



THE AGA KHAN UNIVERSITY

INSTITUTE FOR GLOBAL HEALTH
AND DEVELOPMENT

The Impact of Climate Change on Global Health and an Overview of AKU's Activities

December 2020



*“We’re seeing villages are being wiped away by earthquakes, by landslides, by avalanches. We’re seeing people moving to dangerous areas in modern environments.”
And with more people living in cities than ever before, many end up living in dangerous, unsafe conditions... I would ask you to try to bring this issue forward so that we address it in good time.”*

His Highness the Aga Khan

Dubai, November 2016



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Cover Page Photo:

Internally Displaced Persons camp set up by Aga Khan University in Sukkur District, Sindh Province in September of 2010.

Photo credit: Zaigham Islam



Summary

This report is an overview of AKU's activities pertaining to climate change and global health. As a foundation document of the Institute for Global Health and Development, it offers associated faculty, students and staff a concise summary of the issues pertaining to the nexus of climate change and health as well as an understanding of the depth and scope of AKU's expertise and experience in working with these issues.

The objective of the report is to establish an initial benchmark for the Institute's strategic directions for research in climate change and global health. It will also assist in the development of the Institute's framework for policy action, education programs, community-based interventions and more. These items will form the basis for the work program of a thematic group on climate change and global health.

The report begins with a summary of the relationship between climate change and global health. The body of the paper addresses AKU's expertise and experience in related areas, laying the foundation for the Institute's launch of a thematic group focusing on the development of a strategy for research and action. The report includes an index of relevant stakeholders for engagement in the Institute's work.

Introduction

Climate change is one of the greatest threats to human health. The Aga Khan University (AKU) and its Institute for Global Health and Development (IGHD) are dedicated to understanding and mitigating environmental health impacts in partnership with leading organizations and affected communities. Increasing carbon dioxide (CO₂) levels, rising ambient temperatures, frequent extreme weather and rising sea levels have become global crises, affecting air and water quality, food and water supply, environmental degradation, and vector borne diseases.

The effects of climate change can be both arbitrary and systematic. Rising sea levels and more intense and frequent weather events threaten coastal communities. Conflict and migration disrupt efforts to manage natural resources and achieve sustainable development. The impacts on human health are profound, including increased morbidity and mortality due to higher incidence of respiratory and cardiovascular diseases, injuries, malnutrition, and diarrheal, infectious and vector-borne diseases.



The impact on climate change on a diverse set of additional health concerns – nutrition, gender equity, mental health, even genetics – needs heightened attention. In addition, there are great inequities that results in differential impacts on individuals and communities. Those contributing the least to climate change are often among the most affected. The call for more research, innovative, collaboration and sustainable solutions has never been greater.

The Institute for Global Health and Development intends to show leadership through interdisciplinary research and coordinated action. This report offers an overview of the impact of climate change on global health, AKU's relevant activities and lays the foundation for the development of the Institute's strategy to make a difference.

The Nature of Climate Change and Global Health

From the torrential monsoon floods in Karachi, Pakistan to the historic heatwave and wildfires destroying over 400 million acres of land in California, the year 2020 marked a reckoning in the climate change crisis that scientists have predicted for decades (Stelloh, 2020; Hashim and Imtiaz, 2020). The U.S Geological Survey tracks rising global temperatures due to continued greenhouse emissions, more frequent and severe droughts and tropical storms, faster melting glaciers and permafrost, and rising sea levels that threaten the lives of coastal communities and wildlife (n.d.).

Climate change impacts human health through multiple mechanisms that are interlinked and are modulated by non-climatic determinants of health and other human actions (WHO 2014). Climate change has direct effects on human health at the individual level as evident in infectious and vector borne diseases such as malaria and cholera. At community, regional and global levels, human health is threatened by deteriorating water quality, increased air pollution, soil degradation, and changes to safety and shelter for those forced to move. Climate change also impacts health indirectly by influencing the determinants of socioeconomic, physical, and mental wellbeing.

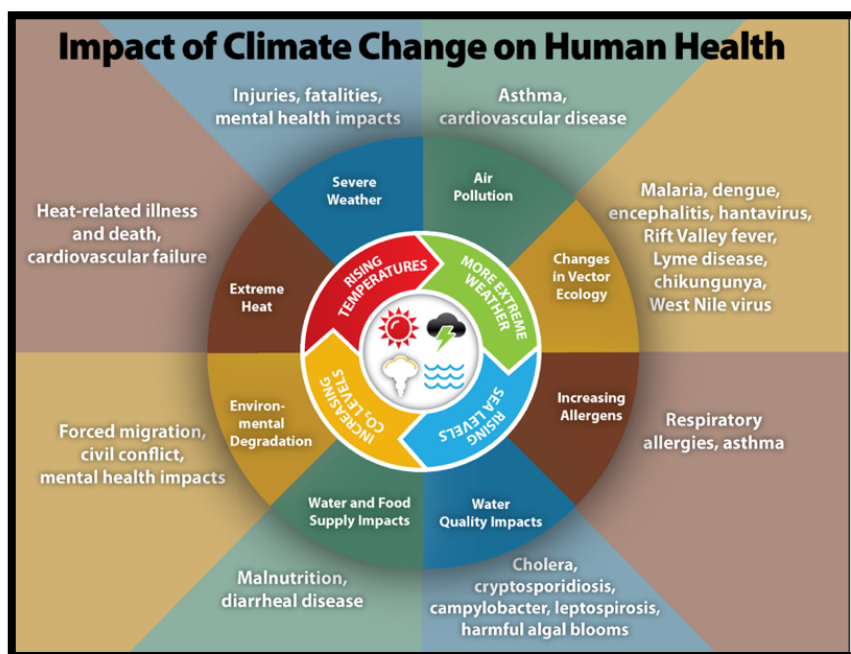
As acknowledged by the World Health Organization (WHO), climate change is the greatest threat to human health in the 21st century and projected threats put the wellbeing of billions of lives at risk (Campbell-Lendrum and Prüss-Ustün, 2018; WHO, 2014). Evidence of direct and indirect health effects of climate change is plentiful. Heat related morbidity and mortality include respiratory diseases, dehydration, hyperthermia, renal and cardiovascular diseases. Similarly, cold weather conditions lead



to increased hospital admissions, morbidity and mortality associated with respiratory and cardiovascular diseases. Floods lead to drowning, electrocution, injuries and psychological distress. Floods cause the spread of infectious diseases, food and water contamination, migration and disruption of health services. Wildfires lead to loss of life, infrastructure, and biodiversity, as well as destroying forests, wildlife and agricultural land.

Climate Change and AKU Geographies

In the past decade, half of South Asia's population has been affected by one or more climate change related disasters that has caused more than US\$149.27 billion in damage (Fallesen et.al, 2019). Pakistan is the world's fifth most vulnerable nation based on the Global Climate Risk Index, between 1998-2019, Pakistan experienced 153 extreme weather events, lost nearly 10,000 lives, and suffered US\$4 billion in economic loss causing 30 million climate migrants (Bhutto, 2020). The floods in August 2020 had economic and health repercussions. Damage to hospitals and clinics, decreased hygiene and sanitation conditions, increased risk of malaria, respiratory infections, and diarrheal diseases are all linked to such climate change influenced episodes (WHO Pakistan, 2010).



Similarly, East African countries such as Kenya (ranked 7th in 2018 and Rwanda (ranked 8th) are among the most affected countries in the world according to the Global Climate Risk Index. Intensifying seasonal rains affect East Africa with Kenya experiencing almost twice the normal rainfall of the wet season between March and July 2018 and causing the death of 183, injury of 97, and the displacement of 321, 630 people, as well as the loss of livelihoods and livestock (Kilavi et. al., 2018).

Agriculture and food security also face consequences of climate change with serious implications for human health. The agriculture sector employs over 80% of East



Africans and nearly 70% of the South Asian population. Most of these people live in rural communities (Jaffery, 2019; Case, n.d). Extreme weather events such as catastrophic rainfall and prolonged drought affect agricultural production due to erosion of topsoil, leaching of nutrients, or absence of hydration. These problems are expected to reduce crop production in South Asia by 30%, lead to increased migration, and increase exposure to diseases such as malaria (Jaffery, 2019; Case, n.d.).

What climate change will encompass for the people of low-income countries in Asia and Africa over the years ahead remains a daunting question. Mitigation strategies are paramount. Especially for cities and communities in poor coastal regions – often home to vulnerable people least able to marshal the resources to adapt – there is an imperative to develop plans that address risks and provide solutions. It is to this end that the Institute for Global Health and Development will form a thematic group on climate change and health and strive to make meaningful contributions.

Engaging in Strategic Collaboration

The Institute for Global Health and Development must establish and leverage strategic collaborations in order to have an impact on these issues. Internally, the Institute can harness specific capabilities and interests of AKU's various entities:

- The Medical Colleges and Schools of Nursing and Midwifery can help prepare leaders in these fields who understand the interaction between climate and health and who will champion the issues over the years ahead.
- The Graduate School of Media and Communication has an excellent track record of raising awareness through such programs as “Giving Nature a Voice” and “Voices from the Roof of the World”, and more can be done to cultivate journalists with niche expertise in climate and health.
- The Institute for the Study of Muslim Civilization has expertise in medical anthropology that can deepen understanding of the issues and inform policy making.
- The Institutes for Educational Development can help train teachers who will help educate future generations about planetary stewardship and global health.
- Importantly, selected research institutes and centres at AKU can work with the Institute for Global Health and Development to conduct transdisciplinary research and present solutions.

The Institute can (and was designed to) take advantage of AKU's unique membership in the Aga Khan Development Network (AKDN). As such, its impact on



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climate change and health can be dramatically magnified through partnership with the Aga Khan Foundation, Aga Khan Health Services, Aga Khan Agency for Habitat, Aga Khan Fund for Economic Development, and the University of Central Asia, among others. The agencies and institutions of the AKDN have long championed the cause of good stewardship of the environment. However, as environmental degradation and climate change have had a growing impact on the populations that AKDN serves, protecting the environment and mitigating climate change, as well as helping populations adapt to the effects of climate change, has taken on increased urgency and importance. All agencies of the AKDN are actively pursuing paths to reduce their carbon footprints, opening substantial opportunities for the Institute to advance environmental initiatives focused on health.

AKU has well established partnerships and research collaborations with many other universities, including some having research centres focused on issues of climate change and health. For example, University College London's Institute for Global Health is home to a research centre on climate change, migration, conflict and health. The Institute for Global Health at University of California, San Francisco is leading the Climate Change and Global Health Initiative, helping to mobilize a stronger international response, supporting the health sector to minimize the adverse impacts of climate change today, and building health systems that are resilient to future climate change challenges. AKU has close relationships with several of universities among the dozens of institutions comprising the International Universities Climate Alliance which facilitates knowledge sharing to lower carbon emissions and increase the rate of climate action. These and many other groups must be part of a strategy for global engagement.

The Institute must also connect with the various national, regional and global organizations that have taken up responsibility for global health, climate well-being, or other sectors, such as energy, that have an important and connected impact. The United Nations and its agencies, such as the World Health Organization and the United Nations Environment Programme, as well as the World Bank and other international financial institutions will be important partners. Bilateral donors, foundations and other funders, large and small, must be made aware of the Institute's capacity to have a significant impact in regions where other major players lack influence and expertise.

See Appendix A for a list of relevant stakeholders for engagement.



Leveraging Climate Change Agreements and Policies

The United Nations Framework Convention on Climate Change (UNFCCC) serves as the parent treaty of two international climate change agreements: the Kyoto Protocol and the Paris Agreement (United Nations Climate Change, n.d.). The Kyoto Protocol was adopted on December 11, 1997 and entered into force beginning February 16, 2005 among 192 nations with the purpose of reducing carbon dioxide and greenhouse gas emissions. This agreement provides clear guidelines for developed nations, responsible for the bulk of emissions, to reduce and manage their output (EARTH.ORG, 2020). The Paris Agreement was put into force on November 4, 2016 to keep global temperatures “below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius” (United Nations Climate Change, n.d.).

These two international agreements come with their own challenges. For example, the United States is not a signatory to the Paris Agreement, although it is the second greatest emitter of greenhouse gases (Blokhin, 2020; The White House, 2017). From 1990-2015, carbon dioxide emissions were recorded to have increased by 60%, but the increase in the richest 1% was three times greater than the changes identified in the poorest half (Harvey, 2020). Significant inequities in health outcomes have developed between the people responsible for the greatest greenhouse gas emissions and those that suffer from the consequences of climate change.

The international mobilization of resources for the development and enforcement of related climate change policies and guidelines offers opportunities. One such area would be better coordination of vision, goals, and mechanisms of monitoring and evaluation. Global commitment to the Sustainable Development Goals is rallying multisectoral collaboration with the potential to improve the complex factors affecting the environment and human health. The Institute will need to clearly identify and express its value proposition within these opportunities. It will also have an important role in ensuring local and regional strategies and investments are tailored such that solutions are meaningful, sustained and contributing to global goals.

See Appendix B for information on climate change policies relevant South Asia and East Africa.



Impact of Climate Change on Global Health

a. Air Pollution and Health

Air pollution, both ambient and household air pollution together, cause more than 7 million deaths globally and it makes the greatest environmental health risk factor and the fourth largest risk factor to global health (Ramanathan, 2020). Reduction in air quality is rooted in the rise of greenhouse gas emissions, which the International Panel on Climate Change (IPCC) estimates is caused by “transport (14%), energy; including generation of electricity and heat (35%), industry (21%), buildings (6%) and agriculture and land use change (24%)” (Campbell-Lendrum and Prüss-Ustün, 2018). The IPCC reports that energy sources including electricity generation and heat is the leading factor of the greenhouse gases emission which accounts for 35% followed by agriculture use (24%), industry (21%), transport (14%), and buildings (6%). These pollutants can effect on ambient air pollution, as well as climate change (IPCC, 2014) . Air pollution and climate change both effects on respiratory health independently or simultaneously (De Sario et. al., 2013). For example, increased incidence of thunderstorms has been linked with greater pollen production in some geographical regions and led to a rise in asthma attacks in different population groups (Cecchi et. al., 2018). Several air pollutants are generated from naturally occurring processes such as smoke, mineral dust, volatile organic compounds and PM_{2.5}. In addition to causing adverse climate changes, these harmful chemicals undergo rapid transformation into biologically toxic compounds that results in increased incidence of respiratory infections and allergies (Kinney, 2018). More than 90% of the population breathes unhealthy air globally which exceeds the WHO guidelines which are 10µg/m₃ with the highest exposure to low and middle-income countries (WHO, 2020). Most deaths occur due to stroke, lung cancers, obstructive lung diseases, heart diseases, and acute pulmonary diseases and it account for 3.2 global burden of diseases. Although this information is well-known, the evidence is still lacking. For example, the Lancet Commission identified clear gaps in literature related to pollution and health (Landrigan et. al., 2018).

Greenhouse gases and air pollution have slight differences although they are intricately linked in relation to their impact on climate change. Climate change is mainly due to greenhouse gases which have long atmospheric lifetimes and have a uniform global impact while air pollution has a more localized and short response time. Some sources emit both air pollutants and greenhouse gases while other sources mainly emit climate related pollutants or air pollutants. Thus, it is important to identify sources of pollution and their respective types of emissions as a potential solution to tackling climate change. The effects of these emissions impacts ambient air quality of urban



areas, particulate matter and ozone production, sea levels, wind and solar radiations (Chisthaisong et. al., 2007).

Household air pollution (HAP) contributes significantly towards greenhouse gas emissions that ultimately leads to climate change and adverse health impacts. According to WHO, black carbon emitted from cooking stoves used in household settings is the second most common pollutant responsible for global warming. Similarly, methane has also been categorized as one of the household pollutants that is indirectly contributing towards increased burden of respiratory disorders through ozone formation (IPCC, 2014). HAP is mostly seen in rural and low-income households in Asia, Africa, and South America because of the use of solid fuels for their stoves, lamps, and open fires for cooking and heating purposes. Examples of solid fuels include dung, firewood, coal and crop residues (Ramanathan, 2020; WHO 2018). The use of such materials compounded with inefficient burning stoves and poor ventilation systems lead to the concentration of dangerous air pollutants in the homes of three billion people who rely on such resources. Cooking indoors with solid fuels causes a high level of smoke where concentrations can exceed several thousand $\mu\text{g}/\text{m}^3$ of PM (Pope et. al., 2014). In 2017, the Global Burden of Diseases estimated that there was a 1000 fold greater death rate in LMICs due to HAP than in developed countries (2018). In Pakistan, 52% of the population and around 75% of the rural population is exposed to a high level of HAP (Fatmi et. al., 2020). Such exposure causes four million deaths a year of which three million are due to non-communicable disease such as pulmonary disease, heart disease, and stroke (Ramanathan, 2020; Campbell-Lendrum and Prüss-Ustün, 2019).

A study in rural Sindh, Pakistan found an increased risk of acute coronary syndrome among women who used solid fuels for cooking in their households compared to women who have not been using solid fuel for 15 years (Fatmi et. al., 2014). A case-control study from Peshawar, Pakistan reported 7.01% of chronic bronchitis cases compared to 2.29% in the control group and a higher incidence of chronic bronchitis in women 10 to 60 years old exposed to the burning of rice straws, wood-burning, dung cake, and grass in their households (Akhtar et. al., 2007). Another study from Dadu Sindh, Pakistan highlighted the high incidence of acute respiratory infection among children less than five years old who were exposed to HAP (Janjua et. al., 2012). A study in peri-urban areas in Karachi observed throat infection, eye congestion, breathing difficulties, cough, asthma, and nasal congestion where wood has been used as fuel for cooking compared to cleaner fuels (Siddiqui et. al., 2005). Another study from the semirural area of Karachi, Pakistan conducted on pregnant women reported low birth weight among those who used wood as fuel for cooking as compared to using natural gas (Siddiqui et. al., 2008). Previous literature from Pakistan has also established a strong



association between childhood pneumonia and indoor air pollution (Siddiqui et. al., 2009; Khan & Lohano, 2018). Literature suggests adverse pregnancy outcomes including low birth weight and stillbirths are significantly associated with HAP in Pakistan (Pope et. al., 2010).

The impact of air quality on health isn't only an issue for those in rural regions of the globe but also in cities experiencing urbanization and modernization. Although such activities are linked with economic progress, there are profound consequences on human health due to such endeavors. Children in cities are at a greater risk for inhaling high concentrations of air pollutants and developing respiratory conditions, such as asthma, that have lifelong consequences (Schwela, 2012). This is a global issue and China, and its capital Beijing, serves as a great example. The air conditions in Beijing have led to an "airpocalypse" as China continues to lead as the greatest international emitter of carbon dioxide (Beattie and Liu, 2016; Friedrich, Ge, Pickens, 2017). Beijing's air pollution has led to higher adult mortality from respiratory issues, such as lung cancer, which has increased substantially in the population although the smoking rate has not increased (Ye, 2015). During the 2020 UN General Assembly, President Jinping of China announced a national plan to reduce carbon emissions and be carbon neutral by 2060 (Xie 2020). China now joins other countries determined to go carbon neutral such as Canada, Austria, Chile, European Union, Finland, France, Japan and more (Darby and Gerretsen, 2019).

According to WHO estimates, in 2016, 336,000 deaths occurred in the Eastern Mediterranean Region due to ambient air pollution. Air pollution studies done in Pakistan showed one of Pakistan's two megacities (Karachi and Lahore) has one of the highest total suspended particle concentrations compared to the other major cities of the world (Fatmi et. al., 2012). In 2008, a study of air pollution level on morbidity reports that an exceptionally high concentration of PM_{2.5} is likely to result in a considerably higher hospital admission rate for cardiovascular and respiratory diseases in Karachi, Pakistan (Cohen et. al., 2017). A study conducted in Quetta has described that mean suspended particulate matter were high in concentration that exceeds the normal concentration, varied from area to area, and found high imprint score of suspended particulate matter respiratory diseases and SPM-reported premature deaths are very high, and the children were the most affected groups (Ilyas et. al., 2010). Another study conducted in the city of Quetta, Pakistan showed that the systolic and diastolic blood pressure were significantly lower among the children living in the low polluted area which is 108.3/66.4mmhg as compared to the children living in the highly polluted area (115.9/70.9mmhg) regardless of age, SES, weight, height, ethnicity, second-hand smoking, creatinine, potassium, and sodium level (Sughis et. al., 2012).



b. Rising Temperatures and Women and Children's Health

Vulnerable populations such as children, mothers, pregnant women, and low-income individuals are more likely to face the disproportionate effects of climate change to their health (McGill, 2016). Heatwaves, high seasonal temperatures and environmental heat are identified as critical climate change risks that present major health threats to these vulnerable populations, especially if they are already physiologically compromised (EEA, 2017; Barros et al., 2014). Global temperatures have increased over the century, especially after the industrial revolution, with the average temperature rising between 0.015-0.30 °C per decade (Rylander, Odland, and Sandanger, 2013). Increased ambient temperatures and heatwaves have a wide range of deleterious effects on health, both direct and indirectly. Indirect effects include increases in infectious diseases, soil drying and evaporation resulting in crop failure and livestock deaths, and wildfires. The direct impacts of heat exposure on health has not entered public discourse but are significant nonetheless. Common manifestations of heat exposure include increased mortality rates among the elderly or those with chronic non-communicable diseases (Gasparrini et. al., 2015), aggression, violence and suicide (Chersich et. al., 2019), as well as adverse pregnancy and birth outcomes such as preterm birth, low birth weight and stillbirths (Chersich et. al., 2020).

Climate variability and change, including longer and more intense periods of extreme heat, threatens to undo the hard-fought gains in maternal and child health over the past few decades, and threaten the possibility of achieving Sustainable Development Goals 1 and 3. Pregnant women have unique vulnerabilities, particularly in LMIC's, where pregnancy is often precarious, even in the absence of heat stress. The physiological and anatomical changes that occur during pregnancy pose particular challenges to thermoregulation, meaning that pregnancy per se increases the vulnerability of women to environmental hazards, including heat (Kuehn and McCormick, 2017). A recent systematic review of 70 studies published in the BMJ (with contributions from AKU), noted that almost all studies reported increases in rates of preterm birth and stillbirths during periods of extreme heat (Chersich et. al., 2020). In meta-analyses, risk of preterm birth rose 1.16 fold during heatwaves stillbirths increased 1.46 fold. Evidence also exists that shows heat exposure increases the risk of pre-eclampsia and postpartum haemorrhage (Tam et. al., 2008; Cil and Cameron, 2017). Long-term impacts of heat stress in pregnancy extend into adulthood, affecting health and economic prospects.



Neonates (infants in the first 28 days post-birth) are at high risk as they have a limited capacity to thermoregulate and are at greater risk of dehydration than adults (Kovats and Hajat, 2008). Neonates, especially those born preterm, have a range of vulnerabilities to extreme heat and are dependent on the mother for breastfeeding and hydration. Specific indirect pathways through which escalating temperatures impact maternal and neonatal health include raised rates of infections such as malaria and zika virus, behavioral changes, compromised health worker performance (ILO, 2019), socio-economic deterioration (Goldenberg et. al., 2008; Vos et. al., 2014), psychological stress (Harville et. al., 2015), vitamin deficiencies (Ebi and Carlos Corvalan, 2006), and food insecurity (Cil and Cameron, 2017).

Of relevance, many women continue to perform physical labor relating to house chores (e.g., fetching wood and water, and subsistence farming) during pregnancy. Exposure to extreme heat in occupational settings such as agriculture and other outdoor work may occur prior to pregnancy recognition and throughout pregnancy that has been linked to congenital anomalies in the neonate (Lin et. al., 2017; Okun et. al., 2009) Even late in pregnancy, women may push themselves beyond their heat tolerance limits to avoid losing their livelihoods or sources of income (Pope et. al., 2015). This is especially true in settings where maternity pay is rare and women have to work throughout pregnancy in order to save for the period after delivery (Masson et, al., 2019).

Heat exposure and adverse health impacts have major equity implications. Exogenous and endogenous heat exposures are concentrated in poorer populations, where there is less access to health services, poorer quality housing, lack of access to mitigating equipment such as air conditioning, lack of access to clean and reliable energy, and safe water.

More and more detailed understanding remains needed on the linkages and quantification of the linkages between climate exposures and maternal and neonatal health conditions. Such information is an important first step towards designing effective solutions to the unfolding climate crisis. Indeed, globally, the key solutions for protecting communities against extreme heat are poorly developed, especially local-level surveillance systems and Early Warning Systems that signal a heat wave event and set in motion interventions to protect the public (Ebi and Barrio, 2017). Evidence is urgently needed to clarify feasible and acceptable interventions and to support their rapid scale-up.

c. Migration, Conflict, Climate Change and Health



Climate change and the impact it has on exacerbating preexisting vulnerabilities is related to migration, displacement, and conflict. The relationship between these diverse factors and the health consequences are complex and isolating the environment as the primary driver is difficult to prove. However, climate change is undoubtedly an important factor in human migration, conflict, and health outcomes. Current data and information is limited but forecasts are predicting that by 2050 there will be between 25 million and 1 billion environmental migrants (Flavell and Chazalnoël, 2014). Furthermore, most environmental migrants will migrate internally from rural to urban regions. There are greater chances of cross border migration in East Africa and Asia due to drought and flood, respectively (Flavell and Chazalnoël, 2014).

One of the direct way's climate events influence human migration is when natural disasters increase humanitarian risk and requires human migration for safety reasons. One example is coastal areas and low-lying islands that are becoming progressively less habitable due to rising sea levels. Such climate change related events also increase competition for limited resources that can exacerbate tensions, which can lead to displacement and conflict (Brown, 2008). This can also increase migration into cities and further accelerate urbanization. As the human population increases in cities, there is increased competition for limited resources that increased the chance of conflict as well (Brown, 2008).

Developing countries face great challenges because a significant sector of the population derives their livelihoods from agriculture, livestock, forestry, water management and tourism. Climate related events lead to land degradation, drought, and desertification that directly impacts household incomes that may lead to migration as well (Brown, 2008). In addition to migration, data has shown that in low-income settings, extreme rainfall that impacts the agriculture sector is associated with higher rates of personal violence and property crime. Data has also shown that with every-one standard deviation change towards higher temperature, the frequency of interpersonal conflict increases by 4% and intergroup violence increases by 14% (Hsiang et. al., 2013).

The consequences of such events on health outcomes are immense. Aside from the direct impact on human health from such events, there is also damage to health care services and facilities, which may already be limited in LMIC countries. The groups of people who are most vulnerable to such events are, once again, women and children who already face great inequities in other facets of their lives that compounds the health consequences they experience.

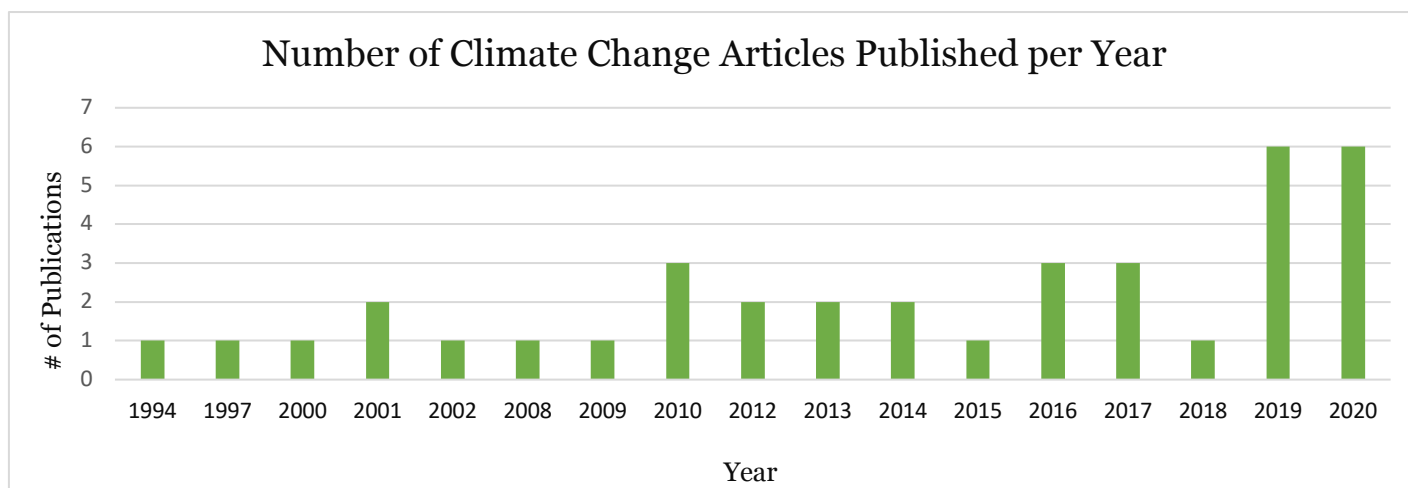


AKU's Climate Change Work History

The Institute for Global Health and Development is a new entity at AKU, but there is a modest record of climate change activities dating back to 1994. A literature review revealed a total of 39 publications having 43 unique AKU authors involving 92 unique external collaborators from 32 countries. The themes covered in the publications include:

- Air pollution/ quality and health
- Drinking water/ water purity
- Natural disasters and disease
- Large scale studies comparing countries/ different socioeconomic regions
- Determining relationships between various climate factors and health

Agboatwalla, M.	Ahmed, T.	Akhtar, S	Ali, N. A.	Azam, I.
Berendes, H. W.	Bhutta, Z. A	Chu, C.	Coggon, D.	Faizan, M. K.
Fatmi, Z	Fikree, F. F.	Haider, B. A.	Iqbal, R.	Jafri, L.
Jafri, W.	Jahangeer, A.	Jamali, T.	Kadir, M. M.	Khan, A. H.
Khan, S.	Khoja, A.	Khursheed, M	Luby, S.	Mashal, T.
McClure, E. M.	Menezes, E. V.	Midhet, F.	Nafees, A. A.	Naseer, M.
Pasha, O.	Rabbani, U	Rahman, A.	Rathi, S. K.	Rozi, S.
Shafiq, M.	Siddiqui, A. R.	Syed, A. H.	Taj, T.	Wasay, M.
Yakoob, J.	Yakoob, M. Y.	Zaidi, S.		



The recent growth in publications is evidence of growing faculty interest in the connections between climate change and health. This was confirmed by responses in faculty survey of interest levels in various areas of transdisciplinary research. The



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hundreds of registrations received for the Institute's first webinar relevant to climate change also confirms stakeholder interest in AKU's emerging plans for greater engagement and impact in this area

Developing the Institute's Strategy

The Institute for Global Health and Development has invited interested faculty to form a thematic working group on climate change and global health. This group will start to the work to develop the Institute's strategy, guided by the Institute's International Advisory Board and the University's Board of Trustees and Executive Leadership.

Research will be a major priority, focused especially on South Asia and East Africa. The University's investments in stronger infrastructure for data collection, analysis, and utilization will be essential to success, as will be the attraction of new talent with skills in data science and research interests in climate change as it pertains to health.

Beyond research, the Institute will develop avenues for strengthening education and training programmes, supporting innovations that advance precarious timelines for identifying and implementing solutions, and serving the interests of the communities and people served by the University.

There is much work to be done – and no time to lose.



Appendix A: Stakeholders for Engagement

<i>Type</i>	Organization	Year Established	Purpose	Focus Countries	Key Resources/ Activities
UN Groups	World Health Organization	1948	WHO works worldwide to promote health, keep the world safe, and serve the vulnerable.	194 member states	<ol style="list-style-type: none"> Promote intersectoral approaches for health Prioritize health in all policies and healthy settings. Climate change in small island developing states
	The United Nations Environment Programme (UNEP):	1972	Provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.	193 member states	<ol style="list-style-type: none"> Multiple working groups subdivisions, one of which is climate change
	United Nations Framework Convention on Climate Change (UNFCCC)	1994	UNFCCC is the UN entity tasked with supporting the global response to the threat of climate change.	197 parties	<ol style="list-style-type: none"> Intergovernmental climate change negotiations Technical expertise and implementation of policies (reference Appendix B) Negotiation sessions yearly
	International Organization for Migration (IOM)	1951	IOM supports migrants across the world, developing effective responses to the shifting dynamics of migration and, as such, is a key source of advice on migration policy and practice.	173 member states and 8 observer states	<ol style="list-style-type: none"> Migration Data Portal Migration Law Database Research and Publications



	The Intergovernmental Panel on Climate Change (IPCC)	1988	To provide governments at all levels with scientific information that they can use to develop climate policies.	195 member states	1. Scoping meetings 2. Workshops and expert meetings for several working groups
Funders	Reference the IGHD Funders report for more information.				
Government Entities	Ministry of Climate Change- Government of Pakistan		Develop national policies, working groups, projects, and standards related to climate change and Pakistan.	Pakistan	
	Uganda Ministry of Water and Environment	2007	To promote and ensure the rational and sustainable utilization, development and effective management of water and environment resources for socio-economic development of the country'	Uganda	Developed Uganda National Climate Change Policy
	Kenya Climate Change Working Group (KCCWG)	2009	To come together to form a united front in confronting the causes and effects of climate change in broad and specific terms in Kenya, Africa, and elsewhere where their contribution	Kenya	Developed Kenya National Climate Change Action Plan- 2013



			would be needed.		
Global Coalitions	Climate Action Network		CAN is a network of NGOs working on climate change from around the world.	Global	1. Eastern Africa Division 2. Multiple working groups, policy work, research publications, regional and national chapters.
	World Federation of Public Health Associations	1967	The only worldwide professional society representing and serving the broad field of public health internationally to make a difference in the health of the people in today's globalised world.	Global, over 5 million members	1. Working group on environmental health 2. Policy, advocacy, and more
University Based Groups (Researchers, Scientists, Experts)	Center for Climate Change Communication- George Mason University	2007	We develop and apply social science insights to help society make informed decisions that will stabilize the earth's life-sustaining climate and prevent further harm from climate change.		1. Research 2. Training 3. Engagement
	The Climate Change and Global Health Research Group- University of Alberta		The Climate Change and Global Health Research Group conducts community-based, participatory epidemiology at		1. Advancing Climate-Health Knowledge 2. Training and Developing Climate-Health Capacity 3. Shaping Policy and Informing Practice 4. Serving Science, the Academy, and Society



			the social-environment-health nexus, in the context of global environmental change.		
	UCSF Climate Change and Global Health		Mobilizing a stronger international response to climate change.		Develop partnerships to conduct original analyses, convene climate and health leaders, and translate rigorous evidence on the health impacts of climate change into climate-smart policy.
	University of Washington, Center for Health and the Global Environment (CHanGE), US		CHAnGE collaboratively develops and promotes innovative approaches to understanding and managing the risks of global environmental change.		CHAnGE conducts research and policy analysis, education and training, and technical assistance and capacity building, integrating health, environmental, and social sciences.
	London School of Hygiene and Tropical Medicine, Centre on Climate Change & Planetary Health, UK		To generate evidence-based solutions for planetary health.		Conduct research, create solutions, nurture leaders, support programs, and provide guidance.
	CICERO, Center for International Climate Research, Norway		We deliver new insight that help solve the climate challenge and strengthen international climate cooperation.		CICERO has a national role in promoting knowledge about climate change and is internationally recognised as a driving force for innovative climate communication. We are in constant dialogue about the responses to climate change with public and private decision makers, government administration and civil society.



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<i>NGOs and Civil Society</i>	<u>Click here for a list of 619 groups based in Europe, Africa, Asia, North America, and Latin America that work on climate and environment issues</u>				
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Appendix B: Climate Change and Health Policies

Policy	Policy Host	Year Initiated	Purpose	Scope
Global Policies				
Kyoto Protocol	United Nations Framework Convention on Climate Change	1997	“Stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system” ¹	Member state signatories
Paris Agreement	United Nations Framework Convention on Climate Change	2015	“Keep the global average temperature rise this century as close as possible to 1.5 degrees Celsius above pre-industrial levels.” ¹	Member state signatories
National Policies				
National Climate Change Policy- Pakistan	Ministry of Climate Change	2012	To ensure that climate change is mainstreamed in the economically and socially vulnerable sectors of the economy and to steer Pakistan towards climate resilient development. 10 core policy initiatives. ²	Pakistan
National Climate Change Action Plan 2018-2022	Ministry of Environment and Forestry	2018	First country in Africa to develop climate change dedicated legislation. Emphasizes sustainable development, adaption, and mitigation. ³	Kenya

¹ <https://unfccc.int/about-us/about-the-secretariat>

² http://www.gcisc.org.pk/National_Climate_Change_Policy_2012.pdf

³ <https://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2018/10/8737.pdf>



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