Bridging Borders, Building Futures: The Journey to EWB-Pakistan

A Founding White Paper

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Executive Summary

EWB Pakistan is a volunteer-run engineering organisation founded in July 2025. Our mission is motivated by Pakistan’s standing amongst the most climate vulnerable nations in the world. Floods, glacial instability, water scarcity, and extreme heat are realities that already shape the lives of millions. Yet sustainability, if properly understood, extends beyond climate alone.

The present generation's needs, to move safely, live securely, and rely on the systems around them, are not being met at all. By this measure, Pakistan's crumbling roads and unsafe streets represent the same kind of failure as its climate exposure, even where the causes differ entirely.

Considerable work is already underway, from government climate commitments to civil society projects delivering real results in specific communities. Yet much of this progress remains concentrated in particular regions and institutions, leaving a wider opportunity largely untouched: the engineering talent filling Pakistan's universities and cities, often unaware of how directly its skills could be applied to the country's most pressing challenges, and rarely given the structure needed to turn intention into implemented change.

EWB Pakistan endeavours to close this gap through: technical partnerships, national awareness efforts, and a design challenge intended to turn young engineering talent into implementing sustainable and long lasting, community-serving solutions. This paper sets out that reasoning in full, and closes with an invitation: to volunteer, to collaborate, to contribute an idea, or to help fund the work ahead.

Introduction

Pakistan experiences climate change as an everyday development challenge rather than a distant environmental concern. Its impact fall hardest on communities with the fewest resources to adapt, in a country that contributes less than one percent of global greenhouse gas emissions.[1]

Engineers Without Borders began internationally as a movement built on the belief: engineering should serve people and help communities meet their basic needs with dignity. Member chapters work across borders to mobilise students, professionals, educators, and partners to support community-led solutions in affected areas. From sanitation to renewable energy, resilient infrastructure and disaster preparedness. EWB Canada and EWB Zambia, for example, have

installed solar power in secondary schools together, and EWB Netherlands is working in Ghana to turn waste into construction material. EWB Pakistan is now a startup member of this network.

The journey to create EWB-Pakistan comes from the conviction that Pakistan's engineering talent, both at home and across the diaspora, can be organised into a national force for service, resilience, and sustainable development if they have a structure to work within. As a founder, this white paper is both a reflection and a call to action: a reflection on why EWB-Pakistan is needed now, and a call to engineers, universities, communities, institutions, and partners to build something that outlives individual ambition and serves the country with purpose.

Understanding Sustainability and Pakistan’s Issues

Sustainability is often invoked loosely, so it merits precision. The most widely cited definition comes from the United Nations World Commission on Environment and Development's 1987 report, Our Common Future, which defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[2] A related definition, articulated seven years earlier by the International Union for Conservation of Nature, the United Nations Environment Programme, and the World Wide Fund for Nature in the 1980 World Conservation Strategy, held that development is sustainable only if it accounts for its social and environmental consequences alongside its economic ones, weighed across both immediate and long-term horizons.[3]

By this standard, Pakistan's sustainable progress demands close attention to a wide range of matters, from climate pressures such as flooding and water scarcity, to social and civic concerns such as failing infrastructure and public safety. Each represents a distinct front on which the present generation's needs are, or are not, being adequately met. The sections that follow examine this range in full, beginning with the climate pressures confronting Pakistan.

Climate Pressures Facing Pakistan

Pakistan's exposure to climate change is not a projection for some distant future. It is a present, recurring reality, and its scale is difficult to overstate. According to Germanwatch's Climate Risk Index 2025, Pakistan was ranked the country most affected by extreme weather events in 2022, driven largely by that year's floods.[4] Record-breaking monsoon rainfall, which some models suggest climate change intensified by as much as fifty percent in Sindh and Balochistan,[5] combined with glacial lake outburst flooding to affect more than thirty three million people and claim over 1700 lives.[4] The economic toll was equally severe, with physical damages nearing fifteen billion dollars,[6] a burden made starker by the fact that Pakistan contributes less than one percent of global greenhouse gas emissions.[1]

Water security compounds this vulnerability. Pakistan’s first census in 1951 yielded a per capita water availability of 5,260 cubic metres a year. By 2025, that figure had fallen to 899 cubic metres, placing the country firmly below the internationally recognised threshold of water scarcity.[7] This decline is driven by rapid population growth set against a water infrastructure that has remained largely unchanged for decades, leaving agriculture, drinking water supply, and industry increasingly dependent on a shrinking and unreliable resource.

In the country's north, the glaciers that feed the Indus River system are themselves in retreat. More than 3000 glacial lakes have formed across Gilgit Baltistan and Khyber Pakhtunkhwa as warming temperatures accelerate glacial melt, of which 33 have been formally assessed as prone to hazardous outburst flooding.[8] Over 7 million people living downstream remain exposed to this risk, a threat that has already materialised in past flooding events and is projected to intensify as glacial retreat continues.

Rising heat compounds these pressures further. In June 2024, a prolonged heatwave across Karachi and southern Sindh sent thousands of people to hospital with heatstroke, with provincial authorities reporting more than 6,000 admissions by 27 June. The Edhi Foundation recorded 568 bodies at its Karachi morgues in six days, which it linked to the heat, though local authorities disputed that attribution and confirmed far fewer deaths.[9] Jacobabad reached 51°C in May 2022, among the hottest temperatures recorded anywhere on Earth that year, and attribution scientists found that the wider heatwave across India and Pakistan that spring was made roughly thirty times more likely by human-caused climate change.[10] For a population with limited access to reliable electricity and cooling, these heatwaves represent a mounting threat to public health that recurs with growing frequency and severity each year.

Taken together, these pressures, flooding, water scarcity, glacial instability, and extreme heat, illustrate a climate reality that is already reshaping daily life across Pakistan, and one that is expected to intensify in the years ahead. Yet a full accounting of the country's sustainability challenges cannot stop here. The systems meant to carry Pakistan through these pressures, its roads, its cities, its everyday public infrastructure, warrant the same scrutiny.

Civic and Infrastructure Unsustainability

Sustainability, as established, extends beyond climate to the everyday systems people depend on to move safely through their own cities. Pakistan's road network illustrates this clearly. In 2021 alone, road traffic crashes claimed an estimated twenty eight thousand lives nationally, according to WHO estimates, accounting for over two percent of all deaths in the country.[11] Pedestrians alone account for about 41 percent of these deaths, and together with cyclists and motorcyclists, vulnerable road users make up roughly half of the total,[12] a pattern that reflects infrastructure designed with little regard for those travelling outside a car. An assessment by the International Road Assessment Programme found that as of 2024, only one percent of Pakistan's roads meet a basic safety standard for pedestrians.[13] These outcomes are not the product of any single failure, but of infrastructure, vehicle standards, and safety data that have not kept pace with the country's growth.

Public safety in urban centres tells a related story. In Karachi alone, over sixty four thousand street crime incidents were officially reported in 2025.[14] Yet official figures likely understate the true scale, as many residents anticipate harassment, delays, or refusal at police stations and choose not to report incidents at all, meaning reliable, real time information about where and when such risks are highest is often simply unavailable to the people who need it most.[15] This is, at its core, an information and infrastructure gap as much as a security one: residents frequently lack the tools to make informed, everyday decisions about their own safety, and the systems meant to generate that information remain thin and inconsistent.

Neither of these challenges stems from a single cause, and neither will be solved by infrastructure investment alone. But both illustrate, in concrete terms, how the present generation's needs, to move and live safely, are going unmet in ways that have little to do with climate, and everything to do with systems that were never built, resourced, or maintained with people's daily safety in mind.

Efforts Already Underway

None of these challenges have gone unaddressed, and it is worth recognising the work already underway. On the environmental front, Pakistan's Ministry of Climate Change has taken concrete steps in recent years: the country submitted its Third Nationally Determined Contribution to the United Nations Framework Convention on Climate Change in September 2025, committing to cut projected greenhouse gas emissions by up to 50% by 2035 (17 percent unconditionally and a further 33 percent conditional on international support) and outlining an estimated investment requirement of over five hundred and sixty five billion dollars to do so.[16] This has been paired with a National Climate Finance Strategy, launched in November 2024, to help direct resources toward adaptation.[17] On matters beyond climate, government efforts are similarly underway: the National Road Safety Strategy 2018–2030, launched in 2018, sets out action plans centred on roads, vehicles, and drivers, with the aim of saving 6,000 lives that would otherwise be lost in road crashes.[18]

Civil society has matched this with direct, community-level work, often reaching communities faster than national policy can. The International Rescue Committee’s LIFE project, funded through the Australian Government’s Water for Women Fund, aimed to bring climate-resilient water, sanitation, and hygiene services to about 168,000 people across 75 villages in three districts of Khyber Pakhtunkhwa.[19] A successor phase, LIFE-II, focused on gender equality and social inclusion within climate-resilient WASH interventions.[20] Elsewhere, UNICEF and the Khyber Pakhtunkhwa government, with funding from the UK Foreign, Commonwealth & Development Office, rehabilitated 17 water supply schemes in Swat damaged by the 2022 floods, using elevated and reinforced structures to withstand future flash floods, benefiting over 122,000 people.[21]

The Gap

The efforts already underway are real and consequential, but they are not sufficient. Three gaps in particular stand between the progress already made and the progress still needed: a gap in reach, a gap in awareness, and a gap in collaboration.

Much of the most effective climate and sustainability work in Pakistan today is concentrated in rural and flood-affected districts, delivered through targeted, donor-funded projects. This work is necessary, but it leaves out a large and important population: students and young professionals in Pakistan's major cities, many of them trained at the country's leading universities, who are rarely engaged with these issues as a matter of professional responsibility rather than distant charity. Sustainability is too often treated as something that happens elsewhere, to other people, rather than a challenge that the country's own emerging engineering talent is equipped, and needed, to help solve.

Alongside this sits a quieter gap in awareness. Many of Pakistan's brightest engineering graduates enter the workforce with strong technical training but limited exposure to how that training could be applied to the country's climate and infrastructure challenges. Sustainability, resilience, and community-centred engineering are rarely treated as core parts of an engineer's professional identity

in Pakistan, leaving considerable talent and potential goodwill underutilised simply because it was never pointed in this direction.

More structural still is the absence of collaboration between those who could close these gaps together. Pakistan is not short of the people needed: technical experts who understand the problems in depth, engineers and enthusiasts willing to build and implement solutions, and government bodies with the policy authority to scale what works. What is missing is the connective structure between them. Technical solutions rarely reach the engineers who could implement them at scale; grassroots implementation rarely reaches the policy support needed to sustain it; and policy, in turn, is rarely informed by what is actually working on the ground. Without this connective structure, good intentions and real capability remain fragmented rather than compounding into lasting impact.

How EWB Pakistan Closes This Gap

EWB Pakistan is a young organisation, and we do not claim to have solved these gaps. What we offer is a model built specifically to close them, one that connects research, engineering capability, and community practicality rather than leaving each to work in isolation. An early example of this in practice is our engagement with the Borrowed Earth Project, an organisation running youth climate research fellowships across Pakistan, which approached EWB Pakistan to support the development of an early warning system for glacial lake outburst floods in Gilgit-Baltistan.[22] Once the fellowship's research is complete, EWB Pakistan's engineers will take on the technical design itself, with a deliberate focus on building something affordable and serviceable by the very communities it is meant to protect. This kind of collaborative, hand-off model, connecting an organisation gathering ground-level knowledge with the engineering capacity to act on it, is the kind of partnership work we intend to pursue more broadly wherever the need for it arises.

EWB Pakistan's second pillar of focus is to raise awareness. We intend to run conferences, webinars, seminars, and informative video content aimed at both school-age students and university audiences, extending engagement well beyond the rural, project-specific settings that most existing efforts have reached. The aim is simple: to make Pakistan's climate and civic sustainability challenges as familiar to a student in Lahore or Karachi as they already are to a farmer in a flood-affected district, and to establish that engineers carry a professional stake in these issues, not merely a passing charitable interest in them.

The centrepiece of our approach is a national design challenge, presenting students with the real sustainability issues Pakistan is facing and inviting them to develop technically and financially sound solutions. This is where the organisation's model comes together in full, drawing on the reach and awareness efforts above to give the country's brightest young engineers a genuine outlet for their thinking, rather than leaving that talent untapped. Winning teams will not simply receive a prize; EWB Pakistan intends to work directly with them toward implementation, raising funding and providing professional engineering support to help move winning ideas from proposal to reality.

Who We Are

EWB Pakistan was founded in July 2025, after a series of interviews with the board we received official startup member confirmation from Engineers Without Borders International, marking the beginning of our journey toward full membership. We are currently awaiting NGO registration within Pakistan, a step that will formalise our standing as we work toward full EWB membership status. As founder and president of Engineers Without Borders - Pakistan, I lead an entirely volunteer-run organisation, built by engineering professionals and students spanning a wide range of technical backgrounds, based both within Pakistan and across the diaspora. Alongside this, we are drafting our organisational charter and internal policies, steadily gathering volunteers to support the range of tasks this work requires, and building a social media presence to reach students, professionals, and partners who share this mission.

Perhaps our greatest asset, beyond our volunteers, is the network we now belong to. Engineers Without Borders operates in numerous countries worldwide, with member organisations that have spent years designing and implementing engineering solutions for underserved communities. As part of this network, EWB Pakistan is able to draw on established technical expertise, financial guidance, and hardwon lessons from organisations that have already faced many of the challenges we are only beginning to encounter. We do not start this work alone. We start it as part of a global community already committed to the same mission we have set for Pakistan.

The Appeal

Pakistan does not lack talent, ambition, or heart. What it needs is a place for that talent to gather, and a mission worth gathering around. EWB Pakistan exists to be that place.

We are asking you to be part of building something that did not exist a year ago and that we believe Pakistan has long needed: an engineering community organised not around individual careers, but around collective service to the country that shaped us. This is not a call reserved for climate scientists, disaster experts, or seasoned professionals alone. It is a call to anyone who has ever looked at Pakistan, its floods, its fraying infrastructure, its overlooked corners, and felt that it deserved better, and wondered what they could actually do about it.

If you are an engineer, a student, or simply someone with a few hours to spare and a willingness to contribute, we want you. Background matters far less than intent. Whether you can offer technical expertise, help run an event, support a research fellow, or simply lend a few hours a month, there is a place for you in this effort, and every hour given moves this mission forward.

If you have an idea, one that could genuinely help a community if it were properly developed and implemented, we want to hear it. Some of the most important solutions Pakistan needs will not come from institutions. They will come from someone who noticed a problem closely enough to imagine a way through it.

If you are in a position to collaborate, as an organisation, an institution, or a fellow changemaker, reach out. And if you are able to support this work financially, know that every contribution goes directly toward building the kind of engineering-led solutions this country urgently needs, designed with the people they serve in mind, from the first sketch to the finished system.

This paper is not meant to dwell on what is broken. It is meant to gather those who intend to fix it. Pakistan's engineers, at home and scattered across the world, have always had the ability to build a better future for this country. EWB Pakistan is where we intend to do it together, and we would be glad to have you with us.

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