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Occupational and Environmental Health Hazards among Agriculture Laborers: An Evidence-Based Study from Punjab, Pakistan

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Abstract: Laborers from the agriculture sector have often been victims rather than beneficiaries of the green revolution, technological development, and globalization trends that characterized the 20th century. In recent decades, the laborers working in the agriculture sector have been half of the world's labor force, with an estimated number of 1.3 billion worldwide, and a majority of them found in developing countries. Adequate balance between agricultural growth and protection from occupational & environmental health hazards is very crucial for the future of the world's food production and for the sustainability of the sector. The study was conducted in three divisions of Punjab, and primary data was collected through multistage simple random sampling techniques. The interview schedule was used as a tool for data collection. The results revealed that the occupational and environmental circumstances of the laborers were not conducive towards their health and well-being. The agricultural laborers have to face many health hazards, whereas the majority of the laborers were exploited only due to their illiteracy and ignorance about Government policies and laws related to them. A huge proportion of the participants reported chronic health, malnutrition, and socio-economic problems significantly associated with their working environment, amenities and available facilities.

Key Words: Agricultural Laborer, Socio-economic Problems, Agricultural Development, Agricultural Labor Force

Introduction

The laborers from the agriculture sector have been more often victimized instead of beneficiaries of technological development and the green revolution, which largely characterized the 21st century (Chothodi et al., 2022). In recent decades, the laborers working in the agriculture sector are considered more than half of the world's labor force, which is around 1.3 billion worldwide, and the majority of them are found in developing countries. Development of the agriculture sector is one of the most imperative factors for the fulfilment of basic human needs, poverty alleviation, boosting shared prosperity and becoming the major contributor to national development for most developing countries (Milheiras et al., 2022; Falconnier et al., 2023). The International Labor Organization revealed that the circumstances of the agricultural sector are significantly associated with occupational and environmental health hazards to laborers. The nature of work in the agricultural sector is linked with various risks to the health and life of the laborer, while a large number of demographic, socioeconomic conditions, nature of weather, risks related to wild animals, toxic plants, unsafe biological and chemical products, long-standing work, uncertainty about timings and hazardous machines of agricultural purpose among many others creates serious health threats (Kumar et al., 2023).

The conditions for agriculture in developing nations like Pakistan are very primitive conditions, especially with respect to their social, physical, psychological, economic and health perspectives, among others (Sengupta et al., 2023). A huge proportion of the rural population is directly and indirectly associated

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with agriculture sectors and bears inadequate facilities with respect to their basic needs, such as health education, among others. Due to unhealthy hygienic conditions and practices in agriculture in rural areas, the prevalence of various endemic and epidemic diseases aggravates workers' ill health conditions and malnutrition. Most health impairments happen due to unsafe drinking water, poor sanitation conditions, unsafe hygienic practices, and the utilization of parasitic and bacterial chemicals, among others. Governments and private organizations have tried to meet the health requirements, but unfortunately, health coverage for rural communities is one of the largest challenges (Rautela et al., [2022](#)).

The livelihood conditions, demographic and background, and social, economic and environmental factors are also significantly associated with the rituals of agriculture laborers. The living environment and the structure of the house, with basic facilities such as toilets, kitchen, and sufficient living space, have a direct impact on their health status and productivity (Ewert et al., [2023](#)). The agriculture sector is one of the three most health-hazardous fields in both developed and developing nations, and an estimated 1.7 million agriculture laborers face severe morbidity and mortality problems every year. About 170,000 deaths are reported annually because of multidimensional health hazards, which means the laborer working in the agriculture sector has at least twice the risk of health as compared with any other sector (Bezner et al., [2021](#)). Furthermore, a huge proportion of agriculture is thus deprived of basic living facilities such as appropriate housing, safe drinking water and sanitation, education and social protection, among others (George et al., [2023](#)).

Empirical evidence highlighted the various occupational and environmental health hazards incidents, which provide intensive understanding regarding the issues (Pradhan et al., [2022](#)). There are a variety of incidents caused by major occupational and workplace mismanagements, along with major or minor injuries (Saikh et al., [2023](#)). Every year, a significant number of deaths or injuries that lead towards later death are reported, with the rest to occupational and workplace incidents that have long-lasting impacts on agriculture laborer and their families. Unfortunately, there is a considerable gap between the ground-level issues and the remedies provided to agricultural laborer due to the unavailability or poor adaptation of agriculture-related laws and policies (Venus et al., [2022](#)).

Chronic conditions due to unavailability of basic facilities, low exposure and skills, unexpected working situations, unrest working hours, and insufficient food and dietary practice, among others, are critical for evaluation (Paracchini et al., [2022](#)). The laborer working in the agriculture sector are unable to approach or provide a proper system for the basic health needs by the formers, governments and any private organization to prevent or cure their health issues at the beginning level. The situation is more alarming and seeking attention when a huge proportion of the rural population has direct involvement, and their health issues create an unbearable burden on the national health system and national economy. It also keeps on stake with the remaining population from infectious or viral diseases, especially children under five, women and the elders of communities (D'Annolfo et al., [2021](#)).

Despite the fact that a large number of world nations have achieved the status as developed or advanced countries and provided all basic necessities to their laborer. Special attention is given to the sectors where a huge workforce is involved, such as the agriculture sector, and minimum preventive health, curing & emergency arrangements are provided, while the largest portion comprises developing or poor nations where all these basic facilities are not available. These situations have negative consequences not only for the laborer but also for national administrative and economic management. People normally rush towards urban or developed areas for better economic, health and education facilities, and this process creates overall discrepancy (Ahmad et al., [2023](#)). The interaction between working conditions and occupational health hazards is largely associated with an individual's life, family engagements and communal affiliations that lead towards a healthy life and well-being of agriculture laborer (Feng et al., [2022](#)).

In the agriculture sector, a number of factors such as population density, fauna, climate conditions, living conditions, education facilities, proper learning or training process, adaptation and functionality of advanced technology, among others, have direct impacts on the health and working conditions of laborer (Rehman et al., [2022](#)). The availability and functionality of advanced technology, as well as preventive health awareness regarding the nature of work and basic health facilities at the workplace, not only reduce the incidence of morbidity and mortality but also enhance the socio-economic condition and productivity



of agriculture laborers. Better health conditions and productivity help to maintain the basic life facilities for themselves and their families, such as better housing, improved living conditions, safe water, sanitation, hygiene and education conditions, among others (Sharma et al., 2023).

Adequate balance between agricultural growth and protection from occupational & environmental health hazards is very crucial for the future of the world's food production and for the sustainability of the sector (Patri et al., 2022). Health conditions of agricultural laborers must be integrated into the national development policy with improved safety strategies and intensive emphasis on socioeconomic, demographic and environmental protection provided by authorities and policymakers.

Study Objectives

1. To access the socio-economic and demographic conditions of agriculture laborer in Punjab, Pakistan.
2. To investigate occupational and environmental health hazards among agriculture laborers in Punjab, Pakistan.

Research Methodology

For this quantitative research study, researchers applied a multistage simple random sampling method to collect primary information from the selected area. The population was laborers working in the agriculture sector in Punjab, and the target participants were male household heads who had worked in agriculture for five years. For the purpose of data collection, from all ten administrative divisions of Punjab, only three divisions named Gujranwala, Faisalabad and Dera Ghazi Khan were randomly selected. One district from each selected division, such as Gujranwala, Faisalabad and Layyah, was selected through the fish bawl draw sampling method. In the third stage, three Tehsils named Gujranwala, Jaranwala and Layyah were selected, and in the fourth stage, 15 villages, five from each tehsil were selected by using a random sampling method and 25 respondents were selected from each village through a deliberate sampling method.

According to the nature of the study, the researcher used a purposive sampling method to choose the respondents because the majority of the respondents were illiterate. They may feel reluctant to give their personal information and discuss their life matters with a stranger. A structured interview schedule was prepared according to the nature, objectives, and hypothesis of the study, and it comprised both closed and open-ended questions. It was considered that all the socioeconomic aspects that contribute to occupational and environmental health hazards among agricultural laborers were covered. Pre-testing of the tool was done to check its validity and reliability before actual data collection. Interviews were conducted from the field during the day, and it took a total of one month to complete 375 interviews. Various descriptive and inferential statistical analyses were applied to draw results/findings through the statistical software SPSS-22.

Results and Discussion

The socio-economic and demographic background information of study participants was presented through descriptive analysis. Descriptive statistics are generally used to present quantitative descriptions, which are basically used to describe the basic features and mostly contain information regarding numbers and percentages that describe population characteristics. Table 1 presents the details regarding the demographic distribution of the study participants.

Table 1

Distribution of demographic aspects of the respondents

Participant Characteristics	N	%	Valid Percent	Cumulative Percent	
D.G. Khan	125	33.3	33.3	33.3	
Living Area (Divisions)	Faisalabad	125	33.3	33.3	66.6
	Gujranwala	125	33.3	33.3	100.0
Total	375	100.0	100.0		

Participant Characteristics		N	%	Valid Percent	Cumulative Percent
Age (in years)	Under 18	14	3.7	3.7	3.7
	19 – 30	199	53.1	53.1	56.8
	31 – 45	135	36.0	36.0	92.8
	46 – 60	26	6.9	6.9	99.7
	60 or above	1	.3	.3	100.0
	Total	375	100.0	100.0	
Marital Status	Married	247	65.9	65.9	65.9
	Unmarried	120	32.0	32.0	97.9
	Divorced	8	2.1	2.1	100.0
	Total	375	100.0	100.0	
Family System	Nuclear	107	28.5	28.5	28.5
	Joint	268	71.5	71.5	100.0
	Total	375	100.0	100.0	
Educational Status	Literate	116	30.9	30.9	30.9
	Illiterate	259	69.1	69.1	100.0
	Total	375	100.0	100.0	
Working Hours (in a day)	6 – 8	111	29.6	29.6	29.6
	9 – 12	165	44.0	44.0	73.6
	12 or above	99	26.4	26.4	100.0
	Total	375	100.0	100.0	
Monthly Income (Rs)	1 – 5000	33	8.8	8.8	8.8
	5001 – 10000	214	57.1	57.1	65.9
	10001 – 15000	120	32.0	32.0	97.9
	15001 – 20000 or above	8	2.1	2.1	100.0
	Total	375	100.0	100.0	

The results presented in Table 1 indicated that the participants were equally approached from all selected administrative divisions, such as D.G. Khan, Faisalabad and Gujranwala. Of most of the study participants, 53.1% fell in the age bracket of 19 – 30 years, and 36.0% were 31 – 45 years. A huge proportion, 65.9%, were married and out of a total of 71.5% of participants living in a joint family system. When the participants were asked about their education level, 69.1% of participants reported that they were illiterate and did not get any formal education. When the researchers discussed the working hours or time of work, a large portion of 70.4% of participants claimed they work 9 – 12 or more during their daily life, and unfortunately, only 2.1% of agriculture laborer are able to earn 20000 or more in a month.

Table 2

Distribution of basic life facilities for agriculture laborers

Available Facilities	Yes		No		Total	
	N	%	N	%	N	%
Personal home	262	69.9	113	30.1	375	100.0
Appropriate diet	11	2.9	364	97.1	375	100.0
Safe drinking	43	11.5	332	88.5	375	100.0
Improved Sanitation/toilet	31	8.3	344	91.7	375	100.0
Electricity	289	77.1	86	22.9	375	100.0
Access to education	159	42.4	216	57.6	375	100.0
Access to a health facility	116	30.9	259	69.1	375	100.0
Participating in family gatherings	209	55.7	166	44.3	375	100.0

Table 2 presents the distribution of basic life facilities of agriculture laborers in the form of numbers and percentages. The study findings highlighted that one-third, 30.1%, of study participants do not have their



own personal home for living, and there are 97.1% of participants claimed that they did not get appropriate food/diet in their daily lives. About 88.5% and 91.7% of participants categorically reported that they did not have improved facilities for safe drinking water and sanitation/toilets in their homes. The unavailability of basic sanitation and toilet facilities is strongly associated with various infectious diseases that are the major reason for morbidity and mortality among the population. Similarly, 22.9% did not have basic facilities for electricity, 57.6% reported poor access to education, and 69.1% did not have access to basic health facilities. When the participants were asked about their involvement in family gatherings, 44.3% replied they were unable to participate in their family gatherings due to various reasons such as poor economic conditions, long working hours, strict work rot and farmer-discouraging behaviors, among others.

Table 3

Occupational and environmental health hazards faced by an agricultural laborer

Characteristics		N	%	Valid Percent	Cumulative Percent
Occupational problems faced by agricultural laborers	Yes	366	97.6	97.6	98.6
	No	9	2.4	2.4	96.8
	Total	375	100.0	100.0	
Nature of occupational problems	Unrest / long working	99	26.4	27.0	27.0
	Poor facilities	170	45.3	44.0	71.0
	Insulting behavior	16	4.3	4.4	75.4
	All of the Above	90	24.0	24.6	100.0
	Total	375	100.0	100.0	
Environmental problems faced by agricultural laborers	Yes	209	55.7	55.7	55.7
	No	157	41.9	41.9	97.6
	To some extent	9	2.4	2.4	100.0
	Total	375	100.0	100.0	
Nature of environmental problems	Physical problems	94	25.1	43.1	43.1
	Sexual problems/harassment	2	.5	.9	44.0
	Emotional/Desperation	84	22.4	38.5	82.6
	All of above	38	10.1	17.4	100.0
	Total	218	58.1	100.0	
	Missing System	157	41.9		
Health problems faced by agricultural laborers	Yes	365	97.3	97.3	97.3
	No	10	2.7	2.7	100.0
	Total	375	100.0	100.0	
Nature of health Problems (during last year)	Workplace injury	71	19.2	17.2	17.2
	Pesticide poisoning	49	13.1	13.4	30.6
	Lungs/Hailing diseases	71	18.9	19.4	50.0
	All of the above	183	48.8	50.0	100.0
	Total	375	100.0	100.0	

Occupational and environmental health hazards faced by agricultural labourer are presented in Table 3, and findings of the study indicated that 97.6% of participants reported they have to face various occupational problems such as 26.4% reported unrest, rotten or long working hours, 44.0% reported poor facilities at the workplace and 4.4% report insulting behavior from formers while 24.6% participant claims all the said issues. Similarly, the response regarding environmental problems faced by agriculture laborer indicated that 55.7% of participants face environmental problems. Among them, 25.1% face physical issues, 0.2% face sexual harassment, 22.4% face desperation, and 10.1 participants face all the above issues. A huge proportion, 97.3%, face health hazards due to their occupational and environmental circumstances. There are 19.2% of participants faced injuries at the workplace, 13.1% faced pesticide poisoning, 19.4%

faced lung/Hailing diseases, and 48.8% of participants reported that they faced all the above-mentioned issues during the period of last year.

Conclusions

The study concludes that most existing literature (D'Annolfo et al., 2021; Feng et al., 2022 & Sharma, 2023) endorsed the study findings as working conditions of the laborers were not conducive because most of the respondents worked for more than 12 hours daily but amazingly their monthly income was very low. The overwhelming majority of the agricultural laborers were receiving lesser wages from their employers, and the monthly income of the total respondents was insufficient for their requirements, while the majority of the respondents had no other source of earning/ no time to involve in other economic activity and they were facing many social and economic problems. The finding of the study shows that huge numbers of respondents are homeless and deprived of the basic facilities in their houses like kitchen, water supply and sanitation.

Almost the overwhelming majority of the respondents, 97.3%, think that agricultural laborers have to face occupational and environmental health hazards such as lung and hailing diseases, occupational injury and pesticide poisoning, among others. The study also concludes that agriculture is a hazardous sector, as it shows that 89.6% of agricultural laborers had to face health hazards, while occupational injury and pesticide poisoning were the major health hazards that agricultural laborers had to face. In spite of the fact that agricultural laborers were vulnerable to many serious health issues, the majority of the laborers, 96.8%, had no life insurance. On the other hand, when it was asked from the laborers about the way of handling and using the pesticides, no one was able to answer it. The element of harassment was also found in the study. More than half of the respondents, 55.7%, experienced harassment during the job period, while 2.4% of respondents replied to some extent, and these were facing physical, emotional and sexual harassment.

Recommendations

- As the study shows that agricultural laborers have to face health hazards, a mechanism of social security benefits should be offered for these laborers.
- It is necessary for the Government to adopt all appropriate measures to abolish all forms of harassment in the workplace and save poor agricultural laborers from this menace.
- Training courses should be organized by the government in rural areas of the country to sensitize agricultural laborers to pesticides, their exposure, their use, and their poisonous effects.
- There should be a proper service structure for the agricultural laborers.
- The benefits/policy of life insurance for agricultural laborers should be introduced.

References

- Ahmad, M., Kumari, M., Kumar, N., Goswami, G., Fahad, S., & Asgher, Md. S. (2023). Assessing livelihood vulnerability to climate variability in the Himalayan region: a district-level analysis of Jammu Province, India. *GeoJournal*. <https://doi.org/10.1007/s10708-023-10829-2>
- Bezner Kerr, R., Madsen, S., Stüber, M., Liebert, J., Enloe, S., Borghino, N., Parros, P., Mutyambai, D. M., Prudhon, M., & Wezel, A. (2021). Can agroecology improve food security and nutrition? A review. *Global Food Security*, 29, 100540. <https://doi.org/10.1016/j.gfs.2021.100540>
- Chothodi, S., Patidar, H., Parmar, K., & Mishra, R. (2022) Environment and human well-being: revisiting linkages and major issues. *The Indian Geographical Journal*, 97(1), 1–16. https://mail.igschennai.org/IGJ/2022/Jun/IGJ_Vol97_1_June2022_1.pdf
- D'Annolfo, R., Gemmill-Herren, B., Amudavi, D., Shiraku, H. W., Piva, M., & Garibaldi, L. A. (2020). The effects of agroecological farming systems on smallholder livelihoods: a case study on push-pull system from Western Kenya. *International Journal of Agricultural Sustainability*, 1–15. <https://doi.org/10.1080/14735903.2020.1822639>
- Ewert, F., Baatz, R., & Finger, R. (2023). Agroecology for a Sustainable Agriculture and Food System: From Local Solutions to Large-Scale Adoption. *Annual Review of Resource Economics*, 15(1), 351–381. <https://doi.org/10.1146/annurev-resource-102422-090105>



- Falconnier, G. N., Cardinael, R., Corbeels, M., Baudron, F., Chivenge, P., Couédel, A., Ripoche, A., Affholder, F., Naudin, K., Benaillon, E., Rusinamhodzi, L., Leroux, L., Vanlauwe, B., & Giller, K. E. (2023). The input reduction principle of agroecology is wrong when it comes to mineral fertilizer use in sub-Saharan Africa. *Outlook on Agriculture*, 52(3), 311–326. <https://doi.org/10.1177/00307270231199795>
- Feng, Y., Chen, H., & Zheng, X. (2022). Component analysis of ancient glass products based on hierarchical analysis clustering algorithm. *Highlights in Science, Engineering and Technology*, 21, 180–185. <https://doi.org/10.54097/hset.v21i.3155>
- George, A., Sharma, P., & Pradhan, K. C. (2023). Spatiotemporal Pattern of Vulnerability to Climate Change in Madhya Pradesh, India. *Applied Spatial Analysis and Policy*, 17(1), 55–85. <https://doi.org/10.1007/s12061-023-09535-w>
- Kumar, A., Kumar, S., Kuldeep Singh Rautela, Kumari, A., Sulochana Shekhar, & Mohanasundari Thangavel. (2023). Exploring temperature dynamics in Madhya Pradesh: a spatial-temporal analysis. *Environmental Monitoring and Assessment*, 195(11). <https://doi.org/10.1007/s10661-023-11884-5>
- Milheiras, S. G., Sallu, S. M., Loveridge, R., Nnyiti, P., Mwangi, L. E., Baraka, E., Lala, M., Moore, E., Shirima, D. D., Kioko, E. N., Marshall, A., & Pfeifer, M. (2022). Agroecological practices increase farmers' well-being in an agricultural growth corridor in Tanzania. *Agronomy for Sustainable Development*, 42(4). <https://doi.org/10.1007/s13593-022-00789-1>
- Paracchini, M. L., Justes, E., Wezel, A., Zingari, P. C., Kahane, R., Masden, S., Scopel, E., Héraud, A., Bhéret-Breton, P., Buckley, R., Colbert, E., Kapalla, D., Sorge, M., Adu Asieduwaa, Kerr, R. B., Maes, O., & Nègre, T. (2020, September 17). *Agroecological practices supporting food production and reducing food insecurity in developing countries*. Isara.hal.science. <https://isara.hal.science/hal-03653197>
- Patri, P., Sharma, P., & Patra, S. K. (2022). Does economic development reduce disaster damage risk from floods in India? Empirical evidence using the ZINB model. *International Journal of Disaster Risk Reduction*, 79, 103163. <https://doi.org/10.1016/j.ijdrr.2022.103163>
- Peeters A, Škorjanc K, Wezel A, Migliorini P (2021) OASIS, the Original Agroecological Survey Indicator System. A simple and comprehensive system for agroecological transition assessment. Agroecology Europe, Corbais, Belgium.
- Pradhan, K. C., & Narayanan, K. (2020). Does climatic risk induce labour migration? Evidence from Semi-Arid Tropics region of India. *Journal of Public Affairs*, 22(1). <https://doi.org/10.1002/pa.2323>
- Rautela, K. S., Kuniyal, J. C., Alam, M. A., Bhoj, A. S., & Kanwar, N. (2022). Assessment of Daily Streamflow, Sediment Fluxes, and Erosion Rate of a Pro-glacial Stream Basin, Central Himalaya, Uttarakhand. *Water, Air, & Soil Pollution*, 233(4). <https://doi.org/10.1007/s11270-022-05567-z>
- Rehman, S., Azhoni, A., & Chabbi, P. H. (2022). Livelihood vulnerability assessment and climate change perception analysis in Arunachal Pradesh, India. *GeoJournal*. <https://doi.org/10.1007/s10708-022-10703-7>
- Saikh, N. I., & Mondal, P. (2023). GIS-based machine learning algorithm for flood susceptibility analysis in the Pagla river basin, Eastern India. *Natural Hazards Research*, 3(3), 420–436. <https://doi.org/10.1016/j.nhres.2023.05.004>
- Sengupta, A., & Mohanasundari Thangavel. (2023). Analysis of the Effects of Climate Change on Cotton Production in Maharashtra State of India Using Statistical Model and GIS Mapping. *Caraka Tani*, 38(1), 152–152. <https://doi.org/10.20961/carakatani.v38i1.64377>
- Sharma, A. (2023). Drought risk management in Madhya Pradesh, India: a policy perspective. *International Journal of Emergency Management*, 18(1), 23–23. <https://doi.org/10.1504/ijem.2023.129408>
- Venus, T. E., Bilgram, S., Sauer, J., & Khatri-Chettri, A. (2021). Livelihood vulnerability and climate change: a comparative analysis of smallholders in the Indo-Gangetic plains. *Environment, Development and Sustainability*, 24(2), 1981–2009. <https://doi.org/10.1007/s10668-021-01516-8>