CPEC) initiative. It is centred on the extraction of one of the world's largest lignite reserves - 175 billion tons - found in Tharparkar, Sindh. State narratives flaunt coal extraction as a guarantee to Pakistan's energy security, and the prosperity of local populations through the creation of jobs and new business opportunities. However, the local Thari population has primarily experienced coal projects in terms of vast land acquisitions²⁷ that significantly distressed their ongoing livelihood system,²⁸ toxic impacts on their water sources induced by wastewater dumping and dewatering²⁹, closures and blockades of pathways and grazing lands and environmental and health hazards.³⁰ As argued by the government and coal companies, shifting to local coal may potentially save the government \$800 million annually on coal imports³¹. However, this calculation overlooks the significant human, environmental and social costs of coal extraction that must be considered if one is to assess the true cost of local coal extraction.³²

Despite the coal-induced woes of local people, the government is set to scale up the use and consumption of local lignite beyond Thar coalfield. Plans are underway to build a 105 km long railway track³³ from the Thar coalfield in Islamkot (district Tharparkar) to Chhor (district Umerkot). It is meant to ferry lignite from Thar coal mines to other parts of the country. Implementation of this plan will inevitably increase the nation's carbon footprint, including

22 *The word wanriyais a variation of local term wanrused to refer to Tree. The wanriyasmigrated to cities and practiced trade in timber. Hence in local parlance acquired the name wanriya.*

23 *Recorded conversation with a local climate activist.*

24 *Ibid*

25 *A 2022 study found that ten villages around the two active coal blocks were home to 63,000 animals with 13 animals per family on average in a district where 94 per cent households own some kind of livestock. Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-*

26 *<https://www.graana.com/blog/tharparkar-sindh-a-tapestry-of-culture-history-and-harmony/>*

27 *<https://www.priedpk.org/wp-content/uploads/2023/01/Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights>*

28 *<https://www.priedpk.org/wp-content/uploads/2023/01/Coal-Power-and-Livelihood-Disruptions-in-Thar.pdf>*

29 *<https://www.priedpk.org/wp-content/uploads/2023/02/Research-Study-Thars-Changing-Hydrology-1.pdf>*

30 *<https://www.priedpk.org/wp-content/uploads/2023/11/project-brief-01-Health-Hazards.pdf>*

31 *<https://tribune.com.pk/story/2462720/all-plants-to-shift-to-local-coal>*

32 *<https://tribune.com.pk/story/2462720/all-plants-to-shift-to-local-coal>*

33 *<https://www.dawn.com/news/1769367>*

the alarming smog and pollution risks already plaguing Pakistan which ranks second among the most polluted countries in terms of population weighted particulate matter (PM2) concentration.

That Pakistan faces a compounding environmental and economic crisis cannot be gainsaid. Air pollution alone caused 128,000 deaths in the country in 2017.³⁴ The country's severe environmental degradation coincides with a prolonged economic downturn. A significant contributor to this economic decline is the power sector's massive circular debt, primarily resulting from heavy capacity payments to fossil fuel-based power plants, dollar-indexed investment returns to fossil fuel investors and sectoral inefficiencies. In addition, Pakistan owes Rs.487 billion to China—its major coal financier—in terms of power bills.³⁵ This perfect storm of economic and environmental challenges demands urgent attention and reform to transition towards a more sustainable and resilient future.



Globally, coal accounts for 44 per cent of CO2 emissions. When used as fuel to generate electricity, it emits twice as much carbon dioxide as burned coal³⁶. While numerous governments are proactively reducing carbon emissions to alleviate the impacts of global warming, Pakistan is regrettably escalating its dependence on coal, the most carbon-intensive energy source. Contrary to the prevailing state and mainstream narrative that touts coal as a cost-effective and indigenous energy resource; coal projects are inextricably linked to global economic and fiscal indicators beyond national control. As these indicators (interest and exchange rates) fluctuate, the cost of coal correspondingly increases for consumers. Consequently, the substantial inclusion of local coal in the national energy mix (2700 MWs) has failed to stem the surge in energy prices.

Numerous studies conducted on coal mining and power generation in Tharparkar and its effects on people show

34 <https://energyandcleanair.org/publication/air-quality-health-and-toxics-impacts-of-the-proposed-coal-mining-and-power-cluster-in-thar-pakistan/>

35 <https://tribune.com.pk/story/2462720/all-plants-to-shift-to-local-coal>

36 <https://www.imf.org/en/Blogs/Articles/2020/12/08/blog-a-greener-future-begins-with-a-shift-to-coal-alternatives>

adverse impacts on underground water³⁷, environment and health³⁸ and land loss³⁹, among others. Despite the detailed and verified evidence, the energy policy of Pakistan is pursuing the extractive path, with plans to expand local coal mining, usage and trade.

1.2. Rationale

Under the Paris Agreement 2015, the global community pledged to reduce anthropogenic greenhouse gas (GHG) emissions by cutting financing for fossil fuels, including coal. However, this commitment contradicts the reality of the world's 60 largest banks investing USD 705 billion in fossil fuel companies in 2023. Since the agreement's signing, financial commitments to companies expanding fossil fuel businesses have surged, totalling USD 3.3 trillion.

⁴⁰Caught between a staggeringly high fossil fuel funding and what they deem 'carbon games',

indigenous communities espouse the principle of keeping fossil fuels in the ground as the only solution because 25 years of carbon trading have failed to halt fossil fuel extraction.⁴¹

The funding of fossil fuel projects ultimately exacts a multifarious toll on local communities situated near extraction zones. These communities are forced to relinquish their essential, life-sustaining resources to fuel energy production or generate profits for entities both within and beyond their national borders. In most instances, the benefits, forms of energy, products generated, and profits earned are neither equitably shared nor transparently communicated to the inhabitants of these extraction zones. Tharparkar exemplifies one such extractive zone where the convergence of international and local finance, extractive companies, and flawed power policies has culminated in consequences that mirror those experienced globally.

According to the Forest Department of Sindh, Tharparkar boasts approximately 0.3 million acres of rangeland, supporting a population of over 1.5 million humans and six million domestic animals, with an average of four animals per person as of 2018. The region's livelihood system is centered around livestock rearing, facilitated by unrestricted access to communal grazing fields available to all. A study by Gobind M, Hirani et al. (2008) revealed that Tharparkar accounts for 22 per cent of Sindh province's total livestock. Notably, 92 per cent of the surveyed families in the region identified livestock as their primary and sole sustainable source of livelihood.

37 <https://www.priedpk.org/wp-content/uploads/2022/02/Project-Brief-Coal-Power-Project-Poisoning-Water-in-Thar.pdf>

38 <https://www.dawn.com/news/1560255#:~:text=Itsper cent20findingsper cent20showper cent20thatper cent20Thar,childrenper cent2Cper cent2032per cent2C000per cent20prematureper cent20birthsper cent20etc.>

39 <https://www.priedpk.org/wp-content/uploads/2023/01/Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf>

40 https://www.bankingonclimatechaos.org/wp-content/uploads/2024/07/BOCC_2024_vF3.pdf

41 *Ibid*.p39

This delicately balanced livelihood system is inextricably linked to natural resources such as land, surface water, and groundwater, which are being severely impacted by coal mining and power generation. The resulting humanitarian, health, and economic crises necessitate a comprehensive understanding of the situation, and the development of climate-resilient and economically viable energy policies for Pakistan. This study aims to quantify the losses incurred by households due to these initiatives. It challenges the prevailing narrative that promotes local coal as a cheaper and alternative energy source by conducting a small-scale cost-benefit analysis. The study seeks to determine whether coal-based power generation is economically viable if its unaccounted social, environmental, and economic costs are factored into the equation. The findings aim to support the expert consensus that coal power is approximately 37 per cent more expensive than solar power.⁴²

1.3. Objectives

The study places a special focus on the scheduled caste inhabitants of minority Hindu communities in Tharparkar's villages. Justification for this focus includes reasons like their historical landlessness and lower social status resulting from it, greater reliance on common resources like land due to the absence of privately owned lands among these communities and lack of access to cash that exacerbates the impacts of land non-compensated acquisition of lands that these communities historically used.



42 <https://renewablesfirst.org/wp-content/uploads/2024/03/BTM-CHAPTER-4-Coal.pdf>

With that focus at its heart, the study aims to achieve the following objectives.

- 1** To carry out an in-depth (both qualitative and quantitative) analysis and ascertain the nature and intensity of overall livelihood losses the local communities have been facing due to coal mining operations and coal-fired power plants in Thar.
- 2** To identify the major livelihood sources and skills available to the local communities as well as the livelihood challenges, and the coping strategies they had had before the advent of coal mining and power generation projects in the area.
- 3** To know the nature and scale of the livelihood losses the communities — particularly women, scheduled castes/religious minorities and the poor — have been suffering due to coal power projects both within villages located in operational coalfield blocks and beyond the Thar coalfield - for example, villages around Gorano and Dukkar Chou wastewater reservoirs and Vijihar.
- 4** To assess the extent of new livelihood opportunities (for example, jobs in coal power companies, emerging labour and business prospects) available to local communities (particularly from the villages in Thar coalfield) in the wake of coal mining and thermal power plants started in the area.
- 5** To make a quantitative assessment of livelihood losses caused by (i) acquisition of farmland and grazing land by coal power companies, and (ii) degradation of land and water resources induced by coal mines and thermal power plants.
- 6** To document community and civil society voices resisting coal-induced livelihood losses.

1.4. Scope and Methodology

The present study understands livelihoods as constituted by three factors - assets, income and expenditure (Ian Scoones, 2015). In the context of Tharparkar, both owned and accessed agricultural and grazing land provide essential assets, including livestock, crops, staple food, fodder, and cash. The productivity and accessibility of these two primary livelihood resources are influenced by broader factors such as climate, rainfall, social position within the caste hierarchy, and available labour. This study aims to quantify the livelihood impacts of coal projects in twelve villages situated within the Thar Coal Block-I (TCB-I) and Thar Coal Block-II (TCB-II) areas, specifically: Bhav Jo Tar, Meghay Jo Tar, Gorano, Dukkar Chau, Thario Halepoto, Bitra, Jaman Sammu, Jeendu Dars, Bhopay Jo Tar, Khario Ghulam Shah, Tilwayo, and Veijihar. The selection of villages and geographical limits were due to time and resource constraints. It should be noted that the above villages do not represent an exhaustive list of villages affected by coal mining and power generation.

Focusing on quantifying livelihood losses in affected village households, a persistent methodological challenge was to contextualize the concept of a household, given its diverse definitions and complex regional and country-specific variations. Scholars define a household as “a group of people living together, sharing expenses and at least one meal per day” (Beaman & Dillon, 2010). This underscores the need for flexibility to accommodate local contexts. With an average size of 5.43 persons in 2023⁴³, a typical Thari household consists of a family complex where two or more brothers or patrilineal uncles reside together with their families. These complexes combine to form larger caste-based residential and social units called *para* and each village contains as many *paras* as the castes living in it. As a political unit, a household is headed by the eldest male (*wadda*) who is unilaterally respected, maintains order in case of conflicts, and consultatively decides electoral and political matters. Households utilise privately held lands for agriculture while grazing links them to communal grazing lands. Like societal and structural variations, property regimes, forms of ownership and ways of accessing natural resources are also different in Tharparkar. The district revenue scheme divides land mainly into three categories of private (*survey*, also called *kabooli*), state-owned (*yaksala*) and communal grazing (*gaucher*) land. Every household thus either uses its private and/ or accessed state land for agriculture and all residents of villages collectively use the *gaucher*. This local system of land-use stands under significant stress after the rigorous application of Pakistan’s Land Acquisition Act, LAA, of 1894, to enable coal projects. The LAA 1894 does not recognize any land usage except that of the private land and hence allows compensation only against this category. Prior studies of areas around the coal blocks show that not more than one-third of each village falls under the *survey* category.⁴⁴ This means large portions of land having been acquired without compensation in an economy squarely dependent on them. This situation necessitates and justifies focusing on land and land-related livelihood for quantification in the present configuration. This quantification includes losses of land (all categories), crops, fodders, animals, dairy products, woods, and seasonal foods collected from communal lands. The quantified losses were then converted into Pakistani rupees by considering the prevalent price of each item. For purposes of careful calculation, we lowered the per acre price of *gaucher* land to PKR 80,000, compared to PKR 180,000 per acre for the private land offered by coal companies. This allowed for a more careful estimation while catering to regional variations in the prices of land.

However, these themes and forms of losses are by no means exhaustive, nor definitive, since coal-induced socio-economic changes experienced by locals in Tharparkar go beyond livelihood-related crises. Many of these harms such as disrupted mobility of people and animals, loss of local control over resources, impact on grazing activities, and seasonal vegetable collection from communal lands are not easy to quantify. They require more holistic methodologies. Similarly, water quality deterioration and its unavailability have caused greater expense of money, time and energy to procure the same amount of water, thereby reducing time and energy for alternative livelihood pursuits. Moreover, the impacts of closed pathways on Thari herders and travelers have not been quantified here nor the impacts of new market-based food items like wheat in terms of financial and health costs.

An equally pressing issue is the near impossibility of static financial calculations of the loss of sustainable resources like *gaucher* and water bodies that continuously replenish themselves. Thus the limited factors amenable to economic calculations have been presented in the study that uses the land acquisition year (mostly 2014) as the base year. While this may not guarantee a direct causal relationship between the losses and coal projects, a strong correlation can be inferred since coal development projects are the biggest developmental initiative recently undertaken in Tharparkar.

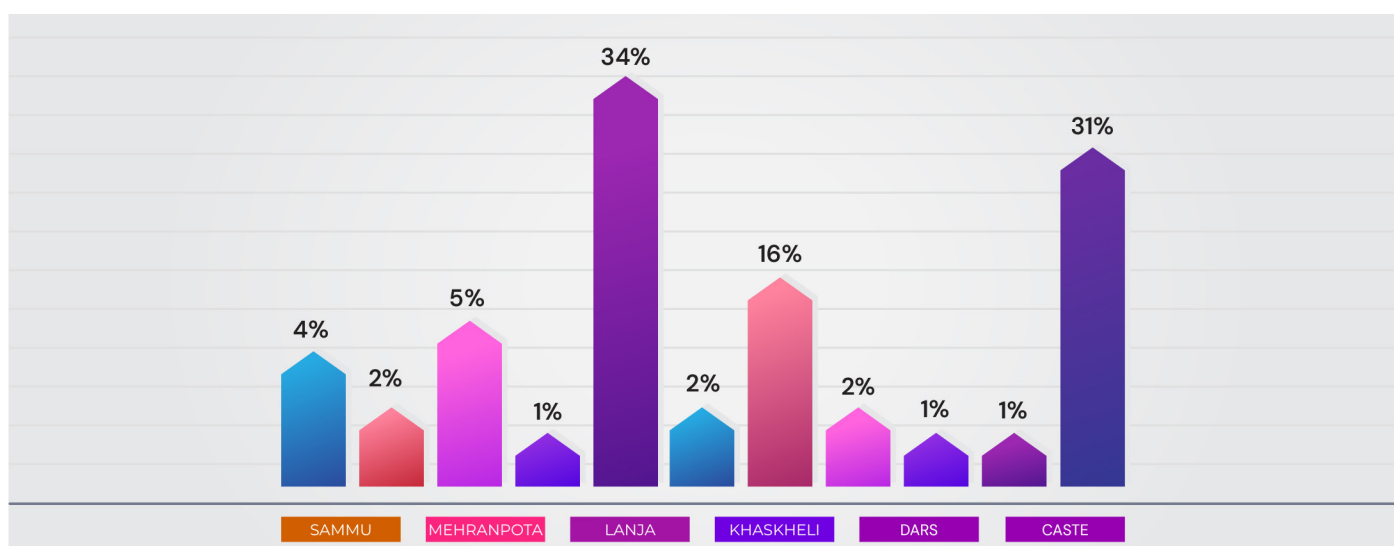
The data is based on interviews from one male and one female from four households (eight interviews) from each *para*, and the total number of interviews depended on the number of *paras* within each village. The research team comprised four enumerators (two male and two female). The data collection exercise was designed as a Focused

43 <https://www.pbs.gov.pk/sites/default/files/population/2023/Sindh.pdf>

44

Group Discussion (FGD) to ensure data transparency as respondents could correct each other for information provided. The cumulative number of FGDs was 40. Some respondents were interviewed individually since their assets and positions were too well known to need a group discussion. The total number of people interviewed was 176. Verbal consent was taken from all respondents before conducting the FGD sessions. The identities and names of the respondents have been changed in the data description to ensure safety and privacy.

Graph-1. Share of respondents by caste



1.5. Land Tenure and Land-use Patterns

Of the total five million hectares of Tharparkar’s land, nearly three million is cultivatable through rain-fed agriculture. Almost half of it is privately owned and the rest is either owned by state or is declared as communal *gaucher*.⁴⁵ However, profound differences exist in land and animal ownership. Reportedly 54 per cent of people in the district own land compared to the 90 per cent who own livestock.⁴⁶ The animal owners include the 46 per cent landless Tharis (mostly scheduled castes of Kohli and Bheel) who primarily depend on access to cultivatable and grazing lands for livelihood.

The earliest land grants policy for Tharparkar (1930) divides the desert land into three major categories - *kabooli* (privately owned), *Yaksala* (state-owned) and the public use lands (*gaucher*) equally held and accessed by all for animal grazing.⁴⁷ The landholdings left behind by Hindu migrants after the 1947 partition of the subcontinent, and those left by Hindus after the 1965 and 1971 India-Pakistan wars are named *Evacuee* and *Enemy* lands in the subsequent policies.⁴⁸ These myriad land categories are used and accessed in both formal and customary ways.

While the State laws recognize only the privately owned land as legitimate and relegate all other lands to State

⁴⁵ *Ibid*

⁴⁶ *Ibid*

⁴⁷ *Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf.P.23.*

⁴⁸ *Since both the Enemy and Evacuee lands belonged to migrated Hindu residents, the Revenue records count these lands under the category of Qabuli(privately held lands). The Lahore based Custodian Department in early 1970s declared the total Enemy lands in Tharparkar to be around 0.2 million acres, of which almost 11 per cent had been allotted to various grantees (landless Haris and Makani residents) by the financial year 2003-04. (Land Rights in Tharparkar – Hameed Diplai/ wordpress.com). However, no exact estimate of such lands exists as stated in media reports, in relation to the anticipated land survey of Tharparkar that will demarcate and possibly allot these lands “to their real owners and landless peasants, particularly women”. For details see <https://www.dawn.com/news/1769353>*

ownership by default,⁴⁹ the local Thari system sanctions many uses and forms of ownership.

Three forms of local land tenure systems were dominant within villages of Islamkot *taluka* i.e. Adhyari,⁵⁰Patti ⁵¹ and Makaada.⁵² The landless scheduled castes who work mostly as tenants for large landholders rely upon these systems. Although these tenants are formally entitled to cultivation rights conferred on permanent tenants in the Sindh Tenancy Act (1950),⁵³ such rights are seldom claimed, asserted or followed in Tharparkar.⁵⁴

Another important land-use concerns *Yaksala* or state-owned lands, whereby grantees who have cultivated the allotted lands continuously for a specified time period are declared rightful owners of such lands, through entry in the revenue record called *hameshgi*. While the *yaksala* land category apparently comes with the promise of eventual land ownership, these lands have neither been formally allotted nor entered in relevant *hameshgi* records since decades.⁵⁵

Gaucher: Each village has a designated though rarely demarcated, *gaucher* land equally accessible to every resident in the village. It is used only for grazing. Locals trace the *gaucher* land to the reign of Mughal Emperor Akbar who generously allocated such lands and named them after cow that the Hindus hold in reverence. Village headmen (*mukhias*) were responsible for their upkeep, ensuring equal use by all until 1952. In 1952, the government of Pakistan abolished the term and converted the *gaucher* status into 'Government Land'.⁵⁶ However, the use of lands in the customary fashion has continued despite this change of status. It was not until the inception of coal projects that this status – "Government Land" - was asserted by the State against its own policies that protect such lands from any other use except grazing. This usurpation of land by the State, in collusion with coal companies, has naturally left Tharis stranded with a livelihood crisis.

1.6. A Brief History of Coal in Tharparkar

Pakistan is home to many developed coal mines in Sindh (Lakhra, Meting Jhampir), Punjab (Makarwal, Salt Range), Balochistan (Barkhan/ Chamalang, Duki, Mach, Deghari, Pir Ismail, Harnai), Khyber Pakhtunkhwa (Hangu/ Orakzai, Cherat) and Azad Kashmir (Kotli). These reserves amount to 114,298 million tons.⁵⁷ However, they are dwarfed by the 175 billion tons of lignite coal discovered in Tharparkar district of Sindh in early 1990s. The district remains at the heart of Pakistan's drive towards indigenous coal extraction for energy generation⁵⁸.

49 <https://www.priedpk.org/wp-content/uploads/2023/01/Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf> P.20.

50 *In this local tenancy regime, the landlord and tenant bear half of the cultivation each (tilling through tractors, seed, other land preparation and cultivation expenses) and divide the total yield by half (50 per cent) between themselves.*

51 *Under this land-use arrangement, the landlord is paid one fourth of the total yield by the tenant who bears all expenses and labour.*

52 *Makaada denotes a contract between the landlord and lessee who pays a fixed monetary amount per acre to the landlord in each season in exchange for use of land.*

53 *See section 5(l), Section 2 (a and b), Section 3 (clauses a and b) for shifting tenancy rights.*

54 *Recorded during a conversation with a local law practitioner.*

55 *See Chapter IV for consequences of this non-implementation for locals after coal-led land acquisitions.*

56 *Land Rights in Tharparkar – Hameed Diplai (wordpress.com)*

57 https://openjicareport.jica.go.jp/pdf/12113221_01.pdf .P.10

58 *Coal mines in Tharparkar are open, cast driven mines that do not require human miners for extraction. Mine job safety remains a huge problem in Pakistan. Pakistan Central Mines Labour Federation (PCMLF) estimates that about 100,000 miners work in the country's 400 coal mines, most of them joining at around the age of 13 and retiring early due to respiratory illnesses, tuberculosis and injuries at age 30 (<https://www.industrialunion.org/pakistans-deadly-coal-mines>).*

A total of four CFPPs are installed in Tharparkar's That Coal Block - I & II with total installed capacity of 2640 Megawatts (MWs) excluding the Thar coal-based 660 MWs Lucky Power Plant in Karachi. Besides, the conversion of three imported coal based CFPPs (Sahiwal, Hub and Port Qasim) with cumulative capacity of 3960 MWs to Thar coal in on cards and is thought to save Pakistan \$700 millions in coal imports⁵⁹. However, experts are skeptical given the fact that twice as much local coal will need to be burned to acquire same amount of electricity⁶⁰. Similarly, major chunks of profits from local coal fly abroad since their financial architecture is tethered to global financial indicators, interest and exchange rates etc, that are beyond national control⁶¹. Most importantly, these investments embody climate injustice for local communities whose livelihood systems and resources have been claimed without mitigation. Nationally, if Pakistan develops all of its planned coalfields, the area is poised to become the largest CO₂, mercury and air pollution spot in South Asia⁶². Please refer to Annex for details of installed coal projects.

1.7. Nature, Types and Causes of Coal-induced Livelihood Disruptions

This section accounts for following three major forms of livelihood disruptions introduced by coal based power generation and mining in Tharparkar.

1.7.1. Coal-induced Environmental and Biodiversity Disruptions

Mining, in general, is now widely understood to be a threat to species, both animal and plant; a fact that assumes even greater importance since 'mining resources [often] exist in significant bio-diverse areas'⁶³. Tharparkar is home to a great diversity of species including 149 plant species, 205 bird species, 41 mammalian, 31 reptilian and amphibian and 1,065 species of invertebrates⁶⁴ that risk annihilation as coal mining proceeds along with the inevitable deforestation and habitat destruction. Coal-induced environmental/biodiversity disruptions in Tharparkar include but are not limited to:

A gradual decrease and (in some cases) loss of several species of plants including the vital *kip* plant widely used in constructing the traditional insulated huts called *chaunra*.

The gradual disappearance of *kip* also reduces nutritious fodder for small and big animals impacting milk production. This decrease in *kip* is mainly reported in villages around wastewater dumping and water re-injection sites, among others.

Increasing coal mining and random dumping of waste water is affecting economically significant trees like *kandi* as well as the culturally important ones like *rohira* which is revered by the local Hindu population. Hundreds of *rohira* trees can be seen blackened and withered inside a major wastewater dumping site in Gorano village.

The land acquisition contracts offered to locals by coal companies allocate meagre and fixed compensation for trees to all affected parties before removing the richly diverse plant species forever. The plant species in *gaucher* however, did not even qualify for any compensation at all.

59 <https://www.dawn.com/news/1850837#:~:text=PAKISTANper cent20isper cent20tryingper cent20to per cent20encourage,importedper cent20coalper cent20to per cent20Tharper cent20coal>.

60 <https://www.thenews.com.pk/magazine/money-matters/1214241-understanding-the-bad-economics-of-thar-coal>

61 *Ibid*

62 https://energyandcleanair.org/wp/wp-content/uploads/2020/05/Thar-Coal-Cluster-Case-Study_Pakistan.pdf

63 <https://royalsocietypublishing.org/doi/epdf/10.1098/rspb.2018.1926>

64 <https://www.iucn.org/story/202311/call-urgent-conservation-program-tharparkars-ecosystem>



1.7.2. Coal-induced Water-related Livelihood Disruptions

Accessible and potable water sustains human and animal life in Tharparkar and the region heavily relies on rain-water that fills the first 'Dune Sand Aquifer'.⁶⁵ Thari people usually extract water through dug wells or solar-powered pumps from the rain-fed aquifer. They rely on surface reservoirs called *tarais* to supply water for animals.

Water-related woes of Thari people directly impacting livelihood involve:

The deterioration of underground water due to coal waste dumping has resulted in the loss of almost 40 sweet water dug-wells in villages like Gorano and Meghay Jo Tar. It has resulted in the accumulation of toxic metals in underground water.⁶⁶

More time and effort are now consumed to fetch water, leaving women with little energy to invest in other livelihood-creation activities.

65 <https://www.priedpk.org/wp-content/uploads/2023/02/Research-Study-Thars-Changing-Hydrology-1.pdf>.P.6.

66 <https://shorturl.at/jCZ45>

The dwindling of animals, both in numbers and productivity, given the lack of water or its worsening quality.

Due to the reasons cited above, a shortage of dairy products acquired from animals and increased expenditure on food procurement.

Water-borne animal diseases and animal deaths in areas around wastewater dumping sites such as Gorano.

Increased financial investment in ensuring water supply for use within the homesteads.

1.7.3. Coal-induced Land Related Livelihood Disruptions

The land-related livelihood losses for Thari people in the wake of coal projects can be summarized as:

The lack of grazing land directly impacts the number of animal holdings.

A lack of edible foods, firewood, nuts and roots collected there in causing greater kitchen expenses.

Increase in expenses on animal fodder for those retaining animals without grazing lands.

A lack of dairy-based food products and increased dependence on expensive market-based foods.

The loss of agricultural land and labour forcing people to adopt unfamiliar forms of work.

The loss of grain and fodder stores that ensured cooperation and solidarity through an exchange.



Impacts of Coal Power Projects on Pastoral Economy

Home to nearly six million domestic animals, Tharparkar accounted for 10.9 per cent of cattle including 30 per cent of sheep, 17.5 per cent of goats, almost 50 per cent of camels, 19 per cent of horses and 25 per cent of the total donkeys in Sindh in 2006.⁶⁷ Domestic animals are the primary assets in Tharparkar's household economy as major sources of environmentally adapted food (meat, milk, yoghurt, *lassi*, butter, *ghee*). *Gaucher* lands, along with those cultivated for local crops sustain humans by providing grains and animals by ensuring stocks of fodder for dry season. Animals in turn enable access to cash to procure wheat, deal with emergent health or marriage expenses and other exigencies. The vitality of animals and their health directly impact how a Thari household fares in terms of prosperity and well-being.

Since rainwater collects in natural depressions of *gaucher*, vast range-lands help preservation of and access to water for animals as well. However, Thari pastoralists also move seasonally towards the neighboring canal-irrigated districts of Sindh in search of fresh pastures. Raj Meghwar, a *dhanaar* (shepherd) from Jaman Sammu village said: "The affluent among us take their animals to canal-irrigated districts like Badin during dry months, not so much because of the absolute lack of grass here, but to change animals' feed and provide them fresh grass".⁶⁸

Scholars of pastoralism hold that the daily, seasonal and inter-annual⁶⁹ movements are vital to sustainable pastoral mobility. Large herd owners employ trained *dhanaars* who mostly live in make-shift residences (huts or *chaunra*). The small herd owners, mainly from scheduled castes, rely on daily mobility within the *gaucher*. Though some *gaucher* lands are also cultivated with village consensus, land use customs discourage such practices and consider it a violation.⁷⁰ Besides these grazing lands, some privately held dune lands not fit for cultivation such as *marho*⁷¹ are often permanently reserved as pastures accessible to all. Such arrangements always involve prior permission of their owners though.

The present chapter details the impacts of acquisition of *gaucher* for coal projects on livelihood of Tharis which include; dwindling animal holdings, lack of dairy food items, squeezed saleable assets, decreased firewood and construction material and seasonal wild vegetables and expenses incurred due to blocked pathways and enclosed graziers. The villagers in Khario Ghulam Shah, for example, have to travel many extra miles to access settlements and the graveyard. Similarly, Tilwayo, a village close to a coal mine in TCB-I faces livelihood and existential threats due to flooding, among other woes. Some of these are narrated in the following case study.

67 Pakistan Bureau of Statistics. *Pakistan Livestock Census, 2006*.

68 The shepherd further narrated that Thari people have age old techniques of drying yoghurt and converting it into small dried balls stored in pitchers as surplus food for use in case of a drought.

69 <https://pastres.org/2023/12/15/mobility-is-vital-for-successful-pastoralism/>

70 Two more customary restrictions include a general sanction on cutting trees within the grazing spaces, and caring, tending and safeguarding them from unsustainable ways of grazing and food acquisition.

71 When asked about this category, the respondents counted it as *Kabooliland*, given their formal entry as such in the revenue record, though it is not used for agricultural purposes. Thus the count of such lands is included in the category of *Kabooliland* in the data.



2.1. Tilwayo --- A Village Under 'Siege'

Perched under the giant mound formed by coal mining in TCB-I is a village called Tilwayo that is home to 2,600 people. It remains in constant danger of flooding even during normal rains. More recently, water from coal mines has been randomly discharged around the village, already facing a sanitation problem due to a lack of proper drainage. To make things worse, the coal companies have expanded their mining operations and started dumping the mud less than half a kilometer from the village houses, causing horrific breathing and pollution problems. As the research team sat in the Meghwar *para*, a neighborhood of the village, talking to landless members of the caste who work as menial laborers in Islamkot, some dogs from inside the nearby enclosure of the coal mine attacked their goats. A commotion ensued and after some time two goats that had lost their eyes and ears to ferocious dogs were shown to us.

"Nearly 400 of our goats have been killed by the company dogs; we can neither chase them away nor fire at them since firearms are banned around the coal mine", said Aslam, a local farmer. "Before coal companies," he said, "we could scare away dangerous animals and dogs. Nothing is possible now since the whole area has been tightly securitized. Even in case of normal rains, we stay up all night, fearing the water from the mine-wall would inundate our homes."

Aslam shared his concerns regarding the rising health hazards due to the bad air quality caused by the mines. The landless castes in the village have been virtually turned into daily wage laborers since neither grazing nor agriculture is possible.

2.2. Contribution of Livestock-Rearing in Household Economy

Gaucher is most crucial to landless animal holders of the poorest castes. Reasons for this reliance are a lack of resources to migrate towards canal-irrigated districts in the dry season, insufficient stocks of fodder induced by landlessness and the centuries-old habits of moving within and around these lands as wood, herb and vegetable collectors. During one visit, the research team encountered a member of the Bheel community walking towards the forest in the evening. Asked where he was going, the man replied: “My skin allergy is not going away. I will go and cover myself with a particular variety of sand for a while to ease my pain.” This is but just one example of the all-encompassing dependence on land that has been disrupted due to the large-scale land acquisition for coal projects.

2.2.1. A Thari Home Sans Animals?

Before the inception of the coal projects, almost 4,600 animals were owned by the eighty-eight households interviewed for this study. On average, this ratio has decreased by 86 per cent in the surveyed villages nearly a decade after the coal projects - from 52 animals per household before coal to just 21 animals per household. These losses were most severe in the case of the lowest landless caste of Kohli which registered a 96 per cent decrease followed by Bheel (46 per cent) and Meghwar (21 per cent) communities.

Dwindling livestock means that coal projects are nothing less than an all-encompassing assault on the livelihoods of the Thari people. The myriad consequences of the absence of grazing spaces and animals can be glimpsed through the following case study of a member of the Bheel community.

2.2.2. Tea at New Senheri Dars

The New Senhri Dars Model Village is built less than a kilometer from the smoke-emitting chimney of the coal-fired power plant in TCB-I. The research team parked in front of a dilapidated shop to buy milk for the tea. An awkward moment followed as the journalist escorting us stared aghast at the pack of milk and asked, “Why are we buying milk? Isn’t Tharparkar known for its plentiful livestock?” No one answered, waiting for the situation to reveal itself.

Gamu Bheel, a resident of New Senhri Dars Model Village, greeted us at the central temple of the model village and silently took the packs of milk. Once a prosperous owner of several cows and goats, Gamu now lives without livestock, unable to entertain the occasional guests with *chaiay*, black tea made with milk. People sat on the platform of the temple, gathering to narrate their stories. Their inventory of woes included non compensation for *gaucher* lands, failed promises of free electricity and jobs and pervasive blacklisting of locals by coal companies that excludes them from even getting menial jobs. The influential members of the Muslim *dars* community of the village managed to get some contracts—allowing them to establish businesses like hotels while the poorest sections were largely excluded from new business and income opportunities. The so-called model village also presented a bleak picture of the life inside. Compared to the *chaunras* in other villages, the rooms in the houses of model village were unbearably hot, lacked space and air and could barely accommodate three beds. The place offered little respite, communion or the merrymaking that once characterized the village where locals gathered for singing and storytelling, sometimes throughout the night.

Curiously, the relocated villagers experienced a spate of sudden deaths, unexpected and unexplained, right after their resettlement in the new village. Research is needed to explore the causes of these deaths and determine whether they were caused by coal-related operations or the trauma of dislocation and resettlement.

The coal companies had initially agreed to pay each family a livelihood compensation of PKR 120,000 annually. Members of most of these families, however, said nothing had been paid to them from 2019 onwards. When asked about the uses of compensation money for private lands that some families got, most mentioned food procurement, social and health related expenses as major spending heads. With no modern education, skills and jobs training, most locals can only work as menial laborers in squalid conditions to meet the newly added monetary pressures in the absence of grazing and rain-fed agriculture.

Though the company allotted 800 acres of land to the displaced families of New Senhri Dars as *gaucher*, the land in question belonged to people from Thario Halepoto. These original owners claim that this land was previously used for agricultural purposes. The people of Thario Halepoto have reportedly refused to accept any compensation from the company against their land. To assert their right over land, they throng the place every rainy season, cultivating it as per their tradition which incites the residents of New Sehri Dars who need it as *gaucher* land. Thus, people from both villages have been embroiled in a conflict for years now while coal mining and power generation continue unabated. Displaced from their ancestral habitat, locked out of *gaucher* and living in settlements that inhibit human-animal symbiosis, the people of New Senhri Dars Model village are hostages to Pakistan’s coal initiatives. With all traditional sources of livelihood including animals, lands, crops, fodder, and social and cultural relationships disrupted, the new village is an example of development-induced social, economic and psychological strife.

2.3. Categories of Land Available for Grazing in Surveyed Villages

As the cultivation cycle ends around mid-November each year, the *kabooli* and *Yaksala* lands are reintegrated into the pastoral economy for animals to graze throughout the dry season. This customary land-use pattern adapted to seasonal variation ensured maximum utilization and replenishment of land resources since grazing animals add to soil fertility. The interviewed households cumulatively owned 1,513.5 acres of *kabooli* land, accessed 493 acres of *Yaksala* and approximately 21,800 acres of *gaucher* land before the inception of coal projects. These lands were reduced, respectively, to 704 (46 per cent), 139 (28 per cent) and 17,800 (20 per cent) acres after coal projects.

Table-1. *Yaksala* and *gaucher* ownership before and after coal projects in surveyed villages

Available Land	Kabooli (in acres)	Yaksala (in acres)	Gaucher (in acres)
Land available before coal (in acres)	1,513	493	21,800
Land available after coal (in acres)	704	139	1,7800

These figures suggest that grazing lands have been widely targeted for coal development, irrespective of the fact that the lowest and the poorest of the Thari population is reliant on these lands for livelihood. Notably, the lower social status stifles the ability of these castes to get their voices heard and to extract the promises made by the government and policymakers. Even more deplorable is the fact that the Coal Act, developed by the Thar Coal and Energy Board (TCEB), barely mentions the resuscitation and rehabilitation of these vital and long-held sources of local sustenance devastated in the wake of coal projects.

Sohrab Bheel, a resident of New Senhri Dars, was one of the many who had to agree to relocation once the major landlords of the village assented to it. Some informal accounts claim that the coal companies used traditional rivalries of the village people with the neighboring settlements to induce agreement to move. Moreover, Sohrab and his relatives were promised jobs, free units of electricity and livelihood allowance in the event of relocation. However, it seems that nothing came of those promises once the people had moved out and their villages and grazing lands claimed and enclosed within the coalfields.

Similarly, the policies related to *yaksala* have not been implemented for at least a decade now. The *yaksala* users who have been consistently tilling these lands and qualifying the conditions to own these lands as per land grant policies have been rendered stranded since no entry into the *Hameshgi* record has been done since many years. In the absence of implementation of policies governing *yaksala* lands, their users have been effectively denied any claim to compensation for lands lost to coal projects.

2.4. Loss of *Gaucher* by Village

Sohrab Bheel, who lives in the model village of New Senhri Dars, says the *gaucher* where he grazed his cattle was claimed by coal companies. The paths leading to grazing lands are now closed to the community and their animals. Where once people had access to free grazing, now they have to pay for fodder. "Keeping animals without access to *gaucher* and procuring fodder for them is a daily struggle. We have to buy fodder from the market. A few goats that I can now afford do not allow us the luxury of milk, let alone butter or yoghurt prepared at home."

Careful estimates showed a loss of 4,900 acres of *gaucher* land in surveyed villages with a cumulative value of PKR 392 million.⁷² These grazing lands were acquired virtually without any compensation on account of archaic definitions of property stated in the Land Acquisition Act, 1894. The loss of *survey* (privately held) lands has not been included since a compensation of PKR 180,000 per acre was awarded by coal companies to their owners. However, major objections to the process of this acquisition are frequently voiced by the Tharis. These include mode and determination of the compensation, arbitrary powers of revenue officials and urgency clauses in LAA, 1894, that inhibit land owners from rights and time to appeal.

Villages of Bhave Jo Tar, Thario Halepoto, Jeendu Dars, Khario Ghulam Shah and Warvai respectively lost 1,200, 1,050, 500, 700 and 800 acres of communal grazing land to coal mining operations and thermal power plants. Similarly, Jaman Sammu, Bitra, Veijihar and New Senhri Dars lost 300, 200, 100 and 50 acres of their *Gaucher* respectively. The villages of Gorano and Dukkar Chau did not lose any *Gaucher* while data for Tilwayo could not be confirmed.

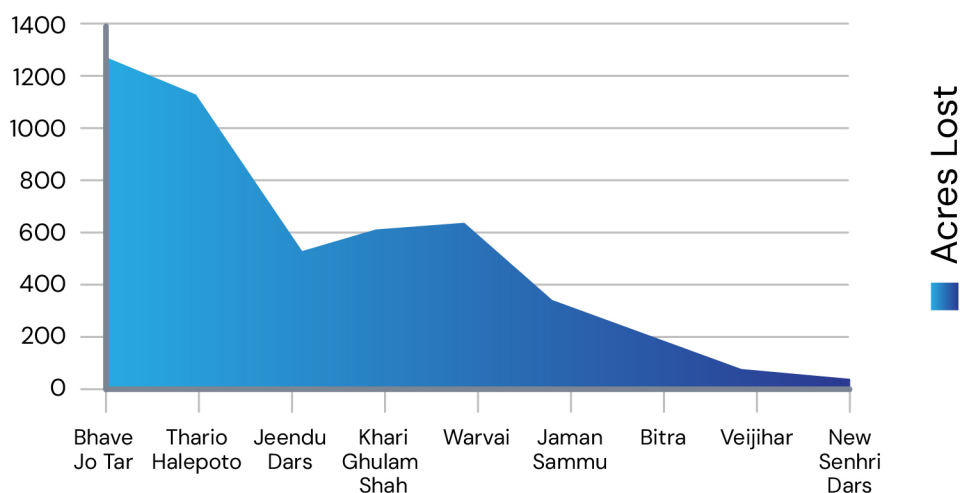
For many, life has changed dramatically after resettlement in the New Senhri Dars Model Village. Sohrab Bheel describes this as "difficult". He now shares a house in the so-called Model Village with two other families. A lack of space, leaking roofs in summer rains, the incessant need for cash and urgencies of an existential nature seem to mark his life. For many like him, procuring food, milk and kitchen items from the market, things that almost came of their own accord in pre-coal days, require drudgeries like labour, seasonal migration and struggles to acquire jobs in the company.

⁷² While *Gaucher* provides numerous livelihood related resources including food, fodder and wood, the value of these resources has been excluded from this table and the rate of *Gaucher* land is kept minimal i.e. 800,00 per acre against the 180,000 per acre of *Kabooli* land given by coal companies.

Nandu *Bheel*, another respondent from New Senhri Dars Village said: “Though we always used to migrate for *labara* during wheat harvest season in the canal-irrigated districts, we never went in a situation of helplessness as we do now. Having lost our lands, grains, fodder and finally animals, *labara* is the only livelihood opportunity for us to ensure food supplies for the coming year.”

“To tell you the truth”, Nandu said, “I remember the days when we used to slaughter goats for our guests, people used to gift or lend *maunds* of fodder to the needy as everything was abundant. Gone are those days when we spent whole nights in singing and storytelling.”

Graph-2. Gaucher acquired by coal projects in nine surveyed villages

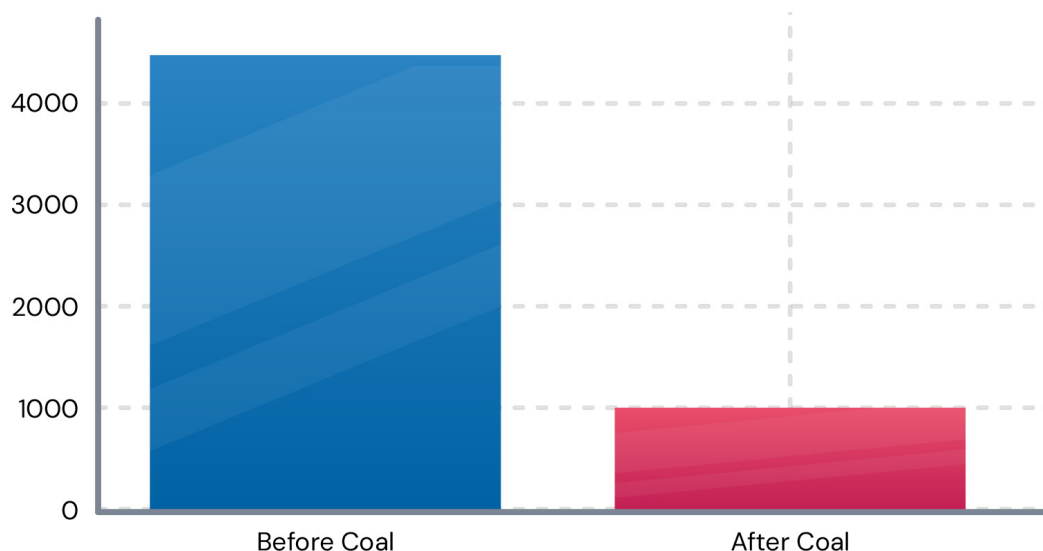


2.5. Number of Animals Lost in Surveyed Population After Coal

In Tharparkar, cultivation and grazing complement each other in significant ways. A disruption in one can be fatal for the other. The free grazing of animals in *gaucher* ensures people’s freedom from immediate livelihood worries in the harsh desert zone, unsuited to physical exertion across the year. Moreover, Thari lifestyle has been integrated with animals and grazing practices for centuries, enabling movement and stewardship of the land and its resources.

While the exact figures for the number of animals at the village level are unavailable, animal holdings decreased by 40 per cent for the 88 interviewed households, going down from 4,636 before land acquisition to just 1,835 after nearly a decade. The animals held by interviewed families prior to *gaucher* acquisition were reduced in value from PKR 150 million to PKR 20 million – a staggering decrease of 86 per cent.

Graph-3. Number of animals lost in surveyed households



2.5.1. Loss of Dairy Products in Surveyed Scheduled Caste Households

As the number of domestic animals dwindled, so did the prospect of accessing nutritious foods and dairy products like yoghurt, dairy-based drinks and butter for semi-pastoral local populations. Thar’s population had adapted to these foods climatically; they served as potent sources of protein and nutrition helping the desert inhabitants fight scorching desert heat and food shortages. The available dairy foods registered a cumulative decrease of 35per cent in interviewed households. In addition to loss of food and nutrition, this means a significant reliance on market-based food items making Thari people vulnerable to price fluctuations and malnutrition. Moreover, the loss of milk translates into loss of dairy products and drinks like yoghurt and *lassi* which have not been quantified in the following calculation. Similarly, the change in stable food patterns of local populations may have long term health and resilience consequences that should be thoroughly studied and researched.

Table-2. Total value (PKR) of animal and dairy products lost after coal projects

Sr. No	Category of Livelihood Loss	PKR Value Before Coal	PKR Value After Coal	Difference in PKR	Per cent-age of Difference
1	Animals (Before coal 4636, Lost: 2,801)	156,364,000	22,041,500	134,322,500	85.90per cent
2	Dairy Products (butter, ghee, milk)	193,696	125,025	68,671	35.45per cent

2.5.2: Losses in Animals and Dairy items in Surveyed Scheduled Caste Households

Kohli, the lowest among the scheduled castes, lost 97 per cent in terms of animals and dairy products, followed by Bheels registering 57 per cent decrease in animals and 63 per cent loss in dairy food items. On average, Meghwars lost 45 per cent animals and 22 per cent of previously available dairy food items. The figures again reinforce the impression that the landless castes who do not have access to private tracts of land are affected most by the coal projects. With no alternative sources of income these castes are faced with significant challenges including access to nutrition post land acquisition for the coal projects.

Table-3. Losses in animals and dairy items in surveyed scheduled caste households

Caste	Avg. Animals per cent Change	Avg. Animal Products per cent Change
Bheel	-57.31per cent	-62.87per cent
Kohli	-97.44per cent	-96.10per cent
Meghwar	-45.34per cent	-21.97per cent

2.6. Reasons for Animal Loss

A significant majority of households interviewed (59 per cent) attributed their animal losses to the lack of *gaucher*. The land acquisition process, the data suggests, has to align with local livelihood realities where many forms of land remain vital to people's sustenance without being owned. The LAA, 1894, jeopardizes this customary land-use reality and refuses to recognize the sanctity or inviolability of any land not owned by a human agent. The local land users, it must be noted, have to cope with many related pressures that come to bear upon the pastoral economy. For example, the drastically reduced *gaucher* has forced 17 per cent of respondents to sell animals to meet the daily kitchen expenses, while 11 per cent said inflation compelled them to sell animals. Disease and consumption of ash and smoke-laden grass were counted as reasons for animal loss by 6 per cent of the households and respiratory diseases (*khulko*) were mentioned by 2 per cent of the respondents.

Table-4. Reasons for animal loss

Sr. No	Reasons for Animal Loss	Percentage
1	Lack of <i>gaucher</i> /fodder	59 per cent
2	Sold animals for food and other needs	17 per cent
3	Inflation	11 per cent
4	Disease	6 per cent
6	Smoke-laden grass consumption	6 per cent
7	Death due to respiratory diseases	2 per cent

2.7. Expenses on Human and Animal Health after Coal Projects

The survey showed that households of three landless castes of Bheel, Kohli and Meghwar respectively spend PKR 5,000, PKR 11,000 and PKR 8,500 on human and animal health every month. Expenses on human health were the greatest among the lowest of scheduled castes i.e. Kohli. The settlement of Kohli community in the village of Bhave Jo Tar was particularly unlivable. Caught between a new carpet road (that endangers playing and wandering Kohli children and animals) and a coal power plant, Kohlis of Bhave Jo Tar face innumerable challenges in daily life. The noise and security lights of the power plants have robbed the villagers of the quiet comfort of night, especially exposing the huts of Kohlis whose *chaunras* are a few yards away from the plant's fence. The Kohli residents, especially their women, traverse significant distances to relieve themselves. Moreover, water from the plants accumulates around Kohli homes who complain of mosquito infestation. While some partially functional dispensaries have been provided to locals by the coal companies, no veterinary health services, facilities or hospitals are in place. Locals said that they had to call the government veterinary doctor posted in Thar in case of an animal health emergency. The overall pace of development in Tharparkar has also rendered placement of conventional treatment facilities and healing practitioners (*Daahis*) untenable. Thus animals and humans are at a greater risk of being without effective healthcare in the event of diseases. Thari people and animals face a situation where traditional healers are rare and modern healthcare facilities scant.

Table-5. Expenses on human and animal health for surveyed landless castes

Caste	Average monthly expenses on animal health (PKR)	Average monthly expenses on human health (in PKR)	Total
Bheel	1,666.67	3,333.33	5,000
Kohli	1,666.67	9,500	11,166.67
Meghwar	4,000	4,666.67	8,666.67

2.8: Expenses on Previously Free Construction Material and Fire-wood

Almost all the respondents confirmed that they relied on *gaucher* lands to acquire material to construct the conventional hut-houses called *chaunra*. This reliance is now disrupted as the coal mines expand and claim wider areas. A typical *chaunra* requires wood from trees like *tankaro* that support roofs made out of a dried local plant called *kip*. Moreover, supporting staffs made of *aq* plants are used to bind the *kip* pieces on the roof as well as around the wooden boundaries of houses usually made of *beri* trees. Increasing land acquisitions have disrupted their access to these plants. Built once with plants and trees freely available, a typical *chaunra* now costs nearly PKR. 60,000. With plants and trees now rare and commoditized, locals report the *kip* plant is slowly going extinct in their areas and where it is found, people have started selling it to meet the increasing pressure of inflation as reliance on market food items and wheat increases.

An elderly man once took the research team to observe the boundary around his home made of *devi*. "If you use *devi* to make a boundary, the residents will lose some years of their life", he said, to our profound surprise. When asked for the reasons, he explained, "this plant keeps leaving its thorns around us", pointing at the scattered *keekar* thorns. "*Beri* kills its thorns by itself after some time and never bothers us. If *devi*'s thorn hits the udder of a sheep or goat, it never heals and the animal cannot be milked ever again. It can only be slaughtered."

Glimpses of such details show the depth of the Thari people’s ecological adaptation to their environment. Even small-scale changes in the environment can irrevocably impact the intricate patterns of this adaptation. Apart from coal mining and land acquisition, the adoption of modern work and labour conditions reduces the time and energy available to locals for building conventional homes. New and demanding work regimes leave people with no time to cut and dry the *khip*, carve staffs out of *tankaro* trees and related architectural work for the conventional climatically adapted homes.

The locals report that the annual replacement of roof-thatching material by acquiring fresh *khip*, drying it and renewing the roofs is an added burden now. Furthermore, those still reliant on conventional architecture were spending 48 per cent more on construction materials after the inception of coal projects.

Table-6. Expenses on construction material and Fire-wood in surveyed households

Sr. No	Category of Loss	Before Coal (PKR)	After Coal (PKR)	Difference (PKR)
1	Expenses on Construction Material and Fire-wood	1,418,120	2,201,441	-783,321

2.8.1. Loss of Construction Material by Caste

Spending around PKR 2 million on construction materials, the 88 households are an example of how the disruption of ongoing ecological relations of a community unleashes a livelihood crisis. The economic and ecological injustices inherent in Pakistan’s fossil fuel-based power generation disrupt ecological relations and exacerbate regional and urban-rural inequalities. Such initiatives force the most vulnerable into further poverty. These communities pay a heavy cost for the consumption habits and lifestyles of the well-off. This is apparent from the data that shows land-owning castes of Thakur, Dars, Sammu and Rahimun lost little in terms of construction materials. By contrast the three landless castes—namely Kohli, Bheel and Meghwar—were spending PKR 970,000, 630,000 and 200,000 respectively.

Table-7. Loss of construction material by caste

Caste	Total Value of loss (in PKR)
Bheel	975,000
Dars	0
Junejo	75,000
Khaskheli	75,500
Kohli	637,500
Lanja	100,040
Meghwar	200,000
Mehranpota	25,400
Rahimon	113,001
Sammu	0
Soomra	0
Thakur	0
Total	2,201,441

2.9. Proximity to Toxic Environs and Loss of Animals

Though physical proximity to toxic coal environs (coal mines and coal plants) may not qualify as an objective reason for losses suffered by communities, it nevertheless serves as an important clue regarding the impacts of coal mining and power plant waste on living beings. The Union Council (UC) closest to the coal mine of TCB-I, Khario Ghulam Shah registered the highest 74 per cent loss in animal holdings followed by 63 per cent in the next closest UC of Jeendu Dars and 52 per cent and 43 per cent in Giriancho and Seengaro respectively. Only Veijihar, the UC furthest from coal projects, gained in terms of animal holdings since the inception of coal projects. The mounting losses in animals in union councils closest to coal mines may serve as yet another measure of Tharparkar's livelihood crisis in the wake of contemporary coal development.

Table-8. Animal loss/gain for various UCs after coal projects

UC	Animal Holdings (per cent)
Giriancho	-51.98per cent
Jeendu Dars	-62.87per cent
Khario Gulam Shah	-74.27per cent
Seengaro	-43.25per cent
Veijihar	37.57per cent
Positive values indicate increase.	
Negative values indicate decrease.	

Impact of Coal Power Projects on Rain-fed Agriculture

Tharparkar is a highly arid region marked by water scarcity. The population relies on rain-fed agriculture that starts with the onset of monsoons in July and ends in November each year. Major crops grown in the area include green beans, pulses (*mung and korar*), *bajhar*, *lobia* and *tir* which serve as sources of cash, and human and animal food. Almost all crops except *tir* (sesame) produce stalk along with grains which is stored by cultivators for their animals. This chapter outlines forms of agricultural land, land and labor tenures, the extent of agricultural land losses and associated reduction in crops, fodder and consequent access to cash. Moreover, these losses also mean a lack of home-grown staple foods including pulses like *mung*. These changes have affected all types of landowners, big and small. However, the worst losers again have been the scheduled castes who lack private lands and hence also disqualified for any compensation. The only form of land they accessed i.e. *yaksala* (state-owned) for growing crops was acquired by the coal companies without any compensation. Apart from these categories of land, unrecognized forms of land like *na-kabuli* have also been acquired for coal projects in arbitrary ways. The chapter takes into account these losses to illustrate what they meant for local population and social ecology.

3.1: Rain-fed Agriculture: Season, Labour and Tenures

Large cultivators who often come from higher castes depend on lower castes especially *Bheels* and *Kohlis* for labour. Small and medium-range landowners, however, work their fields with family members. The forms of labor work include clearing of fields, tilling (in almost all cases with tractors now), sowing and tending, and installing fences around fields to safeguard against wandering animals. Besides these cultivators, some landowners lease their lands to financially sound cultivators under *adhlap* (sharing half of the expenses and produce), *patti* (landlord takes one-fourth) or *makada* (permanent cash-based rent). Besides *kabuli*, *yaksala* lands are also cultivated and in some cases leased to other cultivators as well. All the agricultural lands are either converted or can be potentially converted into pastures after the harvest.

3.2. Relative dependence of Landholding and Landless Communities on Rain-fed Agriculture

Before the inception of coal projects, interviewed households of three landless communities —Kohli, Meghwar, and Bheel—were using 84 per cent or 399 acres of the total 474 acres of *Yaksala* lands held by all 88 households. By contrast, these scheduled castes held just 26 per cent (300 acres) of the total 1,508 acres of *kabooli* land possessed by all surveyed households in the pre-coal period. The *Kohlis* were the most dispossessed in terms of *kabooli* land ownership, having a share of just 5 acres in total. They were also the worst affected as they lost more than sixty of the 93 acres of *yaksala* land they accessed before coal projects. Bheels were left with just 50 acres of *yaksala* after losing 95 acres to coal projects and Meghwars lost a whopping 123 of their total 161 acres. While some big landowners lost a significant amount of their private lands, they were mostly able to retain the same amount by buying land elsewhere.

Overall, coal projects ate up nearly 70 per cent of the *yaksala* lands being used/ accessed by scheduled castes before coal projects.

Since neither alternative grazing nor agricultural land or any compensation against their loss was offered, thousands from the lowest social ladder have been left clueless about future livelihood sources and trajectories.

Table-9. Relative dependence of landholding and landless communities on rain-fed agriculture

Caste	Before Coal (Acres)		After Coal (Acres)	
	kabooli	yaksala	kabooli	Yaksala
Bheel	217.5	145.5	160.5	50
Dars	165	10	65	10
Junejo	27	0	27	0
Khaskheli	7	0	4	0
Kohli	5	93	0	31
Lanja	60	0	55	0
Meghwar	78	161	39	38
Mehranpota	135	0	20	0
Rahimon	346	5	210	0
Sammu	435	50	100	10
Soomra	8	10	0	0
Thakur	25	0	24	0
Total	1508.5	474.5	704.5	139

Note: The bold entries represent scheduled castes in the surveyed villages.

3.3. Losses in Crop Production in Interviewed Households

The acquisition of fodder from crops links rain-fed agriculture with aspects of the pastoral economy since fodder stocks determine animal holdings. Hence the decrease in crops has also indirect consequences for animal holdings. A major decrease of 84 percent in the production of pulses (*mung*) sold in the market and stored as food was recorded for all households. It was followed by *Tir* which decreased by two-thirds (75per cent), green beans (*ganwar*), *korar* (pulses) and *bajhar* decreasing by 47, 45 and 31 per cent respectively. On average, a household in coal-affected villages of TCB-I & II faced an annual decrease worth PKR 89,832 against green beans followed by 31,833 against *korar*, 21,867 against *bajhar* and 17,701 against *mung*. Figures showed that interviewed households experienced diminishing crops in all four cases except 0.10 per cent increase in *lobia*.

These losses are making rain-fed agriculture unsustainable in some cases. For example, Muhammad Iqbal, a social and political activist, owns several tracts of private and *yaksala* lands and cultivates more than fifty acres around the village of Meghay Jo Tar. The village is the prime water re-injection site in TCB-II. Iqbal had stopped cultivating *bajhar*, *ganwar* or pulses altogether. When asked, he said, "I actually made calculations of how much I spend on cultivation in terms of seeds, fuel for tractors, labour and time. When I added to all these expenditures

the uncertainty of rain, crop production, and the increasingly worsening quality of underground water, I concluded that it would be way more profitable for me to procure wheat for my annual consumption and spend the rest of my resources on other things including my political activities. The time and worries of cultivating land, arranging labour for its harvest, transporting it to market, consumed a better part of me that I now dedicate to social activities, family and some form of earning through driving my jeep for the locals.”

A host of factors such as transport networks, availability of vehicles, possibilities of travelling to nearby towns like Islamkot or Mithi and prospects of earning through mobility combine to undermine rain-fed agriculture that once offered a variety of foods and ensured a continued bond with the land and its care.

Iqbal said: “Coal companies are contaminating our underground water by re-injecting mine water back, deep into the third aquifer. When we ask them about the consequences of these activities, they say there is nothing wrong with the water they re-inject. Why don’t they store this water in a dam around us so that we can cultivate our lands with it?”

Other than being a potent critique of the contemporary coal development projects, the question implicates both coal companies and the state which seem to be largely oblivious to the environmental consequences of coal mining.

Meghay Jo Tar is a population of several thousand people and recently two reverse osmosis (RO) plants have been installed to provide safe drinking water. However, Iqbal questioned this, saying, “What about the water for the thousands of animals? Can RO plants entertain them daily? What will be the consequences for us and animal health if they continue to consume polluted well-water?” Meghay Jo Tar is one of the villages whose underground water quality was studied by civil society groups and the report, reviewed and launched by Elaw,⁷³ identified the presence of lead, mercury and other toxins in water, well above the WHO permitted levels. However, no efforts seem on stage to mitigate the situation and safeguard Tharis’ access to clean water.

Table-10. Losses in crop production in interviewed households

Crop	Average Production Before Coal (in PKR)	Average Production After Coal (in PKR)	Change (in PKR)	per cent Change
bajhar	69,772.41	47,904.89	-21,867.53	-31.34per cent
ganwar	189,494.25	99,661.93	-89,832.32	-47.41per cent
korar	71,089.08	39,255.68	-31,833.40	-44.78
mung	20,854.89	3,153.41	-17,701.48	-84.88per cent
lobia	3,124.14	3,422.19	298.05	0.10per cent
tir (Til)	8,471.26	2,112.22	-6,359.05	-75.07per cent

73 <https://www.dawn.com/news/1745937/concerns-raised-over-poisoning-of-potable-water-in-thar>

3.4. Additional Household Expenses on Wheat

The translation of loss of food items in monetary terms should not be allowed to downplay the myriad possible results on long-term health and well-being of locals who rely on less nutritious and climatically less adapted foods like wheat. On average, a Thari household spends two times more (PKR. 14,961) on buying wheat from the market as compared to the days before coal (PKR.5919). The conventional crop of *bajhar* used to be the staple diet in Tharparkar and it continues to be the case in villages away from coalfields. These changes might be linked to road networks enabling greater access to markets and mobility, famine-induced wheat distribution by Sindh government⁷⁴ and coal-induced land acquisition.

Besides, almost 98 per cent of the interviewed family heads expressed that they got edible and storable food items (Non-Timber Forest Products) from *gaucher* or private land in the rainy season before coal projects. Almost 88 per cent said that these foods have decreased and 10 per cent (mostly scheduled castes) reported their complete unavailability.

Table-11. Average per household expenses on wheat procurement

Average Wheat Expenses before coal	Average Wheat Expenses after coal	Difference
5,919.85	14,961.82	9,041.97

3.5. Weighted Wheat Use in Surveyed Households of Scheduled Castes

The study showed that weight of the wheat procured among interviewed households of scheduled castes (Kohli, Bheel and Meghwar) either increased or remained the same. However, even procurement of the same amount is now costlier given inflation. For Bheel households, the annual wheat used before coal was 81 maunds which went up to 105 while for Kohlis it increased from 16 to 22 maunds after coal. The slight reduction in the use of wheat among Meghwar is perhaps due to their migration towards urban centers or reduced access to cultivatable land.

Table-12. Weighted wheat used in households of scheduled castes before and after coal

Caste	Before Coal (40kg = 1 maund)		After Coal (40kg = 1 maund)	
	Average monthly wheat consumption	Annual Wheat consumption	Average Monthly wheat consumption	Annual Wheat Consumption
Bheel	4.9	81	4.8	105
Kohli	2.7	16	3.7	22
Meghwar	3.4	78.0	5.3	74.5

74 <https://reliefweb.int/report/pakistan/much-awaited-free-wheat-distribution-thar-begins-today>



CHAPTER-4

Resistance against coal

The local population in Tharparkar has consistently raised voices against invasion of their environment by coal companies, mining and power generation. This resistance includes forums like *Thar KoiloRajounri* (People's Tribunal on Thar Coal), a perennial platform that brings together indigenous inhabitants of villages in coalfields. Youth platforms like *Thar SujaagSath* and environmental protection movements including *KaroonjharBachao Movement* have resisted mining, excesses to workers and labourers, unfair acquisition of land for coal projects and the cutting of the green mountain range in Tharparkar's east. Civil society organizations like Thar Citizens Forum (TCF), Civil Society Support Program (CSSP), non-governmental organizations like Thar Deep have also been active in creating the momentum against coal in recent years.

The struggle for climate justice in Tharparkar following coal projects centers around the wastewater reservoir situated just outside Gorano village. It spans 1,500 acres of land. Locals claim that the land occupied by the wastewater dumping facility exceeds 2,000 acres. Gorano is a natural depression that has historically attracted rainwater and is known for being one of the few places where the first rainwater aquifer is sweet. Thari people access this aquifer through dug wells. Just a few years after the reservoir's establishment – holding toxic wastewater from coal mines and power generation plants – at least 40 dug wells in Gorano have turned brackish, rendering their sweet waters useless. Ironically, coal companies initially promoted the reservoir as a nature conservatory that would also provide free fish to locals in the desert. This projection of the reservoir went so far that coal companies convinced the International Union for Conservation of Nature (IUCN) to declare Gorano Pond a new habitat for migratory birds.⁷⁵

75 <https://customnews.pk/2019/02/04/iucn-declares-gorano-in-tharparkar-a-new-habitat-for-migratory-birds/>

Luchhman Das, a local resident told the research team that the whole system of livelihood has been jeopardized by the reservoir.

“Our soil has become too soft to support trees, and they fall with the wind. Agricultural production has also declined. A population of 3,500 people relies on water from an RO plant with a daily capacity of 2,500 litres, which translates to less than a litre per person. Is it even humanly possible to survive on this amount? Do we wash clothes or pots, water animals, or drink it ourselves? There are times when people lack water to prepare dough. The company closes the RO plant for a day every week, making that day the hardest for us. Our misery doesn't end there. The water has a distinct quality and taste, and it even reduces the lifespan of clothes we wash with it.”

The people of Gorano organized a remarkable 630-day sit-in against the reservoir in front of the Karachi Press Club, the longest sit-in in Pakistan's history. They weren't alone in their struggle, as various political forces, including Awami Tehreek, joined them in a 32-day long march against the dam and environmentally unsustainable development projects. The long march began in Islamkot and concluded in Karachi.⁷⁶ Numerous press conferences, rallies, public meetings (Kaths) and events have been organized since then to highlight the toxic impacts of the reservoir on all living beings in the vicinity.⁷⁷ Apart from public agitation, the movement also involves long legal battles against the reservoir by members of Thar KoiloRajunri who finally had to move Pakistan's Apex court to get resolution and relief after their petition was discharged by Sindh High Court in 2023.⁷⁸

Besides these struggles, other forums, such as the Thar Citizen Foundation, have continuously organised conferences, meetings, and campaigns to highlight the post-coal economic, land-related, and environmental issues facing Tharparkar. The anti-coal movement in Tharparkar is now effectively entering its second stage, whereby it seeks alliances and synergies with Civil Society Organizations (CSOs), climate activists, and human rights forums across Sindh and Pakistan. Recently, the 'JeewanSaanhRajounri' or Life-Chain event at Gorano Dam, organised under the auspices of Thar KoiloRajounri, saw fervent participation from civil society, climate and human rights forums, academia, and student forums from across the province.⁷⁹

Significant gains have been made due to these small but active movements, particularly in terms of politicizing Tharparkar's youth and wider social and media groups. The movement has drastically reduced securitisation levels and the atmosphere of fear surrounding coal projects. As a result, people have gradually gained confidence and power from within Tharparkar's society and like-minded groups, alliances, and organizations across Sindh and Pakistan.

The coal companies have been cautious in their proposed displacement of TharioHalepoto, a village in TCB-II. Villagers report that coal companies have accepted all their demands regarding household designs, compensations, and timing of pre-displacement enumeration surveys. Tharparkar's indigenous communities have written to coal financing banks, such as ICBC and the Asian Development Bank, seeking inclusion of coal plants in their Energy Transition Mechanisms (ETMs).

The anti-coal campaign has engaged state institutions, including district administrations, on issues like land acquisition, reforms in land laws, water degradation from coal mining, and lightning strikes. However, progress has been difficult to achieve with state authorities on significant matters, such as introducing a dedicated Displacement and Rehabilitation Policy for Tharparkar. Despite civil society's detailed responses, proposed amendments, and suggestions, the government has yet to formally respond and adopt this framework.

76 <https://www.dawn.com/news/1312937>

77 <https://www.dawn.com/news/1308076>, <https://www.dawn.com/news/1305840>.

78 <https://www.dawn.com/news/1771108>

79 <https://chehradigital.com/en/blog-post.php?post=1702>

No significant steps have been taken to resolve water contamination crises in villages surrounding coal mines. Moreover, efforts to shift wastewater disposal sites away from human settlements and ensure safer discharge and re-injection of coal-mine water have been unsuccessful. The government has also failed to address the broader environmental and livelihood crises. Except for Gorano, no other village has received livelihood compensation, and even in Gorano, the amount is a meagre monthly PKR 8,000 per household.

CHAPTER-5

Livelihood Policy Gaps in Tharparkar in the Wake of Coal Power Projects

5.1.A Glimpse of Wider Policy Environment

Mainstream perceptions of Tharparkar are shaped by images of poverty and famine. In the mid-2020s, news outlets suddenly featured photographs of starving children and elderly, barefoot women migrating out of the hunger-stricken land due to famine. Tharparkar's desert landscape, lacking vegetation, water, roads, modern amenities, bustling markets, and irrigated agriculture, reinforces these images. Beyond public consumption, these surface-level understandings also make the area vulnerable to classic neoliberal economic interventions through large-scale development projects.

The Prime Minister's speech at the inauguration of Phase II of Thar Coal mines exemplifies this image. Thar is portrayed as a 'barren', 'deserted', and lifeless place where coal mines have brought vitality and signs of life. However, even high-level policy thinking struggles to reconcile conflicting ideals and methodologies of 'development' with Thari ground realities.

Notably, the Sindh Poverty Reduction Strategy (PRS) 2020, supported by the European Union's technical assistance, is one such policy document aimed at addressing poverty in Sindh¹. The PRS focuses on Community-Driven Local Development (CDLD) and includes three main strategies: Community-Driven Local Development, Addressing Urban Poverty, and Rural Growth Centres.⁸⁰

The Strategy is guided by three overarching principles of (i) agglomeration or establishing 'rural growth centres' (RGCs) understood as market centres that will provide economic activity and ensure growth through employment (ii) sectoral focus and (iii) community ownership (Sindh Poverty Reduction Strategy, 2020. P.19). However, the district-wise identification of such growth centres runs into significant trouble while aligning the Strategy to Thari context where 92 per cent population lives in scattered rural margins.⁸¹ The implementation framework of this strategy for Tharparkar highlights Thar's alarmingly low position on the Human Development Index (P.18). It then notes Tharparkar's substantial share of livestock, comprising half of the province's camels, one-third of its sheep, one-fifth of its goats and horses, and one-tenth of its cattle (P.18). The document concludes by downplaying the growth potential of rural areas, stating, "As such, rural areas in Tharparkar are not envisaged as playing a growth

⁸⁰ <https://faolex.fao.org/docs/pdf/pak191276.pdf>

⁸¹ Government of Sindh Implementation of Poverty Reduction Strategy: Identification of Growth and Service Hubs in Tharparkar District, November, 2020. <https://urbandirectorate.gos.pk/wp-content/uploads/2020/10/PRSperscent20Tharparkarpercent20Report.pdf>

role, except for the traditional artisanal industry” (P.26).

Rather than envisaging strategies to maximize the business potential of livestock and other possibilities in rural areas, it instead proposes Rural Services Centres rather than RGCs for Tharparkar. Visiting non-coal affected villages in Islamkot reveals a relatively prosperous life, independent of modern amenities, where people coexist with cattle. This contradicts the PRS implementation document’s characterization of Tharparkar as “bereft of any natural resources, other than limited patches of arable land” (P.18). The present survey, for example, found that 88 households have access to over 1,000 acres of *yaksala* (state-owned) agricultural land. Moreover, the document fails to acknowledge the vast communal grazing lands that support the district’s significant share of cattle, goats, and sheep.

Tharparkar’s forms of prosperity and well-being diverge from conventional measures of progress and development. Consequently, policies lack innovative solutions to support organic, earth-bound, and feasible forms of development. Any poverty alleviation program in Tharparkar that neglects the majority of scheduled castes, increasing their access to state lands, and protecting *gauchers* – which underpin the local agro-pastoral economy – is likely to fail. Effective solutions must resonate with the local cultural and political context, leveraging local Tharis’ skills to create livelihoods in familiar ways.

By advocating for contextualised solutions at the state policy level, we will examine policy gaps and violations/ omissions regarding livelihoods in Tharparkar.



5.2. Violations/ Omissions of International and National Policies Regarding Tharparkar's Threatened Livelihood Security

1. *The forcible acquisition of Thari people's centuries-old lands without compensation is an assault on their way of life and livelihood, protected by the International Covenant on Economic, Social and Cultural Rights. Article 1.2 of the covenant explicitly protects peoples' means of subsistence, stating that 'In no case may a people be deprived of its own means of subsistence', while also conferring entitlement to all people to freely dispose of their natural wealth and resources.*
2. *The problems of air pollution, coal-ash, dust, water degradation, and water-borne diseases in Tharparkar, along with reported stunted births and growth of children at the Meghay Jo Tar water-reinjection site, starkly violate Article 24 of the Convention on the Rights of the Child, which safeguards their right to a safe and hygienic environment, drinking water, and sanitation.*
3. *Coal mining in Tharparkar threatens vital access to plants, herbs, and trees. Large-scale open-cast mining has led to the widespread eradication of trees that local populations have guarded, stewarded, and cared for over centuries. A sustainable system for using these plants and trees was in place but is being rapidly destroyed by the Land Acquisition Act of 1894.*
4. *The United Nations' Kunming-Montreal Global Diversity Framework prioritizes 'the sustainable use of biodiversity' among its four overarching goals, which inform 23 specific targets to be achieved by 2050. The role of plants in conventional Thari livelihoods is central and must be studied and protected to ensure Thari life, culture, and economy flourish alongside its ecology.*
5. *The post-2020 Global Biodiversity Framework, implementing the UN Convention on Biological Diversity, must account for nature's contributions to people and inform public and private decisions. Khip, vital to Thar's architecture and animal fodder, is increasingly rare in villages hosting coal company-built wastewater reservoirs. Global environment protection agencies must account for strategically important trees and plants like kandi and khip in Thari livelihood systems, informing industrial and public decisions.*
6. *Coal companies' Corporate Social Responsibility agendas fail to provide local Thari people with relevant skills for better employment. Consequently, most employees from these coalfield blocks are manual laborers. Lucrative contracts are offered to outsiders, and local laborers are reportedly blacklisted on petty excuses, violating Article 3(b) of the Discrimination (Employment and Occupation) Convention, 1958 (No. III), which obliges member states to provide vocational education and placement services.*
7. *Reports from coalfield workers reveal no representative bodies exist to negotiate working conditions and remuneration, breaching the Freedom of Association for workers, as per the International Labour Organization Convention (1948). Without representative bodies, coal companies cannot comply with Article 5(1) of the Promotional Framework for Occupational Safety and Health Convention, 2006, leading to unaddressed worker complaints, such as poor food quality at work sites.*

5.3.Omissions/ Violations of National Policies

Pakistan's National Adaptation Plan (NAP) 2023 prioritizes addressing inequality and promoting local decisions that safeguard vulnerable groups from climate change and socioeconomic insecurity impacts. However, the country's decision to exploit Tharparkar's local coal has resulted in billions of rupees in losses for vulnerable groups, widespread land dispossession, unsustainable land-use changes, and increasing environmental degradation, including lightning strikes and degraded water quality, posing health risks to populations. There is an urgent need to align Pakistan's energy policies with NAP 2023's principles.

One of NAP 2023's six pillars is Green Jobs and Livelihoods, which encompasses promoting renewable energy, sustainable agriculture, green manufacturing, and green industries. Conversely, the state plans to connect the entire country to Thar coal mines via a railway line to increase the market for the dirtiest fossil fuel. This move contradicts the state's declared intention to reduce emissions, as outlined in NAP 2023's first pillar.

Clause A of Sub-section 1 of The Sindh Companies Profit (Workers' Participation) Act, 2015, requires every provincial company to establish a Workers' Participation Fund within the year the scheme becomes applicable or within nine months of that year's close, and (b) allocate five per cent of annual profits to the established fund. However, coal companies operating in Tharparkar have either failed to establish such funds or been slow to do so, and have not constituted transparent and inclusive oversight bodies to govern their disbursement and use.

Thar Coal Pricing Framework counts debt servicing, equity return to sponsors and project operational costs⁸² in price determination of coal but does not integrate the coal-induced social, environmental and economic damage borne by the communities into tariff structure. The framework is in need of urgent reform to include local losses in a comprehensive way through inclusive and transparent methodologies for determination of such losses.

Coal projects are plagued by policy issues that make it difficult to assess the economic feasibility of producing power from local coal. For example, there is a stark difference of \$10/ton in the rate of coal production assumed by Thar Coal Energy Board (TCEB)—the prime institution that sets coal prices—and the one given as actual cost of coal in the Indicative Generation Capacity Expansion Plan (IGCEP). Coal fired power plants (CFPPs), it seems, must be optimized under least cost analysis.⁸³

Land Acquisition Act, 1894 is the perennial colonial instrument that has been employed by the state to grab communal and *yaksala* lands of Tharparkar to enable coal projects at the cost of thousands from

82 <https://tceb.gos.pk/wp-content/uploads/2019/04/Thar-Coal-Pricing-Framework.pdf>

83

minority groups who relied on these lands. The provision of urgency clause (Section, 17) has been most instrumental in speedy and chaotic acquisition. However, the clause fails to specify 'urgency' just as the Act itself fails to reasonably define 'public interest', impose a time limit between acquisition and

compensation, to restore land to original owners, and confers limitless arbitrary power on Executive District Officer of Revenue to define 'persons interested' and set compensation rates. Lacking in accountability and any resettlement/rehabilitation provisions, the LAA 1894 must be entirely reformed to save indigenous ecologies from private land grab.⁸⁴

Articles (1) (2) and (3) of Section 19 of the Sindh Environmental Protection Act, 2014 empower Sindh Environmental Protection Agency (SEPA) to conduct environmental monitoring of all projects initially approved by it and assess the harms caused by discharged effluents, wastes and air pollutants. At least 40 dug-wells in Gorano and many in Meghay Jo Tar have been rendered brackish due to wastewater discharged or re-injected in those villages. Similarly, coal ash now pervades crops around power plants of TCB-II. No stringent implementation of these powers and mandates is still in sight.

Section 14 of the same Act expressly prohibits the disposal of solid and hazardous wastes at unauthorized places. The random, dangerous discharge of mine-water in open spaces, without any notice by coal companies, in the village of Tilwayo during April, 2024, specifically violates the said provision.

While the Resettlement Policy Framework for Thar Coal Fields (2015) is in place, its formal adoption and incorporation of civil society's comments on the draft policy are still awaited.

The resuscitation of *muhaga* claims in the latest Land Grants Policy (2002) and its stipulated preference of *makani* instead of landless *haris* for grants of state-owned (*yaksala*) lands enable large landowners to claim *Yaksala* lands around their private properties and exclude the most deserving and poorest section from such grants. The lifting of the ban on cutting/ felling trees without permission is also a serious threat to Tharparkar's rare trees and plants, which are vital for the livelihood of local Thari communities.

Thar's land grant policies need to recognize the central importance of commons/grazing lands for the local subsistence economy on both social and legal registers and ensure that the common land is properly demarcated, safeguarded from the uses other than grazing and protected from private profiteering by extractive industries.

84 For an extended review of the problems inherent in LAA 1894, please refer to *Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf*. P. 29-33.

Literature Review

'Development' started in the mid-twentieth century with anticipations of 'uplifting' the marginal and 'unproductive' societies outside contemporary Euro-America through financial aid, transfer of technology, capital and technical/expert knowledge (Rostow, 2000). The gradual failure of the development projects invited scathing critiques emphasizing its role as a contributor to poverty, destruction, undemocratic forms of power and inequality in aid recipient societies rather than a solution to these problems (Ferguson, 1994,). This interface between the developed and under-developed took new forms with rising energy needs of modernity culminating in resource extraction from indigenous third-world lands that were now seen as ripe for resource exploitation rather than targets of development aid. This extractive relationship holds on a global north-south scale as well as within nations of the global south. India's tribal and hinterlands, for example, pay a huge cost for its growing industrial, electricity and other modern needs, making it the world's fourth largest consumer of electricity (World Coal Institute, 2006) with coal as its major industrial energy supplier (Paltasingh and Satapathy, 2021. p.491).

The extremely harmful impacts of open-cast coal mining on these communities, their livelihoods, ecosystems and natural resources are widely recognized (Paltasingh and Stapathy, 2021, Dutt, 2009, 2016). In a striking parallel to the situation in Tharparkar, the Indian state injudiciously applies the eminent domain-based Resettlement and Compensation laws (Ahmad, N &Dutt L, 2016) in western Odhisa to enable grab of indigenous land by coal companies. Besides legal parallels, impacts of open-cast mining on local communities similarly translate into loss of communal lands, natural resource depletion, conflict and societal chaos (Paltasingh and Satapathy, 2021). Apart from these direct harms to environment, research now abounds on risks of coal dust particles for mine workers' health.



High levels of human exposure to airborne particles (of coal) can lead to diseases like ischemic heart disease (IHD), cerebrovascular disease, chronic obstructive pulmonary disease (COPD), lung cancer and infection along with a reduction in life expectancy (from 1 to 5 years). Apart from the activist and conservationist literature emphasizing various harms of coal mining and burning, academic attention on the use of fossil fuels in human activities and their impacts on the biosphere have generated rich debates. Environmental Sociology, largely placed within the New Ecological Paradigm within broader social sciences, calls for a reduction in pressures on natural systems by human-nonhuman activities (Pellow and Nyseth, 2013).

The founder of Environmental Justice (EJ) studies Robert D. Bullard in his foundational text on the subject 'Dumping in Dixie' identified ethnic, racial, and implementation biases in prevalent environmental protection models of the late 1990s. Identifying environmental justice as an extension of the social justice movement, Bullard emphasized equal protection of all ethnicities from environmental risks and threats, meaningful government consultation with grassroots environmental activists in policy decisions, identification of research gaps and preparation of action plans for environmental protection (Bullard, 1990).

Joan Martinez Alier et al. (2016) characterize environmental justice movement in terms of 'ecological distribution conflicts' which essentially means ecologically imbalanced transactions whereby some groups, and communities lose their environmental assets or communal spaces (land, river, coasts, mangroves, air, water etc.) but are not paid for these losses (Joan Martinez Alier et al. P.732). These are essentially the externalized costs of industrial activities explored in the case of coal plants in Pakistan in the present study.

Such losses and ecological imbalances in transactions are at the heart of 'climate justice' as a concept and movement. The authors further note that for the people affected by a project, for the present study's purposes a case of fossil fuel-based energy project, 'the central goal of their campaign is to stop a project, or to impede planning and construction from moving forward' (Ibid, P.739).

In the case of Thar coal projects, the campaigns on the ground have so far focused on organizing people around coal as a threat (to their livelihood, environment, assets, and geographies) while expert analysts have pointed to possibilities of financial solutions like retiring middle-aged fossil fuel-based power plants that may cost the country USD 108 million while enabling it to avoid 18 million tons of CO₂ emissions. Since the climate justice discourse, campaigns for greater environmental conservation as well as environmental decision-making inevitably involve questions of accounting the negative externalities' of fossil fuels.

However, accounting exercises are notoriously unable to account for the 'value' inherent in sustainable sources capable of regenerating themselves across time. Local assets like grazing lands, or water bodies, for example, add value to local lives that cannot be the subject of fixed monetary costing. An important example of this failure is Ronald H. Coase' model of 'efficient social outcomes through bargaining and contracting' in order to 'reap the net social gain by paying for the replacement of coal with renewables'. In his seminal work titled 'The Problem of Social Cost' Coase seeks to disprove Cecil Pigou's (The Economics of Welfare) argument that economic actors polluting environments should simply be taxed. Coase proposes that the overall social productivity of these activities should be counted and compared with its losses before taxing such activities. He suggests that such an overall counting is economically more productive instead of taxing a list of harmful activities. However, the point precisely is that total social product is not and cannot be satisfactorily accounted for in monetary terms. The grazing land of Thari people, for example, renewed itself every year, provided consistent supply of fodder for animals and various edible foods for humans, offered respite and shade, construction material and firewood, and secure environs for females to move around with animals. All these values can neither be characterized nor counted even in purportedly 'holistic' monetary exercises. This question brings us to the heart of the problem i.e. the problem

of 'Value'. For the actors located in the conceptual and real world of development, energy security-driven bureaucrats, private corporations and their managers, Value resides in profit, maximization of utility, taking risks at the costs of others and service delivery. For Thari people, these values however may turn out to be alien.

Moreover, Coase's analysis rests on embedded assumptions about social, legal and power relations between actors. Mostly, it is impossible for victims of industrial actors to negotiate the question of Value with polluters or even to bring them at the negotiating table in the first place. In the case of coal projects in Tharparkar, power differentials between locals and coal companies armed with laws like LAA, 1894, have ensured that the balance of power is heavily tilted towards the latter. A situation of bargain and contract is only possible through a strong political movement to save the environment, and local resources and meet Pakistan's nationally determined emission targets. All these concerns are informed by ideals and values that significantly depart from Coase's monetary accounting.

This debate may be provisionally understood to indicate the need for a paradigmatic shift in economic and productive approaches currently in vogue within the top-down model of globalization. Helena Norberg Hodge (2000. P.96) claims that the present crisis of development, increasing third world debt and rapidly eroding local self-reliance implicate existing models of development (P.97). Central to this implication is one-sidedness of information in the global flows. Helena argues that while people in the third world remain unaware of the impacts of modernity and development-based lifestyles and changes in the West, the western taxpayers are also equally in the dark about impacts of projects funded by their taxes. Helena takes to task the 'fragmented expertise based on quantitative analysis that largely externalizes the human, environmental and biodiversity-related costs of development. She suggests a turn towards counter-development that exposes such costs of industrialism and forcefully presents the viability of traditional lifestyles and alternatives to mainstream development (P.99). As an implementation strategy, Helena states 'To combat the rapid spread of (development's) monoculture, we need to meet it on its own terms: global, top-down, fast-paced and capital-intensive' (Ibid). The 'technological uniformity' of the mainstream Western model of development, she contends, must also be countered by supporting cultural diversity and multiplicity of local solutions (P.100). Based on a study of big development in Ladakh, Norberg's work makes a case for de-centralization of production whereby aid and development programs should support self-reliance and production for local consumption instead of cash. The writer emphasizes de-centralization of power production where renewable energy is adopted on national scales, using indigenous renewable resources (P. 101). This, Helena suggests, is only possible by devoting resources to generate knowledge about local resources, supporting local researchers, creating knowledge about diverse ecologies and tailor-making solutions to suit them (Ibid). In the case of Tharparkar, this broad-based approach can translate into the best suitable resources of power generation. Tharparkar is home to considerable wind energy potential while its long summers can support off-grid and localized solar power. The path of coal extraction for power generation is neither indigenous (because it is tethered to financial indicators beyond national control) nor sustainable (because it involves large-scale deterioration of livelihood sources).



Conclusion & Recommendations

In conclusion, Thar coal projects have devastated the conventional livelihood system, stressing major resources of livelihood like land, water and access to rangelands without proper mitigation plans. A cumulative loss of nearly PKR 206 million was reported by 88 households surveyed during the study within twelve villages of TCB-I and TCB-II. A further loss of lands (*Yaksala* and *gaucher*) adds PKR 420 million into this count.

Thousands of people from the poorest and minority scheduled castes have lost access to grazing spaces, lack basic amenities like electricity and quality education and face burgeoning food insecurity. Millions of animals are without access to adequate drinking water in villages in proximity to coal mines, wastewater reservoirs and water re-injection sites in Tharparkar. The emergence of new labour regimes in the form of menial jobs in coal companies has enabled access to cash for some people along with irrevocable costs in terms of lack of time for traditional livelihood activities, blacklisting by coal companies and exposure to alien forms of work in dangerous settings like mines.

These losses directly implicate the mainstream state and media narrative that consistently eulogizes coal projects as harbingers of local and national prosperity. Expert studies⁸⁵ show local coal to be at least 37 per cent more expensive than the free and abundantly available renewable energy sources like solar and wind options in Tharparkar. The coal pricing framework does not just exclude the externalized costs of coal projects for local communities in tariff determination but also miscalculates the cumulative costs per ton of local coal extracted from mines in Tharparkar⁸⁶.

The livelihood and environmental crisis caused by Thar Coal Projects necessitates an alternative energy vision based on renewable sources of power, mitigation of losses, resuscitation of Tharparkar's conventional rain-fed agriculture and livestock-based economy and a halt to dangerous State plans of spreading the coal menace across Pakistan through the railway track.

85 <https://renewablesfirst.org/wp-content/uploads/2024/03/BTM-CHAPTER-4-Coal.pdf>

86 *ibid*

Recommendations for mitigation of coal-induced losses:

The government should form a commission comprising revenue officials and local notables to identify and demarcate all the common lands in Tharparkar in line with the historical practices, record and public memory. It should quantify the size of land lost to coal companies, and its social and environmental impacts on the communities and take appropriate measures by providing them with alternative spaces of equal value and character.

Make appropriate non-discriminatory arrangements for the rehabilitation of all those driven out or displaced or whose livelihoods were impacted because of the coal operations.

Introduce stringent procedural restrictions and subject future land deals to the consent of those dependent on it for their livelihood.

Grant ownership rights to all those who have been cultivating land under the yaksala land tenure for more than five years without any interruption.

Find a suitable political solution for all those who, on account of lack of transparency, knowledge, or flexibility on the part of the revenue officials, failed to comply with the obscure technical requirements to convert the land to their own name.

Form a separate commission having strong local representation to evaluate the authenticity of the existing revenue registers and record of rights in the open and determine the need for the reconstruction of new surveys.

Design and implement strong procedural and substantive protections around all the natural resources and easement and customary rights in the future followed by remedial measures to restore the integrity of all the resources, especially the precious water resources that have been polluted because of the dirty coal environs.

Embed the participatory role of the locals concerning any decision impacting Thar, its livelihood or any other cultural or social practices.



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ANNEX

Profile of Coal-Fired Power Plants in Tharparkar

Name of Plant	Installed Capacity (MW)	Fuel	Thar Coal Field Block	Total Debt component (\$)	Foreign Financiers	Foreign Lending (\$ Millions)	Local Financiers	Local Lending (\$Million)	Commercial Operations Date	Status	Owning Entity/ Company	Parent Company
 <p>THAL NOVA Power Station</p>	330	Coal: Lignite	II	\$ 493 Million	China Development Bank, Other Chines Banks, CMEC	837	Hub Power, Thal Limited, Novatex, Habib Bank	124	February, 2023	Operation (but not at full capacity due to system constraints)	HUBCO (37 per cent) Thal Limited (31.5 per cent) China Machinery Engineering Corporation CMEC (10 per cent) DESCON Engineering Limited (1 per cent)	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy
 <p>SSRL Power Station: 2 Units</p>	1320	Coal: Lignite	I	\$2 Billion	ICBC, China Exim Bank, China Development Bank, Agri Bank of China, Bank of Communications, China Minsheng Bank, China Postal Savings Bank, (\$250 million each)	1750	Habib Bank	277	2020 (conflicting reports on financial closure)	Operating	Global Mining China (55 per cent) Asiapak Investments (40 per cent) Duba-based Company (5 per cent)	Shanghai Electric Power Co Limited
 <p>2 Units</p>	660	Coal: Lignite	II	\$1.5 Billion	China Development Bank, Construction Bank of China, ICBC, , Engro, Habib Bank, CMEC China, Liberty Mills Ltd.	800	SECMC, Habib Bank, UBL Pakistan, Bank Alfalah, Askari Bank, Bank of Punjab, Faysal Bank, Meezan Bank, NIB Bank, Soneri Bank, Sindh Bank, NBP, Pakistan	1240	July 9, 2019	Operating	Engro PowerGen Pvt Ltd, Liberty Power Holding Pvt Ltd, Liberty Mills Ltd, Soorty Enterprises, Procon Engineering	Unit:1 Engro Energy Limited (50.1per cent), China National Machinery Industry Corp CN-MIC(35per cent), Habib Bank Ltd (9.5per cent), Liberty Mills Ltd (5.4 per cent) Unit:2 Engro Energy Ltd (50.1per cent), CNMIC (35per cent), Habib Bank Ltd (9.5per cent), Liberty Mills Ltd (5.4per cent)
 <p>Thar Energy Limited Power Station</p>	330	Coal: Lignite	II	\$520 Million	China Development Bank and Habib Bank.	390	Fauji Foundation, Hub Power, CMEC.	130	October, 2022	Operating but not at full capacity due to system constraints.	Hub Power Co Ltd (60per cent), Fauji Foundation (30per cent) CNMIC (10per cent)	Hub Power Co Ltd (60per cent), Fauji Foundation (30per cent) CNMIC (10per cent)