



RESEARCH PAPER

Protecting Environment: Health Implications of Sand Mining in Residential Areas of District Kasur

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ABSTRACT

This paper aims to examine the adverse effects to public health due to sand mining in residential areas. It is an inalienable right of every citizen to be dealt with strictly in accordance with law as enshrined in Articles 4, 9, 24, and 25 of the Constitution of Islamic Republic of Pakistan, 1973 and no action is detrimental to life, liberty, reputation, and property of the citizen is called for even otherwise one of most precious fundamental rights that all the persons shall be dealt no discrimination by the statutory functions but unfortunately these basic fundamental rights are being infringed because of sand mining. In this study mixed-method approach is used, incorporating a literature review, policy document analysis, and statistical data publically available. The significant correlation between respiratory health issues experienced by local residents and dust pollution from mining activities has been observed for which policy recommendations has been given.

KEYWORDS Dust Pollution, Human Security, Public Health, Respiratory Health Issues, Sand Mining

Introduction

The right to live in a non-pollutive environment is considered a fundamental human right by various scholars (Alubaidi, 2024). This right is also enshrined in Articles 4, 9, 24, and 25 of the Constitution of Islamic Republic of Pakistan, 1973 and no action is detrimental to life, liberty, reputation, and property of the citizen. The theme of this study is directly relevant with the human security because environment is directly impacted the human basic needs. Promoting environmental justice through existing laws involves ensuring fair and equitable access to a clean and healthy environment for all communities, particularly those disproportionately affected by environmental issues. That the sand mining in residential areas causing dust in the air which badly effecting the health of residents and in such situation it is very difficult the breath due to air pollution and such problem causing respiratory diseases in the areas and this air pollution is not only affecting the human beings but also affecting the crops. During the transportation of sand through tractor trolleys, the sand blown in the air and created polluted the environment.

Similar studies in other regions, such as India and Indonesia, which have demonstrated that mining activities can lead to respiratory issues (Ijaz 2020), demonstrate that the impact of sand mining on health in District Kasur is a significant cause for concern. These results are especially pertinent to the situation in District Kasur, where sand mining is common. Existing laws and policies, like the Environment Protection Act of 1997 and the Punjab Mining Concession Rules of 2002, are not being enforced properly, which is a violation of constitutional rights and needs to be fixed right away to protect the health and well-being of the community. The purpose of this paper is to investigate the detrimental effects of sand mining on the health of nearby residents. Using a mixed-method approach, incorporating a literature review, policy document analysis, and statistical data publically

available to evaluate the adverse effects to public health due to sand mining in residential areas. By featuring the seriousness of the circumstance, the paper tries to highlight the requirement for viable lawful authorization and strategy execution to safeguard the climate and the strength of Kasur's inhabitants.

Literature Review

The Sand mining activities in inhabited areas is emerging as a major concern for the health of inhabitants (Rebelato et al., 2017). Due to sand mining activities, sand and other related mineral deposits are taken out of their usual stores, causing the earth in disquieting and rising the fine particles at higher levels (Elsayed et al. 2021). It has negative natural effects with regards to physical, synthetic, and organic perspectives like stream related biodiversity, particularly on waterway dolphins, fishes, crocodiles, turtles, otters, and birds. The utilization of large equipment is additionally influencing the aggregate climate. (M.S. Arjun et al, 2023). Despite the fact that sand mining upholds financial and social development and adds to the advancement of numerous nations, broad sand mining has debased the climate (Sonak, 2006). The over-extraction of sand annihilates the climate and biodiversity, compromises water security, and prompts soil disintegration. Sand is viewed as a boundless normal asset by non-industrial nations like India, Iran, Cambodia, and other Asian nations (Sadeghi and Harchegani, 2012; Convention on Biological Diversity, 2014). Mining and its related exercises can be answerable for significant ecological harm where this action is done without legitimate rules and that can prompt getting free from vegetation, soil disintegration and avalanches (Ashraf, et al., [Citation2011](#)). People living close to the sand mines and take courses might be presented to the hurtful silica dust brought about by the mining exercises (Walters et al., 2015). In the US, the sand mining industry is a \$2.6 billion dollar industry, and during 2013, 62% of the modern sand mines were supporting 12 mining, handling, and transport of sand, which created an expansion in airborne residue fixations (Watson et al., 2012). Dust is important for a bigger combination called particulate matter (PM; EPA, 2013). PM is ordered by molecule size, where particles less than 10 μm are delegated PM10 and particles less than 2.5 μm are named fine particles (PM2.5), representing the best wellbeing risk (EPA, 2013). Sand mining caused erosion, water pollution, and unsustainable extraction, according to Suherman (2015) and Basavarajappa (2014), with Basavarajappa focusing specifically on the effects on riverbed environments. V (2023) and Rani (2017) extended this examination to incorporate different sorts of mining, like iron mineral and quarrying, and tracked down comparable adverse consequences on air, water, soil, and human wellbeing.

The impact of buildup defilement coming about in view of sand mining on the overall prosperity of adjoining tenants in District Kasur is a tremendous concern. Defeat (2014) reports that concentrates in other mining areas have exhibited that dust outflows might contain weighty metals, presenting wellbeing chances. Mental issues as well as respiratory issues like sinusitis and hacking are instances of these risks (Olusegun, 2009). High centralizations of minor components like zinc represent a possible danger to the air and soil quality because of barometrical residue testimony from mining regions (Bisquert, 2017). According to Wright (2014), a group of people in South Africa who live close to mining areas have reported experiencing health problems brought on by dust and have noticed that the government and mining organizations have done little to address the problem. These findings emphasize the significance of further investigation into the specific health effects of dust pollution caused by sand mining in District Kasur and the implementation of mitigation measures. The absence of successful requirement of the sand mining guidelines and legitimate structures in possessed regions has various adverse consequences. To stop groundwater exhaustion, Hemalatha (2005) underlines the requirement for more tight guideline and observing of sand mining tasks. Inadequate legal provisions, according to Shamim (2017), contribute to the prevalence of illegal mining and the violation of miners' rights. To diminish the harm that sand mining does to the environment, both Trop (2017) and Andriawan (2021) stress the significance of broad courses of action, actually taking a

look at programs, and extreme execution. At the point when taken in general, these examinations recommend that Locale Kasur's guidelines and legitimate structures are deficient and should be significantly improved to address the different sand mining-related issues.

Health Risks due to Air Pollution Resulting from Sand Mining in Pakistan

The risks to health that are associated with air contamination from various modern activities in Pakistan have been the subject of a number of studies. Both infant post-neonatal mortality and lung cancer mortality are influenced by emissions from cement industries and related activities like mining, according to Nasir (2022). According to Ijaz (2020), underground coal mines had a lot of respirable dust, like silica, which made workers more likely to get sick with respiratory problems. Also, Khan (2017) underlined the wellbeing dangers to laborers in the material business presented by dust in the air. Ahmad (2020) evaluated the dangers that potentially toxic elements and particle pollution in urban road dust pose to human health and the environment, indicating that this pollution has a significant impact on public health. According to all of these studies, Pakistan needs to act quickly and effectively to protect public health and reduce air pollution. The following are additional points that are available:

Air Quality Concerns in Pakistan

During the transportation of sand from one place to another by tractor and trollys, sand is blown into the air which significantly impacted the Pakistan's air quality. The sand blown through transportation formed dust particles in the air, which harm the health of people through inhalation and cause respiratory disease. Some of the pictures are available to prove this fact.

Sources of Dust Pollution in Pakistan

Dust contamination in Pakistan is brought about by sand mining from various complex sources. Ijaz (2020) discovered that the high silica content of coal mining in Punjab's Chakwal District significantly contributes to dust pollution. This is made even worse by the absence of protective measures like dust masks. Eqani (2016) perceived lead (Pb) as a huge piece of buildup defilement in metropolitan and current locales, with basic prosperity bets, particularly for young people. Although these investigations do not solely focus on sand mining, they do highlight the possibility of comparable issues in this sector. It is anticipated that additional research will specifically investigate the causes and effects of residue contamination in Pakistani sand mining.

Health Risks Associated with Dust Pollution

Dust pollution from sand mining poses significant and multifaceted health risks. Road dust, which includes sand mining, has been found to be a major source of particulate matter and toxic elements in mining areas, posing health risks for adults and children (Tian, 2019). Desert sand dust, a typical part of sand mining, has been recognized as a gamble factor for incendiary and hypersensitive lung sicknesses (Fussell, 2021). Road dust from a coal-mining city in China, which might contain sand mining results, has been found to have elevated degrees of weighty metal pollution, presenting wellbeing gambles, especially for kids (Tang, 2017). Respiratory and cardiovascular diseases, as well as mortality, are among the health effects of particulate matter, including sand dust (Myong, 2016). These results emphasize the need for effective measures to reduce the health risks posed by sand mining dust pollution.

Impact on Respiratory Health: Statistics and Attribution of Deaths

In Pakistan 19% of passings from lower respiratory diseases are inferable and it caused 1 lac 14 thousand passings in 2019 or 51 for every one lac individuals (UN climate Program).

Pakistan's Legal Framework to Protect Environment from Sand Mining

The legitimate structure in Pakistan to safeguard the climate from sand mining is presently deficient, prompting critical ecological harm (Prastiyo 2024). The absence of political will and sober minded mining regulations, as well as the shortfall of specialized and monetary help, are significant hindrances to supportable improvement in the mining area (Husain 2005). It is emphasized that stronger environmental protection measures are required, including the confiscation of illegal sand mining tools and criminal penalties (Prastiyo 2024). According to Jiskani (2019), policymakers play a crucial role in evaluating and reexamining the current strategies for the development of the mining sector.

Material and Methods

The study used a combination of methods to thoroughly examine the negative effects of sand mining in residential areas of District Kasur. Particular attention was paid to the impact of dust pollution on public health and air quality. This approach coordinated three key exploration strategies: a writing survey, strategy report investigation, and the assortment and examination of openly accessible measurable information. The review, right off the bat, directed a broad writing audit to accumulate existing information and bits of knowledge on the effects of removal and sand mining exercises. This included looking into scholastic distributions, research reports, and insightful articles that gave data on the ecological and wellbeing impacts of such mining rehearses. By combining discoveries from the writing, the review acquired a more profound comprehension of the possible dangers and outcomes related with dust contamination coming about because of sand mining.

Besides, the review dissected pertinent arrangement records, including the Constitution of Pakistan, the Ecological Assurance Demonstration of 1997, and the Punjab Mining Rules of 2002. By looking at these lawful structures, the exploration evaluated the adequacy of existing strategies and guidelines in alleviating the unfavorable impacts of exhuming and sand mining in local locations. This analysis helped uncover inconsistencies in the implementation and enforcement of policies in order to better protect the environment and public health. Thirdly, the review utilized openly available sources to gather and investigate measurable information on air quality and respiratory circumstances. This quantitative philosophy considered the assessment of buildup tainting's impact on air quality and its relationship with respiratory clinical issues among occupants. By analyzing statistical trends and patterns, the study aimed to provide empirical evidence of the issue's scope and its implications for public health and property rights in District Kasur. By integrating these various research methods, the study was able to provide a comprehensive evaluation of the negative effects of sand mining in residential areas. The examination had the option to give experiences into the complicated cooperations that happen between mining exercises, dust contamination, administrative systems, and results for general wellbeing on account of the combination of discoveries from the writing, strategy investigation, and factual information. Finally, this perplexing technique worked with a cautious perception of the troubles introduced by sand digging and informed recommendations for methodology changes and help strategies to shield the prosperity and flourishing of the neighborhood.

Results and Discussion

The findings of the research that was carried out in District Kasur indicate that there are significant health issues for the nearby residents due to activities like sand mining. The pictures revealed that the sand blown in the air is inhaled by the nearby residents which is creating respiratory diseases to nearby residents. The transportation is not only creating health issues for nearby residents but also resulting in soil degradation, disintegration, and the accumulation of fine particles at higher elevations to nearby residents and negatively affecting the surrounding environments. Additionally, these actions have significant effects on society and the economy. Damage to infrastructure and roads results in increased maintenance costs and inconvenience for residents, in addition to the loss of property value and disruption to livelihoods in the affected communities. The concentrate additionally focuses to imperfections in the area's ongoing administrative system for sand mining, referring to incapable authorization components and legitimate escape clauses as explanations behind uncontrolled asset extraction and ecological debasement. Basic game plan changes and unbending execution measures are endorsed to determine these issues, including correcting mining guidelines, updating approval frameworks, and remembering the neighborhood dynamic cycles associated with sand mining works out.

Conclusion

This study's discoveries stress the criticalness of making a move to address the negative wellbeing impacts of sand mining and uncovering in Region Kasur's neighborhoods. The significant correlation between respiratory health issues experienced by local residents and dust pollution from mining activities highlights the pressing threat to public health posed by unchecked sand mining operations. Sand mining also disturbs the soil, causes erosion, and pollutes the air, all of which exacerbate the negative effects on human health and the surrounding ecosystems. The sweeping impacts of sand mining on the prosperity of networks in Region Kasur are exemplified by the negative financial and social results, like the annihilation of foundation and the deficiency of livelihoods. The deficiencies in the current regulatory framework and enforcement mechanisms, which reveal systemic governance failures, necessitate comprehensive policy reforms and stringent enforcement measures. Strengthening environmental protection guidelines, improving checking and approval capacities, and progressing practical mining practices are fundamental to direct the unfriendly outcomes of sand mining and safeguard the prosperity and success of the neighborhood. In conclusion, in order to address the adverse health effects of sand mining, governments, mining companies, and local communities must collaborate. District Kasur has the potential to pave the way for sustainable development that ensures the long-term prosperity and well-being of its residents by prioritizing public health and environmental conservation in policy decisions and implementation.

Recommendations

- Execute stricter observing and authorization of existing regulations and guidelines overseeing sand mining in Locale Kasur to forestall criminal operations and limit natural harm.
- Encourage more noteworthy cooperation between nearby Natural Security Division and Branch of Mines and Minerals to guarantee that the worries and needs of occupants are enough tended to in the preparation and execution of sand mining projects.
- Energize the reception of supportable mining rehearses that focus on natural preservation, for example, recovery of mined regions, utilization of eco-accommodating mining strategies, and execution of residue concealment measures.
- Survey and reexamine existing mining regulations and guidelines to reinforce ecological insurance measures, upgrade punishments for resistance, and lay out clear rules for mindful mining rehearses.

- Apportion assets for thorough exploration and observing projects to evaluate the long haul natural and wellbeing effects of sand mining in Region Kasur, and utilize this information to illuminate strategy choices and alleviation methodologies.
- Lay out instruments to give pay, medical care administrations, and elective vocation valuable open doors for networks unfavorably impacted by sand mining exercises, especially those encountering medical issues or property harm.
- Lead preparing projects and mindfulness lobbies for excavators, neighborhood specialists, and inhabitants to build comprehension of natural issues connected with sand mining and advance supportable practices.
- Team up with global associations and adjoining nations to trade best practices, advancements, and ability in maintainable mining and natural preservation.

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