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Unskilled Labourers' Risk Perception, Vulnerability and Adaptation to Climate Change in District Quetta, Pakistan

Razia Almass
Professor, Department of Geography and Regional Planning, UOB Quetta
Email: raziaalmas3@gmail.com.

Said Qasim*
Department of Geography and Regional Planning, UOB Quetta
Email: saidqasim2@gmail.com.

Din Muhammad Kakar
Department of Zoology, UOB Quetta Email: dinkakar309@gmail.com.

ABSTRACT

This study tried to determine risk perception, vulnerability, and adaptation strategies of unskilled labourers towards climate change among in District Quetta, Pakistan. Data collection was performed through a questionnaire. Results show that majority of respondents (65%) were aware of climate change. About 38% of respondents strongly agreed that extreme poses serious threat to the unskilled labourers. Major climate related risks reported by the respondents were heatwaves (45%), Dust storms (22.5%), heavy floods (20%) and cold waves (12.5%). About 80% labourers experienced income instability due to climate change. About 65% of the respondents use informal coping mechanisms like changing work patterns (35%), engage in consumption of more water (25%), rest breaks (20.0%), other practices (12.5) and no practices adopted were (7.5%). The analysis shows that adaptive capacity is poor because of poverty, education, and poor implementation of policies though there is moderate awareness. A large majority (90%) indicated that intervention by the government was necessary with only 10% highlighting the need to have awareness programs.

Keywords: Climate Change Vulnerability; Risk Perception; Unskilled Labourers; Adaptive Capacity, Livelihood Insecurity

Introduction

One of the greatest challenge we are facing now-a-days is the Climate change (CC) (Lv & Tang, 2025). Climate change has caused severe threats to human health, livelihoods and economic stability around the world. It hardly treats those working in physically demanding and low-paid jobs (Grimshaw, 2025), especially unskilled labourers that rely on their daily wages. Heat stress has been identified by the global studies as the primary climate risk to unskilled labour, and informal workers represent 60% of productivity losses in the agriculture and construction industries (Han et al,

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2024). The report by Dodman et al. (2023), delivers an in-depth analysis of the climate change risk that unskilled workers in urban areas face in India and Zimbabwe have to face and outlines direct negative consequences of elevated temperatures/constricted exposure to extreme weather conditions leading to physical harm, morbidity and even livelihood loss. Hagan et al. (2026) produced maps of the impacts of climate change on unskilled labourers. Study of Hussainzad et al. (2024) found that infrastructural deficiencies and household level factors increase susceptibility to storms, floods, temperature extremes, as well as other hazards.

Pakistan is affected by adverse impacts of climate change due to geographical location, highly climate-dependent sectors like agriculture and limited institutional capacity (Yousaf et al., 2025). In Pakistan, a large percentage of the workforce is unskilled and informal (Rubab et al., 2025). They often work in outdoor areas and poorly regulated sectors, such as construction sites, markets and streets, transportation and sanitation services. Unskilled labourers, particularly in informal sectors comprising construction, agriculture, daily wage labor and street-based occupations are among the most affected groups. Most of these workers work outdoors, leaving them particularly vulnerable to extreme weather. Research shows that informal and outdoor workers are at a higher risk as they do not have either social protection or access to health care and working conditions. Although climate change effects gradually are gaining more attention, only little empirical research have been conducted regarding unskilled labourers' risk perceptions and adaptive behaviour. Therefore, we tried to determine the risk perceptions and adaptation strategies of unskilled labourers towards climate change impacts in Quetta, Pakistan.

Research Methodology

Description of the Study Area

We employed a case study and used a descriptive approach to examine risk perception, vulnerability, and adaptation strategies of unskilled labourers in Quetta. District Quetta has multi-ethnic culture and people of different ethnic nature are working here. District Quetta is also exposed to climate change issues. Quetta valley is surrounded by mountains and give it a bowl like shape. The only metropolitan city of Baluchistan is Quetta. Quetta valley is a valley of Pishin Lora Basin that borders on Balochistan (Pakistan) and Kandahar (Afghanistan) (Khan& Kakar, 2013). The capital of Balochistan is Quetta city (Coordinates 30.1798 -0 N, 66.9750 -0 E). Quetta is largest populated city in Balochistan and 10th populous city in Pakistan (Figure 1).

Data Collection and sample size section

The research was based on primary data. We designed a questionnaire, covering the objectives of the study. Close ended questions and Likert-scale items were placed in the questionnaire. The census of 2020-21 show that the total unemployed labour force in Quetta is 13,500 of which the male labourers are 13,200 (Pakistan Bureau of Statistics, 2023). We took the male labourers only because study is restricted to male unskilled labourers due to cultural restriction of the area. The Yamane formula $n=N/(1+Ne^2)$ in which statistical formula which explain sample size help in research in case of finite population (Yamane, 1967), with 5% error of acceptance suggested s

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sample size of 400. Random sampling technique was applied for this study of population characteristics are homogenous.

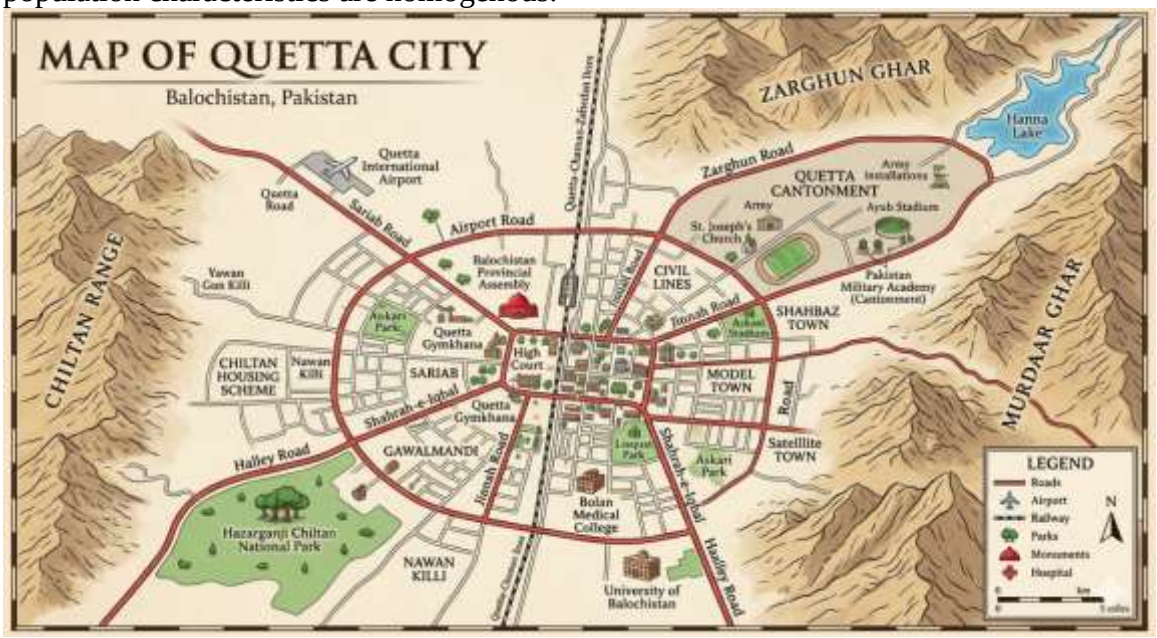


Figure 1: Location of Quetta City

Data Analysis

We used SPSS software for analyzing the collected data. Percentages, Frequencies and means were calculated to show unskilled labourers' views and perceptions regarding climate change, its impacts and adaptation strategies of the unskilled labourers in Quetta.

Results and discussion

Age Groups of unskilled labourers

The age structure revealed that majority of unskilled labourers belonged to the 26-35 age group. Less number of respondents (5%) belonged to the old age group. Results show that most of the workers belonged to the working age group (Table 1).

Table 1: Age groups of unskilled labourers

Age Group (Years)	Frequency	Percentage (%)
18–25	90	22.5%
26–35	140	35.0%
36–45	100	25.0%
46–55	50	12.5%
Above 55	20	5.0%
Total	**400**	**100%**

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Educational Background of Participants

Findings revealed that majority of unskilled labourers in District Quetta were illiterate (45%). About 30% of the surveyed respondents had attained education up to the primary level. The labourers that had secondary and higher secondary education were 17.5% and 7.5% (Figure 2). Results of educational attainment shows that most of the respondents had attained primary level education and were conscious towards climate change, its impacts and handling methods for dealing with its impacts on their health.

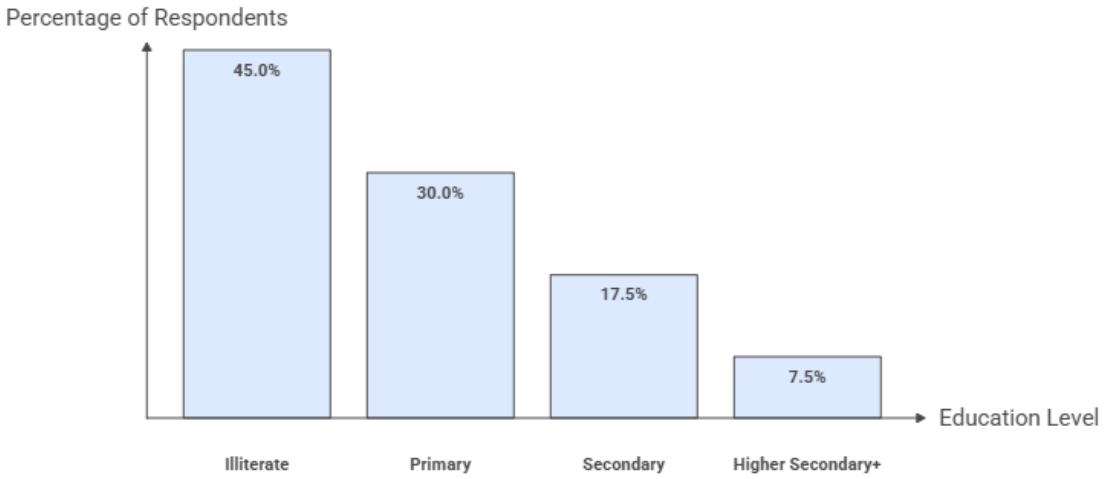


Figure 2: Education Level of Respondents

Level of Awareness Regarding Climate Change

Our survey of respondents showed that a large majority (65%) unskilled labourers were conscious about climate change and its adverse impacts on humans. About 35% of the respondents were unaware regarding climate change impacts. This shows that most of the unskilled labourers had experienced adverse impacts of climate change and they had tried different methods to cope with the impacts of climate change.

Perceived Severity of Climate Change

Results about severity of climate change impacts showed that majority of unskilled labourers (37.5%), "strongly agreed" that climate change poses a serious threat to their daily working hours and had reduced their income. About 32.5% of the respondents showed "Agree" when they were asked about the impacts of climate change are severe or not? About 12.5% respondents were neutral about climate change impacts. About 10% of the respondents clicked on "Disagree" and 7.5% of the respondents reported "strongly disagree" about climate change impacts. Results showed that since a large majority of the labourers "strongly agreed" on climate change impacts. This is why climate change is a problem in District Quetta and policy makers must strive to protect lives and livelihoods of the labourers.

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Table 4: Perception of Climate Change as a Serious Threat

Response	Frequency	Percentage (%)
Strongly Agree	150	37.5%
Agree	130	32.5%
Neutral	50	12.5%
Disagree	40	10.0%
Strongly Disagree	30	7.5%
Total	**400**	**100%**

Experience to Climate-Related Hazards

When the respondents were asked about the climate-related hazards they faced. Most of the respondents (45%) affirmed that the heatwaves have now started to be more frequent than they used to be. About 22.5% of respondents reported dust storms have increased. About 20% respondents reported that mega floods have become more frequent than before. Only about 12.5% reported about increase in cold waves during winters. Results show that all these climate related hazards have become more frequent and intense than before. More labourers are exposed to the impacts of heatwaves, dust storms, heavy floods and cold waves than before.

Table 5: Major Climate-Related Risks Faced

Climate Risk	Frequency	Percentage (%)
Heatwaves	180	45.0%
Dust/Storm	90	22.5%
Heavy Rain/Flood	80	20.0%
Cold Waves	50	12.5%
Total	**400**	**100%**

Climate Change impacts on Income Stability of Unskilled labourers

Perception of unskilled labourers about the impacts of climate change on their income revealed that majority i.e., 80% of the respondents had experienced income decline due to the impacts of climate change. Only 20% unskilled labourers did not mention any change in their income levels due to Climate change. This proves that climate change considerably unsettles livelihood stability among unskilled labourers, particularly those dependent on daily wages. This was due to the fact that many labourers tried to take rest during extreme heat, floods, dust storms and extreme cold situations to safeguard themselves against the extreme climatic hazards.

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Coping and Adaptation Practices of the Unskilled workers towards Climate change

The unskilled labourers in District Quetta reported about different adaptation strategies that to some extent were effective in combating the impacts of climate change. Most of the labourers (35%) changed their working time. They told that they performed work during early morning or evening time and skipped the peak sunshine hours. About 25% labourers reported that they adopted increased intake of water mixed with salt and lemon to save them from the adverse impacts of climate change. Some labourers (20%) reported to take rest breaks and complete the work. About 12.5% labourers reported other protective measures including the use of small cloth to cover their heads during extreme heat, soaking the cloth in cold water repeatedly and covering heads during extreme heat, and use of more clothes to protect their bodies during extreme cold. Only 7.5% labourers reported no use of any adaptation measures to protect themselves against extreme climatic hazards. This study therefore reveals that the labourers in Quetta had adopted some coping strategies for dealing with extreme climate related situations.

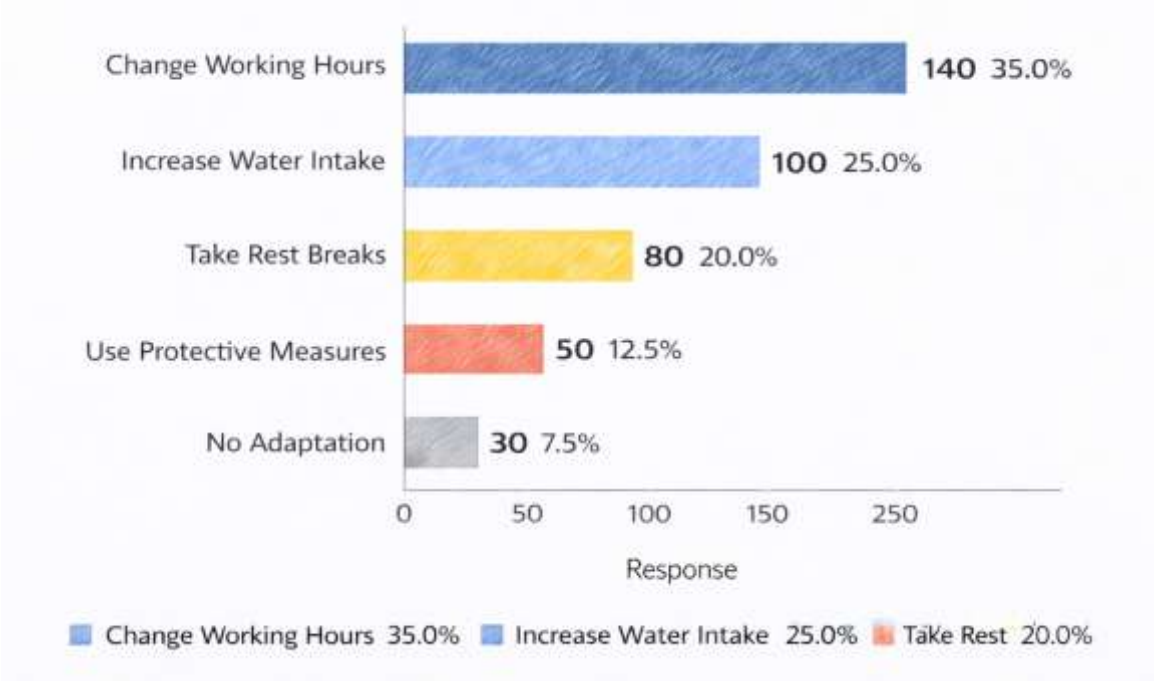


Figure 3: Adaptation Strategies Adopted

Conclusions

In this research, we carried out a questionnaire survey to find out the perceptions, exposure and adaptation strategies of unskilled labourers towards extreme climatic situations in Quetta, Pakistan. The results revealed that most of the labourers belonged to the working age group and also most of the labourers had attained education up to primary level. About 37% of the labourers had experienced that climate change poses serious threats to their working conditions. A large number of these unskilled labourers were conscious about basic information of climate change issues and their

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impacts. However, only a small percent of these labourers had in-depth knowledge of climate change and its impacts. Results also revealed that heatwaves were more common type of climate change followed by dust storms, floods and extreme cold waves. The labourers reported that climate change has significantly affected their livelihoods by declining income as they are unable to work during extreme climatic situations. They had adopted different approaches to combat climate change impacts, including changing working hours, followed by increased water intake, rest breaks and use of other protective measures. This study suggests policy guidelines for the concerned government authorities to make sure the provision of first aid and timely treatment of the affected labourers.

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