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Islamic Relief Pakistan



RESEARCH STUDY

UNPACKING URBAN RESILIENCE: **TOWARDS A FRAMEWORK FOR BUILDING URBAN RESILIENCE TO CLIMATE CHANGE IN THATTA AND KARACHI**

Title of Study: Unpacking Urban Resilience: Towards a Framework for Building Urban Resilience to Climate Change in Thatta and Karachi

Project Name: Climate Sensitive Livelihood Modeling (CSLM) Project

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Though careful efforts have been made to ensure the correctness and accuracy of data, analysis and assessment presented in this report with proper reference and quotes readers must understand that future realized as estimate and the past occurrences may not necessarily guide the future scenarios.

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List of Acronyms and Abbreviations

ABBREVIATION	MEANING
CBDRM	Community-based Disaster Risk Management
CCA	Climate Change Adaptation
CCM	Climate Change Mitigation
CCP	Climate Change Portal
Co2	Carbon Dioxide
COP	Conference of the Parties
DDMA	District Disaster Management Authority
DM	Disaster Management
FGD	Focus Group Discussions
GHGs	Greenhouse Gases
IDIs	In-depth Interviews
IMF	International Monetary Fund
INGO	International Non-Government Organizations
IRP	Islamic Relief Pakistan
KE	Karachi Electric
KM	Kilometers
KPK	Khyber Pakhtunkhwa
NCSW	National Commission on the Status of Women
NDMA	National Disaster Management Authority
NGO	Non-Government Organizations
NNS	National Nutrition Survey
PCRWR	Pakistan Council of Research in Water Resources
PDMA	Provincial Disaster Management Authority
SPSS	Statistical Package for Social Science
UNFCCC	United Nations Framework Convention of Climate Change
UNHR	United Nations Human Rights
UNISDR	United Nations Office for Disaster Risk Reduction
UR	Urban Resilience



Foreword



Asif Sherazi
Country Director,
Islamic Relief Pakistan

Pakistan has been receiving wake up calls about the rapidly changing climate and extremely unpredictable weather patterns. The country has been host to droughts, long dry spells, extreme rainfalls and snowfalls and most recently a flood that affected roughly 33 million people. The country can't bear the financial, emotional and human cost of climatic changes happening at an alarming pace. Even the enchanting wilderness is being affected in a way no one ever imagined of. As it continues to reshape our planet, forecasts paint a disturbing image of the future. In case of the recent floods, the recovery has been slow due to thin resources making lives more difficult for the poor. Considering it to be the biggest challenge of our time, Islamic Relief has been actively advocating for climate justice and rights of the people of Pakistan alongside putting in efforts to bring a lasting change in practices and behaviors. Through 'Voices Organized for Climate Change, Advocacy and Lobbying' (VOCAL), a nationwide campaign, we are bringing all stakeholders including media, civil society, academia and government to unite for a decisive climate action. Sindh being at the forefronts has been paying a big climate cost with communities migrating to safer areas and diminishing livelihoods making the poor poorer. 'Climate Sensitive Livelihood Modeling' (CSLM) aims to minimize the impact of climate change in the coastal areas of Sindh by

enabling the communities for climate adaptation. This research under the CSLM project is the bedrock for future adaptation plans and climate resilient frameworks to carve footprints for interventions in the coastal areas impacted by climate change. In addition to that, the study will improve the capacities of local government and communities simultaneously strengthening the coordination between different stakeholders for a lasting and tangible change. This study is an embodiment of IR's commitment to knowledge creation for viable future planning and community empowerment initiatives for long term development in areas where it matters the most. With challenges mounting, these efforts and contributions by Islamic Relief are directed to make Pakistan a Climate Resilient country and equipping it with the right skills and knowledge to create better and safer tomorrow.

Acknowledgments

It is indeed a great privilege for us to present this report on “Unpacking Urban Resilience: Towards a Framework for Building Urban Resilience to Climate Change in Karachi and Thatta”. This is the way forward for the development of an integrated framework for risk reduction of climate change and enhancement of urban resilience by every stakeholder at each level. This report has been developed with the coordination of communities’ in Thatta and Karachi. A series of IDIs have been conducted with several experts, academics, and numerous professionals in government and non-governmental organizations within the provinces, districts, and local levels. We are sincerely grateful to all those who contributed to the process of this report.

It would not have been possible to develop this report without the technical backstopping of Mr. Raza Hussain Qazi (Advocacy and Campaigns Specialist, IRP-Islamabad); Mr. Mehboob Ali (Area Programme Manager, IRP-Sindh), Mr. Bashir Ahmed Waseem (Programme Coordinator, IRP-Karachi office); and Mr. Zahid Ali Shah (Senior Research and Advocacy Officer, IRP-Islamabad), who provided valuable feedback and expert opinions to contextualize the report in accordance with IR Pakistan’s requirements. Moreover, at the field level, various meetings were arranged and facilitated by the IRP-Sindh team including Mr. Shah Nawaz Shan (Advocacy and Engagement Officer), Ms. Kulsoom Fatima, Ms. Rozina Khatti and Ms. Tahira Ali (Community Development Officers) of IRP. We sincerely thank them for their valuable contribution in the field. IRP-Pakistan also acknowledges the

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Executive Summary

Pakistan is listed amongst the world's most vulnerable countries to the effects of climate change. Due to its location at the mouth of the River Indus, lower Sindh is at an elevated risk. The provincial capital of Sindh (Karachi) is particularly vulnerable due to its large population, high inflow of migrants, huge slum areas, and unplanned development. Just over a hundred kilometers east of Karachi, Thatta is also significantly vulnerable due to its relationship with the coastal belt of the Arabian Sea and the Indus Delta.

Decades of poor urban planning and the rampant threat of climate change pose a massive risk to Thatta and Karachi, who at present are woefully unprepared for a climate catastrophe. Karachi and Thatta represent a ground zero from where a framework for urban climate change resilience can be built, and therefore can provide comparative examples to tackle climate change globally.

This study documents local perceptions and expectations of various stakeholders to learn about vulnerability and mitigation related to climate change and urban resilience in Karachi and Thatta. It identifies evidence-based policy gaps, issues, and impact of climate change in both coastal and urban populations. Ultimately, this research develops a framework for technical support on policy formulation and suggests intervention mechanisms for creating urban resilience.

Mixed method approach has been employed for data collection, detailed field surveys were conducted between August-October 2022 with 417 respondents in Thatta and Karachi. Additionally 30 in-depth interviews were conducted and 4 focus groups were also held. The research population represented 60.4% males, 38.6% females, and 2% Transgenders.

The study shows that the general population of Karachi and Thatta lack awareness about climate change issues, causes, and their solutions. A dearth of political will further exacerbates the problem, since the conflict of interest between different political parties causes negligence towards climate change. The lack of implementation of policies related to climate change and urban resilience in Pakistan is another problem. Due to limited access to basic necessities, lower-classes are especially vulnerable to the impacts of climate change. Unsurprisingly then, the results of this study show that levels of urban resilience are low. There is a need for institutions that can provide accessible information and data about climate change, its threats, responses, and solutions towards mitigating the effects of climate change. This study finds that actions taken by individuals and government agencies are reactive rather than proactive, and there is a need of sensitization, organization, and ownership of Karachi and Thatta by their communities and structures of governance.

Based on our findings we suggest a framework towards urban resilience that requires improved governance and the integrated role of public offices, civil society organizations, and local communities, NDMA, PDMA and DDMA. Developing urban resilience must be taken seriously by all stakeholders at each level, and not solely as an emergency response. There is also a need to develop social networking related to urban resilience, alongside a database that provides easy access at district, town, taluka and Union Council level that includes all relevant data and resource information. Islamic Relief Pakistan can play a vital role in implementing this framework.

1 INTRODUCTION

Background

It is projected that by 2050, approximately two-third of the world's population will be living in urban areas, a notable increase from the current statistic of slightly over half. Urban areas contribute to more than 80 percent of the world's GDPⁱ. Moreover, coastal regions contribute to over 70% of the world's overall production due to ports which are major gateway of economic activitiesⁱⁱ. Coastal areas are more vulnerable to climate change impacts due to rising sea-levels, flooding and heatwaves. Recognizing the urgent need to address these challenges, the concept of urban resilience has gained prominence as a holistic approach to building cities' capacity to withstand and recover from shocks and stresses.

Pakistan is rapidly urbanizing country, with a significant portion of its population living in cities. According to the World Bank report of 2022, Pakistan is projected to witness a significant increase in its urban population. The population residing in urban areas, already facing high levels of pollution and vulnerability to climate change, is expected to rise from 37% in 2020 to 60% by 2050. The country's urban areas are characterized by increasing population densities, inadequate infrastructure, environmental degradation, and a lack of essential services.

The vulnerability of Pakistani cities to climate-related risks is a pressing concern. Coastal cities such as Karachi and Thatta have experienced cyclones, flooding and heatwaves leading to infrastructure disruptions, climate-induced migrations, compromised public health systems, and increased social and economic inequalities. Climate change affects Thatta primarily along the 107-kilometers long coastline. There are two basic reasons; little to no downfall of Indus River water, and the salinity of land and water because of sea intrusion and subsequent land erosion.

Climate change resilience and adaptation: Integrated Approach

Building urban resilience to climate change requires an integrated approach that combines physical, social, economic, and environmental considerations. It involves investing in resilient

infrastructure, implementing effective land-use planning, ensuring access to essential services, enhancing ecosystem management, promoting social cohesion, and fostering community engagement. Furthermore, it entails addressing systemic risks, such as social inequalities and economic disparities that can exacerbate the impacts of climate change on vulnerable communities.

Islamic Relief has been working in Pakistan for the last 25 years, as part of one of the world's largest faith-inspired charities. Since 1992, Islamic Relief has served about 9 million people living in remote parts of the country including Punjab, Balochistan, Khyber Pakhtunkhwa, Azad Jammu & Kashmir (AJ&K), Sindh, and Gilgit Baltistan.

Islamic Relief Pakistan aims to address the deep-rooted issues in the country associated with poverty, education, health, water and sanitation and sustainable livelihoods through long term and effective partnerships with the government, private sector, INGOs, academia and media. Islamic Relief envisions a self-reliant, resilient, and safer Pakistan. The Climate Sensitive Livelihood Modeling (CSLM) project lays the groundwork for this study. Rolled out in two coastal districts of Sindh, the project envisages strengthening the communities living in the coastal belt of Thatta and Karachi, to strengthen the local government and relevant departments to improve service delivery and create close connection with communities to acclimate climate change adaptation plans in sectors of food security, livelihood, water management and social services. This study investigates the perception and readiness of community people and relevant departments regarding climate change resilience building and impacts on both cities. In Pakistan, role of government departments and society in addressing the vulnerabilities of climate change is crucial. We propose an integrated role of think tanks, researchers, civil society and academia in order to connect and guide local stakeholders in order to reduce the impacts of disasters, enhance resilience, and adapt policy supported interventions.

Research Objectives

1. To document perceptions and expectations of local community, professional, practitioners and line departments about long standing risk, uncertainty, vulnerability, adaptation, and mitigation related to climate change and urban resilience
2. To analyze the role of public and private sector organizations for urban resilience in Karachi and Thatta.
3. To identify evidence-based policy gaps, issues, and impact of climate change on population of coastal and urban populations of Karachi and Thatta and their level of urban resilience.
4. To lay the groundwork for a framework for recommendations on technical support for policy formulation and suggest intervention mechanisms for urban resilience.

Methodology of Research

A mixed method approach was used for data collection, and both quantitative and

qualitative data were collected. A thorough literature review was conducted to develop the relationship between key variables. Moreover, policy and recommendation frameworks related to urban resilience and climate change effects and challenges were reviewed at both a global and national level. Fieldwork was conducted in urban settlements, especially where Islamic Relief has implemented interventions in Sindh to record data, stories, and lessons from communities in Thatta and Karachi. A structured questionnaire was given to respondents to answer in either Sindhi or Urdu.

Qualitative data was collected through identified key stakeholders and experts in the fields of climate change, urban development, environment, disaster management, human rights, and related fields, from the relevant academic departments, line agencies, NGOs/INGOs & CSOs at provincial level through in-depth interviews and focus group discussions with local communities of Karachi and Thatta Districts. Quantitative data was analyzed through SPSS version 22. For results and conclusions, a data triangulation approach was utilized to extract overall results collected through literature review, quantitative approach, and qualitative approach.



Study Population of Karachi and Thatta

Quantitative data was collected from Thatta and Karachi with a total sample size of 417. From Karachi, the majority of research participants were selected from District Malir and its coastal area, being most vulnerable to climate change. The population from other districts of Karachi i.e., Kemari, District East, District West is also included in the 350 sample size from the city. The sample size from Thatta is 67 individuals from coastal and agricultural areas, and those individuals who migrated from Thatta to Karachi. For qualitative data 30 IDIs were conducted with experts, academics, government representatives, NGOs, community leaders, social activists, and lawyers. 4 FGDs were conducted with community members of Karachi and Thatta.

2 STUDY RESULTS

2.1 Urban Context, Climate Change, and Urban Resilience in Karachi and Thatta

The Government representatives of coastal areas look less active in disaster management. One of the participants from the Focus Group Discussion of coastal area Thatta said,

“When it rains, or there are such difficulties in our village, we work by ourselves; the government departments do not come to our village. We help each other and work together”.

Regarding economic activities, Thatta can be divided into two groups – namely fishing and farming. In Thatta, the sea has engulfed thousands of acres of land. Therefore, all those who depend on agriculture, are damaged socially, economically, and psychologically. If they are still working on land that remains somewhat viable for commerce, they face issues of water salinity or availability of river water for agriculture. Concerning this, one of the participants said,

“Our biggest problem is water shortage, we don't have enough of it for agriculture and even for drinking, and the government does not have any plan to help us.”

Fishermen who live in coastal areas face threats that could be classified into socio-economic threats, land procuring issues by sea, middleman issues, and fish size issues, etc. In relation to this, one of the respondents from Kharo Chan said,

“We understand that our income has decreased a lot due to the lack of fish and its decreased sizes. Owing to a lack of water from the river, we do not have job opportunities here.”

While discussing climate change and its challenges, locals understand that the weather of the coastal area has changed entirely. Previously they were able to forecast the weather using indigenous knowledge, but nowadays, it is difficult for them to predict it. One of the respondents from Keti Bandar said,

“We have been living in this sea since generations. Our village is here, and the sea is everything to us, but now we all are going through miseries. Besides, the sea itself is suffering a lot due to pollution. We are not aware of the long-lasting solutions to these problems.”

Most of the residents from the coastal area of Thatta have raised complaints about the role of government departments. Locals claim that





most departments have shown reluctance to work in coastal areas to fight climate change. The population living in the coastal area is thinking of shifting their income resources, children's education, and migration from Thatta to Karachi. They have a firm understanding that a harder time is coming for them, and they are likely to face several challenges. One of the participants from Keti Bandar said,

"I am a teacher here, and I am educated among all these people and the situation here is changing day by day. Hence, it becomes difficult, and the environment here is hard to survive in. Truly speaking, our people don't want to live with happiness, but - if there is a storm in the sea, and there are fewer income sources and pressure of middleman - in these circumstances, they don't find any way out other than migration."

Currently there are issues between indigenous peoples of coastal areas who believe that they are emotionally connected with the sea since their forefathers, and investors who are coming from other parts of the country, mainly from Khyber Pakhtunkhwa. Locals believe that these investors do not have any emotional relationship with either the local population or the sea, and only come for the sake of business. Indigenous people in Thatta are living with psychological stress with minimal understanding about the changing climate and its threats. Research also reveals that although their income has increased, some individuals migrating to Karachi from Thatta (particularly their children) are finding it difficult to settle.

2.2 FACTORS OF URBAN RESILIENCE & CLIMATE CHANGE RELATED VULNERABILITIES

Role of Local Administration

From government officials in the basic administrative unit in Pakistan (taluka) to federal representatives, this study sought answers from all major public officials working around climate change and urban resilience in Karachi and Thatta mentioned in methodology. It records their roles and takes into account their views on policies, practices, and issues on the subject. Local government coordinates with DDMA, other government departments, non-governmental organizations, the local community, and political leadership at the district or town level during emergencies. One interlocutor from a local administration discussed,

"If there are questions that whether the buildings are being built correctly or not, the roads are developed in the right manner or not, schools and hospital are working well or not, it is utterly the responsibility of district administration because there are independent government departments for each subject."

This reflects the due roles and responsibilities to be performed by the local government administration to cope with any kind of disaster during emergencies. Research however reveals that local government is not working up to the mark for increasing urban resilience.



Role of Provincial and Federal Governments

After the 18th amendment in the constitution, most federal subjects and public offices are developed at the provincial level. The role and responsibilities of government offices are changed up to deciding authorities and management level. Government departments that oversee climate change are still working in close coordination. NDMA at federal level and PDMA at provincial level working together on various grounds during emergencies. Social welfare department, women development departments, child protection irrigation department, education, and health are provincial subjects at large. Environmental protection and the energy departments are now separate bodies with different authorities, management, and objectives. They are working directly on climate change impact and management at a macro level with policy development, awareness, audit, and certification of industries and companies through social and environmental protection framework and development of renewable energy projects.

There is a need for coordinating a working relationship between all government stakeholders at federal, provincial and local levels to increase urban resilience and deal with climate change impacts.

Reliable Data and Risk Information System

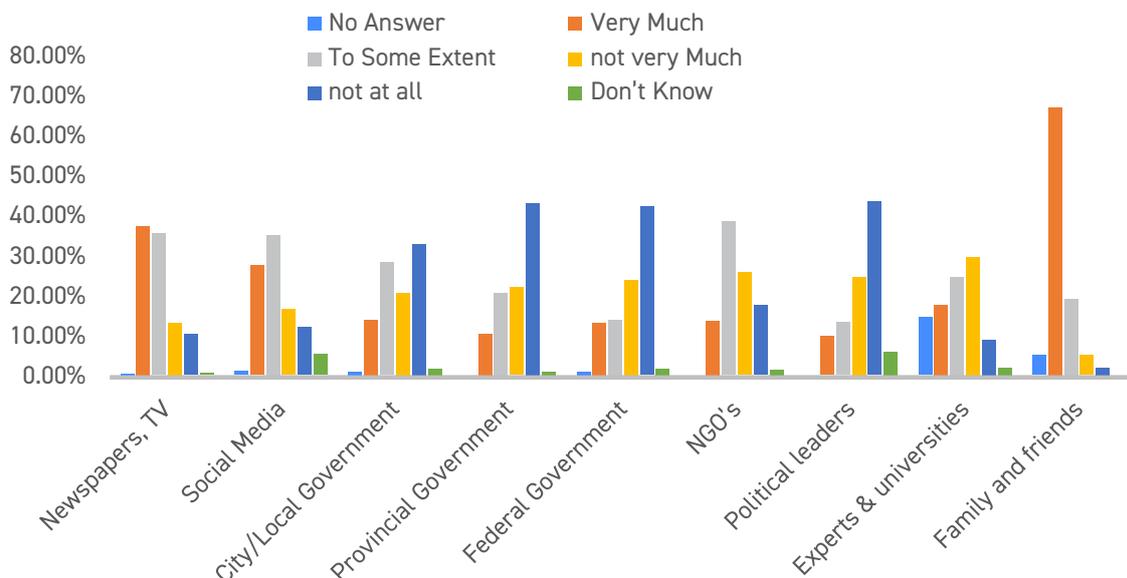
As urban resilience is mainly dependent upon the capacity of government, communities, institutions, and individuals to survive climate change, interventions are futile without reliable data at each level. During FGDs with experts and stakeholders it has been revealed that there is a need for reliable data sources associated with governmental institutions and departments to provide authentic data in Pakistan.

Now is a critical time to develop institutions which could develop authentic, regular, measurable, and reliable data sets in Pakistan. One participant said,

"In disaster risk management, we need different types of data but the availability of data is very difficult because even the government does not prioritize it or collect data for analysis."

Data plays a primary role in any kind of active planning, and is needed by the public to learn about any emergency so that they can take safety measures in advance. One respondent working in the development sector said,

"I don't know about reliable data sets, even know that there is no such big plan of the Government for regular data collection and assessment. We get data only in emergencies."



Trust of the Population in Information Provided Related to Emergencies/Urban Resilience

The above table represents the level of trust participants held on various data and information sources in Thatta and Karachi. The table shows mixed responses, but a majority of people only trust data given by their own family members and friends. Another important insight is that people

do not entirely trust data given by government institutions, whether they be local, provincial, or federal. Participants also demonstrated less trust on information provided by NGOs. There is greater trust in mainstream news media such as newspapers and TV channels than social media.

Readiness and Response

“It was the 11th of August 2022, and I was coming out of my office. It started raining very fast. In a short time, so much water accumulated that I was not able to get out of my car at once. At that point I thought to leave my car there and ran away on foot. Truly, it was the worst situation I faced in my life. Which took almost four hours to be there. Afterwards, I was able to take my car home as it stopped raining heavily”.

pick up the people, but the ambulance takes a long time to arrive, and even the police take a long time to reach”.

This testimony comes from a contributor in Karachi. When it comes to responding to urban emergencies, Karachi does not have adequate solutions and the government is bereft of any concrete planning. Consequently, trust in government departments is low. One female participant from Karachi shared her experience about disaster risk management readiness in the city,

Presently, Karachi has a huge gap in planning for disaster management. All major line departments, private organizations, and, importantly, local government are scattered for ideas, programs, projects, and actions to enhance urban resilience. During Interviews with different government stakeholders and organizations regarding their role on readiness and response, it was revealed that most stakeholders appear unaware of the linkages between climate change and urban resilience. Moreover, they had barely been working on few aspects or grounds only to showcase progress reports, or utilize the budget allocated to them. It also gathered from the discussions that stakeholders either do not have clear objectives or they have been unable to achieve the objectives and priorities in relation to urban resilience. Most importantly, there

“You are talking about disaster management; I understand that if the power goes out here, there will be no readiness to restore it timely. We have a lot of experiences like this. When there is an accident somewhere, ordinary people come to

should be a complete web of local government systems in Karachi to deal with situations of any severity. However, it appears that government institutions and departments have a dearth of planning and lack of clear vision. Most officers and publicly elected representatives accepted the situation that there is a lack of political will at the grassroots level to bring about the reforms.

Infrastructure

According to infrastructure types, age of buildings, high-density areas and flats, Karachi can be divided into various parts for resilience level such as developed areas, under-developed areas and slum areas. Urban resilience can be measured by socio-economic conditions, people's access to facilities, and availability of facilities, etc. In order to counter the factor of risk management, there are no organized practices for disaster risk management for emergencies. It seems that common people have no idea regarding the number of trauma center hospitals required to cope with emergencies considering the need of the population of Karachi and its area-wise distribution. Citizens and experts opine that they are not witnessing any systematic disaster risk management planning in the city. In this connection, they view,

"In the city of Karachi, no work is done in an organized manner with planning in mind"

It is again a matter of grave concern for all residents of the city that the government has no plan for relocation or protection of citizens living in high density slum areas, semi-urban settlements and the large population living in apartment blocks. In the case of an emergency, this could be the cause of a grave humanitarian disaster. The respondents have also observed that there is a huge gap in coordinated and consistent work between the public and private sectors. Most of the groups work reactively without preparedness. One of the participants gave the example of Gwadar Road, which was built of poor quality and was damaged by flooding. He shows his concerns while saying that the Gujjar Nala of Karachi was used to drain out rainwater. Historically there have been about 20 to 25 such rivers in Karachi, but slowly and gradually because of construction, rivers were converted into settlement areas. Consequently, all systems of irrigation, drainage,

and water supply have nearly disappeared which is one of the major cause of urban-flooding. One of the respondents with expertise in climate change issues said,

"Densification and the massive construction of a flat system [apartment blocks] are a living example that the resilience level of Karachi is not a priority of decision-makers, and they do not consider the measures to enhance the resilience [such as] against earthquake effects here".

There are no legal bindings for builders to take safety measures while constructing huge buildings. One of the participants said

"I also have a little problem when people say that the people of Karachi are reliant on climate change effects. I don't mean they're not resilient, but they're resilient because they've had so many problems with climate change that they've figured out how to deal with it, whether it's a water problem, a sanitation problem, or living spaces. They face many issues and cannot classify problems, whether they are related to urban resilience. They have learned to deal with the worst and most difficult conditions".

Furthermore, focusing on this situation, the respondent representing a non-profit organization said, and

"Sensitization at the policy level, the seriousness with political will, commitment at the government level or any higher action tacking body can give sustainable solutions to these problems. It is a matter of grave concern that these top-level groups are not finding any permanent solutions".

Here there is a need for long-term solutions instead of 2-5 years of reactive activities. In this regard, the sustainability level of government programs must focus on projected population and issues forecasting for the future 100 years in the city while focusing on traffic on roads, climate change effects to happen, rain or urban flooding, heat waves, or any other natural or artificial disasters.



Electricity, Water Supply, Sewerage, and Drainage

Basic infrastructural needs are seriously affected during any kind of climatic adversities. Related to disaster risk management, there is another ground reality of Karachi, that due to political and cultural differences, most residential areas are dominated by various ethnic groups; such as Muhajirs, Sindhis, Pakhtuns, Seraikis, Punjabis, etc. Besides, each area has enormous discrimination in proper facilities such as water supply, drainage, roads, and health infrastructure. Another significant difference exists between areas under the control of cantonment boards, various religious groups, and services related to societies, slum areas, and marketplaces. Hence all kinds of discrimination show that there is lack of proper planning and management by the government sector to cope with any disaster risk if it occurs. Regarding essential facilities related to residents of Karachi, the water supply and sewerage system stand as very important to cope with climate change effects. Hence the availability of these facilities shows differences area-wise. Some respondents showed their concerns that the situation is alarming due to no coordination of the community, builders, and other line departments. One respondent opined,

“I see that this [climate change] situation is alarming due to the non-coordination of the community, builders, and other line departments. Hence, the overall situation is not in control due to the ancient pipeline system, uncontrolled, unplanned structural development, and the huge population increase in Karachi”.

It is critical to examine the required capacity of an electric supply system in any city with relevance to urban resilience. Urban strength depends upon all aspects, from installed poles, electric wires, and internal fittings to the availability of electricity and sustainability of the system in the city. According to Karachi Electric (KE), many changes in their transmission system, wiring, etc. have been developed. One KE representative said,

“There are some areas of Karachi where it is a tradition to use electricity in illegal ways that as by theft. Truly, our infrastructure is excellent because no one can twist our ABC wire; hence, no one can steal it. According to our survey, forty percent of people in Karachi were using stolen electricity. Our first plan was to protect people from electric shocks. Owing to the illegal use of electricity, we have witnessed many accidents taking place at our priority of ABC wire”.

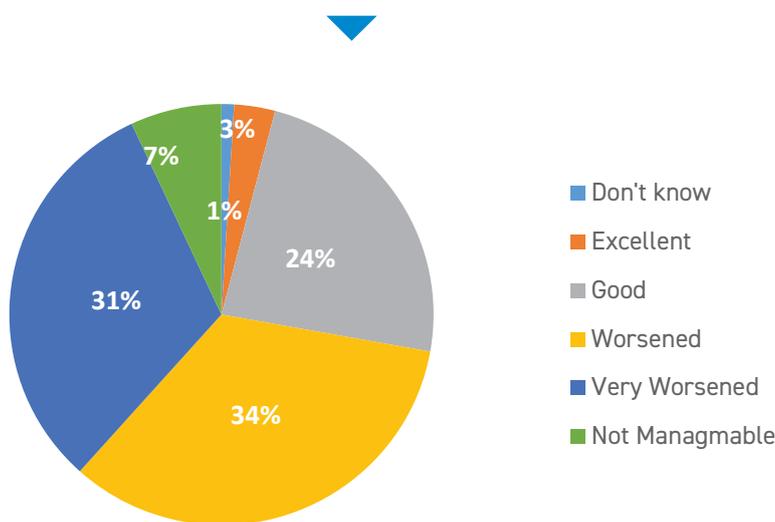
2.3 Climate Change impacts on Karachi & Thatta population

Climate change Impacts on Health and Medical Care

Climate change disasters have major consequences that come in the shape of food shortages, unavailability of drinking water, migration, homelessness, and the spread of communicable and infectious diseases. The existing conditions of the healthcare system

in Pakistan is not up to the mark. Four in ten children under the age of five suffer from stunted growth, according to the new National Nutrition Surveyⁱⁱⁱ. Since the 2010 floods, people have been compelled to move from their place of origin, and all climate change-induced problems lead to health issues in the most vulnerable segments of children, women, elderly persons, and persons with disabilities.

People's perception about their access to health facilities



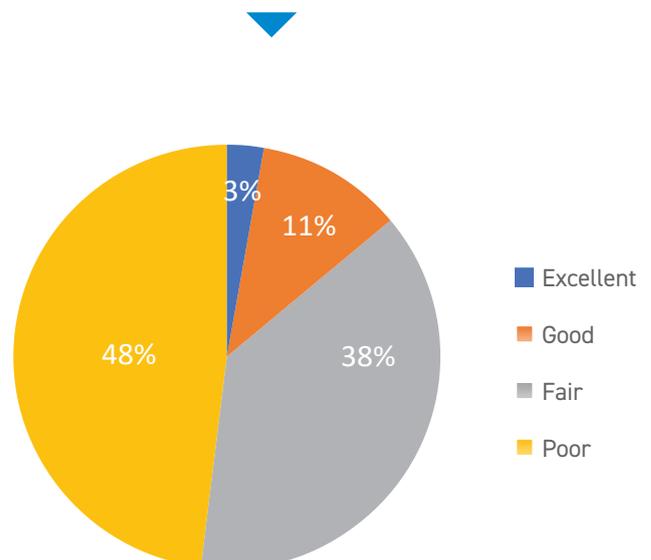
A significant proportion of Karachi's population lives in slum areas with a very low average income. Under normal circumstances, they struggle to afford their daily expenses and lack access to adequate healthcare facilities. However, with climate change issues such as heatwaves and heavy rains, health issues are further exacerbated.

Climate change Impacts on Educational facilities

Education is another basic need that is seriously affected by climate change threats, in urban as well as rural areas, this can be classified into different categories.

- Damaged/destroyed educational institutes due to floods, rains, sea erosion, salinity, and re-location of the population to another place.
- Educational institutes are closed by the government and declared as camps for internally displaced persons.
- Vacations/closure of educational institutes as declared by disasters by the government for a long time; COVID-19 and floods are real examples of these situations.

People thinking about Education Facilities



The decision by the federal and provincial governments to close the education system after the 2022 floods declared their seriousness towards education. They could not learn lessons from history when after the 2005 earthquake in Kashmir, a large number of schools were damaged and remained closed for a long time. Similar problems existed after the floods of 2011 and 2015. Here the question arises of how much the government is neglecting the importance of education in the country.

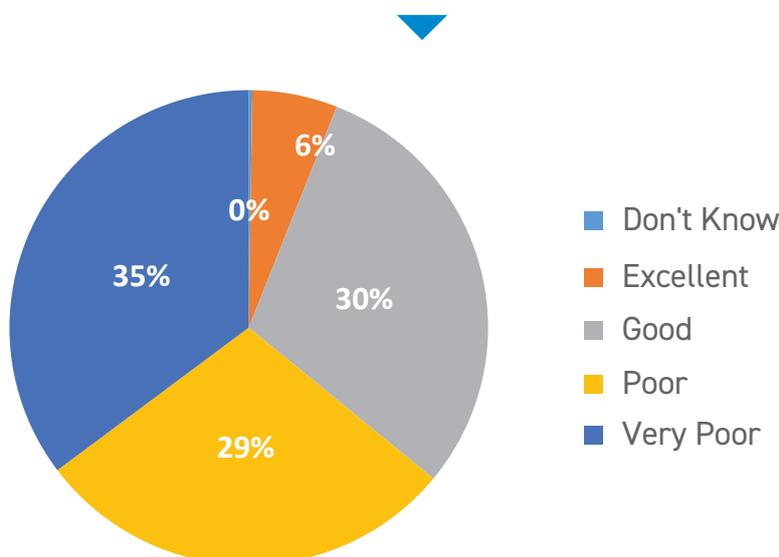
This study states that climate change primarily affects the education of poor people. The impact can be seen in a way that large numbers of

students who belong to poor communities could not continue their education due to increased expenses and a decrease in their income. During a discussion with the community and through survey, it was revealed that the community believes and understands the importance of education for them and their children. When the question was asked about the importance of education a majority of them believed it is very important. When queried about the state of the education system, the findings yielded a range of responses. While a mere 6% deemed it excellent, 30% acknowledged its satisfactory condition. In contrast, a significant 64% expressed their perspective that the conditions were either poor or very poor.



Discussion with the Deputy Commissioner of Thatta

People's perception about condition of education system



Climate change-Induced Vulnerabilities

Migrations

Karachi has a rich history of migration. At the birth of Pakistan, Karachi's population dramatically increased with the arrival of refugees from India. Successive governments have been unable to develop proper policies and mechanisms for facilitating migrants. The climate crisis has played a direct impact on the high inflow of migrants, particularly in 2010, 2011, 2015, and most recently in 2022^{iv}. Concerning this, one of the participants opined,

"We understand that migration is a big issue, and migration is increasing so

fast inside Karachi. This is a city where there is no planning, where most people do not understand climate change, and people have no interest in protecting the environment".

In the coastal areas of Thatta, Sujawal, and Badin, the sea has covered thousands of acres of arable land, and climate change is having such ruthless impact on these societies that it has become difficult to measure the impact on the general population. As the ocean is engulfing the land, people are migrating from coastal areas to Thatta to Karachi. A participant from Thatta explained "It is all happening due to climate change. We are living in a terrible situation, but nothing result-oriented is done by the government".

"It is all happening due to climate change. We are living in a terrible situation, but nothing result-oriented is done by the government".

Perceived Major Reasons of migration

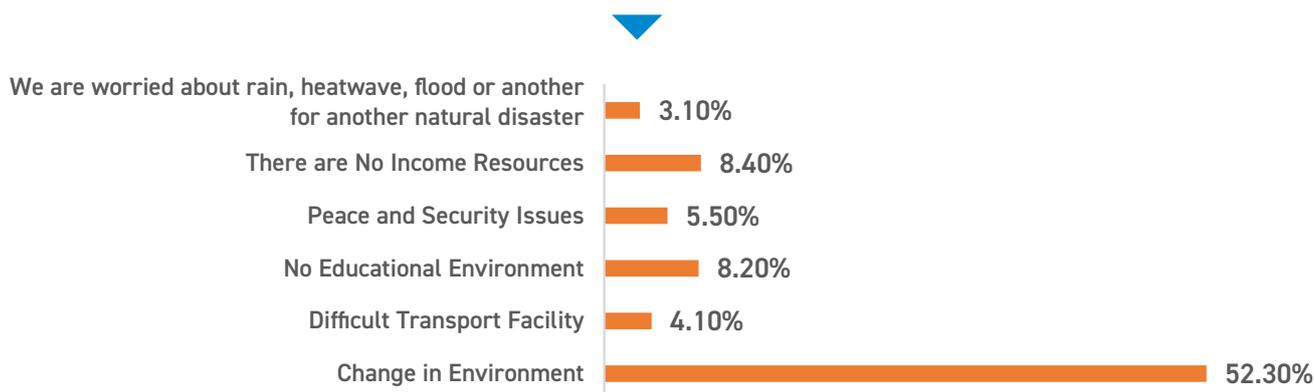


Table 4: Reason if people want to move from current place



Housing of a climate change migrant

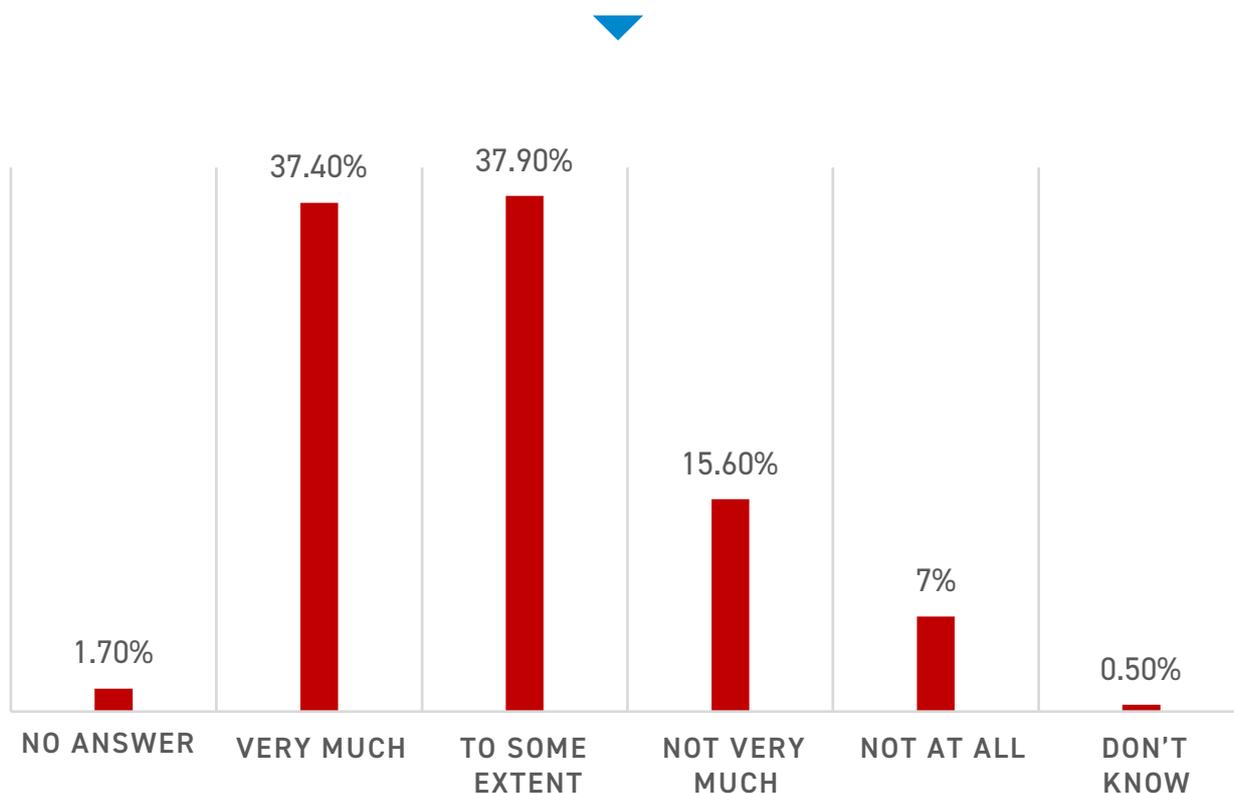
Poverty, Food Insecurity and Homelessness

Threats by climate change impacts are emerging as barriers to reducing poverty. In developing countries like Pakistan, where resilience against climate change is not up to the mark by the government, adaptation and mitigation processes appear to be less integrated to manage issues at hand. When developing countries are already fighting with a lot of challenges of poverty, food insecurity, unavailability of drinking water, poor health issues, shortage of shelters, education, and transportation, etc., then again, any sort of climate change impacts become a serious disaster for them. Recently, Pakistan could not come out with the serious effects against COVID-19 on poverty, and another disaster of heavy rains and floods in 2022 seriously affected the life of the poor all over the country, especially in urban and rural areas of Sindh. Uncertainty among people increases and a large number of the population affected becomes shelter less,

leaving their homes and towns and migrating to larger urban centers of Karachi, Hyderabad, and other cities. These impacts of climate change and its magnitude not only affect the current population but also destine future generations to face poverty, housing, and food insecurity if appropriate measures are not taken by the government and the communities themselves. Due to sea erosion and salinity most agricultural land of Thatta is damaged or taken by the Arabian Sea, which results in people reaching a high level of economic issues and poverty.

Focusing on the satisfaction level of the population with houses, and living areas of the community, when a question asked them if they want to move from their current location, what could be the reason? A majority of the population (52.3%) said they would prefer to move because of environmental issues. 14.4% of respondents said that they were facing issues with housing.

Perception of people getting poorer



2.4 Plight of most vulnerable segments of society due to Climate Change

Women and Children

In Pakistan’s heavily patriarchal society, women face continued violence in the form of inequalities and discrimination. While in the situation of a disaster, female contributors spoke about how they cannot move easily to find support, carry belongings, carry children, find food, space, shelter, etc. During a visit of flood-affected families in a school building that was declared as a camp in Karachi one female participant said

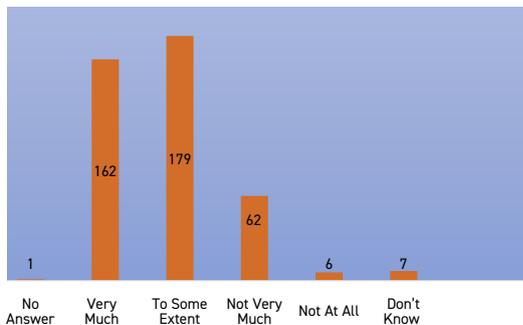
“It took us thirty to forty thousand rupees fare to reach Karachi. Our village is almost always flooded, sometimes due to rain, sometimes due to rivers, sometimes due to changes in weather and it takes three days to find any space to live. It was very difficult to find this camp”.

Women and children face a lot of difficulties to survive, such as physical, emotional, and sexual violence. Moreover, during the visit for the survey of floodaffectedcamp, a male member of a family said

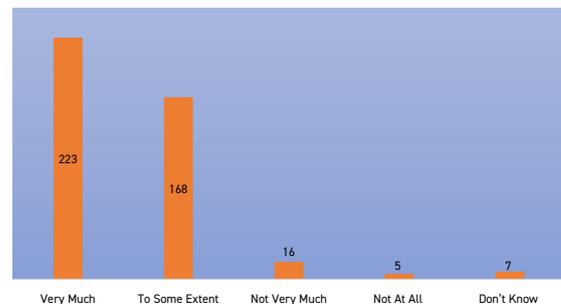
“Children and women are suffering a lot here; children [in particular] are suffering from gastrointestinal diseases”.

Respondents perceive that women and children suffer more from climate change disasters, as demonstrated in charts below. During FGD, female participants told that their medical treatments are also not prioritized by their family’s decision makers, who are male. During disasters, the risk of child marriages also increases, and discontinuation of education occurs due to migrations and displacement. During extreme weather conditions, women need to work harder, and due to their limited mobility, which becomes more difficult. In the overall relationship with urban resilience, there is a need to strengthen women for adaptation and mitigation, especially related to gender-specific aspects. Urban resilience also needs to consider gender mainstreaming concepts to be integrated into running future development projects.

People’s perception about climate change affects female more than male citizens



People’s perception about climate change affects children.





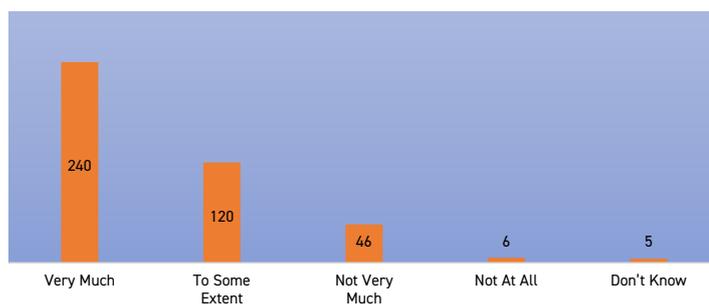
Children playing at Rehri Goth

Elderly Persons and Persons with Special Abilities

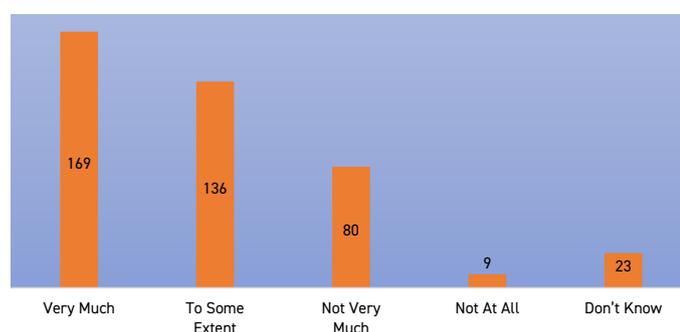
The chart presented below explains the perception of community regarding climate change impacts on elderly and special abilities people. It is less likely for persons with special abilities and the elderly to take benefits and their due rights and their situation gets worse during any climate disaster. These problems increase for citizens who belong

to lower and lower-middle classes in the context of urban resilience. Furthermore, there is a lack of friendly environments for senior citizens and persons with special abilities in existing facilities, buildings, hospitals, schools, colleges, and public washrooms. During discussions and desk review, it has been perceived by the community that elderly people and persons with disabilities have consistently been ignored during resilience planning and climate change response.

People's perception about climate change affects elderly people.



People's perception about climate change affects people with special abilities.



Farmers and Fishermen

The coastal areas of Sindh heavily rely on fishing as a major source of income^v. Karachi's coastal areas, and the cities of Thatta, Sujawal, and Badin have significant portions of their population dependent on the fishing economy. The respondents during discussions told that climate change impact has caused severe damage to crops in Sindh. However, in coastal areas, sea erosion and water salinity have damaged thousands of agricultural lands in Thatta district for many years.

In Sindh, both sides of the River Indus have been affected, including Kishmore, Kandhkot, Shikarpur, Larkana, and Dadu. During FGD, farmers told that rice production has lethally been affected during these heavy rains. Several farmers have been compelled to migrate to urban areas due to floods. Meanwhile, Khairpur, Nawabshah, Nousheroferoz, Sanghar, and Mirpukhas were severely affected, with cotton, rice, fruits, and vegetable crops seriously damaged. Another deadly impact on the agricultural industry also comes to wheat crops, which may not give the required yield because of standing flood water and high salinity.

Fishermen are another segment of society severely affected by climate change, which is divided into marine and freshwater fisheries, mainly from Thatta and Karachi. Practitioners believe that climate change has severely affected the fishing communities from Kharo Chan, Keti Bandar, Rerhi Goth, Dublamuhalla, and other coastal areas of Karachi and plain areas in other districts in Sindh. The rise in temperature, heavy rains, and use of chemicals are affecting fish products. Climate change has also been affecting the ocean's environment, resulting in rising sea levels, increased sea surface temperatures, higher wind speeds, and the destruction of mangrove trees by international contractors, severely damaging vital resources.

A respondent from Keti Bandar said,

"From my childhood onwards, I have resided in this coastal area, where our village is situated within the expanse of the sea. The sea constitutes our entire existence, and unfortunately, we all endure immense hardships without any viable solutions. Government agencies have not extended their support to address our

concerns, and the fishing sector has suffered severe setbacks. What we urgently require are fresh marketing strategies and improved fishing techniques to alleviate our plight."

During discussions with fishing communities at Rerhi Goth, Karachi, Keti Bandar, and Kharo Chan in Thatta, it was revealed that most of the community is living under difficult situations. One respondent commented,

"We understand that our income has decreased a lot, and because of the lack of fish and water from the river, today we do not have the income as in the past; there is a difference in whether everything is changed now. Previously certain times, we and our seniors used to understand through indigenous skills that the weather is changing, there will be no wind in the river, or storms are coming, but nowadays, all is difficult".

During visits to coastal areas and discussions with people for qualitative data, it was observed that there is a need to have trainings related to the latest business market of fishing for them. They do not know about the new dimensions of fishing as a business; they need to know the skills and machines of fish packing for the international market. There is a need to remove middlemen from the process, and a need to equip local fishing communities with entrepreneurial skills.

Slum Dwellers

About 12 million people out of Karachi's 16 million population live in vulnerable informal settlements as Pakistan's largest city faces worsening inundations during the monsoon season^{vi}. People living in slum areas are at greater risk and already living with economic issues, health problems, and unavailability of educational institutes. Thousands of slum houses are developed on drain sides and under bridges; resulting in most drains blocked with rubbish and mud. Several people are living in slum areas, with their homes are developed in unauthorized spaces. Management, communities, and urban planners have their view to removing these settlements to save the city from expected urban flooding due to heavy rains and to increase urban resilience.

2.5 Community participation and Perception about urban Resilience

Community Participation for Urban Resilience

The community is a central part of the urban area. Their structures and groups are different and vary with different magnitudes within the same cities. With the differences and changes in the social and infrastructure of the urban area, the needs and priorities of communities change accordingly. Community participation in urban resilience will help develop equitable, sustainable, effective policies and practical solutions for urban areas keeping in view the needs and adaptive capacities of the community.

Community participation can work effectively even with fewer resources because the community stands for each other to manage the disaster, as in the cases of Tehsil Johi and Mehar of Sindh in the 2022 floods. The local community came to the forefront to raise the embankment. However, to increase resilience to these extreme events in poor communities, municipal and community-based leaders must invest in dynamic, participatory, and gender-responsive tools to manage climate disasters' uneven socioeconomic impacts.

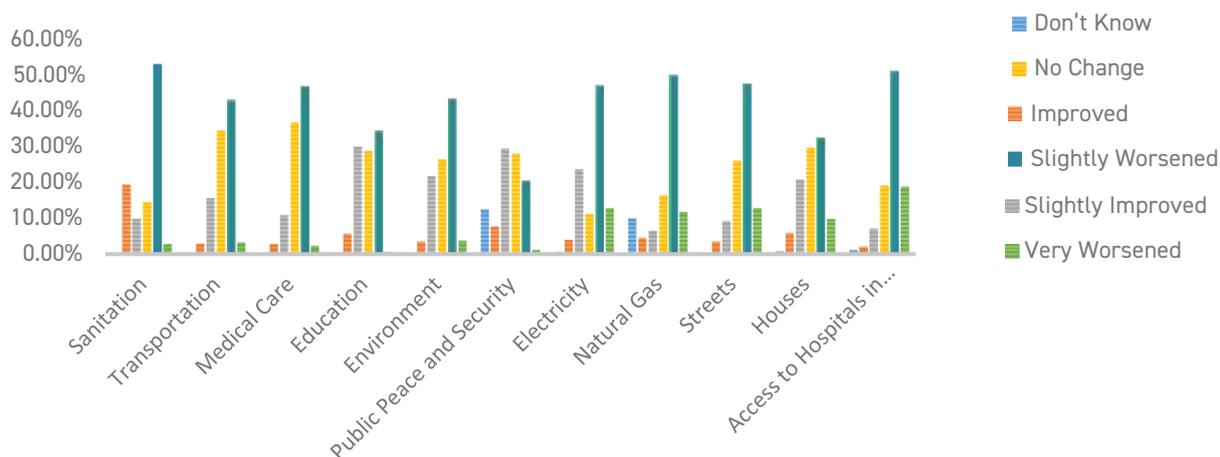
The community that lives together for a reasonable period as in villages, towns, and semi-urban areas, develops a sense of belonging. They find solutions to many problems automatically such as draining water, finding food, clothing, and many other related issues themselves, and by helping each other instead of waiting and looking for external help. Community-based participation revolves around the prevailing social structures and everyday practices adopted to take development beyond crises^{vii}.

Change in daily life and basic facilities during The Last five years

Responses were mixed on how citizens felt if within the last five years their lives and basic needs had improved or not. 50% of respondents believe that things are mostly same and that there has been minimal change. Up to 35% of respondents have the view that housing and their living environment has slightly improved, and access to quality food is also better now. However, respondents also believe that streets/ roads, sanitation, spaces, basic facilities, access to health and education are likely going to worsen. People appear very much worried about access to natural gas, electricity, education system and parks. Respondents have the view that entry and exit routes in the city have worsened.(Table 6)

Perception of people for current social, environment, structure, and administrative situation for urban resilience

Discussing the current condition of social, environmental, structural, and administrative situation for urban resilience, over 55% believe that sanitation is poor. Collectively over 50% of population have the view that natural gas, entry-exit routes, streets, health facilities, electricity, transportation are in poor condition. The community has mixed beliefs about good education in the city, neighborhood social relations, public space security, and convenience shopping.



Skilled Persons

Skilled persons who have social capital and knowledge can provide easy mitigation according to the magnitude of disasters, and can-do wonders in emergencies, crises, and disasters. However, they can also play a pivotal role in the management of hard assets, financial resources, food shortage, and using land and other materials. As they are experts in their fields, skilled people have the ability on their own to manage crises that may attenuate people and build critical facilities. Thus, their role in urban resilience is vital; they can change the conditions if appropriately utilized.

Indigenous Solutions

Indigenous people use their knowledge and experiences to live in harmony with nature; to procure food, water, energy, medicines, building materials, and other necessities from their local ecosystems. Accumulation of experiences of centuries provide them with a wide-ranging and broad understanding of the human environment and disasters. Their knowledge of the environment and social system forms an inseparable part of their identity, adaptive culture, and capacity. In this way, indigenous solutions provide and develop local communities well-adapted to different kinds of climate change^{viii}.

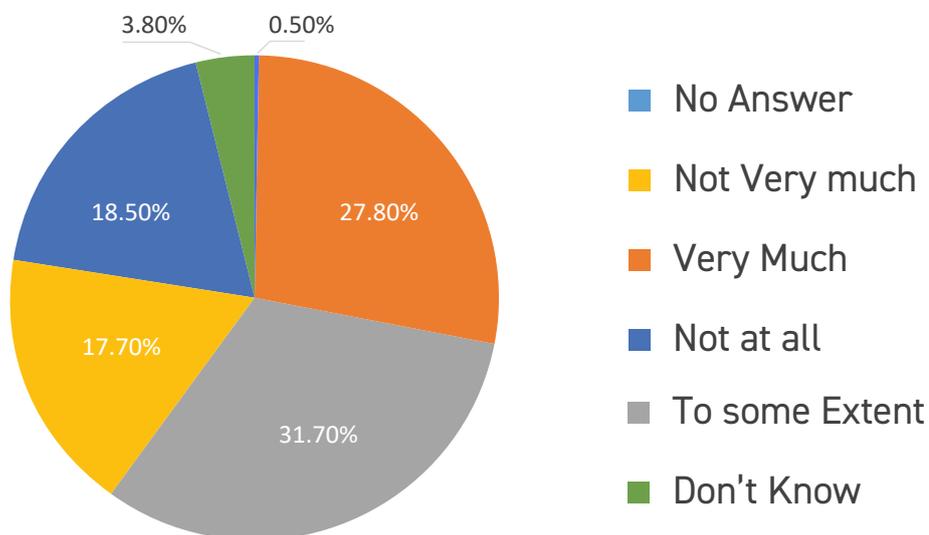
Additionally, indigenous solutions through traditional knowledge and practices maintain

and improve their way of life through natural and community-built resources. Indigenous people have been adapting to climate-induced hazards and risks for generations by developing situation-specific livelihood practices and building the resiliency of their households and communities. This helps them formulate mechanisms for adjusting to stress and improving their adaptive capacity. Indigenous solutions for urban resilience have changed the center from external intervention to local approaches and solutions to face climatic dangers.

Community-Centered Resilience

There is a need for better linkages between the local population, government departments, and NGOs to develop urban resilience more effectively. In this pursuit, urban resilience committees can be developed area-wise. In this way, resource mobilization and resource inventory can be developed. All these committees can engage on regular basis and have meetings or share valuable local knowledge and initiatives virtually through social media which can be a good participatory approach. In this way, appropriate land utilization, effective information systems, climate-friendly activities, plantation, waste management, proper use of water, better sewerage system, etc. Capacity building of the local community, staff of government departments, and enhancement of political will, timely discussions, and financial management could be very important for the development of urban resilience.

Perception of people on how much local organization work area/community



Volunteerism

Volunteerism aims at taking practical steps that give rise to hope, improve lives, and strengthen communities. It is a renewable resource but only if it is supported as a means of creating community resilience and as a property of resilient communities. Volunteering revolves around social structures and practices that are already familiar, and can promote stability in crisis and sustainable development. Citizens are a vital resource in coping with disaster, even though some professional disaster managers view them as an obstacle as they lack training to respond appropriately during disaster and probability of spreading misinformation which creates panic situation (vii).

Volunteerism, like other forms of civic participation, is both a means and an end to development. Thus, the characteristics that the field research participants associated with voluntary work indicate that volunteerism is also a property of resilient communities, enhancing individual and community well-being through self-realization, shared values, and common purpose. Voluntary action can be an essential means of strengthening community resilience in two ways, firstly, as long-term development agendas and secondly, as a response to crises and shocks. Volunteering can be a sign of positive agency and decision-making at local levels. Volunteering can be used as a means of delivering external operating interventions and helping them provide responses to challenges on a priority basis with community needs that may help them, in turn, build their resilience. In the priority area of community resilience for climate change and disaster risk reduction, the volunteers' involvement may play crucial role in disaster risk management, particularly by strengthening the capacity of communities to respond to and prevent disasters.

Social media networking

Social media networking has a significant role in almost every walk of life, and building urban resilience cannot be excluded from it. It serves as a real-time communication tool during disasters, enabling authorities to provide timely updates and safety instructions to residents. Further, it facilitates community engagement and the sharing of best practices

for disaster preparedness and response. Social media can raise awareness about climate change and its impact on cities, motivating individuals and communities to take proactive measures. Fourthly, it can be used to crowdsource information on disaster impacts, helping responders prioritize their efforts. It fosters collaboration between government agencies, non-profits, and local communities, creating a more comprehensive and coordinated approach to urban resilience.

Any information or strategy can easily be shared among thousands and millions of people of every age. People, irrespective of gender, could easily be guided and trained regarding urban resilience through different modes and methods of social media networking.

Contribution of Civil Society Organizations

Critical resilience ideas such as social capital, social memory, learning, adaptation, and reorganization are grounded in civil society. Civil society organizations need to be engaged in issues like resilience, and it can play a vital role and contribute to urban stability^{ix}. Civil society organizations can quickly disseminate information, bring volunteers, and serve in times of disaster, so their cooperation and role in developing urban resilience make much difference. Being locals and from the community, they can also easily find out centers of problems to help citizens from their platform.



3 FINDINGS AND RECOMMENDATIONS

FINDINGS

Several challenges related to climate change and urban resilience have been found in Karachi and Thatta. The results have revealed that resilience levels are low, and most factors need serious attention from the government, policymakers, and NGOs working in the area. The following are some critical issues related to urban resilience:

1) Lack of Coordination Limits Development Strategies

Government departments related to climate change and urban resilience lack coordination with reference to development strategies. Enhancing urban resilience has not been among the priorities of public sector officials. Local, provincial, and federal departments, due to the difference of political interests, have limited coordination experiences particularly when it comes to urban resilience against climate change.

2) Incompatible Policies and Practices

There is a distinct lack of effective and relevant policies for disaster management practices. During disasters, women and persons with disabilities in particular face a number of difficulties. If existing policies would be active, the level of vulnerability would be significantly decreased. While observing the situation at flood-affected camps in Karachi and Thatta, it was seen that no existing policies related to women and persons with disabilities are implemented. There is a similar situation with all other policies and practices related to climate change and urban resilience.

3) Limited Execution of Existing Policy Documents

Where most disaster mitigation documents exist, there is a lack of consistency in the implementation of running projects. For instance, during the 2022 floods, floodwater had not been managed appropriately which resulted in various towns and rural areas of Sindh being inundated. This situation suggests that the planning of the irrigation department in Sindh

has not been implemented, especially after also facing a number of challenges and devastating experiences during the 2010 floods. The water and sewerage system of Karachi have never been managed appropriately despite having a lot of projects run by the local and provincial governments. For instance, Karachi Water and Sewerage Services Improvement Projects have good documentation available on their website, but on the ground overall access to water and sewerage situation of Karachi is unpleasant. Similarly, the Greater Karachi Sewerage Plan (S-III), could not give reasonable results as per documentation. More or less this is the same situation with other running or completed projects of infrastructural development, communication, health, and education, which could be important factors for the development of urban resilience.

4) Reactive Approach of Stakeholders Posturing as Proactive

During the study, while meeting with various stakeholders, analyzing key informative interviews, and literature review, it has been revealed that most departments, community organizations, and national non-governmental organizations have adopted reactive approaches in relation to climatic disasters. As the summer 2022 floods happened during this study, the research team visited and met with major stakeholders in their office and it was found that there was a lack of contingency planning or implementation of any plans developed on the basis of previous natural disasters such as floods, heavy rain, cyclones, and heat waves.

5) Unreliable Data with No Centralized System

Data can play a significant role towards resilience and assessment of climate change effects, even for the development of all necessities which could be part of urban resilience. However, there is an extreme dearth of the institutions or government department which could contribute to the collection and availability of reliable data. Some government or private sector institutions have scattered or outdated data, and most researchers use projections for their analysis. For instance,

Pakistan had a population census after a gap of 19 years in 2017, which has been highly politicized. The Bureau of Statistics published its reports for 2018 and 2019 during 2022. These situations limit the capacity of academics and practitioners to suggest programs and solutions.

6) Limited Commitment Towards Combating Climate Change

In Karachi and Thatta, political parties are very active regarding their own political issues and promotions, but climate change issues and urban resilience are not a part of the real manifesto of any group. Being a part of the government or opposition at the provincial or local level, development projects that could contribute directly to urban resilience have no positive commitment by political parties. Most of the projects are still not properly completed or face improper utilization of funds, which results in the failure of these projects.

7) No Easy Access to Emergency Facilities and Exit Routes

While Karachi is the city with the highest population in the country, it only has one major trauma facility (Shaheed Mohtarma Benazir Bhutto Institute of Trauma), and therefore faces serious issues in coping with emergencies. If accidents or health emergencies occur to people from different parts of the city, they cannot reach in an appropriate timeframe. This situation is also caused by heavy traffic on the roads and the unavailability of fast routes to health emergencies. It was also revealed that there is no centralized, integrated emergency management system in the cities, therefore the timely approach to ambulances, fire brigades, bomb disposal experts, child protection authorities, and civil defense rescue teams, alongside emergency exists from the city is not possible in Karachi and Thatta. This situation keeps citizens in a situation of psychological stress and trauma, and a distinct lack of trust in government planning.

RECOMMENDATIONS

Based on the findings obtained from this study in Thatta and Karachi, we provide recommendations and suggestions for three different stakeholders. This includes international and national NGOs, government, and local communities.

FOR INTERNATIONAL AND NATIONAL NGOs:

1. Accept that climate change is increasing challenges for communities as well as the government at the local, district, and provincial levels, and the level of urban resilience is low in Thatta and Karachi, and Sindh more broadly.
2. Understand that climate change-induced vulnerabilities are increasing day by day and need special attention to enhance urban resilience at all levels.
3. Develop consensus amongst policymakers, scientists, academia, and decision-makers to enhance sustainable development projects to expected threats by climate change.
4. Mainstream climate-induced migration responses within climate change planning, response, and financing.
5. Increase professional networking related to urban resilience at national, provincial, and local levels with all stakeholders, by developing consortiums of NGOs working with different themes to work collaboratively, sharing expertise and experiences.
6. Developing reliable data source centers by NGOs/civil society organizations related to urban resilience to strengthen analysis and sharing of information.
7. Develop practical and applicable concepts of risk financing and risk transfer approach at the public and private level for the protection of assets through banking and insurance systems.
8. Capacity-building training for the utilization of indigenous solutions.
9. Develop adaptation and resilience strategies against sudden-onset and slow-onset natural disasters, the adverse effects of climate change, and environmental degradation, such as desertification, land degradation, drought, and sea level rise, while also taking into account the potential implications for migration.

For Government:

1. Developing and integrating policies related to climate change and urban resilience at the provincial level, local, and country levels, and enhancing the role of NDMA, PDMA, and DDMA is essential. This can be broken down to the local and district level, by developing a Complaints Management System at all levels.
2. Regular maintenance of important infrastructure such as roads, hospitals, educational institutes, electricity and other networks (water supply, drainage, etc).
3. Close coordination between local, provincial, and federal government.
4. The proper role of law enforcement agencies (LEAs) must be enhanced and integrated with all factors of urban resilience.
5. There is a need to develop a database with easy access at the district, town, taluka, and UC levels. This includes data related to:
 - i. Available resources related to urban resilience.
 - ii. Maps of important areas, places, streets, roads, facilities, entry-exit roots, water resources, drainage lines, electricity networks, telephone networks, and internet networks, etc.
 - iii. Emergency contact numbers, of all public and private facilities, trauma centers, hospitals, fire brigades, rescue centers, etc.
 - iv. Information about bridges, tunnels, and buildings.
 - v. Population gender-wise, age-wise, and vulnerability-wise.
 - vi. Residential situations, slum areas, katchha and pakka houses, etc.
 - vii. Data about major assets at risk.
 - viii. All vulnerable infrastructural points.
6. There is a need to develop specialized subjects and degree programs at the college and university level related to climate change, disaster management, data sciences and urban resilience.
7. Develop or update existing climate change

disaster preparedness and contingency plans with an increased focus on vulnerable communities, utilizing disaster risk reduction measures as part of a climate adaptation strategy, including disaster/climate risk financing interventions.

8. Identify capacity gaps and build the capacity of policymakers and key stakeholders regarding climate-induced migration, backed by policy coherence and horizontal and vertical coordination and data sharing mechanisms amongst key departments.
9. Raise awareness among vulnerable communities and propose indigenous and localized adaptation measures.

For Local Communities

1. Local communities need to develop local groups to keep their voices strong and develop basic facilities to enhance urban resilience.
2. Enhance their capacities for urban resilience, coordinating with NGOs working in the field, and develop concepts of citizenship, practices of cleanliness, urban safety, and cities ownership behaviors.
3. Promote positive behaviors, skill development, economic resources, and appropriate planning to enhance resilience level.

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1 Annexure

Perception of people about, development, changing in daily life and basic facilities during last five years														
#	Item	Don't Know		Improved		Slightly Improved		No Change		Slightly Worsened		Very Worsened		Total
1	Housing	0	0	105	52.2	123	29.5	128	30.7	59	14.1	2	0.5	417
2	Living Environment	0	0	46	11.0	126	30.2	163	39.1	76	18.2	6	1.5	417
3	Availability of Water	0	0	33	7.9	14.9	35.7	73	17.5	124	29.7	38	9.1	417
4	Availability of Safe Drinking Water	2	.2	45	10.8	58	13.9	146	35.0	93	22.3	73	17.5	417
5	Access to Adequate food for the Family	3	.7	46	11.0	113	27.1	147	35.3	91	21.8	16	3.8	417
6	Access to Quality Food	1	.2	38	9.1	120	28.8	139	33.3	101	24.2	18	4.3	417
7	Electricity	0	0	23	5.5	94	22.5	49	11.8	152	36.5	99	23.7	417
8	Natural Gas	30	7.2	25	6.0	44	10.6	78	18.7	145	34.8	95	22.8	417
9	Streets/ Roads	1	.2	24	5.8	44	10.6	103	24.7	198	47.5	47	11.3	417
10	Exit and Entry Routes	0	0	14	3.4	45	10.8	102	24.5	176	42.2	79	18.9	417
11	Access to Education	0	0	14	3.4	138	33.1	128	30.7	107	25.7	30	7.2	417
12	Income Resources	0	0	20	4.8	126	30.2	117	28.1	111	26.6	43	10.3	417
13	Access to Health Facilities	0	0	18	4.3	78	18.7	141	33.8	145	34.8	35	8.4	417
14	Buildings	27	6.5	23	5.5	77	18.5	115	27.6	154	36.9	21	5.0	417
15	Home Space	1	.2	16	3.8	98	23.5	103	24.7	149	35.7	50	12.0	417
16	Access to Government Services	2	.5	7	1.7	42	10.1	135	32.4	158	37.9	73	17.5	417
17	Sanitation	1	.2	8	1.9	107	25.7	102	24.5	156	37.4	43	10.3	417
18	Role of NGOs	9	2.2	19	4.6	78	18.7	134	32.1	153	36.7	24	5.8	417



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