



Dimensions and Challenges of Sustainable Development: A Case Study of Pakistan

Abdul Aziz ¹ Prof. Dr. Manzoor Khan Afridi ²

¹ Ph.D. Scholar at the Department of Politics & IR, Faculty of Social Sciences, International Islamic University, Islamabad, Pakistan.

² Dean Faculty of Social Sciences, International Islamic University, Islamabad, Pakistan.

Email: manzoor.afridi@iiu.edu.pk

Corresponding Author: 70chinar@gmail.com

ARTICLE INFO

Vol. 3, Issue 2, 2024

Pages: 217-231

Received:

2024-11-16

Revised:

2024-12-04

Accepted:

2024-12-31

Keywords:

Sustainable development, Sustainable development in Pakistan, Dimensions of sustainable development, Challenges of sustainable development, Pakistan.

ABSTRACT

This study examines the sustainable development in Pakistan, emphasizing the challenges and ways for achieving resilience and progress. Sustainable development which balances environmental preservation, social equity and economic growth is essential for addressing Pakistan's pressing issues such as global warming, climate change, biodiversity loss and resource depletion. The study focuses on Pakistan's commitment to global sustainability frameworks including the UN SDGs (United Nations' Sustainable Development Goals) and Agenda 2030 as guiding principles for national development.

Key findings disclose that while Pakistan has made strides in health, education and clean energy access, significant impediments persist in areas like climate action, economic growth and policy implementation due to resource constraints and governance challenges. Natural disasters particularly floods and environmental degradation further aggravate these issues, stressing the need for integrated and inclusive strategies across sectors such as energy, agriculture and urban planning.

The research concludes that Pakistan's sustainable development efforts must prioritise resource efficiency, resilience-building and the localisation of SDGs. By fostering partnerships with international organisations and enhancing policy frameworks and leveraging innovative solutions, Pakistan can address its sustainability challenges and pave the way for a more equitable and sustainable future.



Content from this work may be used under the terms of the [Creative Commons Attribution-Share-Alike 4.0 International License](#) that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.

Introduction

1. Background

Sustainable development is a complex and elaborate concept that seeks to strike a balance involving social equity, environmental protection and economic growth. It emerged as a critical framework when people became conscious of the shortcomings of old development models resulting in significant environmental degradation, economic constraints and social inequality. Sustainable development was described in the seminal Brundtland Report "Our Common Future" which emphasised the significance of development in a way that satisfies the requirements of both present and future generations (Brundtland, 1987).

The Sustainable Development Goals (SDGs) which were endorsed by the UN in 2015, have increased the importance of sustainable development in recent years. These 17 goals offer a thorough road map for tackling global challenges like poverty, inequality, climate change, environmental degradation, peace and justice in order to create a better and more sustainable future for everyone. The SDGs highlight the need for inclusive and integrated initiatives by illuminating the interconnection of the environmental, social and economic aspects of development.

The literary work on sustainable development has grown significantly, encompassing a wide range of perspectives and approaches. Scholars like Sachs contend that sustainable development requires a profound transformation in how societies organize their economies, govern their institutions and interact with the natural environment (Sachs, 2015). The values of equity, resilience and inclusivity serve as the foundation for this transformation, guaranteeing that the advantages of development are shared evenly and that marginalized populations are safeguarded. The World Economic Forum emphasizes how digital technologies may propel sustainable solutions in the fields including smart cities, sustainable agriculture, and renewable energy. These advancements have the potential to improve quality of life, lower environmental impacts and increase resource efficiency, especially in urban areas where the majority of global population lives.

The yearly United Nations Climate Change Conference (COP) continues to play a vital role in fostering dialogue and collaboration among participants and brings together governments, businesses and civil society to discuss and negotiate climate action and sustainable development strategies (UNFCCC, 2021). These forums facilitate the sharing of the best practices, the formation of partnerships and the mobilization of resources necessary to achieve the SDGs.

Sustainable development represents an essential strategy for addressing the multifaceted and interconnected challenges of the 21st century. All sectors of society must work together to create, implement and come up with solutions that promote social cohesion, economic prosperity and environmental sustainability. As the entire community works through these issues, the ideas and methods of sustainable development will continue to serve as a framework for creating a more sustainable and equitable world.

2. The Context of Pakistan

Sustainable development is critical for Pakistan because of the country's significant economic, environmental and social concerns, which include poverty, resource depletion and climate vulnerability. With a population of over 230 million, rapid urbanization and climate-related hazards including droughts and floods, Pakistan's sustainable development initiatives focus on striking a balance between social justice, environmental preservation and economic progress.

Because of Pakistan's susceptibility to climate change, sustainable development is very important. Pakistan's economy has been severely impacted by environmental deterioration and natural

calamities, especially floods, hence incorporating sustainable practices is crucial for long-term resilience. Reducing carbon emissions, increasing resource efficiency and fostering economic stability can all be achieved by addressing sustainable development in Pakistan's energy, agricultural and urban planning sectors. Consequently, sustainable development is critical in building a resilient Pakistan capable of sustaining growth while managing environmental challenges.

Pakistan has made major commitments to international sustainability frameworks, including the United Nations Sustainable Development Goals (SDGs) and Agenda 2030, which establish targets for addressing global concerns such as poverty, inequality, climate change and environmental degradation. As a signatory to the SDGs, Pakistan embraced the goals in 2015 and has subsequently built frameworks to localize and achieve them. In order to promote efforts to combat poverty, enhance health and safeguard the environment, the Ministry of Planning, Development and Special Initiatives has integrated the Sustainable Development Goals (SDGs) into Pakistan's national development plan (Government of Pakistan, 2022).

Pakistan's Voluntary National Review (VNR) report, given at the UN High-Level Political Forum in 2021, focusses on the country's progress and problems in reaching the SDGs. According to the report, Pakistan has achieved progress in sectors such as health, education and clean energy availability, but there are impediments to climate action and economic growth due to resource constraints and policy implementation issues. Agenda 2030 has led Pakistan's approach to aligning national development goals with global sustainability norms, creating collaborations with organizations such as the World Bank and UNDP to promote capacity-building and policy frameworks (UNDP, 2021).

While Pakistan confronts major obstacles in implementing sustainable practices, the country's commitment to global sustainability standards is a positive step towards a more resilient and prosperous future. By prioritizing SDG targets and adhering to Agenda 2030, Pakistan is pursuing sustainable development paths that benefit both current and future generations.

Theoretical Framework

The theory of sustainable development investigates how countries might concurrently attain social justice, environmental conservation and economic prosperity. It provides a framework for balancing current developmental requirements while ensuring that future generations can meet their own. Ecological Modernization is a current perspective on sustainable development that proposes achieving economic growth and environmental protection at the same time through technology breakthroughs and policy reforms (Mol and Sonnenfeld, 2000). The other one is Green Theory which calls for a fundamental transformation in human-environment relation and the adoption of eco-centric values (Dryzek, 2022). Key Concepts in Sustainable Development Theory include: -

- The principle of **Intergenerational Equity** which says that the development should meet the need of the present without compromising the ability of future generations to meet their own needs.
- **Three Pillars of Sustainability** i.e. Economic Sustainability which ensures long-term economic growth without depleting natural resources, **Environmental Sustainability** that focuses on conserving ecosystems and biodiversity while reducing pollution and resource overuse and **Social Sustainability** which emphasizes equity, inclusivity and access to basic human needs, such as education, healthcare and housing (Sachs, 2015).

- Sustainable development theory stresses on **Interconnectedness** i.e. the interdependence of ecological, economic and social systems, requiring integrated solutions to complex global problems (Rockstrom et al., 2009).
- Modern interpretations of sustainable development incorporate **Resilience and Adaptability** which are part of resilience theory, advocating for adaptive systems capable of responding to environmental and socio-economic shocks.
- Effective sustainable development involves the **Participatory and Inclusive Governance** where participation of all stakeholders, including governments, civil society and the private sector in decision-making processes is required.

Literature Review

“The Age of Sustainable Development” is a comprehensive work by Sachs in which he outlines the principles of sustainable development, providing a detailed analysis of the interactions between economic growth, social inclusion and environmental sustainability. He emphasizes the importance of integrated approaches to address global challenges (Sachs, 2015).

Book on “Sustainable Livelihood and Rural Development” by Scoones revisits the sustainable livelihoods framework, which integrates social, economic and environmental aspects of development. His work underscores the need for policies that support rural livelihoods while promoting sustainability (Scoones, 2015).

Article captioned “What is Sustainable Development? Goals, Indicators, Value, and Practice” provides a comprehensive overview of the evolution of sustainable development goals (SDGs), discussing the indicators and values that underpin the global agenda for sustainability (Kates, et al., 2005).

A seminal article on the topic “A Safe Operating Space for Humanity” introduces the concept of planetary boundaries, identifying critical threshold for key environmental processes. The writers provide a scientific basis for understanding the limits within which humanity can safely operate (Rockstrom et al., 2009).

Book with the title “Less is More: Degrowth will Save the World” critiques the dominant growth-centric development paradigm, advocating for regrowth as a pathway to achieving sustainability. The author provides case studies illustrating how reduced consumption and production can lead to more equitable and sustainable outcomes (Hickel, 2020).

In the book "Global Environmental Governance Reconsidered," the authors analyses the functions of states, non-state actors and international organizations in promoting sustainable development in order to assess the efficacy of global environmental governance structures. This book provides a novel viewpoint by analyzing global governance in terms of three main trends i.e. the emergence of no state actors, new transnational cooperation mechanisms and increasingly segmented and overlapping layers of authority as demonstrated by advancements in global sustainability governance (Biermann & Pattberg, 2012).

“Global Sustainable Development Report 2019: The Future is Now – Science Achieving Sustainable Development” emphasizes the role of science in achieving the SDGs, highlighting key areas for action and the importance of integrated, cross- sectoral approaches (United Nations, 2019).

“World Development Report 2020: Trading for Development in the Age of Global Value Chains” explores the relationship between global value chains and sustainable development, analysing how trade policies can be aligned with sustainability goals (World Bank, 2020).

"Climate Change 2021: The Physical Science Basis," the assessment report from the Intergovernmental Panel on Climate Change (IPCC), offers a thorough analysis of the physical science of climate change and highlights the pressing need for adaptation and mitigation measures in order to achieve sustainable development (IPCC, 2021).

A transition to a circular economy, which aims at minimizing waste and making resources useful, is gaining traction. The article captioned “The Circular Economy – A New Sustainability Paradigm?” evaluates the circular economy ideas, discussing its potential for enhancing sustainability (Geissdoerfer et al., 2017).

Urban sustainability is a growing focus, with researchers examining how cities can lead the way in implementing sustainable practices. “C40 Cities Climate Action Planning Framework” provides guidelines for cities to develop and implement climate action plans that align with sustainable development objectives (C40 Cities Climate Leadership Group, 2018).

Social innovation is increasingly recognized as a key driver of sustainable development. The book “Social Innovation: Blurring Boundaries to Reconfigure Markets” explores how social innovation can address sustainability challenges by fostering new business models and practices. The book addresses three main themes in social innovation i.e. strategies and logics, performance measurement and governance and finally sustainability and the environment (Nicholls & Murdock, 2011).

Formation of the 5Es framework outlines five key pillars designed to guide Pakistan back towards non-inflationary sustainable growth and long-term national prosperity. 5Es include Exports, e-Pakistan, Environment and climate change, Energy and infrastructure and Equity / ethics / empowerment. The successful implementation of the 5Es framework in the light of which the 13th Five Years Plan (2024 to 2029) has been developed, changes our crisis-driven, short term and reactive approach to emerging challenges into a proactive, long-term strategic response for sustainable development and provides a solid foundation for a long-term sustained growth trajectory (Ministry of Planning, Development & Special Initiatives, 2024).

Methodology

The research work utilizes a qualitative research approach to explore the sustainable development challenges in Pakistan and recommend a way forward. Qualitative method allows for in-depth exploration, understanding of contextual factors and examination of multiple perspectives. Policy documents, reports, international agreements, articles, books and relevant literature have been analyzed to understand the historical context, policy frameworks and Pakistan’s engagement with sustainable development framework.

Structured interviews were arranged to gather knowledge, insight, perspective and experiences related to the topic of research. Interviews provide rich qualitative data and allow for a deeper understanding of the complexities and dynamic of the subject matter. Key stakeholders who possessed valuable insights and experiences, including academicians, policymakers, representatives from various ministries, organizations, departments, international organizations and institutes and civil society have been interviewed. Relevant participants directly involved in Pakistan’s climate change, environmental and sustainable development policies were made part of purposeful sampling.

Relevant policy documents, reports, international agreements and other official documents have been analysed to provide a comprehensive understanding of the Pakistan's engagement with sustainable development goals.

Dimensions of Sustainable Development in Pakistan

1. Economic Dimensions

Sustainable development is increasingly seen as essential for Pakistan's long-term economic and social well-being. Economic growth and stability are crucial for sustainable development, especially in developing nations like Pakistan, where poverty, unemployment and inequality are persistent issues.

1.1. Economic Growth and Poverty Reduction

Economic growth plays a fundamental role in reducing poverty and promoting sustainable development. Pakistan has experienced fluctuating economic growth rates over recent decades, with poverty reduction efforts achieving mixed success. According to the World Bank, approximately 21.9% of Pakistan's population lives below the poverty line (World Bank, 2024). Sustainable economic growth can help to reduce poverty by providing jobs, increasing incomes and improving access to services. Sustainable poverty alleviation, on the other hand, necessitates a balanced approach that incorporates both economic and environmental concerns in order to prevent depleting Pakistan's natural resources while promoting prosperity (UNDP, 2021).

1.2. Unemployment, Inequality and Inflation

Unemployment, inequality and inflation are main hurdles to Pakistan's sustainable development. Pakistan's youth unemployment rate remains high, with a considerable gender gap limiting female participation in the labour force. High unemployment impairs economic progress, exacerbates social disparities and puts additional strain on welfare programs. Unemployment must be addressed through skill development, vocational training and policy reforms to ensure sustainable development.

Income disparity is another issue. Wealth concentration in cities contrasts with widespread poverty in rural areas, resulting in an unequal distribution of resources and opportunity.

Inflation, particularly food and energy prices, compounds poverty and inequality by reducing purchasing power and disproportionately impacting those with low incomes. Addressing these concerns through focused economic strategies and social safety nets is crucial for Pakistan's inclusive sustainable growth.

1.3. Role of Agriculture, Industry and Trade

Agriculture, industry and trade are the pillars of Pakistan's economy, each with its own contribution to sustainable development. The agricultural sector, which employs around 37.4% of Pakistan's workforce, is critical to food security and rural livelihoods (FAO, 2025). However, the sector faces issues such as water scarcity, soil degradation and climate change, which endanger its future sustainability. Initiatives that promote climate-resilient agricultural practices, such as effective water management and crop diversity, can help to sustainable growth.

The industrial sector, particularly the textile industry, makes a considerable contribution to Pakistan's GDP and exports. However, industrial activities are a major cause of pollution and resource depletion. Adopting green manufacturing techniques, lowering emissions and installing waste management systems are all examples of sustainable development efforts.

Trade policies also affect sustainable development while expanding export markets can boost growth, sustainable trade practices are imperative to ensure that economic expansion is not detrimental to the environment.

2. Environmental Dimensions

Sustainable development in Pakistan is inextricably linked to its environmental health. The country's distinct terrain and climate render it especially vulnerable to a variety of environmental challenges, including climate change, deforestation, biodiversity loss and pollution.

2.1. Climate Change Impacts

Climate change presents a substantial threat to Pakistan's sustainable development. The country ranks among the top ten most vulnerable to climate-related risks, including extreme weather events and temperature fluctuations. Frequent floods, prolonged droughts and glacial melting in the northern regions are some of the most pressing issues. For instance, floods in 2022 displaced millions, damaged infrastructure and disrupted agricultural production, undermining food security. Pakistan boasts over 7,000 glaciers which is the highest number of glaciers anywhere in the world outside the polar regions, which are melting at an accelerated rate due to rising temperatures (Qutubuddin, 2023). This melting threatens water availability, particularly in the Indus River Basin, which supports agriculture and drinking water needs for millions. Addressing these impacts is essential for Pakistan's sustainable development, as climate resilient strategies can mitigate these environmental risks and protect vulnerable communities.

2.2. Deforestation, Biodiversity Loss and Land Degradation

Deforestation and biodiversity loss are significant barriers to achieving sustainable development in Pakistan. Forest cover in Pakistan is already low, constituting less than 4.7 % of the country's total land area, and is decreasing at an alarming rate due to illegal logging, urban expansion and agricultural conversion (World Bank, 2025). The loss of forested areas not only affects biodiversity but also increases soil erosion and the risk of landslides, particularly in mountainous regions.

Pakistan's biodiversity is under peril, with some species, including the snow leopard and Indus River dolphin, facing extinction owing to habitat degradation and human encroachment.

Another concern is land degradation, which reduces agricultural output and contributes to desertification in areas like Tharparkar. Programs such as Pakistan's "Ten Billion Tree Tsunami" seek to address these challenges by restoring forest cover and safeguarding endangered species (Government of Pakistan, 2018).

2.3 Air, Water and Soil Pollution Issues

Pollution in Pakistan poses serious challenges to sustainable development. Air pollution levels, particularly in urban regions like Lahore and Karachi, frequently exceed permissible limits due to emissions from transport, industrial activity and crop burning, causing respiratory ailments and economic losses. Pakistan has some of the world's highest particulate matter (PM2.5) concentrations, which affect both urban and rural populations.

Water pollution is another major issue. Industrial waste and untreated sewage are frequently thrown into rivers, contaminating freshwater supplies and contributing to waterborne diseases.

Furthermore, soil contamination from excessive pesticide uses and industrial waste disposal affects land fertility, lowering agricultural production. To properly address these environmental concerns, sustainable development requires more intense pollution restrictions and investment in cleaner technology (Pak-EPA, 2016).

3. Social Dimensions

Sustainable development in Pakistan is more than just an economic or environmental issue; it is also a deeply social one, comprising initiatives to enhance education, health and gender equality; reduce poverty; and give access to critical amenities such as clean water, sanitation and energy. Addressing these social dimensions is crucial to ensuring Pakistan's equitable and sustainable future.

3.1 Education, Health and Gender Equality Efforts

Pakistan's sustainable development requires improvements in education, health and gender equality. Education is recognized as a cornerstone for socioeconomic growth, with government and non-governmental organizations working to improve access and quality, particularly among marginalized people. However, Pakistan continues to have issues in terms of literacy rates, school dropout rates and access to high-quality education, particularly in rural areas. Gender disparity in education persists, with lower enrolment rates for females than boys, limiting women's long-term socioeconomic engagement.

Pakistan is also working to enhance access to healthcare, reduce maternity and infant mortality rates and combat infectious diseases. Gender equality initiatives, such as the Ehsaas program and the Punjab Women Protection Authority, seek to empower women via education and economic opportunities, thereby addressing gender inequities that impede inclusive development (Government of Pakistan, 2022). A sustainable social development framework in Pakistan necessitates investment in education, health services and gender equality programs, which contribute to a healthier, more productive population.

3.2 Poverty Alleviation Programs and Social Protection Schemes

Poverty alleviation remains a top objective for Pakistan's sustainable development program. Government initiatives such as the Ehsaas Program and the Benazir Income Support Programme (BISP) provide financial assistance and subsidies to low-income families in order to alleviate poverty and sustain vulnerable populations. These programs, together with economic inclusion initiatives such as microfinance services, contribute to reducing income disparity and strengthening underprivileged communities' socioeconomic resilience. Social protection systems are critical in tackling socioeconomic difficulties and improving the quality of life for Pakistan's citizens. Ehsaas, for example, focusses on food security, healthcare and education for low-income families, contributing to a more inclusive and sustainable development framework. However, obstacles remain in reaching all target populations and ensuring effective resource distribution among regions.

3.3 Access to Basic Services (Water, Sanitation and Energy)

Access to essential amenities such as clean water, sanitation and energy is critical to attaining social sustainability in Pakistan. Despite progress, many rural and urban low-income communities lack proper access to these services, compromising their health and quality of life. Only 36% of Pakistan's population has access to safe drinking water (USAID, 2025) and rural areas are particularly vulnerable to water scarcity and contamination.

Similarly, sanitary coverage is insufficient, resulting in widespread health problems. Efforts such as the Pakistan Clean Green Initiative attempt to fill these gaps but execution remains difficult due to insufficient infrastructure and finance.

Pakistan's energy economy has long been dependent on fossil fuels; imports of petroleum products increased by nearly 60% in July 2024 compared to 2023 (Business Recorder, 2024). This reliance

has led to a severe energy crisis, resulting in frequent power outages that impede economic productivity and societal well-being. As global oil prices fluctuate, Pakistan faces economic strain, as its reliance on fossil fuel imports places immense pressure on foreign exchange reserves (Govt of Pakistan, 2022). Additionally, the environmental costs of fossil fuel dependency are substantial, with thermal power plants contributing to air pollution and greenhouse gas emissions. The government has carried out a number of initiatives to address the energy crisis, including the National Power Policy and the Integrated Energy Plan. However, limited infrastructure, project delays, and high transmission losses continue to impede Pakistan's capacity to create a consistent and sustainable energy supply.

In response to its energy issues, Pakistan has made significant efforts to diversify its energy mix using renewable resources, which helps to achieve the objective of sustainable development. The Alternative and Renewable Energy Policy (AREP) 2019 is aimed to boost renewable energy's contribution of Pakistan's energy mix to 30% by 2030 (Pakistan Ministry of Energy, 2019). Solar and wind projects are gaining traction in Sindh and Balochistan, where geographical factors encourage their development. The Quaid-e-Azam Solar Park in Punjab, for example, is one of the largest solar power projects in South Asia. Hydropower is also an important renewable source, accounting for around 25% of the country's energy demands. Projects like the Diamer-Bhasha Dam, which is now under construction, are expected to greatly boost Pakistan's hydroelectric capacity.

Challenges to Sustainable Development

Pakistan confronts considerable challenges in attaining sustainable development, despite its commitment to the Sustainable Development Goals (SDGs) and other international frameworks. Major challenges include a lack of financial and technological resources, governance issues exacerbated by political instability and environmental deterioration. These factors restrict progress towards sustainable development, requiring specific policies and efficient resource management to mitigate their effects.

1. Political Instability and Governance Issues

Political instability and governance issues are significant barriers to Pakistan's sustainable development. Frequent government changes, policy inconsistencies and lack of long-term planning all disrupt development efforts, resulting in resource mismanagement and policy reversals. This unpredictability also undermines institutional capacity, limiting the government's ability to enforce environmental laws, properly manage resources and engage in international collaboration. Corruption and poor policy execution exacerbate the challenges of sustainable development. Corruption can divert funding away from development projects, while a lack of transparency and accountability restricts progress in the environmental and social sectors. Furthermore, coordination gaps between the federal and provincial governments can result in policy overlaps and inefficiencies, which limit the effectiveness of sustainability measures. For example, provincial environmental protection agencies most of the time lack the resources required to enforce national laws on the environment, jeopardizing the country's ability to combat pollution and biodiversity loss.

2. Financial and Technological Constraints

Financial and technological constraints are among Pakistan's foremost problems to sustainable development. With a growing economy, Pakistan frequently experiences financing constraints, limiting its ability to invest in vital areas such as renewable energy, environmental protection and sustainable agriculture. Insufficient funding for critical infrastructure projects impedes progress

towards the SDGs, particularly in sectors such as health, education and energy. Moreover, foreign aid, while beneficial, may not always reach the intended projects due to bureaucratic inefficiencies and accountability concerns. On the technological front, Pakistan is struggling to keep up with global advances in green technology and digitalization, both of which are critical to a sustainable economy. The lack of access to modern technologies, like efficient water management systems and renewable energy technologies, impedes the country's ability to solve crucial challenges like water scarcity and pollution. In addition, lack of proper research and development funding limits innovation in sustainable practices, worsening the country's environmental and resource difficulties.

3. Environmental Degradation and Natural Disasters

Pakistan is extremely vulnerable to environmental degradation and natural calamities, which seriously constrain sustainable development. Deforestation, land degradation and biodiversity loss are long-term challenges affecting ecosystems and rural livelihoods. Unsustainable agricultural methods and urban growth cause soil erosion, desertification and deforestation, aggravating rural food insecurity and poverty. Natural catastrophes, especially floods and droughts, present additional challenges. In recent years, Pakistan has seen an increase in the frequency of floods, which have left disastrous effects on agriculture, infrastructure and human life. Climate change is worsening these problems, as rising temperatures cause glacial melt in the north and erratic weather patterns across the country. These environmental concerns put a strain on limited financial resources, diverting funding away from sustainable development programs to emergency relief and rehabilitation operations. Also, a lack of climate resilience infrastructure enhances Pakistan's vulnerability, emphasizing the critical need for climate adaptation approaches.

4. Energy Challenges

Providing fair access to energy remains a serious concern, particularly in rural areas where around 40% of families do not have dependable electricity (Qayum, 2023). Although, metropolitan areas have better access, they also endure occasional load shedding due to demand-supply imbalances. The lack of effective transmission and distribution networks exacerbates these problems, as energy losses are significant owing to obsolete equipment and theft. The government has launched energy efficiency programs, such as promoting energy-efficient appliances and improving transmission systems, but progress has been slow. Likewise, policy loopholes and limited funding for efficiency programs impede Pakistan's ability to assure energy accessibility and sustainability. A successful transition to a more sustainable energy model will include not just regulatory changes, but also collaboration with international donors and private sector investors to fund infrastructure development and renewable energy technologies.

5. Urban Sprawl

The growing urbanization of large cities such as Karachi, Lahore and Rawalpindi / Islamabad has resulted in urban sprawl, which is signified by the encroachment of green spaces and agricultural land, disrupting natural ecosystems and biodiversity. Infrastructure developments in these growing cities mostly lack adequate planning, resulting in congestion and inefficient land usage. Uncontrolled urban growth in Pakistan has resulted in housing shortages, overburdened infrastructure and unsustainable strains on public services. The environmental effects of urban infrastructure expansion are also significant as increased constructions and land conversion contribute to air pollution, carbon emissions and natural habitat destruction. Lack of integrated transport networks causes traffic congestion and increases fuel consumption, exacerbating urban

environmental degradation. As Pakistan's cities expand, regulating urban sprawl and maintaining sustainable infrastructure development have become vital for long-term urban viability.

Waste management in Pakistani cities remains a major concern, with most cities lacking proper waste collection, disposal and recycling facilities. Karachi, for example, generates about 12,000 tons of garbage each day, of which only a small part is collected and properly disposed off, while the remaining trash piles up in open dumps or drainage systems, contributing to air, soil and water pollution (Sabir et al., 2016). The dearth of recycling facilities and sustainable waste disposal options has resulted in extensive trash burning, which contributes to air pollution and respiratory health issues among urban populations. Industrial and vehicular emissions in metropolitan areas also contribute significantly to urban air pollution, with cities such as Lahore experiencing severe smog episodes that have an impact on public health and daily life. Moreover, inadequate drainage and sanitation systems contribute to water pollution, damaging ecosystems and threatening community health. Addressing waste management and pollution challenges is vital to promoting sustainable urban growth and ensuring the well-being of residents of cities.

6. Agriculture

Agriculture is the backbone of Pakistan's economy, providing employment to a huge section of the population and playing a vital role in food security and rural development. However, problems such as climate change, obsolete farming practices and the need for rural development initiatives pose complex barriers.

Pakistan is extremely vulnerable to climate change, with its agriculture sector facing the strain of unpredictable weather patterns, rising temperatures and water scarcity. Given the sector's reliance on regular monsoon patterns, any disruption has a direct impact on crop output. For example, unseasonal rain and temperature variations have reduced production in wheat and rice, two of Pakistan's key crops. Rising temperatures have also caused glacier melting, which initially increased river flows but now threatens long-term water availability in the Indus River basin, a vital water source for agriculture. This sensitivity to climate change puts at risk not only food security but also rural livelihoods, as declining agricultural productivity can lead to income instability for farmers. To offset these effects, adaptation techniques such as developing climate-resilient crop varieties and putting in place crop insurance schemes are critical. However, encouraging the use of these measures remains difficult, particularly for smallholder farmers who have limited access to technology and financial resources.

Recommendations

Sustainable development necessitates a comprehensive strategy that incorporates economic growth, environmental conservation and social inclusion. To improve sustainable practices, strategic recommendations must be made at global, regional, national and local levels. These recommendations aim to encourage sustainable practices, ensure equity and promote innovation in all sectors of society.

1. International / Regional Level

1.1. Strengthening Global and Regional Cooperation

Encourage international and regional partnerships that bring together governments, non-governmental organizations, the commercial sector and civil society in pursuit of the Sustainable Development Goals. Collaborative platforms allow participants to share best practices, mobilize resources and coordinate efforts across borders. Increase funding for developing countries through climate finance structures like the Green Climate Fund. This financing is critical for helping these

nations fulfil their SDG commitments, particularly in areas such as climate action and renewable energy.

1.2. Promoting Global Standards

Develop and implement uniform standards for sustainability reporting and environmental protection. This could involve broadening frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD) and the Global Reporting Initiative (GRI) to ensure consistent and transparent reporting. Advocate for the adoption of carbon pricing mechanisms, such as carbon taxes or cap-and-trade systems, on global and regional levels. This would set the stage for businesses and incentivize emission reductions globally.

1.3. Fostering Innovation and Technology Transfer

Facilitate for the transfer of green technologies from developed countries to developing nations. This can be accomplished through international agreements, public-private collaborations and financial incentives that reduce obstructions to technology adoption. Increase investment in global and regional Research and Development (R&D) for sustainable technologies such as renewable energy, energy efficiency and sustainable agriculture. Collaborative R&D activities can help to expedite innovation and the development of sustainable solutions.

2. National Level

2.1. Integrating SDGs into National Policies

Devise comprehensive national strategy for incorporating the SDGs into economic, social and environmental policies. This strategy should include specific targets, time limits and mechanisms for evaluating progress. Fiscal policies should be adjusted to encourage sustainability, such as abolishing subsidies on fossil fuels and creating incentives for green infrastructure, renewable energy and sustainable agriculture.

2.2. Strengthening Regulatory Frameworks

Strengthen and enforce environmental legislation to meet national and international standards. This includes revising existing laws and implementing new regulations to handle developing environmental issues. Encourage companies to adopt sustainable practices by implementing sustainability reporting requirements and providing incentives such as tax rebates for green investments. Corporate Social Responsibility (CSR) principles should be incorporated into business operations to promote sustainability over the long run.

2.3. Enhancing Education and Public Awareness

Integrate sustainability education into school and university curricula to foster a culture of sustainability from an early age. This education should encompass important subjects like climate change, renewable energy and sustainable consumption. Launch national efforts to raise awareness about the importance of sustainable development. These initiatives should target every component of society and encourage behavioral changes that support sustainability, such as waste reduction and energy conservation.

3. Local Level

3.1. Empowering Local Governments and Communities

Empower local governments to take the lead in carrying out initiatives for sustainable development. This involves granting them the necessary finances, authority and technical assistance to plan and implement local sustainability programs. Encourage community-led sustainability initiatives such as local conservation projects, farming in urban areas and renewable

energy cooperatives. These activities can be supported by grants, training programs and partnerships with NGOs and enterprises.

3.2. Promoting Sustainable Urban Development

Invest in smart city schemes that use digital technology to boost urban sustainability. This involves increasing energy efficiency, optimizing waste management and establishing environmental friendly transportation systems. Encourage the construction of green infrastructure in cities, such as parks, green roofs and permeable pavements. Green infrastructure can increase biodiversity, reduce urban heat islands and improve residents' quality of life.

3.3. Encourage Sustainable Consumption and Production

Support local farmers and businesses that follow sustainable methods including organic farming, fair trading and circular economy models. This can be accomplished through certification programs, local procurement policies and consumer educational campaigns. Implement local waste reduction programs that promote recycling, composting and a reduction in single-use plastics. Community-based recycling programs and incentives to reduce waste can help attain these objectives.

3.4. Agriculture

Sustainable agricultural practices are becoming increasingly significant in Pakistan in order to improve food security while also addressing the negative environmental implications of traditional agriculture. Conservation tillage, precision farming and crop variety are all promoted as ways to save water and increase soil fertility. Crop rotation and organic farming have been suggested as methods of reducing reliance on chemical fertilizers and pesticides, which can harm soil health and contaminate water supplies. Furthermore, incorporating sustainable water management strategies, such as drip irrigation and rainwater harvesting, can reduce water wastage in this very water-dependent sector.

Conclusion

Sustainable development in Pakistan remains both an urgent need and an enormous challenge. The country's economic, environmental and social imperfections highlight the critical significance of embracing sustainable practices. While Pakistan has taken remarkable strides to integrate its national policies with global frameworks like the Sustainable Development Goals (SDGs) and Agenda 2030, substantial challenges continue to exist. Climate change-related disasters, insufficient resources, poverty and ineffective policy implementation mechanisms continue to impede progress.

However, Pakistan's dedicated involvement with international sustainability programs, as well as its commitment to incorporating SDGs into the international development agenda, indicate to an optimistic future. To address current issues, Pakistan needs to build institutional capacity, increase resource mobilization and promote creative methods in critical sectors such as energy, agriculture and urban planning. Collaboration with international organizations, civil society and the private sector is critical for ensuring inclusive and equitable progress.

The way forward necessitates a comprehensive strategy that prioritizes climate resilience, economic stability and social equality. Pakistan can tackle the complex challenges of sustainable development by using technology, creating public-private partnerships and encouraging community engagement. Finally, the nation's ability to balance growth with environmental preservation and social well-being will determine its success in developing a resilient and successful future for everyone.

References

- Biermann, F., & Pattberg, P. (Eds.). (2012). *Global environmental governance reconsidered*. MIT Press.
- Brundtland, G. H. (1987). "Our Common Future". The World Commission on Environment and Development.
- Business Recorder Research. (2024, August 19). Petroleum imports snapshot. *Business Recorder*
- C40 Cities Climate Leadership Group (2018). *Climate Action Planning Framework*. C40 Knowledge. https://www.c40knowledgehub.org/s/article/Climate-Action-Planning-Framework?language=en_US
- Dryzek, J. S. (2022). *The politics of the earth: Environmental discourses*. Oxford university press.
- FAO. (2025). FAO in Pakistan: Pakistan at a glance. FAO. <https://www.fao.org/pakistan/our-office/pakistan-at-a-glance/en/>
- Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy—A new sustainability paradigm?. *Journal of Cleaner Production*, 143, 757-768.
- Government of Pakistan. (2018). *Pakistan's Ten Billion Tree Tsunami initiative*. Ministry of Climate Change.
- Government of Pakistan. (2022). *Gender equality initiatives under the Ehsaas Program*. Ministry of Planning, Development & Special Initiatives.
- Government of Pakistan. (2022). *Pakistan energy outlook report (2021–2030): Integrated energy planning for sustainable development*. Ministry of Planning, Development & Special Initiatives.
- Hickel, J. (2020). *Less is more: How degrowth will save the world*. Random House.
- Intergovernmental Panel on Climate Change (IPCC) (2021). *Climate change 2021: The physical science basis*. IPCC
- Kates, R.W., Parris, T.M. and Leiserowitz, A.A. (2005). What is sustainable development? Goals, indicators, values, and practice. *Environment, Science and Policy for Sustainable Development*, 47 (3), 8-21.
- Ministry of Planning, Development & Special Initiatives. (2024). *Uraan Pakistan: 5 Es National Economic Transformation Plan (2024 to 2029)*. Federal Sustainable Development Support Unit. https://pc.gov.pk/uploads/uraanpakistan_book.pdf
- Mol, A. P., & Sonnenfeld, D. A. (2014). *Ecological modernisation around the world: Perspectives and critical debates*. Routledge.
- Nicholls, A., & Murdock, A. (Eds.). (2011). *Social innovation: Blurring boundaries to reconfigure markets*. Springer.
- Pak-EPA (2016). *National environment report of Pakistan*. Geomatic Center for Climate Change & Sustainable Development.
- Pakistan Ministry of Energy. (2019). *Alternative and Renewable Energy Policy 2019*. Ministry of Energy, Government of Pakistan. Retrieved from https://climate-laws.org/documents/alternative-and-renewable-energy-policy-2019_c498?id=alternative-and-renewable-energy-policy-2019_991c

- Qayyum, S. (2023, March 28). Only 40pc Pakistanis have access to clean cooking energy. *The Nations*. <https://www.nation.com.pk/28-Mar-2023/only-40pc-pakistanis-have-access-to-clean-cooking-energy> (Sadia Qayyum is an Energy Specialist in The World Bank).
- Qutubuddin, M.K. (2023). Melting glaciers in Pakistan: A call to action for the G20 Summit to address the situation. *Earth.Org*. <https://earth.org/melting-glaciers-in-pakistan/>
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., & Foley, J. A. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472-475.
- Sabir, W., Waheed, S., Afzal, A., Umer, S. & Rehman, S. (2016). A Study of Solid Waste Management in Karachi City. *Journal of Education & Social Sciences*.4 (2), 144-156, DOI: 10.20547/jess0421604205
- Sachs, J. D. (2015). *The age of sustainable development*. Columbia University Press.
- Scoones, I. (2015). *Sustainable livelihoods and rural development: Agrarian change and peasant studies*. Practical Action Publishing.
- Un. (2019). *Global Sustainable Development report 2019: The future is now – Science achieving sustainable development*. UN
- Undp. (2021). *Pakistan and the Sustainable Development Goals*. Retrieved from <https://www.pk.undp.org>
- Unfccc. (2021). Report of the Conference of the Parties on its twenty-sixth session, held in Glasgow from 31 October to 13 November 2021. Retrieved from UNFCCC website.
- United Nations Development Programme (UNDP). (2021). *Human Development Report 2021*. Retrieved from https://hdr.undp.org/system/files/documents/global-report-document/hdr2021-22reportenglish_0.pdf
- Usaid. (2025). Pakistan overview. *Globalwaters.Org*. <https://www.globalwaters.org/wherewework/asia/Pakistan>.
- World Bank (2020). *World development report 2020: Trading for development in the age of global value chains*. World Bank.
- World Bank. (2024). *Poverty projections for Pakistan: Nowcasting and forecasting*. World Bank Group (Poverty and Equity Global Department).
- World Bank. (2025). *Forest area (% of land area) – Pakistan*. World Bank Group. <https://data.worldbank.org/indicator/ag.lnd.frst.zs?locations=pk>.