

THE HEAT IS ON!

Towards a Climate Resilient Education System
in Pakistan

Cover: A boy flies a kite, in a camp for people displaced by the flood, in Sukkur City, Sindh Province. In December 2010 in Pakistan, millions remain affected by the massive flooding that began in July 2010 and spread through most of the country. Nearly 200,000 people continue to live in camps in the provinces of Sindh and Balochistan, and millions more are returning to homes damaged by floodwater.

© UNICEF/UNI101464/Ramonedá

Author: Fumiyo Kagawa

Suggested citation: Kagawa, F. (2022). *The Heat is On! Towards a Climate Resilient Education System in Pakistan*. Kathmandu: UNICEF Regional Office for South Asia

Disclaimer: The report presents the author's analysis of views expressed by research participants and of relevant documentation. The statements in the publication do not necessarily reflect the policies and views of UNICEF.

For further information:
UNICEF Regional Office for South Asia (ROSA)
P.O. Box 5815, Lekhnath Marg, Kathmandu, Nepal
Tel: +977-1-4417082
Email: rosa@unicef.org
Website: www.unicef.org/rosa

© United Nations Children's Fund (UNICEF)
January 2022

Permission is required to reproduce any part of this publication: All images and illustrations used in this publication are intended for informational purposes only and must be used only in reference to this publication and its content. All photos are used for illustrative purposes only. UNICEF photographs are copyrighted and may not be used for an individual's or organization's own promotional activities or in any commercial context. The content cannot be digitally altered to change meaning or context. All reproductions of non-brand content MUST be credited, as follows: Photographs: "© UNICEF /photographer's last name". Assets not credited are not authorized. Thank you for supporting UNICEF.

Table of Contents

Acknowledgements.....	4
Executive Summary	6
Section 1 – Introduction	10
1.1. Aims and Scope of the Study.....	10
1.2. A Brief Note on Methodology.....	10
Section 2 – Climate Vulnerabilities in Pakistan	11
Section 3 – Climate Change Impacts on Education System	16
3.1. Learning Facilities.....	16
3.2. Education Access	16
3.3. Student Health and Wellbeing.....	17
3.4. Education Provision and Learning Quality	19
Section 4 – Education Sector Responses to Climate Change	20
4.1. Policies, Plans and Strategies	20
4.2. Finance	21
4.3. Curriculum, Teaching and Learning	21
4.4. Teacher Capacity Development.....	24
4.5. Communication, Coordination and Partnership.....	25
4.6. School/Community Student Participation Platforms.....	26
4.7. Monitoring, Evaluation and Accountability.....	27
Section 5 – Discussion and Recommendations.....	29
Section 6 – Conclusion	34
References	36

Acknowledgements

This report was made possible by the generous support and contribution of many individuals while overcoming the challenges due to the COVID-19 pandemic.

This report was commissioned by UNICEF Regional Office for South Asia (ROSA) and written by Fumiyo Kagawa, PhD, Education and Climate Change consultant and Research Director at Sustainability Frontiers UK. The report was drafted with technical guidance and oversight from ROSA's Climate Change and Education sections - Reis Lopez Rello, Regional Climate Change Advisor, and Jim Ackers, Regional Education Advisor with the support of Frank Van Cappelle, Education Specialist, JiEun Lee, Education Officer and Emma Hamilton Clark, Knowledge Management Consultant. David Selby, Founding Director of Sustainability Frontiers UK, offered valuable comment on the report.

We thank the many government officials and experts from the Ministry of Climate Change, the Elementary and Secondary Education Department, Khyber Pakhtunkhwa Province, the Friedrich Naumann Foundation for Freedom and the UNICEF Pakistan Country Office as well as independent experts who made time to participate in the stakeholder survey, offered their invaluable insights and shared helpful country-specific information.

We also extend our heartfelt thanks to all the students and teachers who participated in the focus group discussions. They were from Government Girls High Secondary School Lady Griffth and Government Boys High Secondary School Hansain Shaheed City No. 1 in Peshawar and Government Girls High School Ali Raza Abad in Lahore. Their active participation, first-hand experiences, concerns and insightful views on climate change and education were invaluable.

Our sincere thanks go to the government officials from Elementary and Secondary Education Department, Khyber Pakhtunkhwa Province and School Education Department, Government of the Punjab and the head teachers and deputy head teachers from the above-mentioned schools for all their kind support in organizing the school-level focus group discussions.

Likewise, we extend our gratitude to the following UNICEF Pakistan Country Office colleagues: Ellen Van Kalmthout, Mome Saleem and Erum Burki (Islamabad Country Office); Momina Ashfaq Ahmad, Samad Nawaz and Syed Fawad Ali Shah (Khyber Pakhtunkhwa Field Office); Rubina Nadeem and Sehr Raza Jafri (Punjab Field Office) for their time and support given to the country-specific data collection and the draft report review.



unicef

Executive Summary

This Pakistan country study forms part of a UNICEF Regional Office for South Asia (ROSA) study on the impacts of and responses to climate change across education systems in South Asia. The overall aims of the regional study are:

- To generate evidence on how education systems in South Asia are monitoring, assessing and responding to the impacts of climate change
- To identify the main educational tools and mechanisms being employed in planning for and addressing climate risks
- To showcase the perceptions of key education sector stakeholders regarding further embedding climate change considerations and concerns into education tools and mechanisms.

The research methodology employed includes desk-based documentary review, national level key stakeholder surveys, school-level focus group discussions and a U-Report process targeting youth from 14 to 24 years old.

Pakistan is highly vulnerable to adverse effects of climate change. Different parts of the country are exposed to different climate-induced hazards. They include flash flooding and landslides in the northern mountainous and hilly areas; riverine flooding and saline intrusion in the Indus River basin; tropical cyclones, coastal flooding and erosion in the southern coastal areas; desertification, drought and heat waves in the arid and semi-arid southern regions. Due to the rising temperature exceeding the global average, the Hindu Kush-Karakoram-Himalayan glaciers are rapidly melting and the number of glacial lakes is increasing, so driving up the risk of glacial lake outburst floods (GLOFs). Very rapid population growth, urbanization and increasing economic activity increase pressures on natural resource availability, especially water. A high dependency on a climate sensitive

agricultural sector aggravates Pakistan's vulnerabilities to climate change. Pakistan ranks 14 out of 163 countries in UNICEF's children's climate risk index of 2021.

The study has examined direct and indirect impacts of climate change on the education system in Pakistan. In terms of learning facilities, the unprecedented 2010 and following 2011 floods destroyed and damaged school infrastructure to a considerable degree across the country, Sindh province being the worst affected province. Unsound school buildings and lack of access to safe drinking water in many public schools drive up education sector climate change vulnerability.

Natural hazards are one of the key factors exacerbating already poor educational access, especially for girls. In the aftermath of the 2010 and 2011 floods normal schooling was significantly disrupted as schools had been damaged or had been used as temporary shelters. Also when families are forced to move due to declining livelihoods triggered by climate change-induced shocks, their children face difficulties in continuing schooling. In drought-prone Balochistan, a trend towards an increasing proportion of the population being on the move puts a great strain on education service provision. Some stakeholders participating in this study from elsewhere in Pakistan point out that students who commute to school on foot struggle due to scorching heat and lack of protective equipment and basic facilities (e.g., umbrellas, appropriate clothing, transport support) and thus fear their safety in the light of unpredictable extreme weather events.

As to student physical health and wellbeing, the 2010 floods heightened children's morbidity and mortality with traumatic disaster experiences taking a heavy psychological toll. Ill health caused by increasingly harsh temperatures, vector- and water-borne diseases and environmental pollution is an obstacle in ensuring children's learning.



With regard to climate change impacts on education provision and learning quality, there are no mechanisms in the education sector to systematically monitor lesson time lost and student academic performance in relation to climate-induced hazards and events. Even before the COVID-19 school closures, lesson time was on the decline due to prolonged vacation periods designed to avoid extremely hot or cold temperatures. Classrooms without proper cooling, ventilation and heating facilities pose a great obstacle to quality teaching and learning. Frequent power shortages and outages prevent the utilization of such facilities even when they are available.

This study has also examined education sector responses to climate change, exploring the seven key education system components (i.e., policies, plans and strategies; finance; curriculum, teaching and learning; teacher capacity development; communication, coordination and partnership; school/community student participation platforms; monitoring, evaluation and accountability). Main research findings include the following:

- Considerations of climate change mitigation and adaptation are currently very limited in the education sector both at national and provincial levels
- No climate change mitigation and adaptation specific education sector financial mechanisms exist in the education sector at either national or provincial levels
- The 'emerging trends' in the *National Curriculum Framework* and the environmental components in the *Single National Curriculum* present a window of opportunity to integrate climate change considerations in the curriculum
- There are no systematic pre-service and in-service teacher training opportunities focused on climate change risk reduction and resilience building
- Inter-ministerial collaboration and coordination between the Ministry of Federal Education and the Ministry of Climate Change are currently very limited. The School Safety Cell established within the Directorate of Elementary and Secondary Education in Khyber Pakhtunkhwa, the first of its kind in Pakistan, plays a pivotal role in institutionalising school safety, DRR and climate change resilience building in schools in the province
- The 'clean green clubs' and 'clean green champions' emerging from the Pakistan government's Clean Green School Programme, anticipated to be rolled out across the country, carry great potential for enhancing environmentally friendly behaviours and climate change awareness and action in school and community
- There exists no systematic data available on climate change impacts on school infrastructure, education access, student and teacher health and wellbeing, education provision and learning quality at either national or sub-national levels.

Recommendations to make the education system in Pakistan more resilient in the face of increasing climate change risk are as follows:

Climate Change Impact Monitoring and Assessment in the Education System

- Consult with relevant stakeholders, develop climate change impact and vulnerability indicators and subsequently integrate them into the EMIS, the *Minimum Standards for Quality Education in Pakistan* and the *Pakistan School Safety Framework* as appropriate. Ensure linkages and synergies between these three instruments.
- Develop inter-departmental/inter-ministerial collaboration mechanisms between the education authorities and relevant government ministries/department/agencies (e.g., Ministry of Climate Change; National/Provincial Disaster Management Authority) in gathering, sharing and analysing climate change impact data as it relates to children and schools.

Policies, Plans and Strategies

- Consider updating the *Pakistan School Safety Framework* by addressing climate change adaptation and mitigation more prominently and ensuring integration of the *Pakistan School Safety Framework* in the key education sector policies and plans both at national and sub-national levels.
- Ensure incorporation of climate change risk reduction and resilience building in the *Education Sector Plan* both at national and sub-national levels.
- Integrate education and health interventions more strongly in the *Education Sector Plan* both at national and sub-national levels to protect student health and wellbeing from the adverse effects of climate change.
- Plan so as to ensure that children who are forced to migrate because of the impacts of climate change have access to education.
- Piggybacking on the momentum of programme production during the COVID-19 school closure period, ensure an expanding and sustainable provision of educational TV and radio programmes (together with other distance learning modalities) to reach out-of-school children and raise awareness of standard operating procedures for education in emergencies.

Finance

- Raise awareness among national and sub-national government officials and donors regarding the benefits of financing climate change mitigation and adaptation activities in the education sector and cultivate a shared understanding of the lines constituting a climate change

education budget and how to utilize them effectively.

- Develop equity-focused budgeting in the education sector as part of education sector resilience building in response to climate change.
- Explore external climate change funding opportunities (e.g., Green Climate Fund) with a view to filling the current resource gap so enhancing climate resilience in the education system.

Curriculum, Teaching and Learning

- Conduct a thorough sub-national curriculum audit to identify existing opportunities and gaps connected with climate change risk reduction and resilience building learning and action. Build on the opportunities and close the gaps.
- As part of sub-national curriculum development, actively use 'emerging trends and issues' to address locally specific climate change impacts and risks.
- Ensure clear curriculum progression in terms of knowledge, skills and dispositional learning outcomes concerning climate change mitigation and adaptation from the primary education level upwards.
- Integrate life skills education opportunities which comprehensively address child protection, WASH, health and nutrition to better deal with multi-faceted climate change crises. Help students to develop critical and creative thinking skills, problem solving skills, self-management skills, advocacy and leadership skills, and the skills and attitudes to live in harmony with nature in an age appropriate manner.
- Identify contextually appropriate green skills for a low carbon economy and integrate them into the secondary curriculum.
- Bring the expertise of relevant government ministries/ departments, CSOs/NGOs and other partners to embedding climate change components in the curriculum.
- Provide students with opportunities, arenas and platforms to take concrete actions and play change agency and advocacy roles in mitigating climate change impacts at school, in their local community and beyond.



Teacher Capacity Development

- Conduct a thorough teacher education curriculum audit for both pre-service and in-service training programmes to identify existing opportunities and gaps related to climate change risk reduction and resilience building. Build on opportunities and close the gap.
- Ensure integration of climate change mitigation and adaptation components in existing or emerging WASH, DRR, and school safety teacher capacity building programmes.
- Build teacher capacity in employing a wide range of active/participatory and child-centred pedagogies, such learning modes being vital for action-oriented climate change education.
- Build teacher capacity in providing basic psychosocial support and basic support to maintain student health and wellbeing if threatened or adversely impacted by climate change.
- Build teacher capacity in promoting environmentally sustainable practices at school that are most relevant to the locality (e.g., water conservation; developing school gardens; tree planting; waste management; using and maintaining renewable energy technology; awareness raising and advocacy techniques).

Communication, Coordination and Partnership

- Create a national and sub-national platform/mechanism focused on climate change mitigation and resilience building in the education sector. Or, alternatively, include climate change resilience building components in the existing education coordination mechanisms.
- Mobilizing resources as necessary, ensure the sustainability of the School Safety Cell in Khyber Pakhtunkhwa and consider replicating a similar unit within the Education Department in other provinces/areas.
- At the sub-national level, ensure a multi-sector partnership approach to embedding climate change components in the basic and secondary curriculum, the education sector plan, teacher capacity building programmes and the rolling out of the Clean Green School Programme.
- Establish and/or enhance coordination mechanisms between education authorities and environment/forest authorities at the provincial level.

School/Community Student Participation Platforms

- Create a wide network for 'clean and green champions' to sustain their motivations and actions and to provide mutual learning opportunities. Online-based platforms might be developed for such a purpose.
- Proactively create school and community collaborative opportunities as an integral part of the Clean Green

School Programme. This might include joint school/ community tree planting and aftercare, water conservation and waste management actions and student-led community awareness raising events using creative modalities (e.g., posters, songs, street theatre).

- Ensure that trees to be planted by students are suitable for changing climate and the specific environment. Provide necessary professional advice and support from relevant Ministries/Departments for the choice and maintenance of the trees.



Section 1 Introduction

1.1. Aims and Scope of the Study

This Pakistan country study is one of the eight country studies undertaken as part of a UNICEF Regional Office for South Asia (ROSA) study on the impacts of and responses to climate change across education systems in South Asia.

The overall aims of the regional study are threefold:

- To generate evidence on how education systems in South Asia are monitoring, assessing and responding to the impacts of climate change
- To identify the main educational tools and mechanisms being employed in planning for and addressing climate risks
- To showcase the perceptions of key education sector stakeholders regarding further embedding climate change considerations and concerns into education tools and mechanisms

In examining the interface between climate change and education, this study focuses on three areas:

- Direct and indirect climate change impacts on education systems in terms of learning facilities, education access, student health and wellbeing, education provision (including teacher health and wellbeing) and learning quality, each having significant implications for the quality of education.
- Education system responses to climate change, exploring seven key education system components (i.e., policies, plans and strategies; finance; curriculum, teaching and learning; teacher capacity development; communication, cooperation and partnership; student participation platforms; monitoring, evaluation and accountability).
- Key education sector stakeholder experiences, perceptions and needs concerning climate change education.

It should be noted that this study is primarily focused on the national/overarching level. Comprehensive analysis of each province and area¹ was outside of this study. Sub-national level information and analysis have been included selectively within the time available and framework set for this study.

1.2. A Brief Note on Methodology

The methodology employed is a desk-based documentary review, combined with consultations with and information gathered from key stakeholders in Pakistan through national-level stakeholder surveys, school-level focus group discussions (FGDs) and a U-Report² targeting youth from 14 to 24 years old.

13 national-level stakeholders from the Government, UN organizations, national NGOs and academic institutions were identified by the UNICEF Pakistan Country Office according to the criteria set for the study and each was invited to participate in national-level stakeholder surveys conducted via email or Zoom. Five survey contributions followed (including two group contributions) between 8 August 2020 and 16 February 2021. Email follow-up communications with selected survey respondents took place for further information gathering and clarification. In addition, one FGD was arranged with three provincial government stakeholders in Khyber Pakhtunkhwa on 9 March 2021 to gather their responses to the stakeholder survey. The SWOT (strengths, weaknesses, opportunities and threats) analysis discussion in *Section 5* was one element of the stakeholder survey.

Six school-level FGDs were conducted between 25 November 2020 and 4 February 2021 using the Zoom facility. In Peshawar in the Khyber Pakhtunkhwa province, one government secondary school for girls and one government secondary school for boys were involved. At the girls' school, one teacher FGD (3 female teachers) and one student FGD (5 girls) were conducted. At the boys' school, one teacher FGD (3 male teachers) and one student FGD (5 boys) were conducted. In Lahore in the Punjab province one teacher FGD (5 female teachers) and one student FGD (7 girls) were organized at a government secondary school for girls. UNICEF Pakistan Country Office personnel provided all necessary interpretation support. Before the FGD, student participants were asked to draw two images, i.e., one on 'climate change in my village/locality' and another on 'climate change impacts on my education'. Each drawing prepared by the student was presented and discussed at the FGD.

Analysis of the data gathered is integrated into the relevant sections of this report. The U-Report process was implemented and analysed by a UNICEF ROSA team leading to the completion of the publication, *Rising to the Challenge: Youth Perspectives on Climate Change and Education in Pakistan* (Lopez Rello & Ackers 2021)³ upon which this report draws.

¹ Pakistan is a federation of four provinces, i.e., Balochistan, Khyber Pakhtunkhwa, Punjab, Sindh. The country has three special areas, i.e., Islamabad Capital Territory, Azad Jammu and Kashmir, Gilgit-Baltistan.

² U-Report, run by UNICEF and its partners, is a messaging tool that empowers young people around the world to engage with and speak out on issues that matter to them.

³ For a full report, go to: <<https://www.unicef.org/rosa/media/13991/file/Rising%20to%20the%20Challenge:%20Youth%20Perspectives%20on%20Climate%20Change%20and%20Education%20in%20Pakistan.pdf>>

Section 2

Climate Vulnerabilities in Pakistan

Pakistan is one of the countries most vulnerable to adverse impacts of climate change despite the country's small contribution to global greenhouse gas emissions. The country is ranked the 8th most climate-affected country in the world according to the long-term *Climate Risk Index* covering the period 1999-2018 (Germanwatch 2021).

Climate change impacts have manifested themselves in recurrent natural disasters over the past two decades, including devastating large-scale floods in 2010, 2011 and 2018, prolonged and severe drought from 1998 to 2002 and from 2014 to 2017 and intense sporadic heatwaves (Ministry of Climate Change 2018; Ministry of Planning, Development and Reform 2019).

Diverse topography and distinct climatic zones in the country mean that different parts of the country are exposed to different climate-induced hazards in varying degrees. The northern mountainous and hilly areas are at risk from flash floods and landslides due to the increase in the frequency and intensity of precipitation. Due to temperature rises exceeding the global average, the Hindu Kush-Karakoram-Himalayan glaciers are rapidly melting, and the number of glacial lakes is increasing, thereby driving up the risk of glacial lake outburst floods (GLOFs). The areas along the Indus River basin in Khyber Pakhtunkhwa, Punjab

and Sindh are exposed to riverine flooding, exacerbated by illegal clearing of riverine forests. The southern coastal areas in Sindh and Balochistan are exposed to tropical cyclones, coastal flooding and erosion. Sea level rise projections indicate further exacerbation of coastal erosion and flooding, inundation of the wetlands and lowlands, and mounting saline water intrusion in the Indus Delta plains. Most of the land of Pakistan lies in arid or semi-arid zones⁴ and Balochistan, Sindh and southern Punjab are particularly susceptible to desertification, soil erosion, droughts and heat waves (ADPC & UNDRR 2019; Ministry of Climate Change 2012, 2018). Pakistan is also prone to earthquakes especially in the northern mountainous and western regions (World Bank & ADB 2021).

Pakistan is a 'forest poor' country with only 5.1 per cent of land areas being under forest, one of the lowest forest cover rates in the world (FAO 2019, xiii). Due to the increasing rate of deforestation and impacts of climate change, the country's forest coverage is 'alarmingly on the verge of disappearance' (Ministry of Climate Change 2018, 11). In the *Environmental Protection Index 2020*⁵, Pakistan is ranked 142nd out of 180 countries (Wendling *et al.* 2020).

Pakistan is the fifth most populous country in the world with an estimated total population of 225.2 million in 2021 combined with a high population growth rate of 2 per cent per annum, impacting natural resource availability significantly. 34.6 per cent of the population is between the ages of 0-14 years (UNFPA 2020). This youth bulge in Pakistan can either be a positive or negative force depending on whether youth potential is harnessed and



⁴ Approximately 49 per cent of the country is arid and 35 per cent is semi-arid, meaning that almost 84 per cent of the area receives low rainfall (FAO 2019).

⁵ Employing 32 performance indicators across 11 issues categories, the 2020 *Environmental Performance Index* ranks 180 countries on environmental health and ecosystem vitality (Wendling *et al.* 2020).

whether the productive employment opportunities are available to young people. Failure to harness the youth bulge will create a large mass of frustrated youth who can be a potential source of social and political instability (Hafeez & Ali 2017).

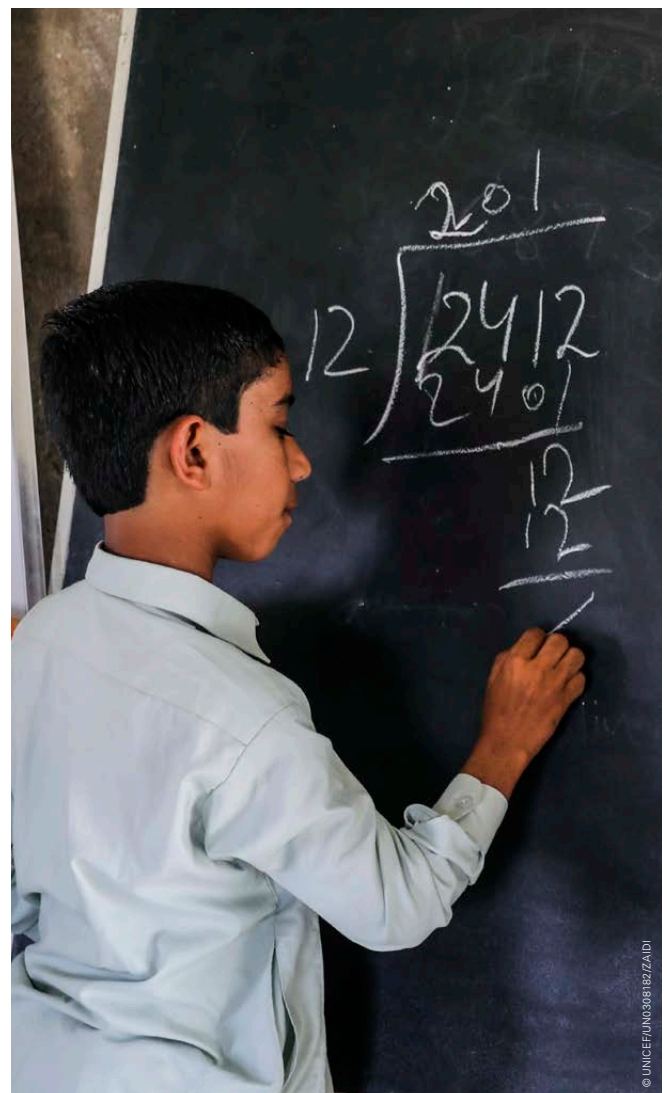
Climate change hits poor and underprivileged communities and people disproportionately given their lack of capacity and resources to adapt and recover from recurring climate change-induced shocks. About 30 per cent of the population in Pakistan live below the poverty line (USAID 2017). Pakistan's vulnerability to climate change is further aggravated due to a heavy dependency on a climate sensitive agriculture sector. Almost 80 per cent of the poor population living in the rural areas depends on agriculture using water irrigation (ADPC & UNDRR 2019). Although Pakistan is a food surplus country, its overall food security is poor due to high levels of poverty and high food prices. As a consequence, Pakistan has significant rates of malnutrition, undernourishment and childhood stunting especially in rural areas (UNICEF ROSA 2020). A recent review exploring the interface between the effects of climate change, food insecurity and exposure to COVID-19 in Pakistan found that the areas or groups at risk of climate change are simultaneously at risk from both food insecurity and COVID-19 due to their multiple vulnerabilities and exposures. The landless poor and women are most at risk from the combined effects of climate change, food insecurity and COVID-19 (Idris 2021).

There is an increasing risk of climate change-induced migration (Ministry of Climate Change 2012). In Pakistan climate change-induced migration and displacement are mainly caused by floods, drought and heat stresses. A large population in different regions across Pakistan have been displaced due to climate change of a temporary or permanent nature⁶ (Ijaz 2017). For instance, in 2020 due to floods caused by monsoon rains 810,000 new displacements took place mostly in Sindh. In recent decades, coastal communities in Sindh have gradually been forced to move further inland in response to seawater intrusion and coastal flooding (IDMC 2021).

According to UNICEF's first child-focused climate risk index, based on children's exposure to climate change and environmental hazards, shocks and stresses as well as children's vulnerabilities to shock, Pakistan ranks 14 out of 163 countries (UNICEF 2021a). 34 per cent of children in Pakistan are already experiencing high or extremely high water vulnerability (UNICEF 2021b). It is projected that climate change further decreases water availability and quality in Pakistan. Declining fresh water availability in the country on account of very rapid population growth, urbanization and increasing economic activity is a serious

concern with potentially far-reaching impacts on all sectors including education. It is projected that the country will transition from a 'water-stressed' to a 'water-scarce' country by 2025. There is an increasing risk of conflict over shrinking water resources (USAID 2017). Water scarcity is already acute in Karachi and water is a major source of conflict, often aggravating rifts among the population along existing ethnic, religious and caste lines (Idris 2021).

It is important to note that the above-mentioned climate change-induced hazards, shocks and vulnerabilities do not occur in isolation. They interact with one another and exacerbate existing social and economic inequalities, while feeding from those inequalities in a complex web of relationships. Unaddressed, the combined effects of climate change hit marginalized groups in society first, hardest and longest. It is therefore critical to address multiple risk factors simultaneously (UNICEF 2015, 2021a).

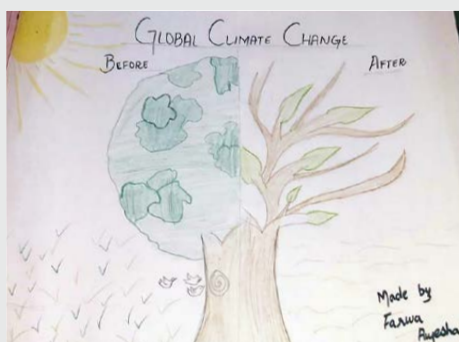


⁶ Data on climate change induced migration and displacement are very limited. The information available has been gathered in an ad-hoc manner (Ijaz 2017; Braam & Kumar 2021).

Climate Change in My Locality

Teacher and students FGD participants were asked about climate change impacts they have noticed and experienced in their locality.

Teacher FGD participants in Peshawar report that due to climate change they have noticed that their seasons have significantly changed. One female teacher says, 'No more four seasons. Now we have only two seasons, extreme winter and extreme summer. The summer period nowadays lasts for seven months'. They also report that they have encountered increasingly severe and more frequent drought and flooding incidents. A male teacher explains that last year the northern city of Chitral (which in the past never had monsoon rains) was now experiencing monsoon rains. He sees this as a clear indication of climate change. Increasing temperatures and unpredictable precipitation patterns have been negatively affecting the crop production in the province. Participating teachers and students are very concerned about deforestation, population growth, rapid urbanization and air and water pollution, all negatively impacting the natural environment.



The global temperature is rising... The water level in reservoirs is getting low due to fewer glaciers. This is the main reason why trees are getting dry. Diseases are increasing day by day. Due to deforestation, flooding is increasing and oxygen levels are decreasing. Birds are migrating to other hilly areas. I want to plant more trees to combat this situation!

Farwa, Grade 9, Peshawar



We are facing a big problem in the world. The earth is crying. Due to climate change the weather and seasons have changed. It is not normal anymore... The hot season is getting much hotter and the cold season is getting much colder than in previous years. Everyone here is feeling and observing these changes... Everyone's life has been affected dramatically. In summer we used to use only ceiling fans but it is not possible to live without air conditioning systems now.

Aamir, Grade 10, Peshawar

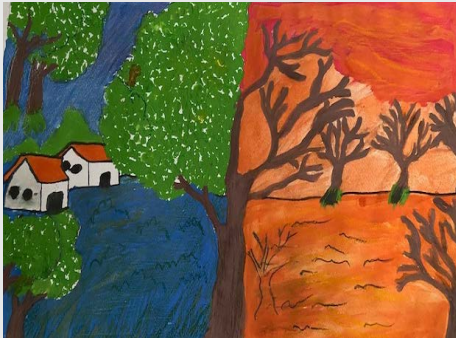


Before we had a very good chain of rains but now we do not have enough of them... We have more vehicles and they are emitting dangerous smokes that are causing climate change and diseases. As populations are increasing, people cut more trees to build more houses. This also creates more climate change.

I have learned these things at school. For instance English books have topics of population growth, environmental changes and climate change. I also witness these problems.

Malika, Grade 6, Peshawar

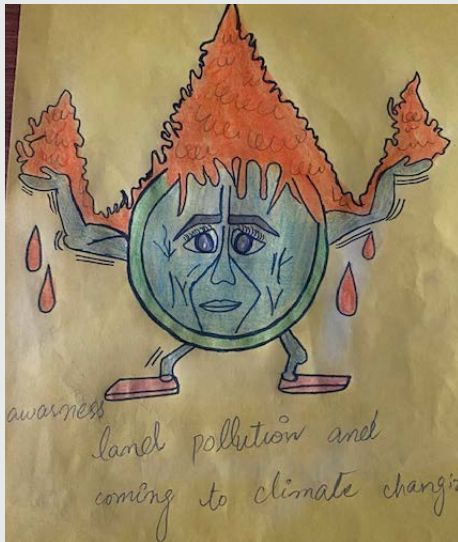
Teacher FGD participants in Lahore report that the summer period is getting longer (almost eight months) and hotter (the temperature rising almost to 50°C). In summer they now encounter very heavy rains as well as strong storms. Severe flooding events are also on the rise. In winter it gets much colder than before. Overall, they experience 'huge changes' and 'new phenomenon' due to climate change. Teachers and students attending the FGDs are very much concerned about air and water pollution as both are 'increasing day by day'.



There is a lot of pollution, which compels people to migrate to other places.

A lot of deforestation. No shades. We are increasingly exposed to severer heat. When it is hot, I prefer to sit outside under the trees but it is not possible as people have cut down trees. As people cut a lot of trees, there are a lot of negative impacts. We now have a lot of flooding and then people have to migrate to different places. Once they migrate they lose their livelihoods. Floods affect not only humans but also natural habitats for animals and birds.

Zara, Grade 9, Lahore



The earth carries a lot of burdens and pollutions due to human activities and factories... Children inhale polluted air and drink polluted water. Pollutions have to be combatted!

In my area due to climate change, people have more breathing problems. I suffer from asthma. In summer, there is lots of dust. I suffer more during the summer and I miss my school.

Warisha, Grade 10, Lahore



Deforestation is happening in my area. People cut down trees to clear the land and for fuels without realizing they are destroying the habitats and are creating more climate change.... Green environment is better for humans, birds and animals. Green environment is more productive and better for our economy.

Aysha, Grade 7, Lahore

Section 3

Climate Change Impacts on Education System

While the impacts of climate change in the education sector have not been researched systematically in Pakistan, the high prevalence of fast-onset natural hazards (e.g., floods, landslides, storms) and slow-onset events (e.g., droughts, environmental degradation and pollution) has been negatively affecting various aspects of education system in Pakistan. According to the U-Report survey conducted for this study, overall 78 per cent of Pakistani youth respondents (n=2,795) claim that their education/studies have been affected by climate change (Lopez Rello & Ackers 2021).

3.1. Learning Facilities

The 2010 flooding in Pakistan was one of the largest natural disasters ever recorded in terms of area and number of people affected. 18 million people, including 3.9 million children, and 78 out of 141 districts in four provinces were severely affected (UNICEF Pakistan 2019). The so-called super floods devastated 10,407 education institutions across Pakistan. 3,741 institutions were fully destroyed and 6,666 were partially damaged⁷, affecting around 32,000 teachers and more than one million students. 90 per cent of affected educational institutions were primary schools. The total financial damage to the education sector was estimated at PKR 26,463.3 million⁸, with Sindh and Punjab being the worst afflicted provinces (ADB *et al.* 2010).

In the aftermath of the 2010 floods, tardiness in rehabilitating damaged schools and the use of schools as emergency shelters for the flood victims resulted

in education activities taking place in the open without adequate shelter. While the country was still recovering from the 2010 floods, further flooding took place in 2011 affecting 9.6 million people. 4,096 education institutions in the provinces of Sindh and Balochistan were affected, with 1,560 institutions fully damaged and 2,536 institutions partially damaged.⁹ The total damage and loss in the education sector in these provinces were estimated at PKR 12,013.78 million¹⁰ (ADB *et al.* 2011).

In July and August 2015, Chitral, a region of high mountains and glaciers located in northern Khyber Pakhtunkhwa, was hit by unprecedented floods and mudslides triggered by torrential rains and Glacial Lake Outburst Floods. The area was vulnerable due to excessive deforestation and grazing. 30 schools were either fully or partially damaged, affecting 3,782 students. The education sector recovery cost was estimated at PKR 177 million.¹¹ Harsh winter weather conditions combined with damaged roads and bridges delayed school rehabilitation efforts (PDMA Khyber Pakhtunkhwa 2015).

In Pakistan, 55 per cent of all the existing public school buildings 'have fallen into disrepair and thus are considered to be of unsatisfactory quality or are unsafe'. Only 52 per cent of public schools have all the following essential components: boundary walls, drinking water, electricity and toilets while 11 per cent of all public schools lack any of these facilities (ADB 2019, 24). Nationally nearly half of primary schools and one-third of middle and secondary schools do not offer access to safe drinking water (UNICEF Pakistan 2019). According to one national stakeholder, the location of public schools is also an issue. They are often built on cheap land such as riverbeds and are, thus, highly exposed to flooding incidents (National Stakeholder 5). The present research has not come across any comprehensive data concerning school locations in relation to potential hazards.

3.2. Education Access

Pakistan has the second highest number of out-of-school children (OOSC) worldwide. Approximately 22.8 million children aged 5 to 16 are out of school, i.e., some 44 per cent of the total population in the school age group. Only 23 per cent of those enrolled at primary level in public schools reach Grade 10 and only 4 per cent reach Grade 12 (ADB 2019, 13).

The profile of OOSC or those who are at risk of dropping out finds girls, rural children, children from economically



⁷ In the 2010 and 2011 *Pakistan Flood Preliminary Damage and Needs Assessment* reports, the damage is classified into two broad categories: 'completely destroyed' and 'partially damaged'. No detailed explanation of these categories is provided.

⁸ US\$311.3 million.

⁹ 13 out of 17 affected districts in Sindh and all 5 districts in Balochistan were affected by the 2010 floods. Among these, two districts in Sindh and three districts in Balochistan were also affected by the 2007 floods (ADB *et al.* 2011).

¹⁰ US\$138.1 million.

¹¹ US\$11 million.

disadvantaged families, Balochi-speaking children and children from other ethnic groups disproportionately represented (Government of Pakistan & UNICEF Pakistan 2017). Natural hazards are one of the factors further exacerbating already poor education access, especially for girls (ADB *et al.* 2011). In the aftermath of the above-mentioned 2010 and 2011 floods, education access was significantly impacted as school buildings were damaged and/or they were used as temporary shelters to accommodate a flood-affected population¹² (ADB *et al.* 2010). Prior to the 2010 floods, an estimated 32 per cent of girls married before age 18 and 3.3 million children under age 14 engaged in child labour. When household food and income insecurity elevated due to the floods, child protection risks rose making children more vulnerable to exploitation, trafficking and abuses (UNICEF Pakistan 2011).

Some national stakeholders participating in the survey for this study highlight the link between population displacement caused by climate change-induced events and student dropout. For instance, when families depending on fishery or agriculture for their livelihoods are forced to move especially in the middle of the school year, their children often end up dropping out (National Stakeholder 3). In the drought-prone province of Balochistan, the ever-increasing migration due to drought poses a significant challenge in providing education services to the population constantly on the move (National Stakeholder 5).

Changing climate is also negatively impacting student motivation to go to school and learn. For instance, a male student in the Peshawar FGD says, 'the summer season is getting much hotter. I cannot walk more than 10 minutes consecutively as I feel too dizzy... While studying at school, I don't feel good.' He goes on to ask 'Why would anybody go to school again when such huge obstacles are in the way?' 'The weather,' he continues, 'is too hot and pollution is everywhere.' In the case of female students going to the government secondary school in Peshawar, walking to school at a normal time is a challenge due to a long distance. This is the case because the number of government schools for girls is very limited compared to those for boys. Female teachers in the Peshawar FGD point out that 'many students don't come to school when it rains as they do not have facilities' (e.g., umbrellas, water proofed jackets, transport support), implying that students are very likely to be absent in difficult weather conditions.

In the U-Report survey conducted for this study, 21 per cent of Pakistani youth respondents (n=2,795) report that climate change has affected their family's ability to afford schooling and 16 per cent state that their journey to school has been affected (Lopez Rello & Ackers 2021).

3.3. Student Health and Wellbeing



Excessive use of fossil fuels, transport, industries, brick kilns - common in our society - release greenhouse gases in our environment and cause global warming. Global warming spreads diseases, especially skin diseases. My hands crack and get very dry, so it is difficult for me to do homework. My hair is falling off...

Mohammed, Grade 7, Peshawar

Playing out often through natural disasters and extreme weather events, climate change adversely affects human health and wellbeing, children being one of the most vulnerable groups. In the aftermath of the 2010 floods, children were exposed to elevated risks of high morbidity and mortality caused by diarrhoea, acute respiratory tract infections, measles and malaria as the combined result of contaminated water, unhygienic conditions, and destruction of WASH facilities among others. Due to underlying prevailing malnutrition Pakistani children were less able to cope with additional shocks. Damage to crops and food stocks as well as delay in crop planting all exacerbated food insecurity, further impacting child malnutrition. In conflict-prone areas, flood-affected children also required protection from unexploded ordnance (UNICEF Pakistan 2011; USAID 2017).

According to Save the Children research exploring psychological and behavioural problems of the children affected by the 2010 floods, participating children reported that they suffered from 'aggression' (87 per cent), 'shyness and lack of expression' (75 per cent), 'adjustment problems to the current situation' (70 per cent), 'feelings of insecurity and fear of water, people, open places and darkness' (73 per cent) (Save the Children 2011, 5).

¹² In 2010, 2,169 schools in the Punjab province and 2,372 schools in the Sindh province were used as shelters for Internally Displaced Persons (IDPs). In 2011, 803 relief camps were established mostly in schools (ADB *et al.* 2010, 2011).

Asked about how worried they were about climate change and what it means for the future, 25 per cent of Pakistani youth U-Report respondents (n=3,517) indicated that they are 'very/extremely worried' (25 per cent) or 'a little worried' (38 per cent) (Lopez Rello & Ackers 2021, 16). In fact, the emotional health and wellbeing of students and teachers constitutes one of the most serious concerns expressed by the FGD participants in both provinces. Combined with underlying security issues (e.g., terrorism) and earthquake risk, extreme weather events make students and teachers 'psychologically more depressed' in the words of one participant in the Khyber Pakhtunkhwa provincial stakeholder FGD. Another participant from the same FGD explains that although flash floods used to occur in July, they have now become unpredictable and can happen anytime. This situation increases fears and anxieties among students who express concern about their own safety especially during their travel between home and the school.

Higher temperatures increase the risk of heatstroke and children are one of the at-risk groups who are particularly vulnerable to heat-related conditions (WHO & UNFCCC

2015). Participants in teacher and student FGDs in both locations report that they suffer from both extremely high and low temperatures. For instance, a female student in Peshawar says: 'In summer it is too hot. Students become unconscious at school. In winter, it is too cold and students suffer from nausea and headaches.' Female teachers in the Lahore FGD have noticed increasing student absenteeism and dropouts due to ill health. 'In winter, it is extremely cold. In summer it is extremely hot. Students suffer from dehydration, diarrhoeal illness, so students do not come to school regularly. How can they learn properly when they are ill?'

Vector-borne diseases such as malaria, dengue and chikungunya are endemic in Pakistan. Malaria alone takes approximately 50,000 lives annually, children, infants and women being among the most affected. Increases in temperature and changing precipitation patterns due to climate change are conducive to an increase in geographical range and the number of incidents of vector-borne disease. It is projected that affected areas will increase in size and number in future (Ministry of Climate Change 2018).



High levels of waste disposal accruing from a combination of rapid urbanization, population growth and increasing consumption are a major source of greenhouse gas emissions. Lack of waste management infrastructure means that most municipal waste is burned, dumped or buried, causing serious environmental problems especially in urban areas. Poorly managed landfill sites contaminate ground and surface water (Ministry of Climate Change 2018). Contaminated water is a major cause of diarrhoeal disease and infectious disease outbreaks, posing serious threat to children's health. It is projected that although diarrhoeal diseases are likely to decrease significantly by 2050, the proportion of those attributable to climate change will increase from 11.7 per cent in 2030 to 17 per cent by 2050 (WHO & UNFCCC 2015).

Air pollution is yet another serious health concern for children in Pakistan. The country is ranked the second most polluted¹³ country globally, while Lahore was the world 18th most polluted city in 2020 (IQAir 2020). Serious air pollution in the province of Punjab has led to repeated school closures and increasing risk from respiratory diseases with long-term health impacts on children (UNICEF Pakistan 2019). Uncontrolled toxic emissions from vehicles and industries including brick kilns as well as the burning of domestic garbage and agricultural burning are major sources of air pollution in Pakistan (IQAir 2020), these emissions also fomenting climate change. Pakistan's heavy reliance on fossil fuels to meet rising energy demands remains a major contributor to air pollution (UNICEF ROSA 2020). Student and teacher FGD participants explain that many students suffer from respiratory problems (e.g., breathing difficulties, asthma, chest infection) due to air pollution. A female student participant in Lahore explains that ill health caused by air pollution is one of the reasons why she and her peers are often absent from school. Polluted air, food and water are affecting children's health which 'ultimately affects student academic performance' (Khyber Pakhtunkhwa Stakeholder FGD).

3.4. Education Provision and Learning Quality

There are no mechanisms in the education sector to systematically monitor lesson time lost and student academic performance in relation to climate change-induced hazards and events.

Teacher and student FGD participants commonly report that, prior to the COVID-19 pandemic, lesson time was already reduced due to extra summer and winter vacation days to avoid extremely high and low temperatures. Teacher participants observed that prolonged and recurrent vacation time led to decreased student motivation for learning.

When it is extremely hot or cold, classrooms without functional cooling or heating facilities pose a significant challenge to quality teaching and learning. In Pakistan, frequent power shortages prevent the use of such facilities when available. In the words of a female teacher in the Lahore FGD, 'the situations are too extreme and the classroom environment is not conducive to quality teaching and learning.' A female teacher in Peshawar has noticed that in a very hot, humid and packed classroom without coping facilities her students' motivation and concentration drop very low. 'They are not listening and they do not respond much.' Other teachers point out that teachers themselves become dehydrated and are as concerned about their own physical conditions as about teaching.

As a way to maintain student concentration and motivation, a female teacher in the Peshawar FGD employs various practical projects in her *Science* lessons so that her students can actively engage in the lessons. She has witnessed positive effects and says, 'If lessons are interesting, they will come!'



¹³ Based on particulate matter (PM 2.5) concentration, the pollutant widely considered most harmful to human health (IQAir 2020).

Section 4

Education Sector Responses to Climate Change

4.1. Policies, Plans and Strategies

The Government of Pakistan is committed to pursuing a green and low carbon development pathway, climate change adaptation being one of its proclaimed topmost priorities. The *National Climate Change Policy* (NCCP) is the main policy document providing an overarching framework for climate change adaptation and mitigation in priority sectors¹⁴ (Ministry of Climate Change 2012), education not being one of them. The NCCP recognises that climate change impacts are disproportionately felt by women and these who live below the poverty line and proposes a few policy measures to enhance their coping capacities. Acknowledging 'limited investment in climate change education' and lack of human resource to effectively address climate change challenges, the NCCP proposes the development of the 'curriculum on climate change and environmental planning with particular emphasis on Disaster Risk Reduction' in the 'formal education system at all levels' and in particular, in the higher education system (ibid., 31).

The *Framework for Implementation of Climate Change Policy (2014-2030)* provides a strategic guide to implementing mitigation and adaptation measures in line with the NCCP. The proposed actions involving the education sector are limited to the development of local water harvesting measures and integration of water conservation, forest ecosystem and biodiversity in the curriculum, all pinpointed as short-term (i.e., 5 years) actions (Climate Change Division 2013).

The *Climate Change Act 2017* (Government of Pakistan 2017) stipulates the establishment of the Pakistan Climate Change Council, an apex national policy formulation and decision making body. The *Act* also mandates the establishment of the Pakistan Climate Change Authority¹⁵. One of the Authority's functions has direct implications for the education sector:

...undertake education and awareness campaigns and programmes to enhance understanding and awareness of different aspects of climate change and promote their integration in education curricula (ibid.,102).

In *Pakistan's Intended Nationally Determined Contribution*, education is not identified as a priority sector (Government of Pakistan 2016).

There are other sector policy documents with no primary remit for education but where specific reference to the education sector is included. The *National Disaster Risk Reduction Policy*, which recognizes climate change and environmental concerns, suggests the integration of DRR into the education syllabus at all levels. It highlights the importance of linking school-based preparedness efforts with wider community-based DRR plans and structures and also suggests 'peer mechanisms' to effectively reach out to school children and youth (National Disaster Management Authority 2013, 16). Earlier, the *National Environmental Policy 2005* proposed the curriculum integration of environmental education at all levels ensuring 'participatory approaches and practices' (Ministry of Environment 2005, 20).

In the *National Education Policy 2017-2025* climate change is mentioned only once in relation to the tertiary education research, with no reference to primary and secondary school education (Ministry of Federal Education and Professional Training 2017).

In line with the global *Comprehensive School Safety Framework*, the National Disaster Management Authority (NDMA) developed the *Pakistan School Safety Framework*, which provides policy guidelines for key stakeholders at national, provincial, district and school levels. The *Framework* was approved by the Prime Minister with instructions to incorporate it into the *National Education Policy* (UNICEF Pakistan 2018), a directive that is yet to be implemented. The *Pakistan School Safety Framework* claims to be 'all encompassing' by its addressing both natural and human-induced disasters (NDMA 2017).¹⁶ While fleeting references to climate change-induced hazards such as drought and extreme temperatures exist in the document, glacial lake outburst floods (GLOFs), sea level rise and salinity instruction are absent in the framework.

At provincial level, steps taken to integrate climate change, environmental and/or DRR-related concerns in the education sector policy and planning documents are various. For instance, in Punjab, the education sector plan includes 'safe, clean, green, healthy and hygienic physical environment incorporating elements of disaster risk management' as one of the priority programmes (Government of Punjab 2020). The Punjab School Education Department has developed a *Provincial School Safety Plan of Action* (ibid.). In the case of Khyber Pakhtunkhwa, the provincial education sector plan has so far no components concerning climate change risk reduction and resilience building for schools (Khyber Pakhtunkhwa Stakeholder FGD).

¹⁴ Adaptation measures are focused on the following sectors: water resources, agriculture and livestock, human health, forestry and biodiversity and other vulnerable ecosystems. Mitigation measures focus on the following sectors: energy, transport, industries, agriculture and livestock and forestry.

¹⁵ The Pakistan Climate Change Authority consists of the following members: the Chairperson appointed by the Prime Minister; Member (Adaptation); Member (Mitigation); Member (Climate Finance); Member (Coordination) and one member from each Province nominated by the respective Provincial Ministers-in-charge (Government of Pakistan 2017, 100).

¹⁶ NDMA has updated the *Framework* by including an additional chapter on 'safe back to school in context of COVID-19' (UNICEF Pakistan 2021a).

Targeting youth from 15 to 29 years old youth, the *National Youth Development Framework* aims at empowering youth considering young people as agents of change regardless of ethnicity, belief, background or gender. 'Environmental protection and conservation' and 'green initiatives' are key areas under the health and social wellbeing thematic area (Government of Pakistan 2019).

According to the U-Report survey conducted for this study, 59 per cent of Pakistani youth respondents consider that the government should be taking most action to address climate change, followed by businesses (17 per cent) and children (15 per cent) (see *Box 1*). 57 per cent of Pakistani youth respondents also think that it is at least 'likely' that the government will take action to address climate change in the wake of the COVID-19 pandemic (Lopez Rello & Ackers 2021).

4.2. Finance

Education sector financing in Pakistan faces multiple challenges: the very low level of education budget allocation¹⁷ compared with enormous needs; the lack of equitable resource allocation across the provinces and districts; chronic underspending of the allocated funds; weak governance of financial management; lack of stakeholder engagement in the budget making process, to name a few. An education budget predominantly goes to recurrent heads (e.g., salaries), allowing less than 10 per cent of the total education budget for maintenance and development of the education system (Ministry of Federal Education and Professional Training 2017). In Khyber Pakhtunkhwa, due to overall resource scarcity, no government resource has been allocated for DRR/school safety initiatives. All such initiatives have been funded by development partners such as UNICEF. In the case of Punjab, as part of implementation of the provincial *WASH in School Strategy*, the provincial

government allocates funds through School Councils to manage health and hygiene in schools. The funding pays for construction of latrines, hand washing stations, availability of soap and water and clean drinking water on school premises (UNICEF Pakistan 2021b).

In terms of wider climate change financing in Pakistan, a climate change budgetary framework and coding system to identify climate-relevant activities are currently absent (ADB 2017).

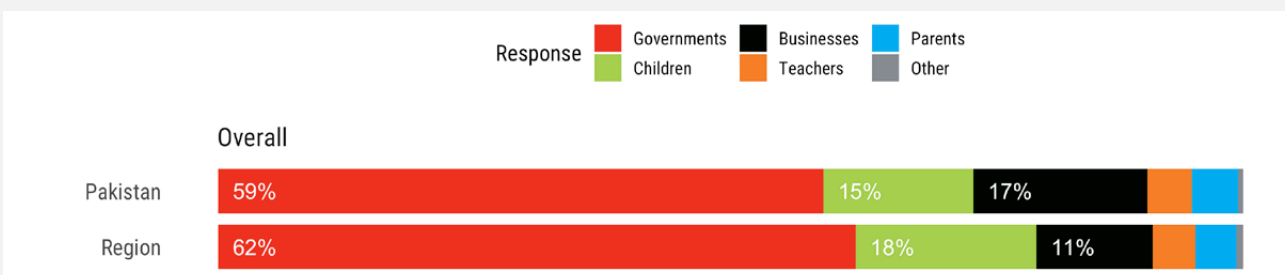
4.3. Curriculum, Teaching and Learning

After the 18th Amendment to the Constitution of Pakistan in 2010, responsibilities for curriculum, textbooks and all other matters related to learning at school (primary to higher secondary level) have been devolved to the provinces and areas. Due to lack of technical capacity, most of the sub-national governments have adopted and implemented the 2006 *National Curriculum* developed by the then Ministry of Education with some minor changes (ADB 2019).

Predicated on the 2006 *National Curriculum*, the *National Curriculum Framework* provides broad guidelines and strategies for curriculum development in Pakistan. It suggests that 'emerging trends and issues' including environment and climate change should be considered in formulating curriculum objectives and developing learning support materials (Ministry of Federal Education and Professional Training 2017). In Punjab, all subjects (Grades 1-10) have been reviewed by the Punjab Curriculum Textbook Board and 'emerging trends' such as environment, disaster risk/crisis management and life skills considered (Government of Punjab 2020). In Sindh, there is an education policy intention to integrate environmental and disaster management components in the curriculum with a view to raising student awareness (Government of Sindh 2020).

BOX 1. UNICEF ROSA U-Report: Who should be taking the most action to address climate change? (n= 2,579 in Pakistan; n= 13,532 in the region)

(Lopez Rello & Ackers 2021, 21)



¹⁷ In Pakistan public expenditure on the education sector as a proportion of GDP (2.9 per cent in 2017) is one of the smallest in the region. Comparative figures for 2017 available for 5 other ROSA countries are as follows: Afghanistan 4.0 per cent; Bhutan 7.2 per cent; Nepal 5.5 per cent; Sri Lanka 2.8 per cent (World Bank 2021). According to the *National Education Policy 2017-2025* the government aims at increasing the investment in education to 4 per cent of GDP.

At the time of this research, the development of the *Single National Curriculum* - which will be applied to in all types of schools in Pakistan - i.e., government schools, private schools and Madrasas – is ongoing. In the *Single National Curriculum*, 'environmental awareness & care' is one of the key attributes students should develop through school education (Ministry of Federal Education and Professional Training 2021).

In the U-Report, 73 per cent of Pakistani youth respondents (n= 5,420) are unable to explain what climate change and global warming are about. 36 per cent of youth respondents (n=2,844) state that they have learned about climate change

through *Science* lessons and 30 per cent through the *Geography* lessons, while 10 per cent of respondents claim that they have not learnt about climate change at school (Lopez Rello & Ackers 2021).

In Khyber Pakhtunkhwa, sub-national FGD participants consider that climate change-related topics are 'non-existent' or 'limited' at primary level and 'limited' at secondary level. See *Box 2* for the indicative list of climate change-related topics in the middle and secondary school textbooks.

BOX 2. Khyber Pakhtunkhwa: Climate Change-related Textbook Topics: Indicative List¹⁸

Middle (Grades 6-8)

Subjects	Topics
English	Grade 7 <ul style="list-style-type: none"> • It's Spring (Poem)
General Science	Grade 6 <ul style="list-style-type: none"> • Environment and interaction Grade 7 <ul style="list-style-type: none"> • Environment and feeding relationships Grade 8 <ul style="list-style-type: none"> • Pollutions and its effects on the environment • Effects of climate change • Climate regions of Pakistan
Geography	Grade 6 <ul style="list-style-type: none"> • Climate change science/mechanism • Earth as a home for human beings • Water and human beings Grade 7 <ul style="list-style-type: none"> • Climate of Pakistan • Causes of climate change • Physical status of the earth • Introduction to the atmosphere • Weather and climate • Ozone depletion and its impacts Grade 8 <ul style="list-style-type: none"> • Physical state of the earth • Temperatures of the atmosphere • Weather and climate • Impacts of climate on life
Health & Physical Education	Grade 7 <ul style="list-style-type: none"> • Hazard and danger Grade 8 <ul style="list-style-type: none"> • Hazard and danger
Islamiyat	Grade 8 <ul style="list-style-type: none"> • Islamic teaching and environmental pollution
Urdu	Grade 7 <ul style="list-style-type: none"> • Heavy rains • Ozone layer

¹⁸ This is based on information gathered from the teacher and sub-national stakeholder FGDs and follow-up communications with the participants via UNICEF Pakistan CO.

Lower Secondary (Grades 9-10)	
Subjects	Topics
Biology	Grade 9 <ul style="list-style-type: none"> • Human beings and the environment Grade 10 <ul style="list-style-type: none"> • Global warming
English	Grade 6 <ul style="list-style-type: none"> • Environment and interaction Grade 9 <ul style="list-style-type: none"> • Biodiversity in Pakistan Grade 10 <ul style="list-style-type: none"> • Population growth and its impacts on the environment
General Science	Grade 10 <ul style="list-style-type: none"> • Climate change science/mechanism • Methods to reduce water pollution • Water issues in Pakistan • Fresh water resources in Pakistan • Water resource conservation • Ozone layer depletion
Chemistry	Grade 10 <ul style="list-style-type: none"> • Environmental chemistry
Pakistan Studies	Grade 9 <ul style="list-style-type: none"> • Pakistan's atmosphere
Higher Secondary (Grades 11-12)	
Pakistan Studies	Grade 12 <ul style="list-style-type: none"> • Impacts of climate change on human life
Chemistry	Grade 12 <ul style="list-style-type: none"> • Environmental chemistry (greenhouse effects, global warming) • Pollution

Participants in the teacher FGDs commonly express that treatment of existing climate change and environment-related curricular opportunities is insufficient and welcome the idea of including more climate and environment-related content, specifically lessons oriented towards practical knowledge and skills. If such content is embedded in the curriculum, they feel that it would be much easier to address them, rather than their making individual efforts to introduce them. They support more systematic climate change integration from Grades 1 to 12 across different subjects. 'In this way, we can better explain the climate change phenomena to our students and we can have them practice necessary skills', a male teacher in the Peshawar FGD says.

Some NGOs/CSOs have developed climate change education teaching and learning resources targeting children. For instance, the Friedrich Naumann Foundation for Freedom, an NGO based in Islamabad, developed a

set of six booklets containing simplified climate change information and environmentally friendly action steps (e.g., energy and water conservation and waste management). The booklets with colourful and attractive illustrations are available both in Urdu and English and have been freely distributed to students mainly in the areas where the organization works. As school children tend to share the given booklets with their families and friends, climate change awareness has been extended to home and local communities (National Stakeholder 3). Some of the climate change materials produced by NGOs/CSOs have been presented to the relevant ministries, but no concrete steps have been taken to incorporate such materials in the school curriculum development (National Stakeholders 3, 5).

When asked about what they most wanted to learn about climate change, 19 per cent of Pakistani youth participants (n=3,477) report that they would like to learn all aspects of climate change, followed by learning about local

actions (17 per cent) and learning about climate change prevention measures (17 per cent). However, 18 per cent of respondents report that they have no interest in learning anything about climate change, which constitutes the highest percentage among all the South Asian countries surveyed (see *Box 3*).

Asked the same question, student FGD participants have shared that they would like to learn about adverse effects of climate change and practical actions such as waste management, sustainable farming practices, awareness raising campaigns, among others. A female student in Lahore emphasizes that learning about climate change is important because young people ‘can convey the positive messages to the next generations.’

National stakeholders consulted in this study overall opt for more practical climate change pedagogies which include ‘project-based’ learning and ‘field visits’ (e.g., to waste management factories). These are in line with the aspirations of the *National Curriculum Framework* that promotes a shift from traditional pedagogies focused on rote learning and memorisation to more engaging and child friendly pedagogies including ‘interactive lectures, discussions, cooperative learning and inquiry method.’ Engagement in the community and the outdoor environment is also encouraged as a way to develop higher thinking skills such as critical thinking and problem solving (Ministry of Federal Education and Professional Training 2017, 32, 41-2).

In terms of climate change learning assessment, national stakeholders surveyed suggest employing formative assessment modalities such as project-based assessment and drawings. However, one of the Khyber Pakhtunkhwa FGD participants points that only paper-based assessment methods are currently employed in Pakistan, so including climate change-related questions in the existing assessment tools (i.e., examination questions) is a practical way forward.

4.4. Teacher Capacity Development

In Pakistan both pre-service and in-service teacher education programmes are established and managed at the sub-national level (ADB 2019). Overall, teacher education quality in Pakistan is ‘unsatisfactory’ (Ministry of Federal Education and Professional Training 2017, 43).

Teachers qualified from the pre-service programmes are poorly trained and they have little knowledge of curriculum, textbooks, assessments and the child’s learning needs. Capacity of institutions to deliver in-service teacher training programmes remains limited (UNIVERSALIA 2018). Continuous professional development training is sporadic being donor-driven and hence dependent on funding availability (National Stakeholder 5). Both in-service and pre-service teacher-training programmes require significant improvement.

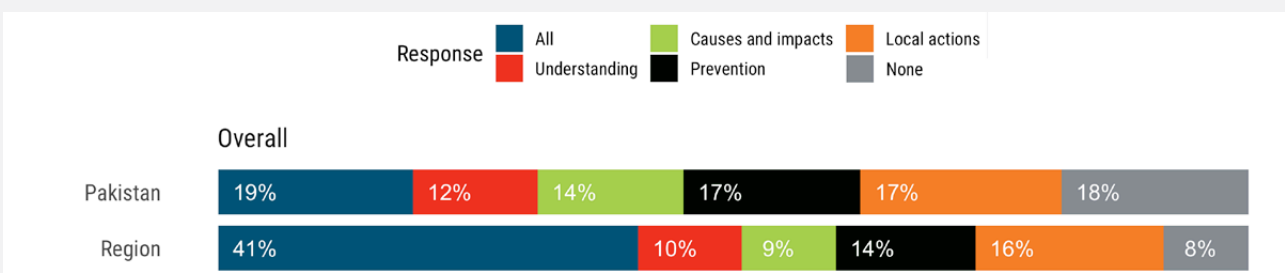
National stakeholders participating in this study commonly report that there exist no systematic pre-service and in-service teacher training opportunities addressing climate change risk reduction and resilience building. While there are NGOs/CSOs which develop short-term teacher training programmes on environmental education, their impacts are unknown as there are no monitoring systems in place to measure the impacts (National Stakeholder 1).

The *Water, Sanitation and Hygiene in Public Sector Schools Strategic Plan* in Sindh and Balochistan includes clear intentions to embed WASH-related awareness raising in continuous professional development programmes (Government of Balochistan & UNICEF 2016; Government of Sindh & UNICEF 2016). In the case of Khyber Pakhtunkhwa, there are ongoing efforts to develop and implement teacher-training programmes on DRR and school safety coordinated by the School Safety Cell (see *Section 4.5*).

BOX 3. UNICEF ROSA U-Report: What do you most want to learn about climate change?

(n=3,477 in Pakistan; n=18,266 in the region)

(Lopez Rello & Ackers 2021, 18)





Teacher FGD participants commonly call for face-to-face training opportunities to develop their capacity to better facilitate school and local community-level climate change and environmental actions involving their students (e.g., on waste management).

4.5. Communication, Coordination and Partnership

The Ministry of Climate Change¹⁹ is the focal ministry for climate change and environmental issues in Pakistan. While climate change and environment became a provincial area of responsibility after the 18th Constitutional Amendment, the Ministry of Climate Change coordinates some of the climate change-related activities at the federal level with corresponding support from the sub-national governments (Ministry of Climate Change 2018). The Prime Minister's Committee on Climate Change (PMCCC) is an apex body

laying down directives for policy formulation on climate change in Pakistan. It includes Federal Ministries/Divisions from multiple sectors (i.e., climate change, finance, agriculture, food security, natural resources, science and technology, water and power, foreign affairs as well as research, planning, development and reform), but does not include education (Government of Pakistan 2017). The PMCCC 'has suffered from lack of sustainability and, thus, is ineffective in building inter-ministerial linkages' (ADB 2017, 47).

In terms of the coordination between the Ministry of Climate Change and the education authorities, there is coordination for seasonal tree planting activities involving schools. However, in terms of climate change curriculum development dedicated formal arrangements have not been made both at federal and provincial levels (National Stakeholders 3, 5).

¹⁹ After the 18th Constitutional Amendment, the Ministry of Environment ceased to exist and the environment and climate change become provincial subjects. A new Ministry of Disaster Management established in 2011 was re-named as the Ministry of Climate Change in 2012. In 2013 the Ministry of Climate Change was downgraded to the Division of Climate Change. In 2015 the Division was re-upgraded to the Ministry of Climate Change (ADB 2017).

The National Disaster Management Authority (NDMA) is a focal body for disaster-related matters. It has provincial and district chapters (i.e., Provincial Disaster Management Authority, District Disaster Management Authority). Its cross-sectorial coordination involves all sectors including education at different levels.

At provincial level, with support from UNICEF the School Safety Cell (SSC) was established within the Directorate of Elementary and Secondary Education Khyber Pakhtunkhwa to institutionalize school safety, DRR and resilience building in schools. With the onset of COVID-19, SSC was designated as the focal unit for pandemic response in the province. Providing a unique cross-sectorial coordination and communication platform, SSC aims at mainstreaming and strengthening school safety and resilience building initiatives within the province in line with the *Pakistan Comprehensive School Safety Framework* and the *Khyber Pakhtunkhwa Emergency Standard Operating Procedures*. SSC also facilitates planning and strategy development, formal and non-formal curriculum development and capacity building programmes for in-service teachers and education managers with a focus on school safety, DRR and resilience building in the province. SSC is the first of its kind in Pakistan (School Safety Cell 2019). SSC also plays a pivotal role in implementing UNICEF plans concerning school safety and climate change adaptation (UNICEF Pakistan 2021b).

4.6. School/Community Student Participation Platforms

The Clean Green Pakistan Movement launched by the Prime Minister in 2018 is a five-year flagship campaign aiming at making Pakistan pollution-free and tackling the effects of climate change. It involves the following five pillars: safe drinking water; solid waste management; total sanitation and hygiene promotion; liquid water management; tree

planting. As part of this initiative, the Clean Green School Programme was launched in 2019 involving 423 government schools across Islamabad with a view to rolling out the programme to 30,000 more schools across the country in the next phase. Through the Clean Green School Programme an 'activity-based and child-friendly syllabus on climate and environmental education'²⁰ has been developed and students are learning environmentally friendly behaviours and skills in order to reduce their environmental footprint and to minimise risks in time of disaster (WaterAid Pakistan undated). Each participating school is to set up a 'clean green club' so that 10,000 students become 'clean and green champions' by taking practical local actions such as tree planting and solid waste management (Jamal 2019). In the case of Khyber Pakhtunkhwa, as part of the Clean Green Pakistan initiative tree planting was organized by the School Safety Cell of the Directorate of Elementary and Secondary Education, technical and financial support being provided by UNICEF to government schools in 11 districts. Orientation sessions were provided for school children by the Education and Forest Departments, focusing on plantation techniques, the importance of afforestation, soil conservation and DRR. 362,745 trees were planted and 168,823 students have attended the sessions subsequently working as clean and green champions (UNICEF Pakistan 2021b).

According to the U-Report survey conducted for this study, 83 per cent of Pakistani youth respondents express that they would like to do something to address climate change with necessary support. 'Joining an organization that addresses climate change' is the most dominant wish expressed (26 per cent) followed by 'teaching own community the impact of climate change' (19 per cent) and 'helping my family and community to suffer less from the impacts of climate change' (18 per cent). However, 17 per cent of the respondents do not consider that they can do anything or need to do anything (see *Box 4*).

BOX 4. UNICEF ROSA U-Report: If you had the necessary support, what would you like to do to address climate change in the future?

(n=2,098 in Pakistan; n=11,607 in the region)

(Lopez Rello & Ackers 2021, 26)



²⁰ It is not proved possible to obtain details of the syllabus.

Child and Youth Engagement and Action

The Billion Tree Afforestation Project and the Ten Billion Tree Tsunami Programme

From 2014 to 2017 the Khyber Pakhtunkhwa government implemented the Billion Tree Afforestation Project in order to fight climate change and pollution. More than one billion trees were planted across 350,000 hectares. The project employed a community-based approach that engaged local communities and energized youth to become 'custodians of a green future.' The project not only restored the forest biodiversity, but also created a half million jobs, including growing saplings and protecting trees from grazing, fires and illegal logging as community guards, among others.

Predicated on the great success, a nationwide five-year 10 Billion Tree Tsunami Programme was launched in 2018 by the Prime Minister. This forms the backbone of the government's Green and Clean Pakistan Movement. Aiming at mitigating the impacts of climate change by restoring and enhancing over one million hectares of forest across the country, the programme is being implemented by the Pakistan government in collaboration with the Provincial and other sub-national authorities (Nature Now undated; Farand 2021). As part of the national tree planting drive, for instance, in Sahiwal District in Punjab students in more than 1,100 public schools planted some 165,000 samplings over the four months (Butt 2019).

Green Youth Movement (GYM)

The Green Youth Movement (GYM), which will be launched soon, is one of the flagship initiatives of Prime Minister's *Kamyab Jawan* (Youth Entrepreneurship) Programme aiming at youth social and economic empowerment. Through the GYM scheme, youth (15 to 24 years old²¹) will be offered small grants to come up with innovative solutions for tackling climate crisis and environmental problems focusing on areas such as solid and liquid waste management, water conservation, renewable energy, agriculture and forestry and eco-tourism. It is envisaged that a nationwide network of GYM clubs will be established in all public and private universities to support youth 'eco-innovators'. This scheme will be linked to the above-mentioned Ten Billion Tree Tsunami Programme so that youth across Pakistan actively contribute to tree planting (Kamyab Jawan 2019, 2021).

Fridays for Future Pakistan (FFFP)

Fridays for Future Pakistan is a Pakistan chapter of the global campaign, Fridays for Future.²² FFFP aims at creating climate change awareness in Pakistan and initiated Friday strikes from December 2018 in a number of universities in Pakistan. It advocates making environmental/climate change education compulsory at lower school level to raise awareness among young generations about the importance of environmental preservation. Social and digital media is an important modality in the FFFP's activism (Fridays for Future Pakistan 2021; Pettit & Wisniewski 2020).

4.7. Monitoring, Evaluation and Accountability

In Pakistan climate change impact data are limited and fragmented both at the national and sub-national levels. 'Among the ministries and sectors, coordination, communication, and information sharing remain weak' (ADB 2017, 47).

The provincial-level Education Management Information Systems (EMIS) gathers basic school profile information using provincially specific questionnaires. Collated data are, in turn, fed into the National Education Management

Information System (UNIVERSALIA 2018). Through the provincial and national EMIS, climate change impact data are not been gathered (National Stakeholder 5). In the words of one national stakeholder, 'A study is required to evaluate the level of impact of climate change on the education system in Pakistan before any monitoring and assessment system could be established' (National Stakeholder 2).

Minimum Standards for Quality Education in Pakistan aims at ensuring quality education provision across all sub-national jurisdictions in the aftermath of the 18th Amendment of Constitution. A set of minimum standards is laid out for each of the following seven areas: learners; curriculum; textbooks and other learning materials; teachers;

²¹ At the time of research there is a discussion to extend the GYM target age group so that it covers children and youth from 10 to 24 years old.

²² Fridays For Future is a global movement started in 2018 after a young Swedish activist, Greta Thunberg, sat every Friday in front of the Swedish parliament protesting against the lack of action on climate crisis. For more information go to: <<https://fridaysforfuture.org>>

assessment; early learning and development; school learning environment (Ministry of Federal Education and Professional Training 2016). Under the school learning environment area, there is one standard touching on disaster risk reduction ('construction of all new schools must be in line with disaster risk free standards'). However, direct reference to disaster risk reduction and climate change is overall lacking in the *Standards*.

The above-mentioned *Pakistan School Safety Framework* includes a detailed 'evaluation check list' with 247 indicators

under the following three broad categories: 'prevention and mitigation'; 'preparedness and risk reduction'; 'response and recovery'. There are two indicators that specifically connect to climate change, referencing site selection and building design and construction. There are also other indicators linked to climate-induced hazards, flooding and cyclones in particular, hence they can be used as proxy indicators to monitor climate change impacts and/or school actions to address them. This research has not identified whether the data have actually been gathered using this checklist or not.



Section 5

Discussion and Recommendations

Box 5 below synthesises the perspectives of national and provincial (Khyber Pakhtunkhwa) stakeholders participating in this study. It indicates the overall strengths and weaknesses of the education system's response to climate change in Pakistan as well as opportunities presented and threats/obstacles to be faced.²³



BOX 5. Education System Response to Climate Change in Pakistan: National Stakeholders' Perspectives

Strengths

- National Disaster Management Authority
- Provincial Disaster Management Authority
- Donor funding
- School Safety Cell (Khyber Pakhtunkhwa)

Weaknesses

- Lack of a concerted and coordinated plan
- Lack of climate change awareness in a majority of the population
- Lack of financial resources (decreasing foreign funding due to the COVID-19 pandemic)
- Climate change not being prioritized in the education sector with weighting given to other priorities
- Lack of national and provincial climate change policy in the education sector, leading to lack of relevant education policy at the sub-national level

Opportunities

- Fully integrating climate change in primary and secondary school curriculum
- Harnessing change agent capacity among youth
- A strong green agenda and commitment by the current government and the Prime Minister
- 'Emerging trends' within the *National Curriculum Framework*
- Linking climate change with skills development

Threats/Obstacles

- Inaction in addressing climate change threats
- Lack of scale and urgency in tackling climate change challenges; tendency to tokenism
- The large number of out-of-school children with no out-of-school learning provision
- Politicized and decentralized education system
- Lack of policy continuity between successive governments

Climate Change Impact Monitoring and Assessment in the Education System

Overall, there are no mechanisms and tools in place to systematically assess and monitor climate change impacts on school infrastructure, student and teacher health and wellbeing, education provision and learning quality at both national and provincial levels. The national and provincial Education Management Information Systems gather basic school profile data but climate change, DRR, emergency-related data have not been gathered through EMIS. Lack of reliable data is an obstacle for policy development and budget allocation for climate change vulnerability reduction and resilience building in the education sector.

The *Minimum Standards for Quality Education in Pakistan* provides a unique but so far unutilized avenue for gathering data on climate change risk reduction in Pakistan. An evaluation checklist included in the *Pakistan School Safety Framework* is another avenue through which climate change impact and response data could be gathered using some of the indicators as proxy indicators. Considering the large number of indicators included, however, it will be more user-friendly to prioritise some, while also embedding climate change specific components.

²³ Note: SWOT entries indicate participants' own placement of ideas but some entries are open to different interpretation as to where they should be placed.

Recommendations

- Consult with relevant stakeholders, develop climate change impact and vulnerability indicators and subsequently integrate them into the EMIS, the *Minimum Standards for Quality Education in Pakistan* and the *Pakistan School Safety Framework* as appropriate. Ensure linkages and synergies between these three instruments.
- Develop inter-departmental/inter-ministerial collaboration mechanisms between the education authorities and relevant government ministries/department/agencies (e.g., Ministry of Climate Change; National/Provincial Disaster Management Authority) in gathering, sharing and analysing climate change impact data as it relates to children and schools.

Policies, Plans and Strategies

A strong government commitment to the Clean Green Pakistan Movement provides a fertile ground in advancing the climate change mitigation and adaptation agenda within the education sector both at the national and sub-national levels.

The *Pakistan School Safety Framework* developed by the NDMA is a significant milestone in building education sector resilience to multi-hazards at national, provincial, district and school levels, although mitigating climate-induced events such as glacial lake outburst floods (GLOFs), sea level rises, salinity intrusion and climate-related migration and displacement are not part of the document. The *Framework* is yet to be integrated in the national and sub-national education policies and plans.

Considerations of climate change resilience building in education sector policies and plans are currently limited. Despite recent climate change momentum in Pakistan, 'the link between climate change and education has not been established' (National Stakeholder 2). Education continuity and capacity to respond to internal migration streams triggered by the salinity intrusion, sea erosion, sea level rise and drought are gaps in education policy and planning documents.

When education access is likely to be disrupted by recurring extreme weather events and oftentimes gradual but sometimes rapid environmental degradation, alternative learning pathways become vital in efforts to ensure education access, retention and quality of learning. During

the COVID-19 pandemic school closures in Pakistan, educational TV programmes were swiftly developed and launched both at the national and provincial (Punjab) levels by the respective governments.²⁴ It is envisaged that beyond the COVID-19 period remote learning through educational TV programmes will continue to play a vital role in providing distance learning to country's hard-to-reach out-of-school children. Such programmes, it is intended, will also serve as standard operating procedures for education in emergencies (Zacharia 2020). The *National Education Policy 2017* already includes 'distance education' as one proposed teaching and learning modalities and these educational TV programmes provide tangible examples of such a policy aspiration.

Recommendations

- Consider updating the *Pakistan School Safety Framework* by addressing climate change adaptation and mitigation more prominently and ensuring integration of the *Pakistan School Safety Framework* in the key education sector policies and plans both at national and sub-national levels.
- Ensure incorporation of climate change risk reduction and resilience building in the *Education Sector Plan* both at national and sub-national levels.
- Integrate education and health interventions more strongly in the *Education Sector Plan* both at national and sub-national levels to protect student health and wellbeing from the adverse effects of climate change.
- Plan so as to ensure that children who are forced to migrate because of the impacts of climate change have access to education.
- Piggybacking on the momentum of programme production during the COVID-19 school closure period, ensure an expanding and sustainable provision of educational TV and radio programmes (together with other distance learning modalities) to reach out-of-school children and raise awareness of standard operating procedures for education in emergencies.

Finance

Overall financial constraints and conflicting priorities in the education sector, the dearth of climate change impact data and lack of awareness among education policy makers, might explain why the sector lacks resource allocations for climate change risk reduction and resilience building. In the case of Punjab, provincial funding has been allocated

²⁴ The Ministry of Federal Education and Professional Training launched 'Teleschool' – the dedicated TV channel by the Pakistan Television in April 2020. The programme is available across Pakistan (including hard-to-reach areas) for Grades 1-12 learners. In the same month, the Punjab province's School Education Department launched its education TV programme called 'Taleem Ghar' for the students Grades 1-10 in the province. Both TV programmes ensure lesson sequences and alignment to the national or provincial curriculum. Both programmes took a phased roll-out approach, meaning that more grades and subjects have been added progressively (Zacharia 2020).

through School Councils as part of provincial *WASH in School Strategy*.

This research has not identified equitable funding mechanisms to address existing disparities in the education sector. Further research into and development of such mechanisms would be beneficial to education sector resilience building since climate change impacts are disproportionately affecting those who are experiencing the most severe multiple disparities.

Recommendations

- Raise awareness among national and sub-national government officials and donors regarding the benefits of financing climate change mitigation and adaptation activities in the education sector and cultivate a shared understanding of the lines constituting a climate change education budget and how to utilize them effectively.
- Develop equity-focused budgeting in the education sector as part of education sector resilience building in response to climate change.
- Explore external climate change funding opportunities (e.g., Green Climate Fund, Adaptation Fund) with a view to filling the current resource gap so enhancing climate resilience in the education system.

Curriculum, Teaching and Learning

The 'emerging trends' in the *National Curriculum Framework* and the environmental components in the *Single National Curriculum* provide a window of opportunity to embed knowledge, skills and attitudes concerning climate change resilience building in the curriculum. Such work can be harmonized with on-going WASH-related curriculum development, especially in the province of Punjab.

Brief exploration of the curriculum in Khyber Pakhtunkhwa has revealed that while there are some examples of climate change-related topics in the curriculum, they are sporadic and practical knowledge and skills on positive climate actions are overall absent. Lack of relevant topics at primary level is a significant gap considering the high student dropout rate at secondary level.

Facing multi-faceted climate crisis, it is vital for students to acquire broad life skills to address inter-related issues of child protection, WASH, health and nutrition holistically. They need to develop and hone critical and creative thinking skills, problem solving skills, self-management skills to better cope with difficult emotions and uncertainties,

advocacy and leadership skills as well as skills and attitudes disposing them to live in harmony with nature, among others.

In line with the Pakistan government's vision to realize green and low carbon development pathways, students should develop new skills and competencies necessary for contributing to a greener and more sustainable economy and lifestyle. This may involve competencies relating to sustainable agriculture, water conservation, environmental protection, renewable energy, sustainable waste management, wise use of natural resources, among others.

Recommendations

- Conduct a thorough sub-national curriculum audit to identify existing opportunities and gaps connected with climate change risk reduction and resilience building learning and action. Build on the opportunities and close the gaps.
- As part of sub-national curriculum development, actively use 'emerging trends and issues' to address locally specific climate change impacts and risks.
- Ensure clear curriculum progression in terms of knowledge, skills and dispositional learning outcomes concerning climate change mitigation and adaptation from the primary education level upwards.
- Integrate life skills education opportunities which comprehensively address child protection, WASH, health and nutrition to better deal with multi-faceted climate change crises. Help students to develop critical and creative thinking skills, problem solving skills, self-management skills, advocacy and leadership skills, and the skills and attitudes to live in harmony with nature in an age appropriate manner.
- Identify contextually appropriate green skills for a low carbon economy and integrate them into the secondary curriculum.
- Bring the expertise of relevant government ministries/departments, CSOs/NGOs and other partners to embedding climate change components in the curriculum.
- Provide students with opportunities, arenas and platforms to take concrete actions and play change agency and advocacy roles in mitigating climate change impacts at school, in their local community and beyond.

Teacher Capacity Development

There are no systematic climate change-specific in-service and pre-service teacher training programmes and materials in Pakistan. For provinces working to embed WASH components or DRR/school safety components in the teacher capacity building programmes - Sindh and Balochistan for the former and Khyber Pakhtunkhwa for the latter - climate change components can be integral parts of such development.

Considering increasing impacts on climate change on student physical and mental health, teachers should be equipped with basic knowledge and skills to give necessary support when required, and should be alert and proactive enough to recognize and act upon oncoming signals of distress.

Key education policy intentions to shift from rote learning to more child-centred, active and practical pedagogies could be a springboard towards realizing action-oriented climate change education in Pakistan.

Recommendations

- Conduct a thorough teacher education curriculum audit for both pre-service and in-service training programmes to identify existing opportunities and gaps related to climate change risk reduction and resilience building. Build on opportunities and close the gap.
- Ensure integration of climate change mitigation and adaptation components in existing or emerging WASH, DRR, and school safety teacher capacity building programmes.
- Build teacher capacity in employing a wide range of active/participatory and child-centred pedagogies, such learning modes being vital for action-oriented climate change education.
- Build teacher capacity in providing basic psychosocial support and basic support to maintain student health and wellbeing if threatened or adversely impacted by climate change.
- Build teacher capacity in promoting environmentally sustainable practices at school that are most relevant to the locality (e.g., water conservation; developing school gardens; tree planting; waste management; using and maintaining renewable energy technology; awareness raising and advocacy techniques).

Communication, Coordination and Partnership

In terms of disaster management, there are cross-sectoral coordination mechanisms that include the education sector at national and sub-national levels. However, in terms of climate change there are no cross-sectoral coordination platforms involving the education sector. To what degree, if at all, disaster management coordination mechanisms include climate change concerns have not been explored in this research.

There is no national platform/mechanism focused on education sector climate change risk mitigation and resilience building. Inter-ministerial coordination and collaboration between the Ministry of Federal Education and Professional Training and the Ministry of Climate Change are currently very limited.

Predicated on lessons learned from the School Safety Cell (SSC) within the Directorate of Elementary and Secondary Education Khyber Pakhtunkhwa, the similar kind of cell could be created in other provinces/areas to enhance education sector coordination for climate change, disaster risk reduction and resilience building at the sub-national level.

To integrate climate change components in the school curriculum, the scaling up the Clean Green School Programme across Pakistan, technical expertise, input and resources from the relevant government ministries/departments/agencies, and from donors, UN agencies, NGOs/CSOs and the private sector²⁵ should be mobilized in a coordinated manner.

Recommendations

- Create a national and sub-national platform/mechanism focused on climate change mitigation and resilience building in the education sector. Or, alternatively, include climate change resilience building components in the existing education coordination mechanisms.
- Mobilizing resources as necessary, ensure the sustainability of the School Safety Cell in Khyber Pakhtunkhwa and consider replicating a similar unit within the Education Department in other provinces/areas.
- At the sub-national level, ensure a multi-sector partnership approach to embedding climate change components in the basic and secondary curriculum, the education sector plan, teacher capacity building programmes and the rolling out of the Clean Green School Programme.
- Establish and/or enhance coordination mechanisms between education authorities and environment/forest authorities at the provincial level.

²⁵ A good example is by the textile company, Sapphire. It introduced biodegradable seed-embedded shopping bags made from cotton waste. It is part of the company's campaign called 'little by little' to create public awareness on environmental issues and get rid of plastic bags (Ahmed undated).

School/Community Student Participation Platforms

The 'clean green clubs' established by the Clean Green School Programme provides a unique platform for government school students to take positive pro-environmental actions. This research has not investigated programme implementation experiences. Lessons learned from the first phase of the programme will help better strategize the effective roll out of the programme across Pakistan.

Tree planting involving school children is widely practiced in Pakistani schools. Whether the schools are paying attention to necessary aftercare is a moot point. For instance, teachers in the Lahore FGD indicated that trees planted by students and teachers in the communities were sometimes destroyed by people in the community. This signals the importance of awareness raising among community members and ensuring that the trees and vegetation are cared for after being planted. No evidence came to light, for instance, of a watering regime for the trees planted by students. There is an opportunity to introduce rainwater harvesting in schools and communities and use the harvested water to look after the trees planted by students. Such practices help students to understand the importance of natural resource conservation and protection through practical actions.

An emerging cohort of 'clean and green champions' should be supported to advance pro-environmental actions beyond the school grounds. Considering the scale and urgency of the climate change challenge, they can play an important role in community advocacy and action.

The soon-to-be-launched Green Youth Movement (GYM) targeting university students is an innovative platform through which young people are encouraged to come up with creative solutions to aspects of the climate crisis. An online marketplace linked to GYM might be developed so that youth-led green innovations can be linked to public and private sector green job providers. Parallel programmes could also be beneficial for younger students and out-of-school youth as a way of developing their skills and boosting their confidence to tackle climate change.

Recommendations

- Create a wide network for 'clean and green champions' to sustain their motivations and actions and to provide mutual learning opportunities. Online-based platformmes might be developed for such a purpose.
- Proactively create school and community collaborative opportunities as an integral part of the Clean Green School Programme. This might include joint school/community tree planting and aftercare, water conservation and waste management actions and student-led community awareness raising events using creative modalities (e.g., posters, songs, street theatre).
- Ensure that trees to be planted by students are suitable for changing climate and the specific environment. Provide necessary professional advice and support from relevant Ministries/ Departments for the choice and maintenance of the trees.



Section 6

Conclusion

This study has highlighted some examples of damaging climate change impacts on school system as experienced in Pakistan. Those impacts include: school infrastructure destruction and damage as well as interrupted education access caused by climate change-induced hazards, in particular, floods; adverse impacts on student health and wellbeing of increasing water- and vector-borne diseases, rising temperatures and environmental pollution; difficulties in teaching and learning in classrooms given the extreme temperatures and given the lack of basic coping facilities.

Key gaps in education system responses to climate change include: insufficient climate change consideration in existing education sector policy and planning documents; lack of education sector resource allocations for climate change risk reduction and resilience building at both national and sub-national levels; limited climate change teaching and learning opportunities in the school curriculum; insufficient teacher capacity-building opportunities focused on climate change risk reduction and resilience building; absence of systematic climate change impact data in the education sector and consequent lack of monitoring and data-informed policy development.

Key recommendations included are: developing and integrating climate change impact and vulnerability indicators into the existing mechanisms and tools (e.g., EMIS, the *Minimum Standards for Quality Education in Pakistan* and the *Pakistan School Safety Framework*); ensuring strategic alignment between education sector policy strategy documents and those concerning climate change; raising awareness amongst government officials about the benefits of financing climate change mitigation and adaptation in the education sector; actively using the 'emerging trends and issues' in the curriculum to address locally specific climate change concerns and issues; launching teacher capacity development programmes that incorporate both climate change-related content and active pedagogies; ensuring a multi-sector partnership and collaboration approach in mainstreaming climate change considerations within education policies, curriculum and capacity building programmes; developing well-functioning student participation platforms for climate change learning and action predicated on the government's Clean Green School Programme.

The education sector has a critical role to play in protecting children and preparing present and future generations to face the full consequences of the climate crisis and in helping them to play a proactive part in finding solutions to the multi-pronged threats we face. It is hoped that this report helps stimulate the discussion and action that is urgently needed to make the education system in Pakistan more climate change resilient and to empower Pakistani students – both girls and boys – to become advocates and agents of change possessing the knowledge, skills and dispositions to actively contribute to building a greener, low-carbon and safer future for their communities and country, and beyond.



References

- ADB. (2019). *School Education in Pakistan: A Sector Assessment*. <<https://www.adb.org/sites/default/files/institutional-document/518461/pakistan-school-education-sector-assessment.pdf>>
- ADB. (2017). *Climate Change Profile of Pakistan*. <<https://www.adb.org/sites/default/files/publication/357876/climate-change-profile-pakistan.pdf>>
- ADB, Government of Pakistan & World Bank. (2011). *2011 Pakistan Floods Preliminary Damage and Needs Assessment*. <https://www.gfdr.org/sites/default/files/Pakistan_Floods_2011_DNA_Report.pdf>
- ADB, Government of Pakistan & World Bank. (2010). *2010 Pakistan Floods Preliminary Damage and Needs Assessment*. <https://reliefweb.int/sites/reliefweb.int/files/resources/64AE3DC5BEDA4E18492577DA001FBE55-Full_Report.pdf>
- ADPC & UNDRR. (2019). *Disaster Risk Reduction in Pakistan. Status Report 2019*. <https://www.preventionweb.net/files/68260_682307pakistanrmstatusreport.pdf>
- Ahmed, R. (undated). 'Sapphire introduces biodegradable, seed infused shopping bags'. <<https://www.pakistantopstories.com/hey-pakistan-are-you-appreciate-brand-seed-infused-shopping-bags/>>
- Braam, D. & Kumar, L. (2021). *Adapting on the Move. Climate Change Displacement and Local Solutions in Coastal Communities in Sindh, Pakistan*. <https://www.internal-displacement.org/global-report/grid2021/downloads/background_papers/background_paper-pakistan.pdf>
- Butt, S. (2019). '164,761 samplings planted in schools.' *Dawn*. <<https://www.dawn.com/news/1525122>>
- Climate Change Division. (2013). *Framework for Implementing Climate Change Policy (2014-2030)*. <<http://www.gcisc.org.pk/Framework%20for%20Implementation%20of%20CC%20Policy.pdf>>
- FAO. (2019). *Forestry Sector Review; Pakistan*. <<http://www.fao.org/3/ca4869en/CA4869EN.pdf>>
- Farand, C. (2021). 'Pakistan explores debt-for-nature scheme to accelerate its 10 billion tree tsunami.' *Climate Home News*. <<https://www.climatechangenews.com/2021/04/16/pakistan-explores-debt-nature-scheme-accelerate-10-billion-tree-tsunami/>>
- Fridays for Future Pakistan. (2021). *Fridays for Future Pakistan [homepage]*. <<https://www.fridaysforfuture.pk>>
- Germanwatch. (2021). *Global Risk Index 2021: Who Suffer Most from Extreme Weather Events? Weather-related Loss Events in 2019 and 2000-2019*. <https://germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_2.pdf>
- Government of Balochistan & UNICEF. (2016). *Water, Sanitation & Hygiene (WASH) in Public Sector Schools Strategic Plan for Balochistan 2017-2022*. <<http://emis.gob.pk/Uploads/Balochistan%20Strategic%20Plan%20for%20%20WinS-Final-16-01-2018.pdf>>
- Government of Pakistan. (2019). *National Youth Development Framework 2020*. <https://kamyabjawan.gov.pk/downloads/eng_nydf.pdf>
- Government of Pakistan. (2017). *Pakistan Climate Change Act, 2017*. <<https://www.google.com/search?client=safari&ls=en&q=Goverment+of+Pakistan+Climate+Change+Policy+2017&ie=UTF-8&oe=UTF-8>>
- Government of Pakistan. (2016). *Pakistan's Intended Nationally Determined Contrition (PAK-INDC)*. <<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Pakistan%20First/Pak-INDC.pdf>>
- Government of Pakistan & UNICEF Pakistan. (2017). *The Situation Analysis of Children in Pakistan*. <<https://www.unicef.org/pakistan/media/596/file/Situation%20Analysis%20of%20Children%20in%20Pakistan.pdf>>
- Government of Punjab. (2020). *Punjab Education Sector Plan 2019/20-2023/24*. <<https://www.globalpartnership.org/sites/default/files/document/file/2020-19-Pakistan-Punjab-ESP.pdf>>
- Government of Sindh. (2020). *Education Sector Plan 2019-2014. Sindh Province, Pakistan*. <<https://www.globalpartnership.org/sites/default/files/document/file/2020-19-Pakistan-Sindh-ESP.pdf>>
- Government of Sindh & UNICEF. (2016). *Water, Sanitation & Hygiene (WASH) in Public Sector Schools Strategic Plan for Sindh 2017-2022*. <<http://www.sindheducation.gov.pk/Contents/Menu/WASH%20in%20Public%20Sector.pdf>>
- Hafeez, E. & Ali, S. (2017). 'The Pakistan youth bulge: A ticking time bomb'. *Dawn*. <<https://www.dawn.com/news/1341111>>
- IDMC. (2021). *Global Report on Internal Displacement (GRID 2021)*. <<https://reliefweb.int/report/world/global-report-internal-displacement-2021-grid-2021>>

- Idris, I. (2021). 'Areas and population groups in Pakistan most exposed to combined effects of climate change, food insecurity and COVID-19'. *K4D Helpdesk Report* 973. <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/16553/973_Areas_population_groups_in_Pakistan_most_exposed_to_combined_effects_of_climate_change_food_insecurity_and_COVID-19.pdf?sequence=1&isAllowed=y>
- Ijaz, A. (2017). 'Climate change and migration in Pakistan.' *The Diplomat*. <<https://thedi diplomat.com/2017/08/climate-change-and-migration-in-pakistan/>>
- IQAir. (2020). *2020 World Air Quality Report. Region & City PM 2.5 Ranking*. <<https://www.iqair.com/world-air-quality-report>>
- Jamal, S. (2019). 'Climate change education to be introduced in Islamabad schools.' *Gulf News*. <<https://gulfnews.com/world/asia/pakistan/climate-change-education-to-be-introduced-in-islamabad-schools-1.67852068>>
- Kamyab Jawan. (2021). Green Youth Movement. <<https://kamyabjawan.gov.pk/home/gym>>
- Kamyab Jawan. (2019). 'Youth will become the driving force for PM's Green Youth Movement (GYM): Usman Dar'. <<https://kamyabjawan.gov.pk/home/GetNewsDescription/38>>
- Lopez Rello, R. & Ackers, J. (2021). *Rising to the Challenge: Youth Perspectives on Climate Change and Education in Pakistan*. <<https://www.unicef.org/rosa/media/13991/file/Rising%20to%20the%20Challenge:%20Youth%20Perspectives%20on%20Climate%20Change%20and%20Education%20in%20Pakistan.pdf>>
- Ministry of Climate Change. (2018). *Pakistan's Second National communication on Climate Change to United Nations Framework Convention on Climate Change (UNFCCC)*. <https://unfccc.int/sites/default/files/resource/183625_Pakistan-NC2-1-Pakistan%20-%20Second%20National%20Communication%20on%20Climate%20Change%202018.pdf>
- Ministry of Climate Change. (2012). *National Climate Change Policy*. <<http://www.nrsp.org.pk/gcf/docs/National-Climate-Change-Policy-of-Pakistan.pdf>>
- Ministry of Federal Education and Professional Training. (2021). *Single National Curriculum*. <<http://www.mofept.gov.pk/ProjectDetail/MzkyNDc2MjMtY2VjY00ZDA4LTk5OTU0tNzUyNDI3ZWZmZnN2Rm>>
- Ministry of Federal Education and Professional Training. (2017). *National Education Policy 2017-2015*. <https://planipolis.iiep.unesco.org/sites/default/files/ressources/pakistan_national_education_policy_2017-2025.pdf>
- Ministry of Federal Education and Professional Training. (2016). *Minimum Standards for Quality Education in Pakistan: Attaining Standards for Improved Learning Outcomes and School Effectiveness*. <https://planipolis.iiep.unesco.org/sites/default/files/ressources/minimum_standards_for_quality_education_in_pakistan.pdf>
- Ministry of Environment. (2005). *National Environmental Policy*. <<https://mowr.gov.pk/wp-content/uploads/2018/05/National-Environmental-Policy-2005.pdf>>
- Ministry of Planning, Development and Reform. (2019). *Pakistan's Implementation of the 2030 Agenda for Sustainable Development: Voluntary National Review*. <https://sustainabledevelopment.un.org/content/documents/233812019_06_15_VNR_2019_Pakistan_latest_version.pdf>
- National Disaster Management Authority (NDMA). (2017). *Pakistan: School Safety Framework*. <<http://210.56.9.218/Publications/PSSF%20v10%203.pdf>>
- National Disaster Management Authority (NDMA). (2013). *National Disaster Risk Reduction Policy*. <<http://web.ndma.gov.pk/plans/drrpolicy2013.pdf>>
- Nature Now. (undated). 'Upscaled: A tree for everyone on the planet'. <https://4fqbik2blqkb1nrebde8yxqj-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/15.-Tree-Tsunamis-in-Pakistan_Upscaled_A-tree-for-everyone-on-the-planet.pdf>
- Pettit, M. & Wisniewski, J. (2020). 'Teaching people about climate change is the first step in fighting it– Interview with Pakistan Activist Iqbal Badruddin.' *Reset*. <<https://en.reset.org/blog/teaching-people-about-climate-change-first-step-fighting-it-interview-pakistani-activist-iqbal->>>
- Provincial Disaster Management Authority (PDMA) Khyber Pakhtunkhwa. (2015). *Chitral Floods 2015: Recovery Needs Assessment and Action Framework*. <<https://www.recoveryplatform.org/assets/publication/PakistanFlood2015/Chitral%20Floods%20-%20Recovery%20Needs%20Assessment.pdf>>
- Save the Children. (2011). *Psychological Assessment Report. Psychological Problems and needs of children in Flood Affected Areas in Pakistan*. <<https://resourcecentre.savethechildren.net/node/3687/pdf/3687.pdf>>
- School Safety Cell, Directorate of Elementary and Secondary Education Khyber Pakhtunkhwa. (2019). About Us. <<http://schoolsafetycell.com/about-us/>>

- UNICEF. (2021a). *The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index*. <<https://www.unicef.org/media/105376/file/UNICEF-climate-crisis-child-rights-crisis.pdf>>
- UNICEF. (2021b). *Reimagining WASH: Water Security for All*. <<https://www.unicef.org/media/95241/file/water-security-for-all.pdf>>
- UNICEF. (2015). *Unless We Act Now*. <https://www.unicef.org/media/50391/file/Unless_we_act_now_The_impact_of_climate_change_on_children-ENG.pdf>
- UNICEF Pakistan. (2021a). *Pakistan COVID-19 Situation Report No.23*. <<https://www.unicef.org/media/96301/file/Pakistan%20COVID-19%20Situation%20Report%20No.23,%201%20-%2031%20Mar%202021.pdf>>
- UNICEF Pakistan. (2021b). Online communication. (7 July 2021)
- UNICEF Pakistan. (2019). *Country Office Annual Report 2019. Pakistan*. <[https://sites.unicef.org/about/annualreport/files/Pakistan-2019-COAR\(1\).pdf](https://sites.unicef.org/about/annualreport/files/Pakistan-2019-COAR(1).pdf)>
- UNICEF Pakistan. (2018). *Annual Report 2018. Pakistan*. <<https://www.unicef.org/pakistan/media/2021/file/Annual%20Report%202018%20Revised%20Final.pdf>>
- UNICEF Pakistan. (2011). *Children in Pakistan. One Year After the Flood – Turning Towards a Brighter Future*. <https://www.unicef.org/media/files/Pakistan_One_Year_After_the_Floods_-_Final_Report_-_Hi-res.pdf>
- UNICEF ROSA. (2020). *Mega Trends in South Asia: A Report by the Economist Intelligent Unit for UNICEF ROSA*. <<https://www.unicef.org/rosa/media/9546/file/MEGATRENDS%20IN%20SOUTH%20ASIA:%20A%20report%20by%20The%20Economist%20Intelligence%20Unit%20for%20UNICEF%20ROSA.pdf>>
- UNFPA. (2020). *World Population Dashboard Pakistan*. <<https://www.unfpa.org/data/world-population/PK>>
- UNIVERSALIA. (2018). *Summative Evaluation of GPE's Country-level support to Education. Pakistan. Batch 2, Country 5: Pakistan (Balochistan and Sindh Provinces)*. <<https://www.globalpartnership.org/sites/default/files/2018-11-26-gpe-cle-final-report-pakistan.pdf>>
- USAID. (2017). *Climate Change Risk Profile Pakistan: Fact Sheet*. <https://www.climatechange.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile_Pakistan.pdf>
- WaterAid Pakistan. (undated). *Clean Green School Programme*. <<https://www.wateraid.org/pk/clean-green-school-programme>>
- Wendling, Z. A., Emerson, J.W., de Sherbinin, A, Esty. D.C. et al. (2020). *2020 Environmental Performance Index*. <<https://epi.yale.edu/downloads/epi2020report20210112.pdf>>
- WHO & UNFCCC. (2015). *Climate and Health Country Profile – Pakistan*. <<http://apps.who.int/iris/bitstream/handle/10665/246150/WHO-FWC-PHE-EPE-15.28-eng.pdf?sequence=1&isAllowed=y>>
- World Bank. (2021). *Government Expenditure on Education, Total (% of GDP)*. <<https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS?end=2019>>
- World Bank & ADB. (2021). *Climate Risk Country Profile: Pakistan*. <<https://www.adb.org/sites/default/files/publication/700916/climate-risk-country-profile-pakistan.pdf>>
- Zacharia, S. (2020). *Pakistan: TeleSchool and Tealeem Ghar (Educational TV at Home)*. <<http://documents1.worldbank.org/curated/en/421821600058352361/pdf/Pakistan-TeleSchool-and-Taleem-Ghar-Educational-TV-at-Home.pdf>>



THE HEAT IS ON!

Towards a Climate Resilient Education System in Pakistan



For further information:

UNICEF Regional Office for South Asia (ROSA)

P.O. Box 5815, Lekhnath Marg, Kathmandu, Nepal

Tel: +977-1-4417082

Email: rosa@unicef.org

Website: www.unicef.org/rosa