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Harnessing Sustainable Consumption and Production (SCP) and Circular Economy (CE) Opportunities to Achieve Higher Climate Ambition in Pakistan

Policy Paper

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List of Abbreviations

ADB	Asian Development Bank
AFOLU	Agriculture, Forestry and Other Land Use
BAU	Business as Usual
BESS	Battery Energy Storage Systems
BTR	Biennial Transparency Report
CBAM	Carbon Border Adjustment Mechanism
CBDR-RC	Common But Differentiated Responsibilities and Respective Capabilities
ccGAP	Climate Change Gender Action Plan
CE	Circular Economy
COP	Conference of the Parties (UNFCCC)
EPR	Extended Producer Responsibility
ETF	Enhanced Transparency Framework
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEDSI	Gender Equality, Disability, and Social Inclusion
GEF	Global Environment Facility
GHG	Greenhouse Gas
GLOF	Glacial Lake Outburst Flood
GPP	Green Public Procurement
IEA	International Energy Agency
IFC	International Finance Corporation
IGCEP	Indicative Generation Capacity Expansion Plan
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
IRP	International Resource Panel
ISWM	Integrated Solid Waste Management
LEDs	Low-Emission Development Strategy
LT-LEDs	Long-Term Low Emission Development Strategy
LULUCF	Land Use, Land-Use Change and Forestry
MDB	Multilateral Development Bank
MFA	Material Flow Accounting
MoCC&EC	Ministry of Climate Change and Environmental Coordination
MRF	Material Recovery Facility
MRV	Monitoring, Reporting and Verification
NAP	National Adaptation Plan
NAP-SCP	National Action Plan on Sustainable Consumption and Production
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution

NEV	New Energy Vehicle
PCCA	Pakistan Climate Change Authority
PPP	Public-Private Partnership
PSC	Policy Support Component (SWITCH-Asia)
RE	Renewable Energy
SCP	Sustainable Consumption and Production
SDG	Sustainable Development Goal
SDPI	Sustainable Development Policy Institute
TA	Technical Advisory
TNC	Third National Communication (UNFCCC)
UGPP	Upscale Green Pakistan Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

Pakistan is among the countries most exposed to climate-related hazards, despite contributing less than 1% of global greenhouse gas emissions. In September 2025, Pakistan submitted its Third Nationally Determined Contribution (NDC 3.0). The headline target is an indicative reduction of up to 50% in projected 2035 emissions against a business-as-usual trajectory, split between a 17% unconditional contribution and a further 33% contingent on adequate, predominantly grant-based or concessional international finance, technology transfer and capacity support. Government estimates put the cumulative investment requirement through 2035 at USD 565.7 billion.¹

Circular economy measures can lower the cost of climate action and help mobilise additional resources: that is the central argument of this Policy Paper, prepared under the EU SWITCH-Asia Policy Support Component to examine how sustainable consumption and production (SCP) and circular economy (CE) approaches can help Pakistan meet its NDC targets more cost-effectively and address substantial climate-finance needs. Treating these approaches as part of the implementation and financing toolkit, rather than an environmental add-on, is the shift in framing this paper sets out to make, though the case does not rest on finance alone. More efficient water use, ecosystem protection, and more durable infrastructure mean the same measures also strengthen climate resilience directly, extending their relevance well beyond mitigation finance.

Pakistan's 2021 Updated NDC gave relatively broad policy recognition to SCP and efficient resource use through the NAP-SCP. NDC 3.0 explicitly refers to integrated solid waste management and circular economy within the waste sector. It also contains measures in other sectors that may be relevant to resource efficiency or lifecycle management, but it does not present them through a cross-sectoral SCP, material-efficiency or circular-economy framework. The principal gap is therefore the operationalisation of circularity beyond waste through evidence, indicators and validated implementation options. Important areas for further assessment include textiles, buildings and construction, renewable-energy equipment lifecycles, batteries and electronic waste, sustainable procurement, and food loss and waste.²³

The Financing Imperative

Finance is a major constraint. NDC 3.0 reports cumulative investment requirements of USD 348.4 billion through 2030 and USD 565.7 billion through 2035. The additional amount represents the estimated requirement for 2031-2035, rather than a financing gap calculated against available resources. Circular economy measures can improve the economics of implementation by reducing material and energy demand, lowering operating costs, recovering value from secondary materials and by-products, and improving project preparation and risk allocation so that public, concessional and private finance can be mobilised more effectively.⁴

Areas Requiring Further Assessment

Pakistan already has a relevant policy base, including the National Action Plan on Sustainable Consumption and Production, NDC 3.0, the National Climate Finance Strategy, the Pakistan Green Taxonomy, sectoral policies and an emerging national circular-economy policy process. Further assessment is needed to determine where material efficiency and lifecycle approaches add the greatest climate, economic and resilience value, which evidence and indicators are required, and which institutional and financing options

1 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

2 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

3 Government of Pakistan. (2021). *Pakistan Updated Nationally Determined Contribution*. <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>

4 World Bank. (2022). *Pakistan Country Climate and Development Report*. <https://documents1.worldbank.org/curated/en/099950111072234047/pdf/P17671804998b80030ac4f0233dc0b995ba.pdf>

are feasible.⁵⁶

Strategic Directions

The paper presents four high-level strategic directions:

- **Broaden the SCP/CE Lens Beyond Waste:** Examine how material efficiency, lifecycle approaches and resource productivity could support selected NDC 3.0 commitments beyond waste, while separating explicit NDC content from analytical opportunities.
- **Strengthen the Evidence Base:** Identify priority material-flow information, sector baselines and indicators capable of relating resource use to emissions, costs, resilience and investment needs.
- **Prioritise Through Assessment and Consultation:** Screen possible sector opportunities against climate relevance, resource savings, economic and trade significance, investment viability, safeguards, institutional feasibility and adaptation co-benefits.
- **Assess Enabling Arrangements Before Adoption:** Examine institutional roles, policy instruments, financing mechanisms, targets and sequencing through further technical analysis and stakeholder validation.

A Near-Term Analytical Opportunity

Pakistan's current policy architecture provides several entry points for assessment, including NDC 3.0, the Pakistan Green Taxonomy, the Green Building Code, the New Energy Vehicles Policy, the National Climate Finance Strategy, the ongoing circular-economy policy process and EPR consultations. The near-term task is to identify a limited number of opportunities for deeper analysis and consultation before detailed standards, targets, financing arrangements or implementation responsibilities are proposed.

5 Sustainable Development Policy Institute. (2025). *National Circular Economy Policy for Pakistan*. https://sdpi.org/national-circular-economy-policy-for-pakistan/project_detail

6 SWITCH-Asia. (2025). *Roundtable on Circular Economy and Resource Efficiency as the Driver of Pakistan's NDC and Long-term Climate Planning*. <https://www.switch-asia.eu/event/round-table-on-circular-economy-and-resource-efficiency-as-the-driver-of-pakistans-lt-leds-and-ndc/>

Introduction

A. The European Union's SWITCH-Asia Programme

Through the European Union Green Deal and Global Gateway, the EU is committed to supporting the transition of countries to a low-carbon, resource-efficient and circular economy while promoting sustainable production and consumption patterns. The SWITCH-Asia Policy Support Component (PSC) aims to enhance SCP progress through scaling up and mainstreaming SCP policy in 42 countries across Asia and the Pacific. The programme's flexible and on-demand interventions, and its mandate to foster cooperation, strengthen networking and build a platform for exchange, make the PSC well-positioned to meet the needs of the region in addressing the triple planetary crises.⁷⁸

B. Global Context

Climate change has unequivocally emerged as a systemic challenge that extends far beyond the energy sector. While rapid decarbonisation of power generation remains necessary, an expanding global evidence base shows that focusing on energy supply alone is insufficient to solve climate change challenges and achieve the objectives of the Paris Agreement. The outcomes of the first Global Stocktake under the UNFCCC confirm that, at the current pace of action, global mitigation efforts remain misaligned with the temperature goals of limiting warming to well below 2°C and pursuing efforts toward 1.5°C.⁹

A central reason for this gap lies in the continued growth of material demand and resource-intensive consumption and production patterns. According to the latest Global Resources Outlook by the International Resources Panel (IRP), the extraction and processing of material resources, including biomass, fossil fuels, metals, and non-metallic minerals, account for more than 55% of global greenhouse gas emissions, a figure that rises beyond 60% when land-use change and land-use-related emissions are included. These same processes are also responsible for a dominant share of biodiversity loss, water stress, and pollution pressures globally.

These findings reshape how climate policy should be framed. They demonstrate that greenhouse gas emissions sit embedded not only in how energy is produced, but in how societies design, build, consume, and discard products, infrastructure, and services. As a result, climate mitigation pathways that do not systematically address material flows, product lifecycles, and consumption patterns risk locking in emissions through embodied carbon, inefficient asset use, and premature waste generation.¹⁰

In response to this growing evidence, SCP and CE approaches have gained increasing recognition within international climate and development discourse, though the two terms do different work and are not interchangeable. SCP describes the demand side: reducing the environmental impact of goods and services across their lifecycle through changes in consumption patterns, procurement choices, and behaviour, while enhancing economic and social well-being. CE operationalises that agenda at the level of industrial systems and material flows: it is the set of strategies, resource efficiency, product durability, reuse, recycling, waste prevention, and industrial symbiosis, through which value chains are redesigned to keep materials in use for longer. Resource efficiency and circularity, both used throughout this paper, are elements of that CE toolkit rather than separate frameworks in their own right: resource efficiency refers to reducing the material or energy input per unit of output, and circularity refers to closing material loops through reuse, recycling, and regeneration. This paper uses SCP where the discussion concerns consumption behaviour, CE where it concerns industrial systems and material cycles, and the combined term SCP/CE where an intervention spans both. The combined term is an analytical lens used by the paper and in Pakistan's wider policy discourse. It is not terminology used consistently in NDC 3.0, which explicitly refers to circular economy only

7 UNEP. Sustainable Consumption and Production. <https://www.unep.org/explore-topics/resource-efficiency/about-sustainable-consumption-and-production>

8 SWITCH-Asia. (2025). *Integrating Sustainable Consumption and Production and Climate Change Policy in Pakistan*. https://www.switch-asia.eu/site/assets/files/4442/pakistan_final_17_jun.pdf

9 UNFCCC. (2023). Outcome of the First Global Stocktake. <https://unfccc.int/topics/global-stocktake>

10 IPCC. (2022). *Climate Change 2022: Mitigation of Climate Change*. <https://www.ipcc.ch/report/ar6/wg3/>

within waste management. Together, SCP and CE provide a systemic framework for addressing emissions that originate across value chains and consumption systems, rather than solely at the point of energy generation.¹¹

At the global level, this shift is increasingly reflected in policy frameworks and climate pledges. The most recent cycle of NDCs, often referred to as NDC 3.0, shows a growing number of countries moving beyond waste-management-only interpretations of circularity toward broader integration of material efficiency, sustainable design, and consumption-side measures. In the Asia-Pacific region, several countries have used SCP and CE policies, dialogues on NDC 3.0, and stakeholder consultations to make CE a main element in climate ambition pathways, directly connecting CE strategies to cutting emissions (mitigation), handling climate impacts (adaptation), and promoting sustainable ways to produce and use resources.¹²

The IPCC Sixth Assessment Report emphasises that avoiding dangerous climate repercussions will require capitalising on all available mitigation and adaptation opportunities, including demand-side measures, resource efficiency, and systemic shifts in consumption and production patterns, thereby reinforcing the imperative of integrating SCP and CE into national climate strategies.¹³

C. Why SCP and CE Matter for Climate Ambition in Developing Economies

For developing economies like Pakistan, the relevance of SCP and CE is especially high. These countries often face rapidly growing demand for infrastructure, housing, transport, and industrial capacity: investments that are inherently material-intensive and that will shape emissions trajectories for decades. Decisions taken today regarding how infrastructure is designed, constructed, and operated can either lock in high-carbon resource pathways or enable long-term decoupling of economic growth from emissions and resource depletion.

SCP and CE provide options to avoid carbon-intensive development lock-in while delivering multiple co-benefits. Improved material efficiency lowers production costs, reduces import dependence on raw materials, and enhances resilience to external price shocks. Circular value chains create new economic opportunities in repair, recycling, remanufacturing, and secondary material markets, supporting employment and local value addition. At the same time, SCP-oriented consumption patterns, such as more efficient buildings, improved public services, and reduced waste, can enhance household welfare and reduce pressure on public budgets.

From a climate perspective, SCP and CE function as mitigation multipliers. By lowering energy and material demand upstream, they reduce the scale of investment required in low-carbon energy supply and infrastructure. This reduction in required capital makes ambitious climate targets more financially attainable within constrained fiscal environments. These benefits extend equally to climate adaptation. Many adaptation measures, such as flood protection, water storage, irrigation systems, climate-resilient roads, and housing, are heavily material-intensive. Without circular and resource-efficient design, adaptation investments risk generating sizable embodied emissions and additional environmental pressures, potentially offsetting mitigation gains elsewhere in the economy.

Drip irrigation, closed-loop industrial water systems, and leak reduction in urban supply networks reduce exposure to water stress directly, in a country where climate change is already intensifying rainfall variability and glacial melt. The same logic extends further than water: circular approaches to waste and industrial by-products cut the pollution loads entering rivers, wetlands, and coastal ecosystems, protecting the biodiversity and ecosystem services that agricultural and fisheries livelihoods depend on, while buildings and infrastructure designed for durability and adaptive reuse tend to hold up better under extreme weather, which lowers the physical and financial exposure created by climate-related damage and reconstruction. None of this is captured by describing circularity as simply a mitigation multiplier. Its adaptation value, in reducing how far climate change amplifies existing vulnerabilities in water, ecosystems, and the built

11 UNEP. *Sustainable Consumption and Production*. <https://www.unep.org/explore-topics/resource-efficiency/about-sustainable-consumption-and-production>

12 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

13 IPCC. (2022). *Climate Change 2022: Mitigation of Climate Change*. <https://www.ipcc.ch/report/ar6/wg3/>

environment, is a separate and largely untapped argument in Pakistan's own policy debate.¹⁴

This SWITCH-Asia TA on SCP-linked NDCs and LT-LEDS in South Asia has been designed precisely within this evolving policy landscape to support countries in systematically integrating SCP and CE principles into their climate ambition frameworks, including NDC 3.0 and LT-LEDS processes.¹⁵

D. The Technical Advisory Context

This Policy Paper was developed as part of an exploratory Technical Advisory (TA) called "Sustainable Consumption and Production (SCP)-linked Nationally Determined Contributions (NDCs) - Lessons Learnt from the Champion Countries and identifying opportunities for capitalising synergies between NDC & SCP," which was carried out in five South Asian countries: Bangladesh, Bhutan, Nepal, Pakistan, and Sri Lanka.¹⁶

The TA has been strategically designed to:

- Assess the current status of SCP integration within existing climate ambitions;
- Identify the potential opportunities for enhanced integration;
- Explore viable pathways for implementing these integration options.¹⁷

Methodology of the Technical Advisory

The TA was implemented as a scoping assessment aimed at exploring potential avenues for integrating SCP into the NDCs and other climate ambition strategies of South Asian countries. The assessment was designed to gather the necessary information through two main processes: (i) studying the relevant policy documents of the country pertaining to SCP and climate change, and (ii) holding consultations with relevant stakeholders.¹⁸

Limitations and Data Caveats

A note on scope is warranted. This paper draws on publicly available policy documents, government publications, and international development partner reports, complemented by primary stakeholder engagement in Pakistan. The analysis draws on two national roundtables on circular economy and resource efficiency as drivers of Pakistan's LT-LEDS and NDC, together with consultations held at EU SWITCH-Asia annual programme events and at UNFCCC COP and Subsidiary Body sessions in 2024 and 2025. Material flow and circularity indicators for Pakistan remain limited in official statistics, and figures on waste generation, recycling rates, and sectoral resource intensity are drawn from a mix of government, multilateral, and secondary sources that do not always use consistent methodologies or reference years. Where estimates diverge, the paper cites the most recent credible figure available, identifies the source and notes important differences in scope or method. These limitations do not undermine the paper's central argument, but they do mean that some quantitative comparisons should be read as indicative of scale and direction rather than as precise measurements. Policy and statistical information was reviewed up to 27 July 2026.^{19,20}

14 IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. <https://www.ipcc.ch/report/ar6/wg2/>

15 SWITCH-Asia. (2025). *Integrating Sustainable Consumption and Production and Climate Change Policy in Pakistan*. https://www.switch-asia.eu/site/assets/files/4442/pakistan_final_17_jun.pdf

16 SWITCH-Asia. (2025). *Integrating Sustainable Consumption and Production and Climate Change Policy in Pakistan*. https://www.switch-asia.eu/site/assets/files/4442/pakistan_final_17_jun.pdf

17 SWITCH-Asia. (2025). *Integrating Sustainable Consumption and Production and Climate Change Policy in Pakistan*. https://www.switch-asia.eu/site/assets/files/4442/pakistan_final_17_jun.pdf

18 SWITCH-Asia. (2025). *Integrating Sustainable Consumption and Production and Climate Change Policy in Pakistan*. https://www.switch-asia.eu/site/assets/files/4442/pakistan_final_17_jun.pdf

19 SWITCH-Asia. (2025). Roundtable on Circular Economy and Resource Efficiency as the Driver of Pakistan's NDC and Long-term Climate Planning. <https://www.switch-asia.eu/event/round-table-on-circular-economy-and-resource-efficiency-as-the-driver-of-pakistans-lt-leds-and-ndc/>

20 SWITCH-Asia Programme. Authors' notes from stakeholder consultations, including national roundtables in Pakistan, annual programme events, and UNFCCC COP and Subsidiary Body sessions, 2024-2025.

A further note concerns the paper's headline financing figure. The USD 565.7 billion estimate is the Government of Pakistan's indicative cumulative investment requirement for implementing NDC 3.0 through 2035. It is presented here as reported, but not as a fully disaggregated investment plan or as a calculated financing gap. The estimate is expected to be refined through sector investment planning, project preparation and updated costing.

The chapters that follow build the case in stages. Sections 1 and 2 set out Pakistan's climate, resource and policy context. Sections 3 and 4 assess how NDC 3.0 already incorporates selected circular-economy elements and where broader SCP/CE opportunities remain. Section 5 examines cost reduction, value recovery and financing options, and Section 6 sets out high-level strategic directions for further assessment.

1. Climate Change and Circular Economy Landscape in Pakistan

Pakistan's climate vulnerability and resource constraints provide the starting point for assessing the role of circularity within national climate strategy.

1.1 Climate Vulnerabilities and Impacts

Pakistan is highly exposed to climate-related hazards, including floods, heatwaves, droughts, glacial lake outburst floods and coastal risks. Climate-risk indices have repeatedly identified Pakistan among the countries most affected by extreme weather, although individual rankings are backward-looking and should not be read as fixed measures of future vulnerability. Over recent decades, climatic events have directly affected millions of people, agricultural production and economic stability.

The catastrophic floods of 2022, described by the UN Secretary-General as a “climate catastrophe,” affected approximately 33 million people, causing widespread displacement and resulting in economic losses estimated at over USD 30 billion, approximately 9% of Pakistan's GDP. These floods exposed vulnerabilities in Pakistan's infrastructure, agriculture, and disaster management capabilities.

Water scarcity, exacerbated by climate change, weighs heavily on agricultural productivity and urban water supply. According to the World Resources Institute, Pakistan is projected to become severely water-stressed by 2040. Additionally, shifting rainfall patterns and glacial melt in the Himalayas threaten Pakistan's primary water sources, further endangering agricultural livelihoods, food security, and hydroelectric energy generation capacity.^{21,22}

Energy insecurity is another dimension of Pakistan's climate challenge, as the country remains heavily dependent on imported fossil fuels, leaving it vulnerable to international market volatility and supply disruptions. Expanding renewable and clean energy, improving efficiency, and strengthening transmission, storage and system flexibility can reduce emissions while supporting energy security.

The country's geography leaves it exposed to climate change impacts, particularly glacier melt, water scarcity, and extreme weather events. Pakistan is warming at a pace faster than the global average, with climate models projecting a marked rise in temperature under high-emission scenarios by the end of the century. The frequency and intensity of extreme climate events are projected to increase, raising disaster risk particularly for low-income and other vulnerable groups.²³

1.2 GHG Emissions Profile and Mitigation Commitments

Despite contributing less than 1% of global GHG emissions, Pakistan is experiencing intensifying climate impacts that threaten its development trajectory. Per capita emissions remain below the global average, while national climate priorities must balance development, adaptation and mitigation needs.²⁴

Pakistan's most recent GHG inventory for 2024 estimates total emissions at 585.08 MtCO₂e. Prepared in line with the 2006 IPCC Guidelines, the inventory covers four major source sectors: Energy (including transport), Industrial Processes and Product Use (IPPU), Agriculture, Forestry and Other Land Use (AFOLU), and Waste.²⁵

21 World Resources Institute. (2019). *Aqueduct Projected Water Stress*. <https://www.wri.org/aqueduct>

22 International Centre for Integrated Mountain Development. (2020). *Climate Change Impacts in the Hindu Kush Himalaya*. <https://www.icimod.org/>

23 IPCC. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. <https://www.ipcc.ch/report/ar6/wg2/>

24 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

25 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

NDC 2.0 retained a 2030 target to reduce projected emissions by up to 50%, comprising a 15% unconditional contribution and a 35% conditional contribution subject to international support. NDC 3.0 extends the horizon to 2035 with a 17% unconditional and 33% conditional contribution. The World Bank's Pakistan Country Climate and Development Report estimated investment needs of approximately USD 348.4 billion through 2030, while NDC 3.0 reports a cumulative requirement of USD 565.7 billion through 2035.²⁶

In the power sector, NDC 3.0 reports that renewable energy accounted for 35.2% of electricity generation in 2024, while the Indicative Generation Capacity Expansion Plan projects renewable and clean sources at 62-69% of installed capacity by 2035. Rapid growth in distributed solar has accelerated the transition, although estimates based on imported module capacity are not directly comparable with verified grid-connected or installed capacity. Transmission, system flexibility, storage and lifecycle management for panels and batteries will be important for sustaining this growth.²⁷

Pakistan also undertook afforestation/reforestation and ecosystem restoration measures across the country through the Upscale Green Pakistan Programme (UGPP), which focuses on large-scale afforestation and ecosystem restoration. The forestry sector is expected to play a major role in enhancing carbon sinks and contribute measurably to Pakistan's mitigation efforts by 2035.²⁸

1.3 Policy Response and the Role of SCP/CE

Pakistan has demonstrated increasing commitment to climate action and sustainable development. The country is a Party to the UNFCCC and the Paris Agreement. The government has developed a range of policy frameworks that recognise the urgency of climate action and the importance of green growth.²⁹

The Ministry of Climate Change spearheaded the National Climate Change Policy and subsequent initiatives. Pakistan's 2021 Updated NDC explicitly referenced the NAP-SCP and its emphasis on efficient resource use and unsustainable production patterns. NDC 3.0 does not carry forward SCP as an explicit cross-sectoral term, although it names circular economy within waste and includes other measures that may have SCP/CE relevance.

Pakistan is progressing work on a national circular-economy policy or roadmap intended to guide circularity across national planning and priority sectors. Current national economic priorities are articulated through URAAN Pakistan: the National Economic Transformation Plan 2024-2029, while earlier frameworks such as Vision 2025 remain relevant in tracing the evolution of national planning priorities.³⁰

In February 2025, the Government highlighted ongoing work to improve waste management and promote circular-economy approaches. The federal Single-use Plastics (Prohibition) Regulations 2023 apply to Islamabad Capital Territory, while provincial initiatives differ in scope and implementation. Nationally comparable data on compliance and reductions in plastic use remain limited.^{31,32}

1.4 Analytical Framework

The sectoral analysis that follows rests on a specific methodology, a defined set of criteria, and an explicit logic for assessing SCP and CE integration potential across Pakistan's climate policy architecture, set out below. The assessment is structured and qualitative; it is not a scored sector-ranking exercise.

26 World Bank. (2022). Pakistan Country Climate and Development Report. <https://documents1.worldbank.org/curated/en/099950111072234047/pdf/P17671804998b80030ac4f0233dc0b995ba.pdf>

27 NEPRA. (2025). *State of Industry Report 2024*. <https://www.nepra.org.pk/State%20of%20Industry%20Report%202024.pdf>

28 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

29 Government of Pakistan. (2021). *National Climate Change Policy*. <https://mocc.gov.pk/SiteImage/Policy/NCCP%20Report.pdf>

30 Government of Pakistan. (2024). *URAAN Pakistan: National Economic Transformation Plan 2024-2029*. <https://pc.gov.pk/web/downloads>

31 Government of Pakistan. (2025). *Pakistan Prioritizes Circular Economy*. Press Information Department, PR No. 149. https://pid.gov.pk/site/press_detail/28069

32 Government of Pakistan. (2023). *Single-use Plastics (Prohibition) Regulations, 2023*. https://mocc.gov.pk/SiteImage/Misc/files/1418%2823%29%20Ex_%20Gaz-II%20%28Climate%29.pdf

Methodology for Sectoral Mapping

The sectoral mapping uses three analytical categories to avoid conflating NDC content with the paper's interpretation of circular potential. The categories distinguish explicit NDC 3.0 recognition, NDC measures with possible SCP/CE relevance, and additional opportunities not articulated in NDC 3.0. This classification is derived from a systematic review of NDC 3.0, the 2021 Updated NDC, the NAP-SCP and other relevant policy documents.³³

Category 1: Explicit NDC 3.0 Recognition. Circular economy is explicitly named under integrated solid waste management. This category is limited to the waste-sector entry point and does not imply cross-sectoral SCP/CE integration.

Category 2: NDC Measures with Possible SCP/CE Relevance. These are measures contained in NDC 3.0, such as energy efficiency, industrial improvements, wastewater treatment, agriculture, batteries or buildings, that may support resource efficiency or lifecycle objectives but are not presented by the NDC as SCP/CE measures.

Category 3: Additional Opportunities Not Articulated in NDC 3.0. These include material-use efficiency, circular textiles, construction materials, product lifecycles, sustainable procurement and wider material-flow accounting. They are areas for further assessment rather than existing NDC commitments.

Criteria for SCP/CE Opportunity Assessment

For each sector, the assessment of SCP/CE opportunity is based on six criteria derived from established analytical frameworks for SCP-NDC integration:

1. Emissions Reduction Potential: The sector's contribution to national GHG emissions and the potential for emission reductions through SCP/CE interventions. Conceptually, this criterion follows the sectoral mitigation potential logic used in marginal abatement cost curve (MACC) analysis and in IPCC Working Group III's sectoral assessments; it is operationalised here through sectoral benchmarking against Pakistan's GHG inventory shares and published mitigation cost-effectiveness studies, rather than original MACC modelling, consistent with this paper's scoping-level methodology.^{34,35}

2. Economic Significance: The sector's contribution to GDP, employment, exports, and national development priorities. Measurement follows standard sectoral contribution analysis, GDP share, export share, and employment intensity drawn from national accounts and trade statistics, the same approach used in World Bank and Asian Development Bank country diagnostics for sector prioritisation.

3. Circularity Readiness: The existence of enabling conditions for circular economy interventions, including policy frameworks, institutional capacity, technological readiness, and market demand. This criterion draws on the enabling-conditions approach to circular economy diagnostics developed by the Ellen MacArthur Foundation and the International Resource Panel's policy-readiness framework for resource efficiency; it is assessed here through document review of existing policy frameworks, institutional mandates, and market signals, rather than a scored maturity index.³⁶

4. Investment Attractiveness: The potential for viable projects or business models, considering revenue or savings, project preparation, risk allocation, available financing mechanisms and the overall investment climate. This follows the bankability-screening logic used by development finance institutions, including the IFC and the Green Climate Fund, in project pipeline assessment, and is assessed qualitatively against existing financing mechanisms and precedent transactions identified in Section 5.³⁷

33 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

34 IPCC. (2022). *Climate Change 2022: Mitigation of Climate Change*. <https://www.ipcc.ch/report/ar6/wg3/>

35 International Resource Panel. (2024). *Global Resources Outlook 2024*. <https://www.unep.org/resources/Global-Resource-Outlook-2024>

36 Ellen MacArthur Foundation. (2019). *Completing the Picture: How the Circular Economy Tackles Climate Change*. <https://www.ellenmacarthurfoundation.org/completing-the-picture>

37 IFC. (2025). *Circular Economy Investment Tracker*. <https://www.ifc.org/ceit-factsheet.pdf>

5. Policy and Institutional Feasibility: The presence of policy windows, institutional mandates, and stakeholder alignment that would facilitate SCP/CE integration. The framework for this criterion follows UNEP's SCP-NDC Integration Framework together with the concept of a policy window from Kingdon's multiple-streams model of policy change, applied here through qualitative assessment of current initiatives, institutional mandates, and stakeholder positions identified through the desk review and roundtable consultations described in the Introduction.³⁸³⁹

6. Adaptation and Resilience Co-benefit: The extent to which SCP/CE interventions in the sector reduce exposure to climate-related vulnerabilities, whether through more efficient water use, protection of ecosystem services at the end of the value chain, or more resilient infrastructure and built environment. This criterion follows the exposure-hazard-vulnerability logic used in IPCC Working Group II assessments and UNEP's guidance on the adaptation co-benefits of resource efficiency, assessed qualitatively against the sectoral vulnerability profiles set out in Section 1.1.⁴⁰

Linking Sectors to NDC Implementation

The analytical framework connects sectoral SCP/CE opportunities to NDC implementation through five dimensions:

Material Efficiency as Mitigation: Reducing material demand lowers emissions across the entire value chain, from extraction to manufacturing to waste management.⁴¹

Waste Valorisation as Revenue Generation: Transforming waste streams into economic resources creates new revenue streams that can be directed toward climate action.⁴²

Circularity as Infrastructure Resilience: Circular approaches to infrastructure, buildings, and urban systems enhance resilience to climate impacts by using materials more efficiently and designing for durability and adaptability.⁴³

Systemic Transformation as Ambition Multiplier: SCP/CE interventions across multiple sectors create synergies that amplify climate ambition beyond what individual sectoral measures could achieve.⁴⁴

Circularity as Vulnerability Reduction: Reducing material and water throughput, limiting pollution and waste leakage into ecosystems at the end of the value chain, and designing for durability collectively lower exposure to climate-related shocks, extending SCP/CE's contribution beyond mitigation into adaptation and resilience.

1.5 The SCP and CE Policy Landscape of Pakistan

Pakistan's SCP and CE policy landscape has evolved over recent years, with increasing recognition of the importance of resource efficiency and circular approaches.

National Action Plan on Sustainable Consumption and Production (NAP-SCP)

The National Action Plan on Sustainable Consumption and Production (NAP-SCP) was developed through a national roundtable and provincial multi-stakeholder consultations to support the mainstreaming of SCP in Pakistan's development planning. The Ministry of Climate Change led the process in collaboration with the United Nations Environment Programme, the EU SWITCH-Asia Programme and the 10-Year Framework

38 IPCC. (2022). Climate Change 2022: Mitigation of Climate Change. <https://www.ipcc.ch/report/ar6/wg3/>

39 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

40 IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. <https://www.ipcc.ch/report/ar6/wg2/>

41 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

42 UNEP. (2024). *Global Waste Management Outlook 2024*. <https://www.unep.org/resources/global-waste-management-outlook-2024>

43 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

44 Ellen MacArthur Foundation. (2019). *Completing the Picture: How the Circular Economy Tackles Climate Change*. <https://www.ellenmacarthurfoundation.org/completing-the-picture>

of Programmes on Sustainable Consumption and Production Secretariat.⁴⁵

The NAP-SCP supports implementation of SDG 12 and sets priorities for sustainable food systems, buildings and cities, transport, water, land and marine ecosystems, industry and education. It identifies ten priority action areas: industry, sustainable cities, marine ecosystems, land ecosystems, climate change, sustainable transport, energy, water, education and sustainable food systems.⁴⁶

National Circular Economy Policy

Pakistan is developing its first national circular-economy policy or roadmap. Available public information confirms ongoing policy-development work, supported by analysis and consultation, but not formal adoption of a final national instrument by the information cut-off date. The process is expected to identify priority sectors, implementation arrangements and opportunities for sustainable business models, eco-innovation and inclusive green jobs.⁴⁷

The emerging policy process provides an opportunity to define priorities, implementation responsibilities, safeguards, indicators and links with NDC 3.0, URAAN Pakistan, the Pakistan Green Taxonomy, provincial policies and sector regulation.⁴⁸

URAAN Pakistan and Earlier National Planning Frameworks

URAAN Pakistan: the National Economic Transformation Plan 2024-2029 is the current federal development framework. Its pillars on exports, energy and infrastructure, environment and climate resilience, digital transformation and equity provide relevant entry points for resource efficiency, cleaner production, green value chains and sustainable procurement. Earlier frameworks, including Vision 2025, remain relevant in tracing the evolution of national planning priorities.⁴⁹

Green Industrialisation and Climate Finance Frameworks

Pakistan's green-industrialisation agenda is supported by the Pakistan Green Taxonomy, the National Climate Finance Strategy and sector policies on energy efficiency, clean air, transport and industrial development. Together, these instruments can help direct finance towards cleaner production, resource efficiency and circular business models while strengthening competitiveness and resilience.⁵⁰

Extended Producer Responsibility Framework

Pakistan is exploring Extended Producer Responsibility (EPR) to ensure manufacturers take responsibility for the entire lifecycle of their products, integrating waste management into production and packaging. In May 2025, Pakistan hosted a multi-stakeholder National Consultation Workshop on Extended Producer Responsibility. EPR is a globally recognised policy tool that shifts the financial and operational burden of waste management from the public sector to producers, incentivising sustainable product design and recycling.^{51,52}

The May 2025 consultation assessed existing policies, stakeholder roles, barriers and enabling conditions, and developed recommendations for a national EPR framework. It did not itself establish a national system; further policy design will be needed to define product scope, producer obligations, fee-setting, reporting,

45 Government of Pakistan. (2017). National Action Plan on Sustainable Consumption and Production.

46 Government of Pakistan. (2017). *National Action Plan on Sustainable Consumption and Production*.

47 Sustainable Development Policy Institute. (2025). National Circular Economy Policy for Pakistan. https://sdpi.org/national-circular-economy-policy-for-pakistan/project_detail

48 Government of Pakistan. (2025). Pakistan Green Taxonomy. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

49 Government of Pakistan. (2024). URAAN Pakistan: National Economic Transformation Plan 2024-2029. <https://pc.gov.pk/web/downloads>

50 Government of Pakistan. (2025). Pakistan Green Taxonomy. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

51 SWITCH-Asia. (2025). *Enablers for Effective Extended Producer Responsibility in the Asia-Pacific Region*. <https://www.switch-asia.eu/resource/enablers-for-effective-epr/>

52 SWITCH-Asia. (2025). *National Consultation Highlights Opportunities and Enablers for EPR Implementation in Pakistan*. <https://www.switch-asia.eu/news/pakistan-needs-epr-policy-on-plastics/>

compliance, provincial roles and the inclusion of informal workers.⁵³

Plastics and Waste Management Reform

The federal Single-use Plastics (Prohibition) Regulations 2023 apply to Islamabad Capital Territory and have been supported by enforcement and awareness activities. Provincial initiatives differ in scope and implementation, while nationally aggregated compliance data remain limited. Continued progress will depend on practical alternatives, consumer awareness, producer responsibility and sustained enforcement.⁵⁴

Pakistan's waste and recycling data remain fragmented, with estimates varying by reference year, geography and definition. Available evidence nevertheless points consistently to gaps in collection, source segregation, recycling, wastewater treatment, safe disposal and management of plastics, batteries and electronic waste. Strengthening nationally comparable data is therefore an implementation priority in its own right.⁵⁵

These climate, fiscal and material pressures reinforce one another. Section 2 considers how they interact within Pakistan's development strategy.

53 SWITCH-Asia. (2025). National Consultation Highlights Opportunities and Enablers for EPR Implementation in Pakistan. <https://www.switch-asia.eu/news/pakistan-needs-epr-policy-on-plastics/>

54 Government of Pakistan. (2023). Single-use Plastics (Prohibition) Regulations, 2023. https://mocc.gov.pk/SiteImage/Misc/files/1418%2823%29%20Ex_%20Gaz-II%20%28Climate%29.pdf

55 Sustainable Development Policy Institute. (2025). State of Circular Economy in Pakistan. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

2. Integrating SCP and CE into Pakistan's Development Strategy

Section 2 examines how climate, fiscal and material pressures interact with Pakistan's development strategy and where SCP and CE can support a more resource-efficient pathway.

2.1 Sustainable Development Challenges in Pakistan

Pakistan currently stands at a juncture where economic growth and environmental sustainability must be balanced to ensure a secure future. Rapid population growth, urban expansion, and industrial development have led to increased pressures on natural resources, exposing the limitations of current production and consumption patterns. Water scarcity, heavy reliance on imported fossil fuels, inefficient energy use, and inadequate waste management are central challenges that risk compromising both economic stability and environmental integrity.⁵⁶

These challenges are exacerbated by the impact of climate change, which adds layers of vulnerability to Pakistan's ecosystems, agricultural productivity, and infrastructure. Sectors such as agriculture, manufacturing, and energy are heavily resource-dependent, which leads to inefficiencies, increased emissions, and a higher carbon footprint. Addressing these issues requires a transformative approach that emphasises sustainable practices and resource optimisation across sectors.⁵⁷

Economic Challenges

Pakistan's economy faces the challenge of moving towards a more diversified and value-added structure while maintaining fiscal and external stability. Limited fiscal space and substantial climate-investment requirements make it important to prioritise measures that reduce lifecycle costs, improve resource productivity and mobilise finance without creating unnecessary public liabilities. The cumulative NDC 3.0 investment requirement also underlines the need to sequence public, concessional and private finance around clearly defined priorities.⁵⁸

Recent macroeconomic stabilisation and the development of climate-finance instruments provide a more constructive basis for this agenda. Pakistan has introduced the Pakistan Green Taxonomy, advanced its National Climate Finance Strategy, issued a sovereign green Sukuk and introduced climate- and NEV-related fiscal measures. These instruments can help align public and private capital with national climate and development priorities, provided that projects are supported by credible data, safeguards and implementation arrangements.^{59,60}

Beyond the fiscal context, agriculture remains constrained by inefficient water use, soil degradation and low productivity, while industry faces infrastructure, technology and financing constraints. Dependence on imported fuel, fertiliser and selected industrial inputs also exposes the economy to external price shocks. Resource efficiency and circular value chains can help reduce these vulnerabilities while supporting local value addition and export competitiveness.

56 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

57 Government of Pakistan. (2024). *URAAN Pakistan: National Economic Transformation Plan 2024-2029*. <https://pc.gov.pk/web/downloads>

58 Government of Pakistan. (2026). *National Climate Finance Strategy - Phase 1*. Ministry of Climate Change and Environmental Coordination.

59 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

60 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

Environmental Challenges

Pakistan faces mounting environmental pressures, including water scarcity, land degradation, waste-management challenges, biodiversity loss and poor air quality. Water resources are under increasing stress from climate change, inefficient irrigation and growing demand, while uncontrolled waste and industrial pollution affect public health and ecosystems. Air pollution remains a serious concern in major urban and industrial areas, driven by several sources including transport, crop-residue burning, brick kilns and industry. Coastal ecosystems face continuing pressure from reduced freshwater flows and saline intrusion, even as mangrove-restoration efforts have expanded forest cover in parts of the Indus Delta.⁶¹

Social Challenges

Pakistan's young and growing population creates demand for quality employment, improved public services and resilient infrastructure. Poverty and multidimensional deprivation remain substantial, while unemployment and underemployment affect young people and women disproportionately. Rural and climate-sensitive communities face particular exposure to environmental shocks and out-migration. Green and circular-economy policies therefore need to consider affordability, skills, decent work, gender equality, disability inclusion and the livelihoods of informal workers.^{62,63}

2.2 SCP as a Strategic Framework for Sustainable Growth

Rather than treating sustainability as a series of separate actions, SCP represents an integrated framework that connects consumption patterns and procurement choices to the resource efficiency and material circularity delivered through circular economy measures, embedding both within Pakistan's broader development goals.⁶⁴

Assessing how SCP could support implementation of URAAN Pakistan, NDC 3.0 and sector-specific policies can help identify where domestic action may align with international climate and sustainability goals. Earlier frameworks, including Vision 2025, remain relevant in tracing the evolution of national planning priorities. The potential contribution of SCP lies in reducing resource dependency, improving efficiency and supporting innovation, but the most suitable entry points require further sector analysis.⁶⁵

By positioning SCP as a strategic element of its economic framework, Pakistan can address immediate environmental concerns while creating new economic opportunities and strengthening its competitive edge. Adopting a circular economy could deliver economic savings and long-term sustainability through optimised resource use and waste minimisation.

2.3 Potential Entry Points for SCP Integration

The areas below identify possible entry points for examining alignment with national policies, sectoral instruments and provincial responsibilities. They do not constitute a settled integration framework.⁶⁶

National Policy and Strategic Alignment

Potential alignment can be examined across Pakistan's current development and climate architecture, including URAAN Pakistan 2024-2029, NDC 3.0, the National Adaptation Plan, the National Climate Finance Strategy, the Pakistan Green Taxonomy and the SDGs. Earlier frameworks such as Vision 2025 may be

61 Government of Pakistan. (2023). *National Clean Air Policy*. <https://mocc.gov.pk/Sitelimage/Misc/files/NCAP%20%2828-02-2023%29%20v1.pdf>

62 World Bank. (2025). *Pakistan: Bold, Sustained, People-Centered Reforms Needed to Reduce Poverty, Build Resilience, and Protect Vulnerable Populations*. <https://www.worldbank.org/en/news/press-release/2025/09/22/pakistan-bold-sustained-people-centered-reforms-needed-to-reduce-poverty-build-resilience-and-protect-vulnerable-populations>

63 United Nations Development Programme. (2025). *Multidimensional Poverty Index 2025: Pakistan Country Profile*. <https://hdr.undp.org/sites/default/files/Country-Profiles/MPI2025/PAK.pdf>

64 UNEP. *Sustainable Consumption and Production*. <https://www.unep.org/explore-topics/resource-efficiency/about-sustainable-consumption-and-production>

65 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/Sitelimage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

66 Government of Pakistan. (2017). *National Action Plan on Sustainable Consumption and Production*.

referenced where they help show policy continuity.⁶⁷

Sectoral Policy Alignment

Possible sectoral entry points include the National Energy Efficiency and Conservation Policy, agriculture and water policies, textile and industrial policy, the New Energy Vehicles Policy, the Green Building Code and relevant waste and hazardous-material frameworks. Further analysis could examine where cleaner production, water productivity, energy efficiency, sustainable procurement and lifecycle responsibility add distinct value.⁶⁸

Provincial and Regional Priorities

Any national integration approach would need to account for provincial policies and implementation responsibilities. Waste services, agriculture, building control, transport, environmental enforcement and land-use planning are largely delivered by provincial and local institutions. The balance between common national principles and locally adapted instruments therefore requires consultation with the responsible authorities.⁶⁹

The practical relevance of SCP and CE is best assessed against NDC 3.0, which provides the principal national framework for current climate ambition and implementation.

67 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

68 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

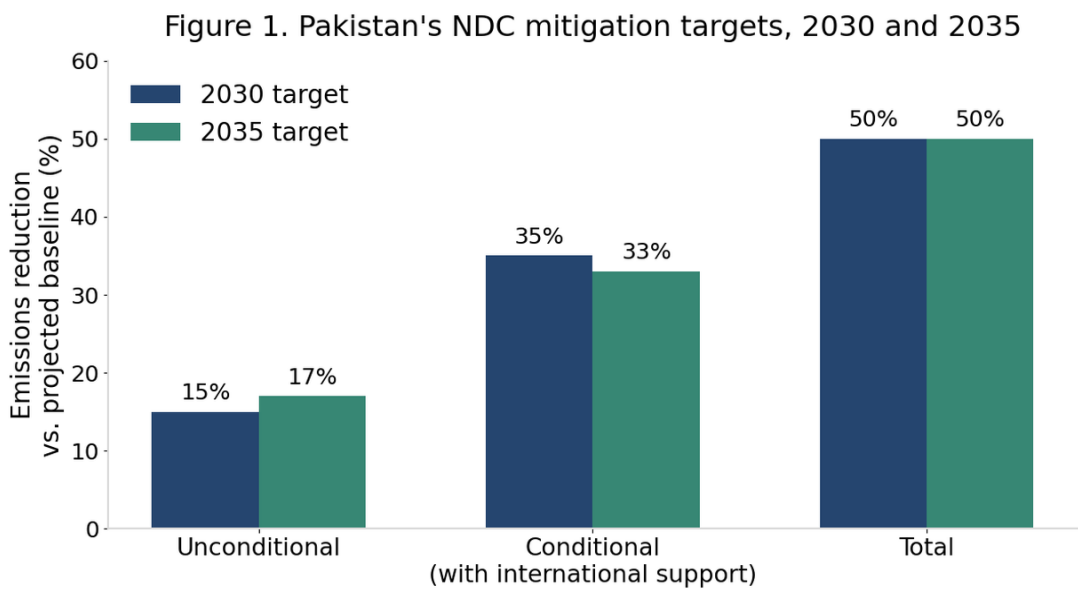
69 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

3. Pakistan’s Nationally Determined Contributions

NDC 3.0 explicitly refers to circular economy within integrated solid waste management, but it does not yet use SCP or CE as a cross-cutting framework across sectors. The relevant test is therefore both vocabulary and substance: measures that reduce material throughput, extend asset life, prevent waste or recover value may contain a circular-economy component even when described primarily as mitigation or adaptation.

Pakistan submitted its first NDC in 2016, followed by an updated version in 2021. In September 2025, Pakistan submitted NDC 3.0, setting out its climate commitments and implementation priorities through 2035.⁷⁰

3.1 Mitigation Targets



NDC 3.0 adopts a comprehensive approach covering multiple sectors. The plan sets:

Target	2030	2035
Unconditional	15% reduction from projected emissions	17% reduction from projected emissions
Conditional (with international support)	35% reduction, conditional on international support	33% reduction, conditional on international support
Total	50%	50%

Source: Government of Pakistan, NDC 3.0, 2025⁷¹

Pakistan retains its 2030 target under NDC 2.0: a reduction of up to 50% below projected emissions, comprising 15% unconditional and 35% conditional. NDC 3.0 establishes an indicative 2035 target of up to 50%, comprising 17% unconditional and 33% conditional. Its adaptation component draws on the National Adaptation Plan and provides more detailed sector priorities.⁷²

70 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

71 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

72 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

Pakistan's NDC 3.0 also includes an indicative voluntary 2035 target to reduce projected emissions from 2,559 million tonnes CO₂e to 1,280 million tonnes CO₂e. Mitigation priorities include expanding renewables to 62–69% of installed capacity, scaling up electric vehicles, climate-smart agriculture, afforestation and ecosystem restoration, and integrated solid waste management.⁷³

3.2 How SCP and CE Appear Across Pakistan's Recent NDCs

Pakistan's 2021 Updated NDC and NDC 3.0 differ in scope and terminology. The comparison is not a simple progression towards broader SCP integration. It is better understood as a change in emphasis accompanied by an operationalisation gap.

- **NDC 2.0 (2021):** The 2021 Updated NDC explicitly referenced the NAP-SCP, efficient resource use, unsustainable production patterns and resource-base inefficiencies across several sectors. It also referred to the 3Rs, reuse, recycling and material-flow analysis for plastic waste. This was broad policy recognition, but it was not translated into quantified material-efficiency targets or a cross-sectoral delivery framework.⁷⁴
- **NDC 3.0 (2025):** NDC 3.0 does not use Sustainable Consumption and Production, material efficiency or resource efficiency as organising terms. It explicitly names "ISWM & Circular Economy" within waste. Measures in energy, industry, agriculture, buildings, transport and wastewater may have SCP/CE relevance, but the NDC does not connect them through a cross-sectoral material or lifecycle framework.⁷⁵

The resulting opportunity is therefore not to claim that NDC 3.0 already integrates SCP across sectors. It is to assess where material efficiency, lifecycle approaches and resource productivity could strengthen implementation of selected commitments, while clearly separating explicit NDC content from additional analytical options.

3.3 Wider Policy Frameworks Relevant to NDC 3.0 Implementation

NDC 3.0 was developed through a "whole-of-nation" approach led by the Ministry of Climate Change and Environmental Coordination and is anchored in Pakistan's National Economic Transformation Plan. The process brought together federal ministries, provincial governments, civil society, academia, young people, and the private sector.⁷⁶

The wider enabling landscape includes frameworks referenced in NDC 3.0 and other national instruments relevant to its implementation. Their inclusion below does not mean that every framework is named in NDC 3.0:

1. **Pakistan Vision 2025:** provided an earlier national development framework whose priorities are carried forward selectively in subsequent plans.⁷⁷
2. **National Economic Transformation Plan (URAAAN Pakistan, 2024-2029):** provides the current overarching development pathway for integrating climate action into Pakistan's economic and social agenda.⁷⁸

73 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

74 Government of Pakistan. (2021). *Pakistan Updated Nationally Determined Contribution*. <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>

75 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

76 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

77 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

78 Government of Pakistan. (2024). *URAAAN Pakistan: National Economic Transformation Plan 2024-2029*. <https://pc.gov.pk/web/downloads>

3. **National Climate Change Policy (NCCP, updated 2021)**: sets national strategies for adaptation and mitigation across sectors.⁷⁹
4. **Pakistan Climate Change Act, 2017**: establishes core institutional architecture for climate governance.⁸⁰
5. **National Adaptation Plan (NAP, 2023)**: provides a strategic blueprint for adaptation through 2030.⁸¹
6. **National Action Plan on Sustainable Consumption and Production (NAP-SCP, 2017)**: not named in NDC 3.0, but a relevant supporting framework that was explicitly recognised in the 2021 Updated NDC and that emphasises integration of SCP practices into national development planning.⁸²
7. **Pakistan Climate Change Authority (PCCA)**: established in 2024 as a dedicated body to steer and coordinate national climate governance.⁸³

NDC 3.0 also gives weight to just transition, gender equality and social inclusion. Pakistan's Climate Change Gender Action Plan (ccGAP) provides a framework for gender-responsive action, alongside engagement with youth, local communities and marginalised groups.⁸⁴

3.4 Gaps in SCP/CE Integration

Despite these elements, several gaps remain in SCP/CE integration.

- **Limited cross-sectoral framing**: Circular economy is explicit in the waste sector, but NDC 3.0 does not use SCP, material efficiency or resource efficiency as organising terms across sectors, implementation plans and indicators.⁸⁵
- **National circular-economy instrument still under development**: While Pakistan is developing its first National Circular Economy Policy, it has not yet been formally adopted.⁸⁶
- **Limited material-flow data**: Pakistan lacks comprehensive and regularly updated material-flow accounts and sector baselines, constraining target-setting and monitoring.⁸⁷
- **Distributed implementation responsibilities**: Many relevant functions lie with provincial and local institutions, while federal ministries lead national policy, reporting and finance. Clearer coordination and division of responsibilities will be important for delivery.⁸⁸
- **Early-stage monitoring systems**: GHG inventories, NDC tracking, material-flow accounting, EPR reporting and circularity indicators are at different stages of development and need compatible classifications and quality arrangements.^{89,90}

79 Government of Pakistan. (2021). National Climate Change Policy. <https://mocc.gov.pk/Sitelmage/Policy/NCCP%20Report.pdf>

80 Government of Pakistan. (2017). *Pakistan Climate Change Act, 2017*.

81 Government of Pakistan. (2023). National Adaptation Plan. <https://mocc.gov.pk/PublicationDetail/ZDg5NjgwMjMtMWVkbC00ODMyLTg1NzctNmQzODFhNTVmMWEz>

82 Government of Pakistan. (2017). National Action Plan on Sustainable Consumption and Production; Government of Pakistan. (2021). Pakistan Updated Nationally Determined Contribution. <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>

83 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

84 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

85 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

86 Sustainable Development Policy Institute. (2025). *National Circular Economy Policy for Pakistan*. https://sdpi.org/national-circular-economy-policy-for-pakistan/project_detail

87 Sustainable Development Policy Institute. (2025). *State of Circular Economy in Pakistan*. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

88 Sustainable Development Policy Institute. (2025). *State of Circular Economy in Pakistan*. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

89 Government of Pakistan. (2025). *Pakistan's First Biennial Transparency Report*. <https://unfccc.int/sites/default/files/resource/Pakistan%27s%20Biennial%20Transparency%20Report%20%28BTR%29%202024.pdf>

90 SWITCH-Asia. (2025). Roundtable on Circular Economy and Resource Efficiency as the Driver of Pakistan's NDC and Long-term Climate Planning.

4. Sectoral Mapping: Integrating SCP and CE in Pakistan's NDC 3.0

A mitigation measure should not be labelled circular solely because it reduces emissions. Renewable energy, afforestation or electric mobility become relevant to CE where implementation also addresses material efficiency, durability, repair, reuse, recovery, safe end-of-life management or regenerative resource use. This distinction guides the sectoral assessment in Section 4.

This section assesses the potential SCP and CE relevance of NDC measures and additional sector opportunities, while distinguishing explicit commitments from the paper's analytical interpretation.

A systematic sector mapping can clarify where NDC 3.0 explicitly recognises circular economy, where existing measures may have resource-efficiency or lifecycle relevance, and where additional opportunities are not articulated in the NDC. The mapping is intended to support further assessment and consultation, not to establish a final set of sector priorities or implementation arrangements.⁹¹

4.1 Sectoral Mapping Table

Sector	NDC 3.0 Content	SCP/CE Opportunity	Issues for Further Assessment
Energy	NDC measures: renewable and clean capacity, BESS, grid modernisation and efficiency ⁹²	Demand-side efficiency; durable and repairable solar and storage equipment; take-back, second-life and recycling systems	Equipment stocks and waste flows; quality and repair standards; producer or importer roles; second-life safety; recycling economics
Transport	NDC measures: new-energy vehicle sales target and charging infrastructure ⁹³	Battery lifecycle management; public transport; shared mobility; efficient freight and logistics	Vehicle-category and battery data; safety and second-life rules; producer or importer roles; recycling economics; links with public transport and freight
Industry (Cement)	NDC industry measures: carbon-intensity reduction, audits, efficiency and blended cement	Lower-clinker products; material efficiency; waste heat recovery; regulated co-processing; industrial symbiosis ⁹⁴	Material availability and quality; lifecycle effects; alternative-fuel safeguards; standards and procurement demand; financing constraints
Industry (Textiles)	Not identified as a distinct value chain; covered only through broader industry measures	Water and chemicals efficiency; closed-loop systems; heat recovery; traceability; textile-waste sorting and recycling; circular design ⁹⁵	Facility baselines; buyer requirements; waste flows; cleaner-production economics; sorting and recycling feasibility; stakeholder roles

91 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

92 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

93 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

94 Government of Pakistan. (2025). Pakistan Green Taxonomy. https://www.mocc.gov.pk/SitelImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

95 Sustainable Development Policy Institute. (2025). State of Circular Economy in Pakistan. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

Sector	NDC 3.0 Content	SCP/CE Opportunity	Issues for Further Assessment
Agriculture and Food	NDC measures: climate-smart agriculture, methane reduction, water and soil management ⁹⁶	Water productivity; nutrient recovery; manure and residue management; food-loss reduction; circular bioeconomy	Crop and geographic evidence; residue trade-offs; extension and affordability; food-loss data; safeguards; locally appropriate indicators
Forestry and Land Use	NDC measures: ecosystem restoration, forestry and carbon sinks ⁹⁷	Agroforestry; sustainable forest products; ecosystem restoration; carefully screened carbon finance	Land rights; permanence and leakage; benefit sharing; sustainable biomass use; community enterprise potential; monitoring costs
Waste, Plastics and E-waste	Explicit CE reference through ISWM & Circular Economy ⁹⁸	Prevention and reuse; EPR; source separation; recycling; composting; methane capture; safe battery and e-waste systems	Waste-flow baselines; municipal capacity; EPR scope; worker inclusion; treatment economics; waste-hierarchy and hazardous-waste safeguards
Buildings and Construction	NDC measures: building energy efficiency, passive cooling, solar rooftops and urban resilience	Material-efficient design; C&D waste recovery; adaptive reuse; lower-impact materials; whole-life procurement	Code implementation; material flows; C&D waste; procurement demand; safety and quality; institutional capacity; costs
Water Resources	NDC adaptation measures: irrigation, recharge, wastewater and water-resource management	Water efficiency; leakage reduction; wastewater treatment and reuse; recharge; nature-based solutions	Water accounting; leakage and reuse potential; service performance; affordability; regulatory roles; ecosystem and health safeguards

4.2 Textiles: Underrepresented Circular Value Chain

The textile industry is a major source of export earnings and industrial employment in Pakistan. It is also resource-intensive, particularly in wet processing, dyeing and finishing, where water, energy and chemical use can be high. Untreated or inadequately treated effluent can contain dyes, salts and other pollutants that affect rivers, groundwater, ecosystems and public health.⁹⁹¹⁰⁰

NDC 3.0 Content: The textile sector has not been prominently mentioned in NDC 3.0. The NDC focuses on establishing a digital platform for GHG emissions monitoring, transparent climate reporting and verification systems, and modern low-carbon production standards for industry as a whole.¹⁰¹

SCP/CE Opportunity: Priority opportunities include water and chemical efficiency, closed-loop water systems, heat recovery, renewable energy, durable and recyclable design, sorting and fibre recovery. Savings vary by facility and should be based on audited resource baselines rather than generic percentages. Traceability, chemical management and credible recycled-content claims are also increasingly important for access to international markets.

96 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

97 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

98 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

99 Government of Pakistan. (2026). Pakistan Economic Survey 2025-26. https://www.finance.gov.pk/survey/chapter_26/Complete_PES2025_26.pdf

100 Sustainable Development Policy Institute. (2025). State of Circular Economy in Pakistan. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

101 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

Further assessment could examine whether a circular-textile roadmap would add value by connecting cleaner production, effluent compliance, resource-efficiency finance, textile-waste definitions, sorting and recycling, circular design, traceability and trade requirements. Any such assessment would also need to distinguish productive secondary-material use from the import or accumulation of low-value waste.¹⁰²

Areas for Further Assessment

Further assessment could examine facility-level water, energy, chemical and waste baselines, buyer and regulatory requirements, the availability of recoverable fibre, and the commercial case for cleaner production, sorting and recycling. A sector roadmap, targets, institutional roles and sequencing would be considered only after this evidence is tested with government, industry, workers and finance providers.

4.3 Cement Industry: NDC Industry Measures with Circular Potential

Pakistan's cement industry is an important source of industrial greenhouse gas emissions because of process emissions, clinker production and fuel use. Continued infrastructure development is likely to increase demand for cement and construction materials, making lower-clinker products, energy efficiency and responsible use of suitable by-products important for climate and resource objectives.¹⁰³

NDC 3.0 Content: The cement industry is implicitly covered in NDC 3.0 through the commitment to reduction of carbon intensity in industry.¹⁰⁴

SCP/CE Opportunity: CE strategies for the cement industry include reducing the clinker factor through suitable supplementary cementitious materials, improving energy and material efficiency, recovering waste heat, and co-processing carefully selected waste-derived fuels where environmental and technical standards are met. Alternative fuels are not automatically circular: feedstock quality, competing higher-value uses, emissions controls and the waste hierarchy must be considered.¹⁰⁵¹⁰⁶

Pakistan's cement industry has experience with alternative fuels, blended cement and waste-heat recovery, and is exploring options such as limestone calcined clay cement and carbon capture, use and storage. The scale of feasible emissions and energy savings varies by plant, fuel mix, clinker substitution, product standards and capital requirements.¹⁰⁷

These measures can support compliance with green-building and lower-carbon material requirements while improving the sector's competitiveness.¹⁰⁸

Areas for Further Assessment

Further assessment could examine the availability and quality of supplementary materials, lifecycle and emissions effects, alternative-fuel feedstocks and safeguards, product standards, procurement demand and financing constraints. These issues would need technical and stakeholder validation before a sector roadmap or performance incentives are proposed.

102 Sustainable Development Policy Institute. (2025). State of Circular Economy in Pakistan. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

103 Government of Pakistan. (2025). Pakistan Green Taxonomy. https://www.mocc.gov.pk/SitelImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

104 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

105 Intergovernmental Panel on Climate Change. (2022). Climate Change 2022: Mitigation of Climate Change, Working Group III contribution to the Sixth Assessment Report. <https://www.ipcc.ch/report/ar6/wg3/>

106 Government of Pakistan. (2025). Pakistan Green Taxonomy. https://www.mocc.gov.pk/SitelImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

107 Government of Pakistan. (2025). Pakistan Green Taxonomy. https://www.mocc.gov.pk/SitelImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

108 International Resource Panel. (2024). Global Resources Outlook 2024. <https://www.unep.org/resources/Global-Resource-Outlook-2024>

4.4 Waste Management: Explicit Circular Economy Entry Point

Priority gaps in Pakistan’s waste and materials system

Collection and segregation	Treatment and recovery	Secondary-material markets
Coverage and data quality vary across cities; source separation remains limited.	Wastewater treatment, organics recovery and controlled disposal capacity remain insufficient.	Recycling is largely informal; reliable national baselines for plastics, e-waste and other streams remain limited

Pakistan’s waste systems face significant gaps in collection, segregation, treatment, recycling and safe disposal. Published national estimates vary by reference year, geography and definition, so a single figure should not be treated as a definitive baseline. Uncollected and poorly managed waste contributes to air, water and soil pollution, drainage blockages, public-health risks and methane emissions.¹⁰⁹

NDC 3.0 Content: Waste management is explicitly included in NDC 3.0 through commitments to integrated solid waste management and methane reduction. Pakistan aims to achieve a 17% emission reduction from the waste sector through integrated solid waste management, composting of organic waste, semi-aerobic landfilling, and wastewater management solutions, including segregation, recycling, composting, landfill gas capture, upgraded treatment facilities, and deployment of advanced methane capture and utilisation systems.¹¹⁰

SCP/CE Opportunity: The priority is to apply the waste hierarchy: prevention and reuse first, followed by recycling and composting, with energy recovery considered for suitable residual streams. Source-separated organic waste can support composting or anaerobic digestion, while dry recyclable materials can supply secondary-material markets. Waste-to-energy requires case-by-case assessment of feedstock, emissions, costs and consistency with higher-value recovery options.

Pakistan’s EPR work provides an entry point for product-specific collection and recovery systems, including packaging, batteries and electronic waste. The federal single-use plastics regulations apply to Islamabad Capital Territory, while provincial initiatives differ. Further policy work would need to examine producer obligations, provincial roles, financing, reporting, compliance and the inclusion of informal workers before a national approach is proposed.¹¹¹

Integrating SCP into waste management can therefore reduce pollution while creating new economic opportunities and supporting sustainable urban development. Reducing plastic and organic waste leakage into rivers, wetlands, and coastal waters also protects the freshwater and marine biodiversity on which fisheries and downstream agriculture depend, linking waste management directly to ecosystem-based adaptation.

Areas for Further Assessment

Further assessment could examine waste flows by geography, municipal capacity, federal and provincial roles, possible EPR product scope, worker and livelihood implications, and the technical and financial case for different treatment and recovery options. Sequencing would then be determined against the waste hierarchy, collection realities and safeguards rather than assumed in advance.

4.5 Agriculture: NDC Measures with Circular Bioeconomy Relevance

Agriculture is a major source of Pakistan’s greenhouse gas emissions and accounts for most freshwater withdrawals. It is also highly vulnerable to heat, rainfall variability, floods, drought and changing river flows,

109 UNEP. (2024). Global Waste Management Outlook 2024. <https://www.unep.org/resources/global-waste-management-outlook-2024>

110 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

111 SWITCH-Asia. (2025). National Consultation Highlights Opportunities and Enablers for EPR Implementation in Pakistan. <https://www.switch-asia.eu/news/pakistan-needs-epr-policy-on-plastics/>

making water productivity, soil health and resilient livelihoods central to both adaptation and mitigation.¹¹²

NDC 3.0 Content: Agriculture is explicitly included in NDC 3.0 as a key sector for adaptation, given its high vulnerability to climate change and direct linkages to national food security. The sector also offers mitigation co-benefit through targeted interventions, including adoption of Alternate Wetting and Drying (AWD) in rice cultivation, application of slow-release fertilisers, enhanced manure management via composting and biogas digesters, and discouraging crop residue burning.¹¹³

SCP/CE Opportunity: A circular bioeconomy can improve water, nutrient and biomass use through precision irrigation, integrated pest management, composting, biogas digesters, crop rotation, agroforestry and better manure management. Benefits vary by crop, location and farming system; Pakistan-wide savings therefore require local evidence and credible baselines.¹¹⁴¹¹⁵

Agricultural residues have competing uses for soil cover, fodder, fuel, compost and industrial feedstock. Circular-bioeconomy planning should therefore prioritise soil health, food security and local livelihoods before diverting residues to energy or other markets. Closing nutrient loops through safe composting and biogas digestion can reduce waste and support soil fertility where quality and extension systems are in place.¹¹⁶

Areas for Further Assessment

Further assessment could compare options by crop and geography, consider competing uses for residues, and test extension needs, farmer affordability, safeguards and measurable outcomes. Any circular-bioeconomy priorities or targets would need to follow local evidence and consultation with provincial institutions and farming communities.

4.6 Energy Sector: NDC Measures with Lifecycle Opportunity

Pakistan's energy system remains exposed to imported-fuel costs and requires substantial investment in generation, transmission, distribution, storage and efficiency. Renewable and clean-energy expansion can improve energy security, while circular-economy measures are relevant to the quality, durability, repair, reuse and end-of-life management of energy equipment.¹¹⁷

NDC 3.0 Content: Pakistan commits to a decisive transition toward clean sources, requiring large-scale investments in renewable energy, grid modernisation, and efficiency improvements. By 2035, renewable energy (including hydropower) and clean energy are expected to reach about 38,472 MW and 43,202 MW, representing around 62% and 69% of the planned capacity mix under IGCEP 2025-2035. Natural gas and furnace oil are set to decline, with net reductions of 2,147 MW and 430 MW respectively, signaling a gradual phase down of fossil fuels in Pakistan's capacity mix. Deployment of Battery Energy Storage Systems (BESS) is planned to enhance grid flexibility, stabilise renewable variability, and support reliable large-scale integration, requiring an estimated USD 1 billion investment.¹¹⁸

SCP/CE Opportunity: Renewable-energy deployment is primarily a mitigation and energy-security measure. Its circular-economy component lies in equipment standards, longer lifetimes, repair and repowering, take-back systems, second-life use and safe recycling of solar panels, batteries, inverters and related electronic equipment. Demand-side efficiency also reduces the amount of generation and network capacity required

112 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

113 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

114 Government of Pakistan. (2017). *National Action Plan on Sustainable Consumption and Production*.

115 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

116 Government of Pakistan. (2017). *National Action Plan on Sustainable Consumption and Production*.

117 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

118 Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

to deliver energy services.¹¹⁹¹²⁰

Pakistan has strong solar and wind resources, but rapid equipment deployment also creates future material and waste-management obligations. Further assessment could examine how renewable-energy and storage targets might connect with quality assurance, consumer protection, data on installed stocks, producer or importer responsibility, and safe end-of-life systems.¹²¹¹²²

Areas for Further Assessment

Further assessment could examine equipment stocks and expected waste flows, product-quality standards, repair capacity, producer or importer responsibility, second-life safety and recycling economics. The analysis would need to distinguish circular lifecycle measures from wider grid, storage and energy-efficiency priorities.

4.7 Buildings and Construction: Operational Efficiency and Material-Use Opportunity

The construction materials sector, including steel, bricks and concrete, is fundamental to Pakistan's infrastructure development but is also resource- and energy-intensive. Brick production, clinker manufacture, steelmaking and construction waste contribute to air pollution, resource use and greenhouse gas emissions.¹²³

NDC 3.0 Content: Buildings and construction are addressed mainly through operational energy efficiency, clean cooking, solar rooftops, passive cooling, efficient air conditioning, appliance standards and LED lighting. Pakistan also has a Green Building Code, providing an existing platform that can be strengthened through implementation and additional provisions on materials and construction waste.¹²⁴

SCP/CE Opportunity: CE in construction can reduce material use, embodied emissions and waste through efficient design, longer building life, adaptive reuse, recycled materials and construction-and-demolition waste recovery. Zigzag kiln technology can reduce fuel use and air pollution compared with traditional kiln operation, while recycled steel generally requires less energy than primary production. Actual savings depend on technology, fuel, material quality and enforcement.¹²⁵¹²⁶

Circular construction can also support resilience when it is combined with appropriate structural, heat, flood and seismic standards. Material passports and design-for-deconstruction improve information and recovery at end of life, but do not by themselves make a building climate- or disaster-resilient.¹²⁷

Areas for Further Assessment

Further assessment could examine implementation of existing codes, construction-material flows, construction-and-demolition waste, procurement demand, safety and quality standards, costs and institutional capacity. This evidence would determine whether additional material-efficiency provisions or procurement pilots are justified.

119 Sustainable Development Policy Institute. (2025). *State of Circular Economy in Pakistan*. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

120 Government of Pakistan. (2022). *National Hazardous Waste Management Policy*. <https://mocc.gov.pk/SiteImage/Policy/National%20Hazardous%20Waste%20Management%20Policy%202022.pdf>

121 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

122 Government of Pakistan. (2022). *National Hazardous Waste Management Policy*. <https://mocc.gov.pk/SiteImage/Policy/National%20Hazardous%20Waste%20Management%20Policy%202022.pdf>

123 Government of Pakistan. (2023). *Green Building Code of Pakistan*. <https://mocc.gov.pk/SiteImage/Misc/files/Green%20Building%20Code%20of%20Pakistan%202023.pdf>

124 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

125 Government of Pakistan. (2023). *Green Building Code of Pakistan*. <https://mocc.gov.pk/SiteImage/Misc/files/Green%20Building%20Code%20of%20Pakistan%202023.pdf>

126 United Nations Environment Programme. (2024). *Global Waste Management Outlook 2024*. <https://www.unep.org/resources/global-waste-management-outlook-2024>

127 Government of Pakistan. (2023). *Green Building Code of Pakistan*. <https://mocc.gov.pk/SiteImage/Misc/files/Green%20Building%20Code%20of%20Pakistan%202023.pdf>

4.8 Transport: NEV Commitments and Lifecycle Opportunity

Transport is a major source of fuel demand, urban air pollution and greenhouse gas emissions in Pakistan. Sustainable mobility therefore requires a combination of cleaner vehicles, public transport, rail, efficient freight and better urban planning.¹²⁸

NDC 3.0 Content: NDC 3.0 and the New Energy Vehicles Policy 2025-2030 target 30% of new vehicle sales as new-energy vehicles by 2030 and expansion of charging infrastructure. The National Clean Air Policy also supports tighter fuel and vehicle-emission standards. Targets vary by vehicle category and should be monitored accordingly.¹²⁹

SCP/CE Opportunity: The CE contribution includes longer vehicle and component life, repair and remanufacturing, battery second life, producer or importer responsibility, safe collection and recycling, and efficient use of public and freight transport assets. Vehicle electrification alone does not address congestion, total travel demand or the material footprint of transport infrastructure.¹³⁰¹³¹

Areas for Further Assessment

Further assessment could examine NEV registration and sales data by category, current and future battery stocks, safety rules, producer or importer responsibility, second-life criteria, recycling economics and the relationship with public transport and freight efficiency. The results would inform, rather than pre-judge, any battery-lifecycle system.

4.9 Summary Assessment

The sectoral mapping shows three broad groups. Waste contains an explicit circular-economy reference in NDC 3.0. Energy, transport, agriculture, forestry, water and buildings contain measures with resource-efficiency or lifecycle relevance, but not all are circular by themselves. Textiles, construction materials, product responsibility, batteries, electronic waste, sustainable procurement and food loss and waste remain underdeveloped.¹³²

The principal area for further examination is whether and where circularity can add distinct value beyond waste. A useful test is whether an intervention reduces material throughput, extends useful life, enables reuse or recovery, prevents waste, or regenerates natural systems. This avoids relabelling all climate action as CE and helps identify where deeper evidence and consultation are justified.¹³³

The financial relevance of these interventions depends on whether they reduce lifecycle costs, avoid public or environmental costs, recover value or create reliable revenue. Section 5 examines these mechanisms and their limitations.

128 Government of Pakistan. (2025). *New Energy Vehicles Policy 2025-2030*. <https://moip.gov.pk/SiteImage/Policy/NEV%20Policy%20Final%2013.8.25.pdf>

129 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

130 Government of Pakistan. (2025). *New Energy Vehicles Policy 2025-2030*. <https://moip.gov.pk/SiteImage/Policy/NEV%20Policy%20Final%2013.8.25.pdf>

131 Government of Pakistan. (2022). *National Hazardous Waste Management Policy*. <https://mocc.gov.pk/SiteImage/Policy/National%20Hazardous%20Waste%20Management%20Policy%202022.pdf>

132 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

133 SWITCH-Asia. (2025). *Roundtable on Circular Economy and Resource Efficiency as the Driver of Pakistan's NDC and Long-term Climate Planning*. <https://www.switch-asia.eu/event/round-table-on-circular-economy-and-resource-efficiency-as-the-driver-of-pakistans-it-leds-and-ndc/>

5. Financing the Circular Transition: Cost Reduction, Value Recovery and Investment Mobilisation

This section examines the financial mechanisms through which SCP and CE can support climate implementation, while distinguishing indicative investment needs from an independently calculated financing gap.

NDC 3.0 reports cumulative investment requirements of USD 348.4 billion through 2030 and USD 565.7 billion through 2035. The additional USD 217.3 billion represents the estimated requirement for 2031-2035. A financing gap would require comparison with committed and realistically available finance; that calculation is beyond the scope of this paper.¹³⁴

The policy question is how to reduce avoidable costs, prioritise high-value interventions and mobilise appropriate public, concessional and private finance. CE can contribute through lower material and energy demand, longer asset life, operational savings, value recovery and business models that create repayment or revenue streams.¹³⁵

These contributions should not be overstated. Some circular interventions require additional upfront capital, collection systems, standards and market development before savings or revenues materialise. Project-level financial analysis is therefore needed to determine who pays, who benefits, the timing of returns, and which risks require public or concessional support.¹³⁶

5.1 How the Circular Economy Can Improve the Economics of Climate Action

Material efficiency, product-life extension, maintenance, reuse and recovery can improve the economics of climate action where they reduce lifecycle costs or avoid replacement and disposal. Their value is intervention-specific and should be demonstrated through credible technical, environmental and financial baselines.¹³⁷

Lowering Capital Requirements

Reducing demand for virgin materials and energy can lower operating and, in some cases, capital requirements across value chains. The largest benefit may arise from designing infrastructure and production systems to deliver the same service with fewer materials, lower losses and longer asset life, rather than from end-of-pipe waste treatment alone.¹³⁸

In the built environment, adaptive reuse, material-efficient design, maintenance and recovery of construction materials can reduce lifecycle emissions and defer some new construction or replacement. These benefits depend on safety, quality, location and service requirements and should not be generalised without project assessment.¹³⁹

Operational Cost Savings

Water, energy and material efficiency can reduce production costs in textiles, cement and other industries, but savings vary by facility and technology. Financing decisions should use audited resource baselines,

¹³⁴ World Bank. (2022). Pakistan Country Climate and Development Report. <https://documents1.worldbank.org/curated/en/099950111072234047/pdf/P17671804998b80030ac4f0233dc0b995ba.pdf>

¹³⁵ Government of Pakistan. (2024; updated phase published 2026). *National Climate Finance Strategy*. <https://mocc.gov.pk/SiteImage/Misc/files/NCFS.pdf>

¹³⁶ World Bank. (2024). Water in Circular Economy and Resilience. <https://www.worldbank.org/en/topic/water/publication/wicer>

¹³⁷ Ellen MacArthur Foundation. (2019). *Completing the Picture: How the Circular Economy Tackles Climate Change*. <https://www.ellenmacarthurfoundation.org/completing-the-picture>

¹³⁸ International Resource Panel. (2024). *Global Resources Outlook 2024*. <https://www.unep.org/resources/Global-Resource-Outlook-2024>

¹³⁹ Government of Pakistan. (2023). *Green Building Code of Pakistan*. <https://mocc.gov.pk/SiteImage/Misc/files/Green%20Building%20Code%20of%20Pakistan%202023.pdf>

investment costs, payback periods, maintenance requirements and verified performance rather than generic percentage assumptions.

Avoiding Environmental and Social Costs

Waste prevention, pollution control and improved collection can also avoid health, drainage, land and ecosystem costs that are otherwise borne by households and public authorities. These avoided costs are economically important even where they do not create a direct cash flow for a private investor, and may therefore justify public or results-based financing.¹⁴⁰¹⁴¹

5.2 Generating Revenue and Recovering Value

Circular systems can generate revenue or savings from secondary materials, repair and service models, producer fees, compost, biogas, recovered energy from suitable residual streams and, in selected cases, verified carbon outcomes. Revenue potential should be assessed conservatively and should not substitute for environmental regulation or public-service obligations.¹⁴²

Carbon Credits from Circular Interventions

Forestry, agroforestry, methane reduction and selected agricultural or industrial interventions may be eligible for carbon finance where they meet applicable methodologies and national requirements. For land-based activities, additionality, permanence, leakage, land rights, community participation, benefit sharing and long-term monitoring are central to environmental integrity.¹⁴³

Waste and industrial projects may also generate mitigation outcomes, but recycling or circularity does not automatically create a creditable emissions reduction. Baselines, ownership of mitigation outcomes, double-counting controls, monitoring costs and alignment with Pakistan's NDC accounting must be addressed.¹⁴⁴

Pakistan's Policy Guidelines for Trading in Carbon Markets 2024 establish a framework for market development and authorisation. Carbon markets should therefore be presented as a potential, screened revenue source rather than a direct or immediate financing channel for all circular-economy interventions.¹⁴⁵

Revenue from Secondary Raw Materials

Secondary-material markets can retain value from metals, paper, plastics, textiles, construction materials and organic resources. Much existing recovery is undertaken by small enterprises and informal workers. Policy should improve quality, demand, traceability, occupational safety and access to finance while avoiding displacement of livelihoods through poorly designed formalisation.¹⁴⁶

The national economic opportunity cannot be estimated reliably from global headline figures alone. Pakistan-specific material-flow accounts, price data, collection costs, market demand and business-model analysis are required to quantify potential value and investment needs.¹⁴⁷

140 UNEP. (2023). *Turning off the Tap: How the World Can End Plastic Pollution and Create a Circular Economy*. <https://www.unep.org/resources/turning-off-tap-end-plastic-pollution-create-circular-economy>

141 UNEP. (2024). *Global Waste Management Outlook 2024*. <https://www.unep.org/resources/global-waste-management-outlook-2024>

142 International Resource Panel. (2024). *Global Resources Outlook 2024*. <https://www.unep.org/resources/Global-Resource-Outlook-2024>

143 Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

144 UNFCCC. (2025). *Boosting Ambition and Implementation of NDCs through Circularity: Practical Toolbox*. <https://www.learningfornature.org/en/building-circularity-into-nationally-determined-contributions/>

145 Government of Pakistan. (2024). *Pakistan Policy Guidelines for Trading in Carbon Markets*. <https://mocc.gov.pk/SiteImage/Policy/Pakistan%20Policy%20Guidelines%20for%20Trading%20in%20Carbon%20Market.pdf>

146 Sustainable Development Policy Institute. (2025). *State of Circular Economy in Pakistan*. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

147 Ellen MacArthur Foundation. (2019). *Completing the Picture: How the Circular Economy Tackles Climate Change*. <https://www.ellenmacarthurfoundation.org/completing-the-picture>

Private Sector Investment Attraction

Private investment is most likely where projects have predictable feedstock or demand, credible counterparties, enforceable contracts, reliable data and revenue or cost savings sufficient to service finance. The Pakistan Green Taxonomy and National Climate Finance Strategy can help define eligible activities and align domestic and international capital with national priorities.¹⁴⁸

5.3 Financing Options for Appraisal

Role of Blended Finance

Blended finance can be useful where a circular-economy project generates economic value but faces risks that commercial finance cannot reasonably absorb at affordable cost. The objective is not to maximise a generic leverage ratio, but to use scarce concessional resources only for clearly identified barriers and additional impact.¹⁴⁹

Any appraisal in Pakistan would need to examine project and market risks, including policy uncertainty, municipal or utility credit risk, feedstock quality, technology performance, foreign-exchange exposure and weak data. It would also need to consider national ownership, debt sustainability and public-finance implications.

De-risking Instruments for Circular Economy Investments

Instrument types that may warrant appraisal include:

Guarantees and risk-sharing: Targeted guarantees can address defined credit, performance or off-taker risks while preserving incentives for due diligence.¹⁵⁰

Concessional debt and equity: Longer tenors or lower-cost capital can support viable projects whose returns are delayed by infrastructure or market-development needs.¹⁵¹

Project-preparation and technical-assistance grants: Support for baselines, feasibility studies, environmental and social assessment, transaction structuring and procurement can convert policy concepts into finance-ready projects.¹⁵²

Results- or outcome-based finance: Payments linked to verified service, waste, resource-efficiency or emissions outcomes can support public goods where direct user revenues are insufficient.¹⁵³

5.4 Illustrative Circular Economy Investment Opportunity Areas

The areas below illustrate categories with investment potential. Converting them into a project pipeline requires named sponsors, locations, technical scope, project stage, capital needs, revenue models, approvals, safeguards and financing requirements.¹⁵⁴

Renewable Energy and Energy Efficiency

Rapid growth in solar, inverters and batteries creates opportunities for quality assurance, repair, repowering, take-back, second-life use and recycling. Finance may support collection and processing infrastructure once

148 IFC. (2025). *Circular Economy Investment Tracker*. <https://www.ifc.org/ceit-factsheet.pdf>

149 Convergence. (2025). *State of Blended Finance 2025*. <https://www.convergence.finance/resource/state-of-blended-finance-2025>

150 World Bank. (2025). *Plastic Waste Reduction-Linked Bond: Case Study*. <https://thedocs.worldbank.org/en/doc/a8e38e1c4426100de215af2a9212e6ed-0340012024/original/Case-Study-Plastic-Waste-Reduction-Linked-Bond.pdf>

151 Government of Pakistan. (2025). *Pakistan Green Taxonomy*. https://www.mocc.gov.pk/SiteImage/Misc/files/2025%20Pakistan%20Green%20Taxonomy_Aug%2014.pdf

152 Government of Pakistan. (2024; updated phase published 2026). *National Climate Finance Strategy*. <https://mocc.gov.pk/SiteImage/Misc/files/NCFS.pdf>

153 World Bank. (2025). *Plastic Waste Reduction-Linked Bond: Case Study*. <https://thedocs.worldbank.org/en/doc/a8e38e1c4426100de215af2a9212e6ed-0340012024/original/Case-Study-Plastic-Waste-Reduction-Linked-Bond.pdf>

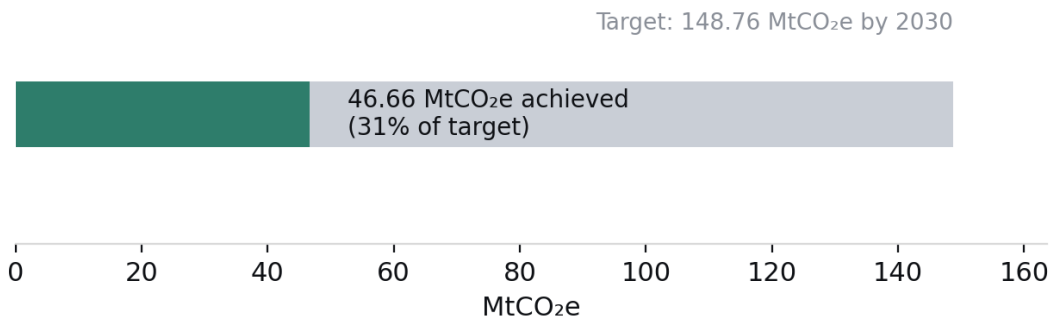
154 Government of Pakistan. (2024; updated phase published 2026). *National Climate Finance Strategy*. <https://mocc.gov.pk/SiteImage/Misc/files/NCFS.pdf>

stock and waste-flow data, standards, producer responsibilities and market demand are established.¹⁵⁵

Energy-efficiency investments and battery storage are identified in national policy and NDC 3.0. Any financing assessment would need to distinguish efficiency projects with measurable savings from public network investments and from end-of-life systems that may require producer fees or regulation.¹⁵⁶

Forestry and Carbon Credits

Figure 2. Upscale Green Pakistan Programme: forestry sequestration progress against the 2021–2030 target



The Upscale Green Pakistan Programme and related ecosystem-restoration activities may create opportunities in sustainable forestry, agroforestry, nursery systems, monitoring and community enterprises. Carbon revenue is possible only where methodologies, additionality, permanence, safeguards, authorisation and benefit sharing are demonstrated; it is not a guaranteed return stream.¹⁵⁷

Waste Management and Secondary Materials

Potential waste opportunity areas include collection and sorting, material-recovery facilities, composting and anaerobic digestion for separated organic waste, landfill-gas capture, wastewater treatment, safe battery and electronic-waste management and product-specific EPR systems. Waste-to-energy requires case-by-case assessment against the waste hierarchy and local feedstock conditions.¹⁵⁸

Textile Circular Economy

Textile opportunities include cleaner production, closed-loop water systems, heat recovery, traceability, sorting, fibre recovery and circular-design services. Bankability depends on facility performance, buyer demand, environmental compliance, feedstock quality and the ability to monetise verified savings or products.¹⁵⁹

Before these opportunities can be treated as priorities, further work would need to assess ownership, sequencing, baselines, safeguards, procurement and financing structures. Section 6 therefore sets out strategic directions for that assessment rather than a detailed implementation programme.

155 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

156 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

157 Government of Pakistan. (2025). Pakistan’s Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

158 UNEP. (2024). Global Waste Management Outlook 2024. <https://www.unep.org/resources/global-waste-management-outlook-2024>

159 Sustainable Development Policy Institute. (2025). *State of Circular Economy in Pakistan*. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

6. Strategic Directions for Further Assessment

From Diagnosis to a Focused Assessment Agenda

The preceding analysis points to two findings. Pakistan already has relevant foundations across the NAP-SCP, NDC 3.0, the Pakistan Green Taxonomy, the National Climate Finance Strategy and sector policies. At the same time, many possible SCP/CE applications remain analytical opportunities rather than validated implementation priorities. The paper therefore retains four high-level strategic directions and leaves detailed institutional, sectoral and financing design to further technical assessment and consultation.

The strategic directions are intentionally limited. They identify what requires examination without prescribing fixed institutional leads, targets, financing windows, sector roadmaps or implementation timelines in advance.

This approach keeps the paper useful as a policy diagnostic while preserving space for evidence-based prioritisation and stakeholder validation.

6.1 Broaden the SCP/CE Lens Beyond Waste

Pakistan could examine how material efficiency, lifecycle approaches and resource productivity might support implementation of selected NDC 3.0 commitments beyond waste. The assessment would need to distinguish explicit NDC content from possible SCP/CE interpretations or additions and avoid relabelling general climate action as circularity.

Any proposed cross-sector approach could build on the NAP-SCP and current climate and development architecture while identifying where national, provincial or sector instruments already provide viable entry points.¹⁶⁰

6.2 Strengthen the Evidence Base

Further work could develop material-flow information, sector baselines and indicators that relate resource use to emissions, costs, resilience and investment needs. Priority data gaps include textiles, construction materials, municipal and product waste, agriculture and renewable-energy equipment.¹⁶¹

This evidence would allow sector opportunities to be compared on a consistent basis and would help determine where circularity indicators can complement, but not replace, GHG inventories and NDC tracking.¹⁶²

6.3 Prioritise Opportunities Through Assessment and Consultation

Potential opportunities could be screened against emissions relevance, resource savings, economic and trade significance, investment viability, environmental and social safeguards, institutional feasibility and adaptation co-benefits. The sector mapping in Section 4 provides candidate areas, not a final priority list.

Priorities, sequencing and targets could then be developed through consultation with the responsible federal, provincial and local institutions, business and worker representatives, finance providers and affected communities.¹⁶³

¹⁶⁰ Government of Pakistan. (2017). National Action Plan on Sustainable Consumption and Production; Government of Pakistan. (2021). Pakistan Updated Nationally Determined Contribution. <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>

¹⁶¹ Government of Pakistan. (2025). Pakistan's First Biennial Transparency Report. <https://unfccc.int/sites/default/files/resource/Pakistan%27s%20Biennial%20Transparency%20Report%20%28BTR%29%202024.pdf>

¹⁶² Sustainable Development Policy Institute. (2025). State of Circular Economy in Pakistan. <https://sdpi.org/assets/lib/uploads/State%20of%20CE%20Report%20-%20SDPI%20-%20Final.pdf>

¹⁶³ Government of Pakistan. (2024; updated phase published 2026). National Climate Finance Strategy. <https://mocc.gov.pk/SiteImage/Misc/files/NCFS.pdf>

6.4 Assess Enabling Arrangements Before Adoption

Institutional roles, policy instruments, financing mechanisms, project-preparation arrangements and implementation sequencing could be assessed before adoption. The appraisal would need to test existing mandates, federal-provincial roles, public-finance implications, environmental and social safeguards, and the realistic potential for private or concessional finance.¹⁶⁴

These four directions define an assessment agenda without settling the detailed programme that later technical analysis and consultation would need to develop.

¹⁶⁴ Government of Pakistan. (2024; updated phase published 2026). National Climate Finance Strategy. <https://mocc.gov.pk/SiteImage/Misc/files/NCFS.pdf>

7. Conclusion

Pakistan's NDC 3.0, submitted in September 2025, sets an indicative economy-wide target to reduce projected 2035 emissions by up to 50% and strengthens adaptation priorities drawn from the National Adaptation Plan. It explicitly recognises circular economy within integrated solid waste management and contains measures across industry, agriculture, energy, transport, water, forestry, buildings and cities that may offer additional SCP/CE entry points.¹⁶⁵

The central finding is that Pakistan does not need to begin from a blank slate, but neither does NDC 3.0 already provide a cross-sectoral SCP/CE framework. The principal opportunity for further assessment is to determine where circularity can add distinct value beyond waste while separating genuine CE measures from general climate action.

Further work could examine possible circular-economy components within selected NDC measures. Examples include equipment durability, repair, take-back and recycling in renewable-energy and NEV programmes; water, nutrient and biomass efficiency in agriculture; material efficiency and suitable by-product use in industry; and prevention, reuse and recovery within waste policy. These examples are areas for assessment, not a settled action programme.¹⁶⁶

The main areas warranting deeper investigation include textile value chains, construction materials and demolition waste, product and packaging responsibility, batteries and electronic waste, sustainable procurement, food loss and waste, and consistent material-flow data. Their relative priority and practical scope would need to be established through evidence and consultation.

The financial case is important but should remain evidence-based. Circular interventions can lower lifecycle costs, avoid environmental and social costs, recover value and create revenue, but the scale and timing of benefits vary. Pakistan-specific baselines and project analysis are needed before opportunities are described as bankable or as quantified contributions to a financing gap.¹⁶⁷

NDC 3.0 and related national policies provide a strong policy signal, but they do not themselves remove project, market, technology or counterparty risk. Any investment strategy would need to assess project preparation requirements, regulation, data, safeguards and financial instruments against specific barriers and national public-finance considerations.

The next step is not to settle institutional arrangements or sector roadmaps in advance. It is to strengthen the evidence base, identify a focused set of candidate opportunities, and subject priorities, institutional options and financing mechanisms to further technical assessment and stakeholder validation.

With that analytical foundation, Pakistan can determine where SCP and CE offer practical, credible contributions to resource security, competitiveness, resilience and climate performance.¹⁶⁸

¹⁶⁵ Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

¹⁶⁶ Government of Pakistan. (2025). Pakistan's Third Nationally Determined Contribution (NDC 3.0). https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

¹⁶⁷ International Resource Panel. (2024). Global Resources Outlook 2024. <https://www.unep.org/resources/Global-Resource-Outlook-2024>

¹⁶⁸ Government of Pakistan. (2025). *Pakistan's Third Nationally Determined Contribution (NDC 3.0)*. https://unfccc.int/sites/default/files/2025-09/Pakistan_NDC3.0_24%20Sep.pdf

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