Pakistan National Action Plan on SDG 12

Sustainable Consumption and Production

Government of Pakistan

Ministry of Climate Change

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Pakistan National Action Plan on SDG 12

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DISCLAIMER

This document is an output of the Project "*Strengthening Pakistan's National Policy Frameworks to Facilitate Resource Efficiency and Sustainable Consumption and Production (RE/SCP)"*, in collaboration with the United Nations Environment Programme (UN Environment); the European Union's (EU) SWITCH-Asia Programme and the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP) Secretariat, with financial support from the United Nations Development Account (UNDA). The present document is an outcome of extensive deliberations and inputs from the Federal and Provincial consultation conducted by National SCP team, led by the Federal Ministry of Climate Change, Government of Pakistan.

Foreword

Pakistan National Action Plan (NAP) on Sustainable Development Goal 12 (SDG12), which is Sustainable Consumption and Production (SCP), has been developed after extensive input and deliberations of all stakeholders. It marks the culmination of national and provincial level multi-stakeholders consultation process launched by the Government of Pakistan, Ministry of Climate Change in collaboration with the EU SWITCH-Asia Policy Support Programme as well as UN Environment serving as the 10YFP Secretariat, with support from the UN Development Account. Adoption of the unanimous resolution by National Assembly on 19th February 2016 registered a history and made Pakistan first country in the World that adopted Agenda 2030 for Sustainable Development as its own national development agenda. This epochal decision, attaches special significance to the NAP-SCP as it lays foundation of the roadmap for achieving sustainable development goals.

Sustainable consumption and production (SCP) is about promoting resource and energy efficiency, sustainable infrastructure and providing access to basic services, green and decent jobs and a better quality of life for all. SCP pattern is not just an environmental issue; it is about maintaining the natural capital and hence productivity and capacity of our planet to meet human needs and sustain economic activities. The implementation of the 10-Year Framework of Programmes on Sustainable Consumption and Production, adopted at Rio+20 in 2012, is the first target set under SDG12. Recognizing this need, the government has launched "Green Pakistan" programme to maintain and increase the natural resource capital. A shift to SCP pattern leads to creation of new opportunities for poverty eradication, and enhancing prosperity for all. The SCP is a powerful decision making tool that plays a key role in climate change, as almost everything we consume and produce affects our water, food and energy security, as it impacts the ecosystems and communities worldwide.

I am sure; this milestone document will lay down the roadmap for promoting sustainable consumption and production in Pakistan to achieve sustainable economic growth as envisaged in the Vision 2025, by doing more and better with less without jeopardizing the needs of the future generations.

Zahid Hamid
Federal Minister for Climate Change,
Government of Pakistan
Islamabad

Acknowledgement

It gives me a great pleasure to acknowledge on behalf of the Government of Pakistan Ministry of Climate Change, the valuable support provided by UN Environment, the EU SWITCH-Asia Policy Support Programme and the 10YFP Secretariat with financial support from the UN Development Account the collaboration made the task of preparation of the National Action Plan on Sustainable Consumption and Production (NAP-SCP) became possible to undertake.

The process for formulation of NAP-SCP commenced with the convening of National Roundtable on SCP in August 2016 in Islamabad. I am grateful to the honourable Federal Minister Mr. Zahid Hamid for inaugurating the Roundtable and Mr. Yousuf Naseem Kokhar, Secretary, Planning Development and Reforms, Major General Asghar Nawaz, Chairman NDMA, Mr.Neil Bhune, UN Resident Coordinator, Mr. John Sorensen, Charge de Affairs of the European Union's, Ms. Bella Evidente, Country Representative UN Habitat, Ms. Angela Kearney, Country Representative UNICEF, Mr. Esam Alqararah, Country Representative UNIDO, Ms. Roshan Ara, Development Advisor SWITCH-Asia Program on SCP, Ms. Janet Salem, Programme Officer UN Environment , Ms. Donna Mei Ling Park, Communication Officer UN Environment, and all the delegates and presenters of the technical papers in the Roundtable for their support and commitment.

I am also thankful to the Chairs and Co-chairs of the technical sessions of the Roundtable Mr. Fazal Abbas Maken, Secretary, Ministry of Science and Technology, Mr. Yasuhiro Toju, Chief Country Representative JICA, Mr. Iqbal Chohan, Secretary Environment Protection Department, Punjab, Dr. Mohammad Khurshid, Director General South Asia Cooperative Environment Programme (SACEP) for taking out time from their busy schedule and sharing their valuable thoughts that greatly facilitated formulation of NAP-SCP.

Further, in pursuance of roadmap announced by the Minister for Climate Change at the Roundtable; provincial consultative workshops were held for preparation of NAP-SCP, from November to December 2016 at Lahore, Karachi, Peshawar, Muzaffarabad, and Gilgit. I am thankful to all provincial Governments including AJK, GB and FATA for their cooperation and valuable inputs, which has helped the Ministry in formulation of NAP-SCP.

The cooperation and support extended by Provincial Planning and Development, Power, Electricity, Forest, Wildlife, Water, Agriculture, Fisheries and Environmental Protection Departments, particularly by Ms. Iffat Farooq, Additional Secretary, Power Department, Dr. Jawed Iqbal, Director General, EPA, Dr. Iman Ullah Joint Chief Economist P&DD, Punjab; Mr. Zamir Ahmed Khan, Secretary, EPD; Mr. Naeem Mughal, DG, Sindh EPA is highly appreciated. I also recognize the efforts and cooperation of Mr. Nizam ud Din Secretary, PHED; Dr. M. Bashir Ahmed Khan; DG, EPA, Khyber Pakhtunkhwa and Mr. Baseer Khan, Chief Conservator, FATA Forest Department. Hospitality and cooperation by Mr. Mansoor Dar, Secretary, Pⅅ Mr. Fayyaz A. Abbas, Secretary, Electricity; Dr. Raja Aurangzeb Khan, DG, Climate Change Centre and Raja Muhammad Razzaque, DG, EPA, AJK; Sajjad Haider, Secretary Forests, Wildlife and Environment; Khadim Hussain Saleem, Secretary Fisheries and Agriculture; Zafar Waqar Taj, Secretary Power and Mr. Shehzad Shigri, DG, EPA, Gilgit Baltistan was also very helpful and appreciable in preparing Action Plans on SCP for AJK and GB.

I appreciate the hard work of the technical team of the Ministry of Climate Change led by Mr. Irfan Tariq, Director General, Climate Change and Environment which made it possible to successfully steer and coordinate with the federal, provincial, academia, civil society, and private sector organizations for their

active involvement and mainstreaming their contributions in the preparation of the NAP on NAP-SCP. The team included Mr. Asif Sahibzada, Mr. Azim Khoso, Dr. Saima, and Mr. Imran Khan.

Last but not the least, I wish to extend my appreciation to the UN Environment-SCP Coordinator Pakistan Mr. Jawed Ali Khan and his team members Ms. Yasmin Jawed, Mr. Tayyab Shahzad, Ms. Faiqa Aziz and Mr. Adil bin Zahid for undertaking daunting task of the preparation of NAP-SCP for Pakistan which demonstrates their high level of professional skills and comprehension.

I am confident that NAP-SCP will serve as an important tool for mainstreaming SCP in the Policies and Programmes at the federal and provincial levels to achieve SDGs targets.

Syed Abu Akif

Secretary, Ministry of Climate Change

Government of Pakistan, Islamabad

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Acronyms

10YFP	10-Year Framework of Programmes on Sustainable Consumption and Production Patterns
AEDB	Alternate Energy Development Board
ADBP	Agricultural Development Bank of Pakistan
AIS	Automatic Identification System
AJK	Azad Jammu & Kashmir
BRT	Bus Rapid Transport
CADD	Capital Administration & Dev. Division
CBOs	Community Based Organizations
CC	Climate Change
CDA	Capital Development Authority
CDG	City District Government
CETPs	Combined Effluent Treatment Plants
CO^2	Carbon Dioxide
CSD	Conference on Sustainable Development
CSR	Corporate Social Responsibility
DDMAs	District Disaster Management Authorities
DFI	Direct Foreign Investment
DMC	Domestic Material Consumption
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EPDs	Environmental Protection Departments
EU	European Union's
FAO	Food and Agriculture Organization
FATA	Federally Administered Tribal Areas
FDI	Foreign Direct Investment
Fig	Figure
FIs	Financial Institutions
FPCCI	Federation of Pakistan Chambers of Commerce & Industry
GB	Gilgit Baltistan
GCISC	Global Change Impact Studies Centre
GDP	Gross Domestic Product
GHGs	Greenhouse gases
GHI	Global Hunger Index
GIS	Geographical Information System
GJ	Giga Joule
GLOF	Glacial Lake Outburst Floods
GoKP	Government of Khyber Pakhtunkhwa
GOP	Government of Pakistan
GPS	Global Positioning System
HDIP	Hydro Carbon Development Institute of Pakistan
HEC	Higher Education Commission
HPP	Hydropower potential
HTV	Heavy Transport Vehicle
ICM	Integrated Coastal Management
ICTs	Information and communication technologies
IEE	Initial Environmental Examination
IPCC	Inter-provincial coordination committee
IPM	Integrated Pest Management
IRSA	Indus River System Authority
IUCN	International Union for Conservation of Nature and Natural Resources
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
JPOI	Johannesburg Plan of Implementation
Kg	Kilogram
kl	kilo liters (1000 liters)
Km	Kilo-meter
KPK	Khyber Pakhtunkhwa
LG	Local Governments
LGRDD	Local Government, Elections and Rural Development Department
LPG	Liquefied Petroleum Gas
LTV	Light Transport Vehicle
M/o	Ministry of
MAF	Million Acre Foot

MCI	Metropolitan Corporation Islamabad
MDGs	Millennium Development Gaols
MF	Material Footprint
MOCC	Ministry of Climate Change
MPCD	Marine Pollution Control Department
MW	Mega Watt
NAP	National Action Plan
NARC	National Agricultural Research Council
NAVTTC	National Vocational & Technical Training Commission
NCCF	National Climate Change Fund
NCPC	National Cleaner Production Center
NCS	National Conservation Strategy
NDMA	National Disaster Management Authority
NEECA	National Energy Efficiency and Conservation Authority
NEPRA	National Electric Power Regulatory Authority
NEQS	National Environmental Quality Standards
NEVTTC	National Vocational & Technical Training Commission
NIBGE	Nuclear Institute of Biology & Genetic Engineering
NGOs	Non-Governmental Organizations
NHA	National Highways Authority
NIE	National Implementing Entity
NIO	National Institute of Oceanography
NSDS	National Sustainable Development Strategy
NTDC	National Transmission & Despatch Company
NTRC	National Transport Research Council
OECD	Organization for Economic Co-operation and Development
OGRA	Oil and Gas Regulatory Authority
OICCI	Overseas Investors Chamber of Commerce and Industry
PAEC	Pakistan Atomic Energy Commission
Pak EPA	Pakistan Environmental Protection Agency
Pak-INDC	Pakistan's Intended Nationally Determined Contribution
PARC	Pakistan Agricultural Research Council
PCRET	Pakistan Council of Renewable Energy Technologies
PCRWR	Pakistan Council of Research in Water Resources
PCSIR	Pakistan Council of Scientific and Industrial Research
PDMAs	Provincial Disaster Management Authorities
PES	Payment for ecosystem services
PHDEB	Pakistan Horticultural Development & Export Board
PHED	Public Health Engineering Department
PIE	Provincial Implementing Entity
PJ	Peta Joule
PMD	Pakistan Meteorological Department
PNAC	Pakistan National Accreditation Council
PPIB	Private Power Infrastructure Board
PPP	Public Private Partnership
PPPA	Public Private Partnership Authority
PPRA	Public Procurement Regulatory Authority
Prov.	Province, including AJK, GB & FATA
PRSP	Poverty Reduction Strategy Paper
PSDP	Public Sector Development Program
PSLM	Pakistan Social and Living Standards Measurement
PSQCA	Pakistan Standards & Quality Control Authority
PTA	Pakistan Telecommunication Authority
R&D	Research and Development
RBHs	Rural Business Hubs
REDD+	Reduction of Emissions from Deforestation and Forest degradation
Rs.	Rupees
SCP	Sustainable Consumption and Production

SCDA	Sindh Coastal Development Authority
SDGs	Sustainable Development Goals
SEA	Strategic Environment Assessment
SERRA	State Earthquake Rehabilitation and Reconstruction Authority, AJK
SLM	Sustainable Land Management
SMART	Self-monitoring and Reporting
SMEDA	Small and Medium Enterprise Development Authority
SMEs	Small and Medium Enterprises
SOM	Soil Organic Matter
SUPARCO	Space and Upper Atmosphere Research Commission
T&D	Transmission and Distribution
TEVTA	Technical Education and Vocational Training Authorities
TPEs	Total Primary Energy Supply
UN	United Nations
UNCSD	United Nation Conference on Sustainable Development
UN Environment	United Nations Environment Programme
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WAN	Wide Area Net Work
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Authority
WF	Water Foot print
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund
ZTBL	Zarai Taraqiati Bank Limited

Executive Summary

The National Action Plan on Sustainable Consumption and Production (NAP-SCP) is an outcome of extensive deliberations and inputs from National Roundtable and Provincial multi stakeholder consultative workshops to pave the way for mainstreaming SCP related policies as tools to achieve sustainable development in Pakistan. The Government of Pakistan, Ministry of Climate Change led the NAP-SCP formulation process in collaboration with UN Environment, the EU SWITCH-Asia Programme and the support of the 10YFP Secretariat.

For formulating the NAP-SCP, out of SDG seventeen sectors following sectors namely *Climate Change, Energy, Sustainable Food System, Sustainable Buildings and Cities, Sustainable Transport, Water, Land eco-system, Marine eco-system, Industry, and Education* were prioritized by the stakeholders at the national and provincial levels to address the 12th SDG target. Pakistan Policy document "Vision 2025" has been taken as the base for the formulation of NAP on SCP. It attaches top priority to mainstream SCP in the sectoral policies of the Government to achieve sustainable development through targeted interventions in the priority sectors for increasing the resource use efficiency in the areas, which are demonstrating major inefficiencies. In response to SDG12 as well as to the implementation of the 10-Year Framework of Programmes on Sustainable Consumption and Production, adopted in 2012 and recognized as the first target under SDG12, the NAP-SCP in all sectors aims on accelerating the shift towards SCP, increasing resource use efficiency, decoupling economic growth from environmental degradation, mainstreaming SCP into sustainable development policies, programmes and strategies, supporting capacity building and facilitate access to financial and technical assistance and dissemination of information and knowledge on SCP principles.

The NAP-SCP provides conceptual objectives and frameworks complemented by a set of suggested policy enablers and actions that could translate SCP into projects on the ground. A paradigm shift is required to provide incentives from low value to high value products and internalization of environmental costs into pricing mechanisms with increased resource use efficiency in the value chain. There is a need to recognize to upgrade human resources, promote environment conservation and management, adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change and resilience to natural disasters.

The key strategic actions include: establishment of climate resilient infrastructure; optimal exploitation of indigenous renewable energy resources, cut waste full losses through investment in transmission and distribution infrastructure; introduction of farm and crop management techniques, increasing storage facilities and on farm residue management, eco-labeling of agricultural products; promote smart cities, prevent urban encroachments on fertile agricultural and forest lands, provide affordable housing, integrated waste management programme; introduction of market tools to promote value chains of transport management; integrated water resource management, recycling and re-use of industrial and domestic wastewater; promotion of sustainable forest and land management; integrated coastal management, protection of marine flora and fauna; greening the supply chain by resource efficiency and clean technologies, upgrade and modernize technologies, development of eco-industrial parks, technology parks, incubators and cleaner production centers; provide quality and affordable education and establish linkages between universities and industries.

The NAP-SCP is an over-arching document that will be implemented by the respective ministries, governments departments, relevant agencies and organizations. It is proposed that these agencies devise their own programmes and develop projects to implement and monitor the actions reflected in the NAP-SCP in short, medium and long-term perspective in accordance with their respective area of responsibility. Similarly, the provincial governments including Azad Jammu Kashmir (AJK), Gilgit-Baltistan (GB), Federally Administered Tribal Areas (FATA) and local governments will also devise their own strategies, and programmes for implementation of the Action Plans for SCP.

The NAP-SCP outline the road map for the country to achieve sustainable socio-economic development by eliminating inefficiencies and over exploitation of resource base to protects environmental degradation. Hence shall meet the needs of the present without compromising the ability of future generations to meet their own needs.

CHAPTER 1: SCOPE & METHODOLOGY

1.1. Background

Sustainable Consumption and Production (SCP) is an overarching objective of and a prerequisite for sustainable development, as recognized in the Johannesburg Plan of Implementation (JPOI) of the World Summit on Sustainable Development (WSSD) in 2002. In 2002 at the WSSD, the global community called for a shift towards SCP which means "**do more and better, with less"**, as cleaner and more resource efficient production processes are less costly and more competitive. It consumes less ecological space and resource base. In 2012, the process was further carried forward at the UN Conference on Sustainable Development (CSD) (Rio +20) in which the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP) was formally adopted, including an initial list of programmes focused on consumer information, sustainable lifestyles and education, sustainable public procurement, sustainable buildings and construction, sustainable tourism including tourism, to which sustainable food systems was later added.

The process culminated with the adoption of 17 Sustainable Development Goals (SDGs) by the UN General Assembly and replaced MDGs as it lacked focus on many critical areas including environmental sustainability. The newly adopted SDGs reflect direct linkages between human well-being, economic development and a healthy environment. Among SDGs, 12th SDG focuses on SCP, which is not only a standalone goal but it has roots in almost all of the SDGs. The implementation of the 10YFP is the first target under SDG12. The targets of SDG most closely related with the concept of SCP are in (Annex I).

A paradigm shift is required to mainstream SCP in the crosscutting elements of the SDG goals. It requires a policy framework and engagement of numerous stakeholders. Collaboration between multiple areas and levels within government is necessary to develop, implement, monitor and evaluate successful SCP actions. This is required not to just improve production, but also to support consumers to move towards sustainable consumption choices.

The impact of development in the recent decades shows tremendous increase and stress on the natural resource base across the world. Similar trend is also reflected in Pakistan with increasing demand for energy, food, water and other resources. This has resulted in resource depletion, pollution, environmental degradation and climate change towards its limits. Hence the current development pattern in Pakistan is not sustainable. The key element for achieving sustainable development is by transition towards adopting Sustainable Consumption and Production (SCP) with increased resource use efficiency in the value chain in all sectors. Pakistan has been selected as one of the pilot countries by UN Environment under EU SWITCH-Asia Regional Programme to develop a National Action Plan on Sustainable Consumption and Production (SCP), and has also received the support of the 10YFP Secretariat to do so.

To mainstream SCP into national level policies for its progression towards sustainable development. The Ministry of Climate Change, in collaboration with UN Environment, the EUSWITCH-Asia programme has initiated a programme in Pakistan on Sustainable Consumption and Production (SCP) titled *"Strengthening Pakistan's National Policy Frameworks to Facilitate Resource Efficiency and Sustainable Consumption and Production (RE/SCP)",* which also received the support of the 10YFP Secretariat and the UN Development Account. The project aims to develop a National Action Plan (NAP) to achieve SCP targets as defined in SDG 12 in a systematic and pragmatic manner. The NAP attempts to mainstream SCP into development planning, sectoral policies and budgetary process which will support

the implementation of SCP objectives and actions at the national and provincial level. The NAP-SCP will act as a guiding document for promoting efficiency, and controlling unsustainable patterns of consumption and production, which if not taken into consideration will further exacerbate socio-economic development and ecosystem of Pakistan. The NAP on one hand prioritizes sectors as well as actions in short, medium and long term along with relevant lead agencies and cost with the perspective to achieve sustainable development. Other initiatives to support SCP and Sustainable Development in Pakistan is in Annex II.

1.2. Conceptual Framework

The conceptual framework aims at defining the main elements necessary to position SCP in policies and development strategies to achieve sustainable development

1.2.1. Socio-Economic Dimension

Pakistan's GDP growth was below average among the Developing Asia group[1]between 1970 and 2015, while its population growth was the fastest. This combination led to affluence (GDP per capita) increasing relatively slowly, by a factor of 2.5 between 1970 and 2015, a performance which saw its ranking on this measure decline from eighth to twelfth out of the 17 countries which make up the Developing Asia group. Pakistan was in the low human development category (as measured by UNDP) in 2015, with an HDI of 0.55, a life expectancy of 66.4 years and a mean of 4.7 years of schooling.

The growth of three key economic indicators for Pakistan since 1970 is shown in Figure. 1. GDP growth, while below the Developing Asia average, still averaged 4.7% p.a. compounding between 1970 and 2015. This rapid growth in GDP did not translate into rapid gains in affluence, which grew at 2.1% p.a., due to Pakistan's simultaneous rapid population growth, which averaged 2.6% p.a. over the same period This rapid growth in population strongly influences a number of other key indicators throughout this report, with Pakistan often displaying major escalation in total environmental demands and loadings between 1970 and 2015, but relatively limited increases in resource availability on a per capita basis [2]. The situation has been further aggravated due to impact of rapid urbanization, weak enforcement of environmental regulations and move towards unbridled consumerism, which drained an already strained economy.

[1] The Developing Asia group referred to throughout this document is a group of 17 countries in the region: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam.

[2] Indicators for a resource efficient and green Asia and the Pacific, Pakistan Country Report, UNEP-SWITCH Asia 2016

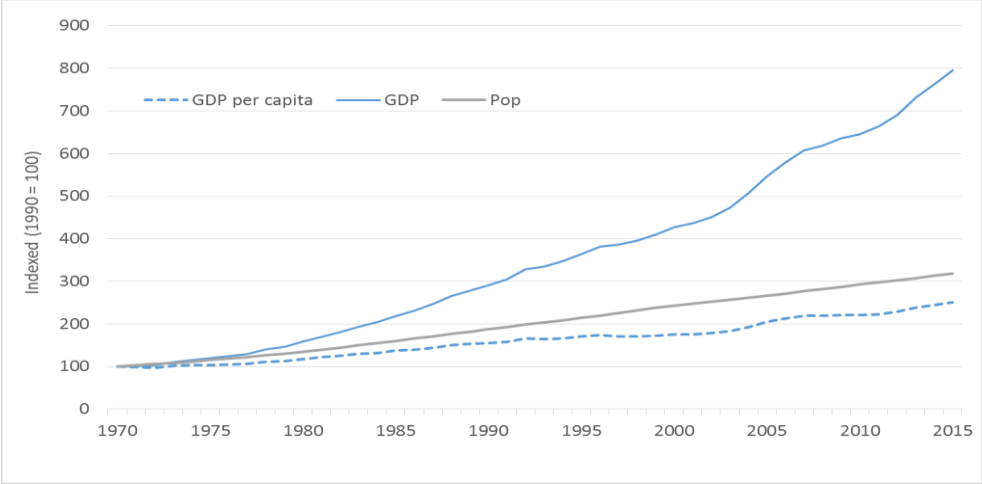

Figure. 1. GDP, population and affluence (GDP per capita) for Pakistan

There is both an urgent need and potential to improve the eco-efficiency of the economic system by overcoming economic inefficiencies through a win-win opportunity, by decreasing costs and producing more efficiently using fewer resources and with a reduced ecological impact. In order to become efficient, it is necessary to redress the imbalance between economic growth and use of natural resources by giving top priority to building a strong human and social capital base as a prerequisite for sustainable development. For sustainable economic growth it is required that economic policies should be aligned with SCP principles and environmental considerations to avert ecological damages to the natural resource base.

1.2.2. Environmental Dimension

Pakistan is losing Rs. 1 billion per day due to environmental degradation which is 6 per cent of GDP. The most significant causes of environmental damage identified and estimated are (i) illness and premature mortality caused by air pollution (indoor and outdoor), (almost 50 per cent of the total damage cost); (ii) diarrheal diseases and typhoid due to inadequate water supply, sanitation and hygiene (about 30 per cent of the total), and (iii) reduced agricultural productivity due to soil degradation (about 20 per cent of the total). The magnitude of these costs indicates that environmental decay has become a serious development concern. Furthermore, accelerated industrial growth and urbanization present additional environmental challenges, such as toxic air and water pollution, and hazardous solid waste. Capturing the development dividend of growth calls for complementary policies integrating SCP Principles to address environmental issues while facilitating development[3].

The forest resources of Pakistan are deteriorating both qualitatively and quantitatively and the annual change rate during 1990- 2000 was 1.8 per cent and during 2000-2005 was 2.1per cent[4]. There is a serious threat of accelerated deforestation and forest degradation in many parts of the country in the wake of rising population and associated wood demands, weak governance of tenure, encroachments and land cover changes superimposed by adverse impacts of climate change.

[3] Pakistan Strategic Country Environmental Assessment Report, World Bank 2006

[4] National Economic & Environmental Development Study (NEEDS);
https://unfccc.int/files/adaptation/application/pdf/pakistanneeds.pdf

Pakistan can be termed as prime victim of global "climate injustice" - bearing the burden of the impacts with a minimal contribution of 0.8 per cent[5] to this global problem. This undeniable fact is now being duly acknowledged as the country is now consistently placed in the extreme vulnerable category by a host of climate change impact indices. Due to changing intensity and variability of temperature and rainfall, Pakistan is exposed to recurring impacts of floods, droughts, sea level rise and severe water and heat stress. This is leading to reduced agriculture productivity, increased desertification, intrusion of sea water and health concerns.

Under these circumstances, SCP is a way forward for the country to leap ahead and start addressing and overcoming challenges. There is a need in Pakistan to mainstream SCP in policy framework and engage all stakeholders in this process. The formulation and effective implementation of SCP policies and strategies will strengthen structure of economy by reorienting economic systems, consumer preferences and producer behaviors. This will offer opportunities for decoupling economic growth and social development from environmental degradation, thus strengthening the sustainability and resilience of a society. It can further help to seize new development opportunities that can contribute to growth and poverty alleviation. A coherent SCP policy can support a triple dividend of greater wellbeing, increased competitiveness, and environmental integrity.

1.2.3. Policy Dimension

Pakistan Policy document "Vision 2025" has been taken as the base for the formulation of NAP on SCP. The "Vision 2025", presents an indigenous model of development called 'Pakistani model' which focuses on inclusive growth and indigenous factors for improving productivity of resources deployed across agricultural, manufacturing and services sectors in a sustainable manner. Hence, the model adopted in Vision 2025 is based on the principles of Sustainable Consumption and Production. It aims to put Pakistan on a fast track of development with the ultimate goal of transforming it to become among top twenty five economies of the world by 2025 and top ten by 2047.

The Vision 2025 envisages attaining a secure, just and prosperous society through socio-economic and human resource development, creation of equal opportunities, good governance and optimal utilization of resources for sustained, indigenous and inclusive growth in an integrated manner. The seven pillars of the Vision 2025 are the key drivers of growth which include (1) Developing Human and Social Capital, to allow the population to optimally contribute and effectively benefit from economic growth through substantial expansion in levels of education (2) Achieving Sustained, Indigenous and Inclusive Growth, is primarily driven by mobilizing indigenous resources and adoption of strategy for balanced development approach which will open global market for Pakistan (3) New Governance Paradigm, is to promote good governance particularly with regards to improving efficiency, transparency and making user-friendly interface with the government (4) Energy, Water & Food Security; aims at ensuring uninterrupted access to affordable and clean energy for economic growth (5) Private Sector & Entrepreneurship led Growth, promotes public private partnerships through a comprehensive policy regime (6) Developing a Competitive Knowledge Economy through value addition to improve competitiveness and improving access to quality of education and healthcare and (7) Modernizing Transportation Infrastructure & Greater Regional Connectivity, to develop modern transportation infrastructure which plays a pivotal role in economic development and attracting investments.

[5] "Report of Task Force on Climate Change", 2010, Ministry of Planning, Government of Pakistan.

1.3. Pakistan Natural Resource Use Indicators

Globally economic development has taken place at a cost of accompanied by a wide array of negative environmental and social impacts. These impacts threaten to undermine, or even reverse, the economic development that has been achieved to date. Similarly, natural resource use trend in Pakistan reveals that the rapid economic growth and human development achieved since 1950's has come at a cost of environmental damage due to unsustainable consumption and production patterns. The per capita consumption of natural resource is much higher in Pakistan for production of one dollar of GDP compared to develop and many developing countries. The consumption of water for producing one US$ of GDP in Pakistan was 1070 Liters as compared to 18 Liter in Asia Pacific OECD countries in 2015 which is much higher. While Per capita water use and water footprint for Pakistan compared with Developing Asian Countries from 1970–2015 measured in kilo liters (kl) has improved (Figure. 2)[6].

Pakistan's total primary energy supply (TPES) in Peta joule (PJ), has increased from 713 PJ in 1970 to 3534 PJ in 2010 but, at the same time the energy consumption per capita has also increased from 12 GJ to 20 GJ. This has resulted in increase in the total energy footprint per capita from 8 GJ to 11 GJ. In terms of the share of renewable energy in the energy mix, it decreased from 64 percent to 37 percent from 1970-2010. As regards use of energy for producing one US$ of GDP in Pakistan is 22.3 Mega Joule which is comparable to the regional average but is higher than Asia Pacific OECD countries which is 5.6 Mega Joule (Figure. 3).

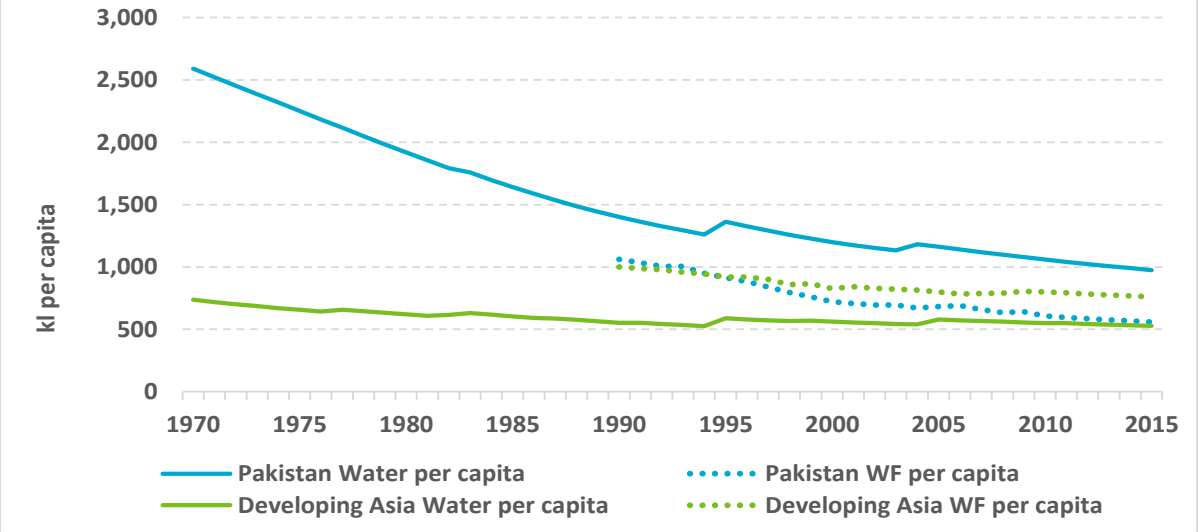

Figure.2. Per capita water use and water footprint in Pakistan and Developing Asia group, 1970–2015, kl per capita

Pakistan's performance in terms of sustainable management and efficient use of natural resources has deteriorated from 1970-2015. Since, the Domestic Material Consumption (DMC) per capita (tons) has increased from 2.8 to 3.8 tons and the Material footprint (MF) per capita (tons) from 2.5 to 2.7 in the same period. Further, Pakistan consumes 3.1 kg for producing one US$ of GDP compared to 0.7 kg by Asia Pacific OECD countries.

[6] Natural Resources and SDGs, Pakistan, 2016.

Total Green House Gas emissions (GHG) and GHG footprint all grew quite rapidly in Pakistan. However, when measured in terms GHG per capita emissions it decreased significantly due to high population growth as compared to the Developing Asia group average, for the period 1990 to 2010 (Fig. 4). Pakistan's Performance against SCP relevant SDG indicators and comparison against the average for Asian developing countries is in Annex III.

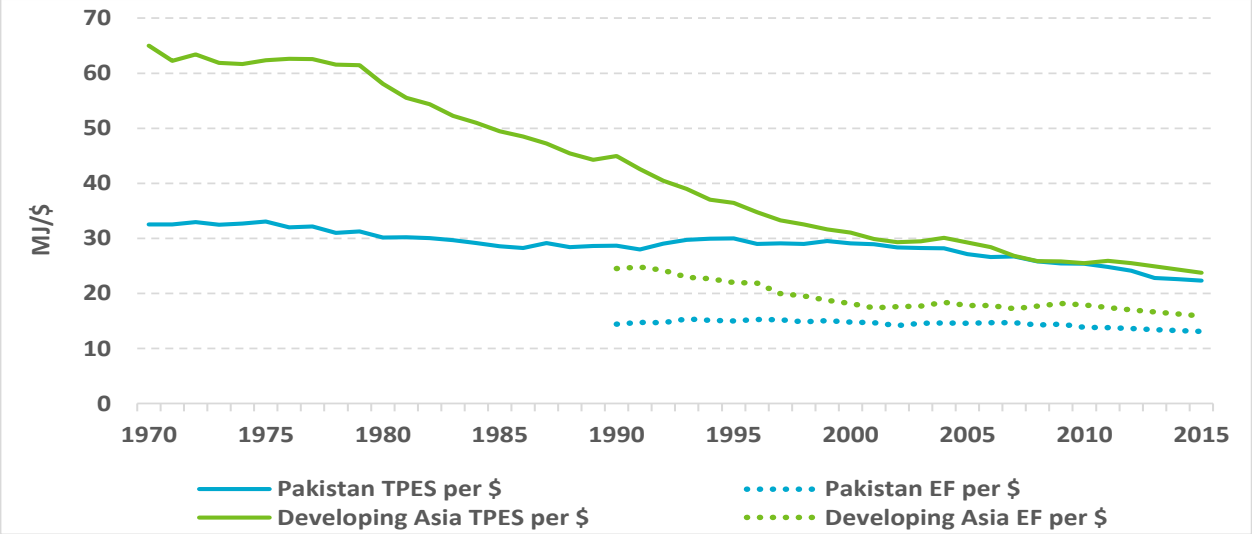

Figure. 3. Energy intensity of production and consumption for Pakistan and Developing Asia group, 1970–2015, MJ per US$

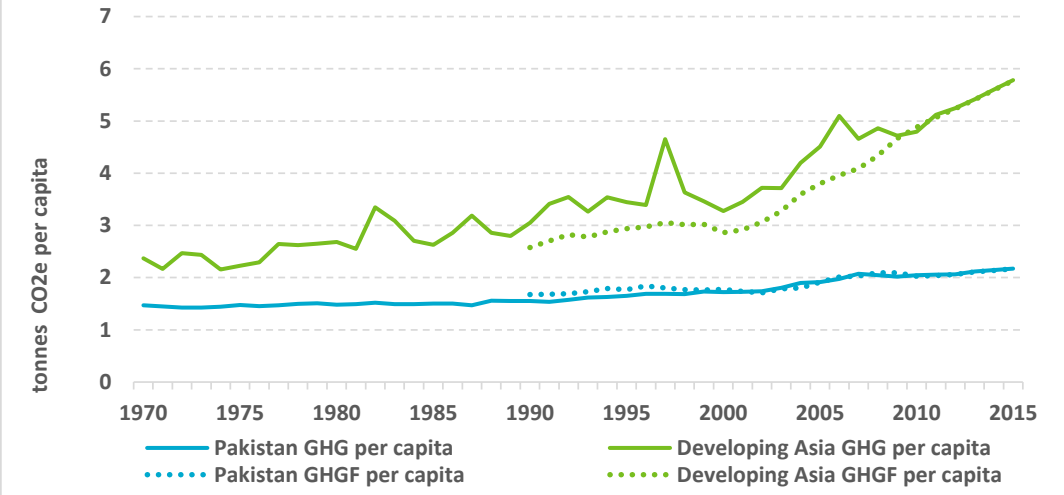

Figure.4. Territorial GHG emissions and GHG footprint per capita for Pakistan and Developing Asia group, 1970–2015, tons

1.4. Methodology

The methodological design process of Pakistan's NAP on SCP is mainly based on a participatory approach for a proactive stakeholder engagement at Federal and Provincial level. The flow map (Figure.5) explains the process of formulation of NAP which comprises of five steps.

Step-I Preliminary Phase: Under this phase, a literature review was carried out for undertaking situation analysis on SCP in the country and problem mapping. Relevant SCP action plans of different countries having similar socioeconomic characteristics to that of Pakistan were also reviewed. A National Multi-stakeholder Technical Committee has been constituted to guide the development of NAP. Members of the Technical Committee are from concerned federal, provincial government agencies and other relevant stakeholder organizations (Annex IV).

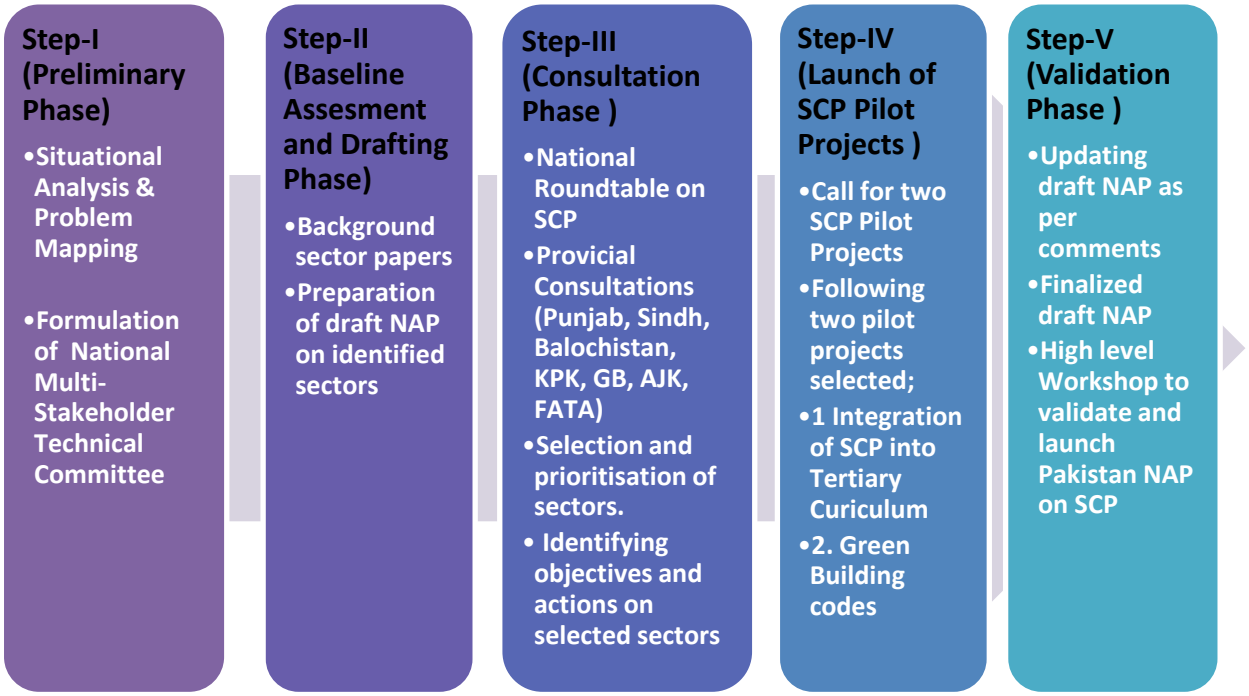

Figure. 5: Flow map for developing National Action Plan on SCP

Step-II Baseline Assessment and Drafting Phase: This involved preparation of background papers of fourteen sectors and preparation of draft NAP on these sectors for consultation process at national and provincial levels. For convenience fourteen sectors were divided into six working groups as presented in Figure. 6.

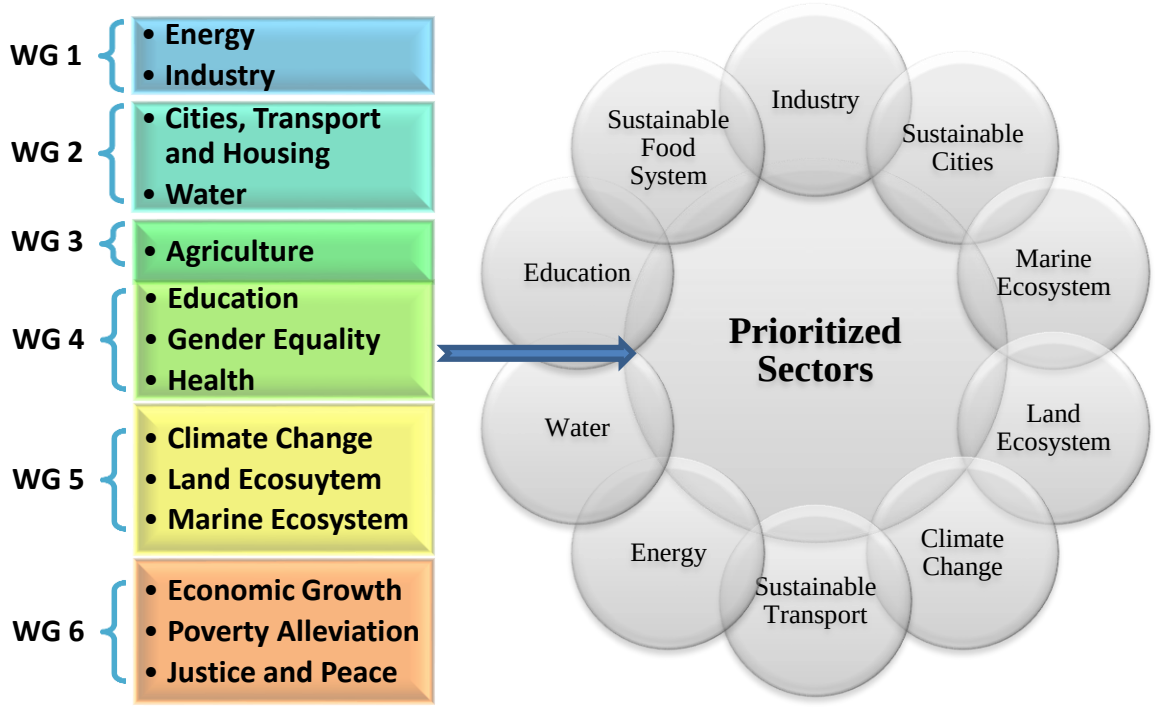

Figure. 6: Structure for Consultation Process

Step-III Consultation Phase: To develop NAP and mainstreaming SCP in development strategies consultation phase took off through a two days National Multi-stakeholder Roundtable on SCP, organized by the Ministry of Climate Change in collaboration with UN Environment and EU-SWITCH Asia Programme on 3rd-4th August 2016 held in Islamabad. The Roundtable was attended by 163 participants representing different stakeholders; government, UN and multi donor agencies, civil society, corporate sector and academia. The National Roundtable comprised of four Technical Sessions and six Working groups.

The four Technical sessions in the Roundtable were deliberated on the following topics: (1) Sustainable Development Policy Framework (2) Existing Initiatives on SCP in Asia Pacific Region and Pakistan (3) Role of Quality and Innovation in achieving SCP and (4) Formulation of National Action Plan on SCP. Each technical session had presentations (i) Integrating SCP to National Policy and Planning Process (SDG 12 & Vision 2025); (ii) Revision of National Sustainable Development Strategy (NSDS), Pakistan in the light of SDGs and SCP and (iii) NAP-SCP (iv) Linkages of SCP with SDGs to prioritize initiatives for NAP; (v) Establishment of the SCP forum in South Asia; and (vi) Conditions for SCP to be successful in Pakistan (vii) Trade Policy framework and SCP; (viii) Achieving Quality, Productivity and Innovation through Accreditation; (ix) Role of Curricula in Tertiary Level Education; (x) Integrating SCP into Primary level Curriculum (xi) SWITCH-Asia Programme on SCP (xii) Protecting, restoring and promoting sustainable use of terrestrial ecosystems; (xiii) Involvement of Youth and female in the SCP; and (xiv) SDG-7 Affordable and Clean Energy.

For consultation and inputs the participants were divided into six working group namely: (i) Energy, Industry (ii) Cities, Housing, Transport and Water, (iii) Agriculture, Food Security and Poverty (iv) Education, Health and Gender Equality (v) Climate Change, Forestry and Marine Ecosystem and (vi) Economic growth, poverty alleviation, peace and Justice. The working groups through their inputs

prioritised the sectors, objectives and actions. The groups also identified problems; policy objective; existing policy instruments; along with time frame for achieving SCP targets in the sectors. They also identified appropriate institutions and actors to be involved for implementation of SCP Action plan in the relevant sectors. The prioritised sectors included *Climate Change, Energy, Sustainable Food System, Sustainable Buildings and Cities, Sustainable Transport, Water, Land eco-system, Marine eco-system, Industry, and Education*. The actions proposed in each prioritized sector were divided into short (Up to 2020), medium (2021-2025) and long-term (2026-2030) time scales.

The outcomes from the National Roundtable were then taken to the provinces for provincial consultation. The Roundtable working group pattern was replicated in the provinces for consultation and their inputs. Provincial consultation took off from Punjab and was held on 7th October 2016, Gilgit Baltistan 25th October 2016, Azad Jammu and Kashmir 1st November 2016, Sindh 22nd November 2016, KPK and FATA 29th November 2016. The workshop in Balochistan could not be held due to unavoidable reasons.

Step-IV Launch of SCP Pilot Projects: For piloting SCP implementation in Pakistan, a call for proposal was sent to all stakeholders to submit their SCP initiative proposal. . From numbers of proposals received, two pilot projects were selected by the Ministry of Climate Change and UN Environment (i)"**Integrating Sustainable Consumption and Production in Tertiary Level Curricula in Pakistan**" and (ii) "**SCP Policy Guidelines for Green Buildings**" as these proposals fall under priority areas of 10YFP which are as follows:

(i) Sustainable Buildings and Construction
(ii) Sustainable Lifestyles and Education.

Step-V Validation Phase: On the basis of feedback from National Roundtable and Provincial consultations the draft NAP-SCP was updated and once again circulated for views/ comments from all stakeholders. The process was concluded with convening of the National Multi-Stakeholder Technical Committee meeting to validate NAP for final presentation at the High level Forum and to the Climate Change Council for its approval.

CHAPTER 2: NATIONAL ACTION PLAN ON Sustainable Consumption and Production

On the basis of the outcomes deliberations at the federal and provincial levels sectors under SDG 12 targets following sectors namely Climate Change, Energy, Sustainable Food System, Sustainable Buildings and Cities, Sustainable Transport, Water, Land eco-system, Marine eco-system, Industry, and Education were prioritized and actions identified. The NAP-SCP consists of challenges and opportunities, relevant SDG targets, objectives, and actions with timeframe (short: 2017 to 2020, medium: 2021-2025 and long-term: 2026-2030). The Plan also identified relevant implementing agencies and approximate cost estimates[7] to achieve the targets. The NAP-SCP emphasizes on accelerating the shift towards SCP, increasing resource use efficiency, decoupling economic growth from environmental degradation, mainstreaming SCP into sustainable development policies, programmes and strategies, supporting capacity building and facilitate access to financial and technical assistance and dissemination of information and knowledge on SCP principles. The performance monitoring and impact indicator to assess implementation of SCP actions and their impacts are in Annex V. The action plans of sectors prioritised under the 12th SDG targets are as follows:

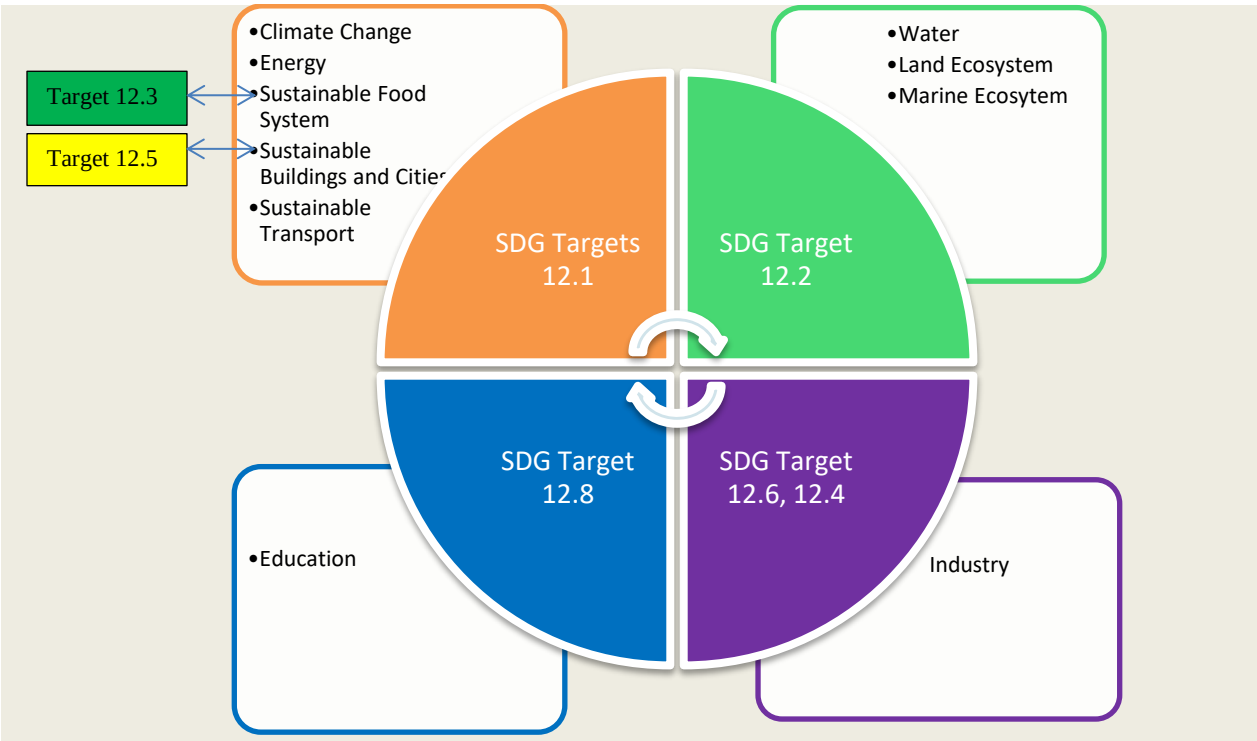

Figure. 7: Graphical presentation of prioritized sectors addressing SCP Targets.

7 The cost have been estimated on the basis of cost proposed by the participants as well as reflected for similar activities in the respective annual development plans.

2.1. SDG Target 12.1, 10YFP; 12.3 Sustainable Food System & 12.5 Sustainable Buildings and Cities, 12.7 (Sustainable Public Procurement)

Target 12.1: Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.

Target 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

Target 12.7: Promote procurement practices that are sustainable, in accordance with national policies and priorities

The sectors covered under SDG target 12.1, 12.3 and 12.5 are Climate Change, Energy, Sustainable Food System, Sustainable Buildings and Cities, and Sustainable Transport.

2.1.1. Climate Change

Climate Change is a serious global threat and Pakistan being eighth on the list of countries most vulnerable to climate change despite its minimal contribution of 0.8 %[8] to the global GHG emissions. The most important climate change potential threats to Pakistan are due to increased variability of monsoon, and floods and droughts. Severe water and heat-stressed conditions in arid and semi-arid regions, leads to reduced agriculture productivity and power generation causing upstream intrusion of saline water in the Indus delta. It is adversely affecting coastal agriculture, mangroves and breeding grounds of fish and threat to coastal areas including the city of Karachi, Thatta and Badin due to sea level rise and increased cyclonic activity. The climate change is severely affecting agriculture productivity, water scarcity, mangroves and breeding grounds of fish and threat to coastal areas. Therefore, the issues of climate change directly and very strongly impinge upon future planning for sustainable development in Pakistan.

2.1.1.1. Climate Change Action Plan

The Climate Change action plan objective with time frame focuses on *taking necessary adaptation and mitigation measures to combat climate change*. In Pakistan there is a need to mainstream climate change into national decision making and its integration with other planning and policy initiatives. There should be screening of all new projects on climate change impacts and opportunities for carbon credit generation by mandating it as part of the EIA process.

There is a need to strengthen disaster management institutions at the all levels to undertake flood and other climate triggered disasters management through appropriate measures. Plan, design, construct and strengthen appropriate flood embankments, dykes, and protective bunds to protect flood plains. Establish a national cell for sharing, networking and regularly updated climate change related data. Develop provincial level climate change strategies for effective implementation of the National Climate Change Policy as well as the Framework for Climate Change for implementation and its integration with other planning and policy initiatives. Mitigation measures include increasing the capacity of carbon sinks, e.g., through afforestation and reforestation. Shift towards renewable energy and reduce GHG emission from

[8]"Report of Task Force on Climate Change", 2010, Ministry of Planning, Government of Pakistan.

industries, agriculture and livestock and transport sector through strict monitoring. Moreover, promote energy efficient transport measures like fuel-efficient vehicles to reduce GHG emissions. Identify the best available technologies through "Technology Need Assessment" to make a clean energy transition to reduce emissions. The proposed actions can substantially reduce the risks associated with climate change impacts. Furthermore, it will build resilience against climate change triggered disasters and protect life, property, physical infrastructure and economy of the country. In addition, it will contribute to the international effort to check climate change by optimally shifting the country's growth trajectory on to a low carbon pathway. The implementation of Climate Change Action Plan (Table 1) will fulfill the SDG target 12.1, and in addition will also contribute to SDG Targets 13.1, 13.2, 13.3, 13.3b.

Table 1: National Action Plan on SCP for Climate Change

Objective 1: Take urgent action to combat climate change and its impacts		
Time frame / Actions	**Key Partner (Lead Agencies/**Other Stakeholders)	**Tentative Cost (Million US $)**
Short term		
• Mainstream climate change and SCP in national sectoral policies, strategies and planning.	**Ministry of Climate Change**, Sectoral ministries like Agri, Water & Power, industries, Trade & Commerce, Finance, Statistics Div; Prov. P&DDs	3.0
• Enhance capacity for integrating climate change concerns in planning process and establish national and regional Expert Groups on Climate Change.	**Ministry of Climate Change**, Prov. EPDs, Provincial Climate Change Centers	2.0
• Build and strengthen adaptation and mitigation capacity to effectively meet the effects posed by Climate Change.		2.0
• Undertake flood and other climate triggered disasters management through appropriate measures.	**Federal Flood Commission,** NDMA, PDMAs, Ministry of Climate Change , Prov. EPDs, Provincial Climate Change Centers	50.0
• Strengthen disaster management institutions at the Federal, Provincial and District levels.	**NDMA**, PDMAs, DDMAs	10.0
• Establish a national cell for sharing, networking and regularly updated climate change related data.	**Ministry of Climate Change , GCISC**, Prov. Climate Change Centers	5.0
• Create the national and provincial Funds for catalyzing matched financing for climate change initiatives.	**Ministry of Climate Change**, M/o Planning, Development & Reforms, M/o Finance, Prov. P&DDs, Climate Change Centers, Finance Deptts.	20.0
• Strengthen existing hydrological network, early warning system and monitor river flows in collaboration with Pakistan Meteorological	**WAPDA**, PMD, Federal Flood Commission, Provincial Irrigation Deptts; District	20.0

Department (PMD) and district authorities.	Governments	
• Formulate and enforce "River Flood Plain" regulations and laws to prevent growth of settlements in flood plains.	**NDMA**, PDMAs, Provincial Irrigation Deptt; MoCC, M/o Planning, Development & Reforms, Prov. P&DDs	1.5
• Identify best available technologies through "Technology Needs Assessment" that can be employed to make a clean energy transition to reduce emissions.	**Ministry of Climate Change ,** Ministry of Water and Power, NEECA, AEDB, Prov. P&DDs	
Medium term		
• Mitigate the impacts of climate change by afforestation and reforestation under Green Pakistan Programme.	**Ministry of Climate Change**, Prov. Forests & Wildlife Deptts.	50.0
• Scaling-up of Glacial Lake Outburst Flood (GLOF) risk reduction in Northern Pakistan to take measures to reduce vulnerability of the communities to Glacier related disasters	**Ministry of Climate Change**, NDMA, PDMAs, Prov. EPDs, Climate Change Centers	36.0
• Design water, food and energy security policies and plans with specific reference to challenges posed by Climate Change.	**Ministry of Water and Power, Ministry of National Food Security and Research,** Ministry of Climate Change, Prov. P&DDs	50.0
• Promote energy efficient transport measures like fuel efficient vehicles, expansion of railway network, mass transit system to reduce GHG emissions.	**Ministry of Communication, Ministry of Climate Change** , NEECA, Prov. P&DDs	50.0
• Ensure strict monitoring of GHG emissions from all sectors like industries, agriculture, livestock, transport etc.	**Ministry of Climate Change** Federal and Provincial EPA's, GCSIC	5.0
Long term		
• Enhance the disaster mitigation and preparedness capacities at federal, provincial and district level	**Ministry of Climate Change** , NDMA, PDMAs, Prov. P&DDs	5.0
• Create National and Provincial Implementing Entities (NIE & PIE) to deal with adaptation and mitigation projects at federal and provincial levels respectively for making reliable projections of SCP and its relation to climatic changes scenarios.	**Ministry of Climate Change** , EPDs, Climate Change Centers, Prov. P&DD	10.0
• Promote climate change resilient Infrastructure, including telecommunication, power, utilities and transport.	**Ministry of Communication,** MoCC, M/o Water & Power, NEECA, PCRET, AEDB, Prov. EPDs, Provincial Climate Change Centers, P&DDs, Communication & Public Works Deptts. LGRDDs; NHA, Electricity Supply Companies	40.0

• Construct disaster resilience multipurpose school buildings that can also be used as shelters during natural calamities.	**M/o Federal Education & Professional Training**, Prov. Education Deptts; NDMA, PDMAs, DDMAs	40.0
• Develop evacuation strategies in case of Glacial Lake Outburst Floods (GLOF) and other glacier related disasters	**NDMA**, Ministry of Climate Change, PDMAs, DDMAs	1.0
• Develop SCP and its relation to climate change curricula with particular emphasis on Disaster Risk Reduction (DRR) and introduce it into formal education system at all levels.	**Ministry of Climate Change,** HEC, M/o Federal Education & Professional Training, Prov. Education Deptts.	5.0
• Redesign and construct cyclone shelters in vulnerable coastal areas using bioengineering techniques.	**NDMA**, PDMAs, Sindh & Balochistan Coastal Dev. Authorities	20.0
• Analyzing flood routing through dam break studies	**Federal Flood Commission**, Prov. Irrigation Deptts; NDMA, PDMAs	2.0
• Plan, design, construct and strengthen appropriate flood embankments, dykes, protective bunds to protect flood plains.	**Federal Flood Commission**, Prov. Irrigation Deptts; NDMA, PDMAs, Ministry of Climate Change, Prov. P&DDs	30.0
• GHG emission inventory to be updated on scientific lines.	**Ministry of Climate Change** , GCISC, SUPARCO, Atomic Energy Commission	2.0

2.1.2. Energy

Energy is considered as the lifeline of any country's economy and in Pakistan it is one of the most critical challenges for sustainable socio-economic development. Unfortunately Pakistan is passing through severe energy crisis since past one decade. The current energy demand is approximately 29000 MW and the shortfall in energy is about 5000- 7000 MW. The electricity shortage causes an annual loss of 4-7% in GDP and 2% reduction in real GDP growth[9] . Further, inefficient use of energy has made the energy crisis more worst as Pakistan uses 22.3 Mega Joule/ US$ of primary energy for producing 1 US$ of GDP as compared to 5.6 Mega Joule/US $ in Asia Pacific OECD countries The inefficient energy infrastructure, energy theft and transmission and distribution losses are major factors in contributing to the widening gap of energy supply and demand. The transmission and distribution losses are much higher in Pakistan (over 25%) than in OECD countries (7%), Korea (3.6%) and China (8%)[9]. The inefficient energy infrastructure, energy theft, transmission and distribution losses are the major factors in contributing to the widening gap of energy supply and demand. The transmission and distribution losses are much higher in Pakistan (over25%) than in OECD countries (7%) Korea (3.6%) and China (8%).

2.1.2.1. Energy Action Plan on SCP

The Energy Sector Action Plan has three objectives aiming at *institutional reforms and strengthening regulatory framework, promoting clean energy technologies and tapping potential resources and reducing carbon footprint.* Pakistan has great potential for energy savings by maximizing distribution efficiency and cutting wasteful losses through investment in transmission and distribution infrastructure

[9]Pakistan Vision 2025, Planning Commission , Government of Pakistan

and effective enforcement of controls. This offers an enormous opportunity for 15-20 per cent savings in total energy consumption, making additional energy available to the national grid and reducing the cost per unit. Pakistan has huge potential for sustainable production of energy by optimizing energy generation mix between oil, gas, hydro, coal, nuclear, solar, wind and biomass with reference to its indigenousness, economic feasibility, scalability, risk assessment and environmental impact. The Plan also emphasizes on enhancing role of public private partnerships in renewable power generation and by introducing investment friendly financial policies in order to attract foreign direct investments in energy sector. It is suggested to disseminate and to energy efficiency equipment, appliances and gadgets with energy performance labeling in domestic use as well as in public and commercial places. To provide incentives such as tax rebate and soft loans in investments in clean energy and introduction of public procurement rules and regulations in line with SCP principles, revise and implement the National Energy Conservation Policy and formulate guidelines for establishment of climate resilient energy infrastructure in development sectors.

Focus on demand management and conservation to ensure prioritization in allocation, elimination of wasteful use, incentives to use more energy efficient equipment and appliances and achieve better balance between peak and off-peak hours. Moreover, institutional reform and strengthening regulatory frameworks to improve transparency and efficiency is a prerequisite. The proposed actions will facilitate improving energy, security and lead Pakistan to low carbon growth trajectory. The implementation of the Action Plan on Energy sector (Table 2) will fulfill the SDG target 12.1 and 12.7, and in addition will also contribute to SDG targets 7.2, 7.3, 7.3a.

Table 2: National Action Plan on SCP for Energy Sector

Objective 1: Strengthening of relevant institutions, policies, rules and regulations, financial mechanisms, innovative and accessible resources for energy efficiency		
Time Frame / Actions	**Key Partner (Lead Agency/**Other Stakeholder)	**Tentative Cost (Million US $)**
Short term		
• Revise and implement National Energy Conservation Policy and adoption of the Power Policy 2015.	**Ministry of Water & Power, NEECA,** MoCC, PPIB, AEDB	10.0
• Build capacity to examine IEE & EIA reports in the relevant institution	**Federal & Prov. EPAs**	2.0
• Skill development in SCP in energy sector through hands-on training, refresher courses, Staff exchange programmes and coordination with local and foreign academia and technical institutions	**Ministry of Water & Power**, WAPDA, PPIB, OGRA, NEPRA, AEDB, NEECA, M/o Petroleum and Natural Resources, TEVTA, NAVTTC, Prov. EPAs	15.0
• Enhance public private partnership investment for energy efficient urban infrastructure.	**PPIB**, NEECA, Prov. EPAs, FPCCI	5.0
• Formulate guidelines for establishment of climate resilient energy infrastructure.	**Ministry of Water & Power,** WAPDA, Electricity Supply Companies, Prov. Power/ Electricity Deptts; MoCC, Prov. Climate	12.0

	Change Centers/ EPAs	
• Tax rebate on energy efficient appliances, equipment's and machineries.	**NEPRA,** CBR, M/o Commerce & Trade, Finance,	20.0
• Give preferential status and tax incentives to IPPs (Independent Power Producers) for investment in clean energy in Power Sector.	**NEPRA,** CBR, M/o Commerce & Trade, Finance,	5.0
• Create awareness regarding advantages of installing solar PV systems for ensuring undisrupted supply of energy for domestic and commercial use.	**AEDB, PPIB**, Electricity Supply Companies, Ministry of Information, Broadcasting & National Heritage, Prov. Information Deptts.	7.0
• Minimize line losses by upgrading the transmission lines.	**WAPDA, Electricity Supply Companies,** NTDC	15.0
• Increase capacity of persons in transmission and distribution (T & D) system.	**WAPDA, Electricity Supply Companies,** NTDC	6.0
Medium term		
• Introduce investment-friendly incentives and financially attractive policies such as Feed in Tariffs on renewable.	**NEPRA**, PPIB, AEDB	2.5
• Review and streamline Public Procurement rules and regulations with SCP to include energy efficiency criteria.	**PPRA**, PPIB, Electricity Supply Companies, NEECA	2.0
• Attract foreign development investment (FDI) in energy sector in order to meet up the resource gap in the public sector.	**NEPRA**, PPIB, AEDB, NEECA	3.5
• Establish energy resource and information centers in provinces.	**Provincial Energy Departments**	2.5
• Enact and enforce energy conservation legislation and audit standards.	**NEECA, PPIB**, Prov. Energy Deptts.	2.5
• Provide incentives through affordable financing for purchase of solar PV systems through banks and leasing mechanisms.	**AEDB,** NEPRA, Banks & Other lending institutions, Prov. Energy Deptts, NGOs	20.0
• Develop punitive laws to protect illegal connections.	**Ministry of Water and Power**, WAPDA, Electric Supply Companies	2.0
• Develop in house technological capacity for manufacturing of renewable power generation in the country through Public Private Partnership	**Ministry of Water and Power**, PPIB, AEDB, NEPRA, FPCCI, TEVTA, NEVTTC	10.0
Long term		
• Laying adequate transmission lines to cater electricity supply needs in the electricity deficient areas.	**WAPDA**, Electricity Supply Companies, NTDC	20.0
Objective2: Promote R & D for clean energy technology and tap Pakistan's huge potential for indigenous and renewable resources and technologies such as micro-hydel, bio-fuel (biogas) solar, wind, geothermal and hydrogen energy.		

Short term		
• Prepare baseline primary data on wind, solar, biogas, hydrogen and geothermal energy potential.	**Ministry of Water and Power,** PPIB, AEDB, Prov. Energy Deptts.	1.5
• Build capacity of farmers for upgrading livestock farms to produce biogas.	**PCRET,** Ministry of National Food Security & Research, AEDB, Prov. Energy & Livestock Deptts.	2.5
• Royalty to be paid to provinces for harnessing their energy resources for Power Generation.	**Ministry of Finance**, Prov. P&DDs	25.0
Medium term		
• Enhance technological know-how and its transfer for installing the clean coal technologies.	**Ministry of Water and Power**, PAEC	30.0
• Install plants to generate power from municipal waste.	**PCRET,** Federal & Prov. EPAs, PPIB, AEDB	25.0
• Encourage and build capacity for community driven micro-hydels to provide affordable electricity to communities living in the forest zone.	**Pro. Energy & Forest Deptts, LGRDD,** NGOs	5.0
• Encourage and construct small and medium size Hydro power potential (HPP) at appropriate potential sites.	**WAPDA**, PPIB, Prov. Energy Deptt, LGRDD, NGOs	50.0
• Give preference for exploration & production of Indigenous natural gas, and Liquefied Petroleum Gas (LPG) over import of oil and gas	**Ministry of Petroleum and Natural Resources**	2.5
Long term		
• Establish center of excellence to explore possibilities and options for power generation through innovative and clean energy technologies.	**Ministry of Water and Power,** HEC	5.0
• Installation of Combined Power Cycle Plants.	**Ministry of Water & Power,** PPIB, Prov. Energy Deptts, NTDC	10.0
• Build capacity for Bottling of Compressed bio-methane.	**PPIB**, AEDB, Prov. Energy Deptts; PCRET, NGOs	3.0
• Production of Hydrogen fuel from agricultural waste.	**PCRET,** PPIB, AEDB, Prov. Energy Deptts	3.0
• Utilization of geo-thermal energy	**PCRET,** PPIB, AEDB, Prov. Energy Deptts	5.0
Objective 3: Reduce the carbon footprint by promoting energy efficiency.		
Short term		
• Disseminate fuel efficiency cookers and energy saving devices	**PCRET, NEECA,** , Prov. Energy Deptts, NGOs	10.0
• Switch from incandescent bulbs to energy efficient bulbs in public and open spaces, streetlights, buildings, industries and commercial	**NEECA**, Prov. Energy Deptts	10.0

places. Install sensors for increasing efficiency.		
• Encourage increase use of direct solar energy for water heating by promoting solar water heaters.	**PCRET,** NEECA, SNGPL, SSGPL, Prov. Energy Deptts.	10.0
Medium term		
• Introduce Certification standards for efficient heating and cooling appliances, equipment's and machineries.	**NEECA, PSQCA,** PNAC	2.5
• Introduce energy performance labelling, disclosure and benchmarking of appliances and systems and setting norms for best available technologies in energy efficiency.	**NEECA,** PNAC, PSQCA	5.0
• Provide incentives for local manufacturing on renewable power generation equipment's through Public Private Partnership	**PCRET,** AEDB, PPIB, NEECA	15.0
Long term		
• Improve refining operations and quality of oil products to reduce GHG emissions	**Ministry of Petroleum and Natural Resources**, Oil refineries	10.0

2.1.3. Sustainable Food System

Food security is one of the most critical challenges for Pakistan. Agriculture being the pedestal of food security, the source of raw materials to numerous industries and major exports, is an essential component of Pakistan's economy. Regardless of notable economic growth and a considerable boost in agricultural production, achieving food security in Pakistan remains a persistent challenge. The reasons being inefficiencies in food distribution, growing population, prospects of climate change, depleting water resources, low spending on agricultural research and development (R&D) and inadequate food safety nets for those in severe poverty. The state of hunger remains critical in the country as Pakistan ranks 93 out of 104 countries in Global Hunger Index (GHI) scores. Once a wheat exporter, Pakistan is now in danger of failing to meet domestic demand for wheat. Average per unit productivity is also low due to imbalance use of fertilizers, reduced water availability, low seed quality and inefficient and poor quality farm machinery.

2.1.3.1. Sustainable Food System Action Plan

The action plan on sustainable food system has four main objectives focusing on *efficient agriculture sector, reducing food waste, preservation of agricultural land, and ensuring food security by adopting climate resilient techniques.* The action plan also presents time frame in order to address prioritized SCP relevant SDG targets. The plan emphases on the shift towards more sustainable food system all along the food value chain. For improving agriculture and food security, Pakistan requires strategic planning that ensures fundamental changes in the ways food is produced, processed, transported and consumed. This will improve overall consumption and production patterns and will help in ensuring food security in the country. There is a need for developing and implementing agriculture and food security policies, strategies and capacity building through training programmes for ensuring sustainable food system. For better management of agriculture productivity, there is a need to promote mechanization, proficient equipment, technologies and dissemination of skills for operation and maintenance. The increase in resource use efficiency can be achieved through reducing food waste by increasing storage facilities, on-farm residue management, promoting Integrated Pest Management (IPM) and use of bio-pesticide and encouraging farmers to practice high value crops according to suitable climatic regions. There is also a

need to create awareness to adopt SCP in the food system by promoting communication and information on food products sustainability throughout the supply chain and establishment of public-private partnerships for an equitable system of food distribution. Further, to improve procurement system towards SCP by value addition, food engineering, facilitating packaging and eco-labeling of food products. This will improve overall consumption and production patterns and will ensure food security in the country. The implementation of the Action Plan (Table 3) will fulfill the SDG target 12.1, 12.3 and 12.7, and also contribute to SDG target 2.4.

Table 3: National Action Plan on SCP for Sustainable Food System

Objective 1: Create a modern, efficient and diversified agriculture by adopting Sustainable agriculture practices, technologies for sustainable production system and to meet food security.		
Time frame / Actions	**Key Implementing Partners**	**Tentative Cost (Million US $)**
Short term		
• Approve Agriculture and Food Security Policy followed by developing Strategies /Action plan.	**Ministry of National Food Security & Research,** Ministry of Planning, Development and Reforms	2.5
• Focus on improving water use efficiency for irrigation through sprinkler and trickle irrigation etc.	**Ministry of National Food Security & Research**, Prov. Irrigation Deptts; Ministry of Climate Change, NGOs	20.0
• Optimization of fertilizers and pesticides use on different crops through R & D.	**PARC, NARC**, Prov. Irrigation Deptts. Prov. Agri. Extension Deptts.	5.0
• Promote treatment of grey water and its recycling for agricultural purposes.	**PARC, NARC**, Prov. LGRDDs, NGOs	20.0
• Introduce training programmes including exposure visits for farmers to learn good farming practices (national & international).	**Ministry of National Food Security & Research, Provincial Agriculture Departments**; PARC, Federal & Prov. Research & Training Institutions	10.0
• Promote biological control of pests through encouraging the use of bio-pesticides and integrated pest management (IPM) techniques for rational use of agrochemicals.	**Ministry of National Food Security & Research,** Provincial Agriculture Departments, Centre for Agriculture and Biosciences International (CABI), Federal & Prov. Research Institutes, Academia	5.0
• Promotion of indigenous and non-hybrid variety of seeds.	**Ministry of National Food Security & Research**, PARC, Federal & Prov. Research Institutes, Agricultural Universities	2.5
• Evaluation and application of innovative ways to use information and communication technologies (ICTs), to educate and incentivize farmers to make efficient use of inputs, adopt efficient farming techniques, optimize crop selection and maximize their yields.	**Ministry of National Food Security & Research**, Prov. Agricultural Deptts; PARC, Agricultural Universities, Federal & Prov. Research Institutes.	10.0

• Ensure fair price to farmers, and mop up marketable surpluses for processing and packaging into value-added products for local and export markets by reforms and establishment of supply and cold chain infrastructure through innovative public-private partnerships to realize full market potential.	**Pakistan Agricultural Storage and Services Corporation Limited, Ministry of National Food Security & Research**, PPRA, Prov. Agricultural Deptts; FPCCI	2.5
• Introduce training programmes, along the lines of technical and vocational training needed for sustainable farming.	**Ministry of National Food Security & Research**, TEVTA, NAVTTC, NGOs, CBOs	10.0
• Introduce an equitable system of food procurement and distribution, improve access of poor households to food at affordable prices and evolve a transparent system of safety nets for very poor households to improve food security.	**Pakistan Agricultural Storage and Services Corporation Limited, Ministry of National Food Security & Research,** Ministry of Planning, Development and Reforms, LGRDDs, PPRA	2.5
Medium Term		
• Introduce regulatory and legislative framework to adopt environmentally friendly agricultural practices.	**Ministry of National Food Security & Research,** PARC, Provincial Agricultural Departments	1.0
• Expanding and encouraging on-farm water management.	**Ministry of National Food Security & Research**, Provincial Irrigation Deptts; NGOs, CBOs	10.0
• Improve service delivery to farmers and introduce support mechanisms for timely access to quality inputs through establishment of community managed Rural Business Hubs (RBHs) and agro-processing industries like dairy and horticulture for value addition.	**Ministry of National Food Security & Research,** Provincial Agriculture & Livestock Departments, PPRA, FPCCI	10.0
• Promote biotechnology in terms of more carbon responsive crops, improved breeds and production of livestock through the use of genetic engineering.	**PARC**, Agricultural Universities, Federal & Prov. Agricultural Deptts.	10.0
• Encourage public and private investments for value addition in high value agricultural products.	**Ministry of National Food Security & Research,** Provincial Agriculture Departments, NGOs, Private sector	2.0
• Ensuring fair price to producers and consumers by improving the procurement and distribution system for essential food items through developing adaptation and mitigation strategies for climate change in different agro climatic zones of the country	**Ministry of National Food Security & Research, Pakistan Agricultural Storage and Services Corporation Limited,** Provincial Agricultural Departments, Ministry of Climate Change, Prov. Climate Change Centers, Federal & Prov. Research Institutes	5.0
• Introduce water pricing for effective control over wastage of irrigation water.	**Ministry of Water and Power,** Provincial irrigation Departments	10.0
• Investing in participatory research that meets the water and production needs of local farmers to reduce water usage in agriculture and building the sectors sustainability.	**Ministry of National Food Security & Research**, Provincial irrigation Departments, PARC, Agricultural Universities, Federal & Prov. Research Institutes	12.0

• Encourage farmers to practice horticulture and plantation of high value according to suitable climatic regions.	**Ministry of National Food Security & Research,** Provincial agriculture & Forest Departments, NGOs, CBOs, Federal & Prov. Research Institutes, PHDEB	15.0
• Improving total factor productivity and competitiveness of the agriculture production systems through technology-based interventions with emphasis on small and medium size farmers and landless tenants	**Ministry of National Food Security & Research**, Provincial agriculture & Irrigation Departments, PARC, Federal & Prov. Research Institutes, NGOs	5.0
• Encourage agro-forestry, floriculture and social forestry.	**Ministry of National Food Security & Research,** Provincial agriculture, Irrigation & Forestry Departments, PARC, Agricultural Universities, NGOs, CBOs	10.0
Long Term		
• Encourage access to export markets by facilitating packaging and eco-labeling of agricultural product.	**Ministry of National Food Security & Research,** PNAC, Ministry of Trade & Commerce, Federal & Prov. Research Institutes, NGOs	10.0
• Enactment of laws regarding seeds to regulate wide spread use of spurious seed, especially GMOs.	**Federal Seed Certification & Registration Department, Ministry of National Food Security & Research**, MoCC, Federal & Prov. EPAs and Agri. Research Institutes	2.0
• Develop programmes for ensuring availability of certified seed and planting material and introduce seed graders	**Ministry of National Food Security & Research,** Federal Seed Certification & Registration Department, Federal & Prov. Agricultural Research and Extension Institutions, ZTBL, NGOs	10.0
• Replace the current procurement system for food and cash crops with rationalized and sustainable programme to encourage adoption of sustainable farming practices.	**Ministry of National Food Security & Research, Pakistan Agricultural Storage and Services Corporation Limited,** PPRA, Provincial Food Departments	5.0
Objective 2: Reduce food waste and crop loss.		
Short term		
• Focus on-farm crop residue management.	**Ministry of National Food Security & Research** / Provincial Agricultural Departments, NGOs, CBOs	1.5
• Impart on-farm trainings to the famers for reduction and management of agricultural waste.	**Agricultural Training Institutes**, Federal & Prov. Agricultural Research and Extension Institutions, CBOs, NGOs	2.0
• Promote application of appropriate harvesting tools.	**Ministry of National Food Security & Research** / Provincial Agricultural Departments, Federal & Prov. Agricultural Research and Extension Institutions, ZTBL, NGOs	2.5
• Increase appropriate storage facilities for	**Ministry of National Food Security &**	10.0

agricultural products and food items to reduce food loss and waste.	**Research,** Federal Seed Certification & Registration Department, Provincial Agricultural and Food Departments, LGRDDs, NGOs, CBOs	
• Legislations on food standards strictly to be enforced.	**Ministry of National Food Security & Research,** Federal & Prov. Food, Agricultural & Research Institutes, PNAC	2.0
• Launch special campaign on benefits of reducing food waste and offering small meals packages at special discounted prices by hotels, restaurants and fast food outlets.	**Ministry of National Food Security & Research**, Ministry of Information, Broadcasting and National Heritage, Provincial information & Agricultural Departments, Pakistan Standards and Quality Control Authority, NGOs, CBOs, Media	2.0
Medium term		
• Reduce post-harvest losses through farm mechanization and by strengthening science based organizations and technology innovation.	**Ministry of National Food Security & Research /** Provincial Agricultural Departments, LGRDDs, Federal & Prov. Research Institutes, NGOs	2.5
Long term		
• Promote life cycle approaches and encourage innovations along entire supply chains.	**Ministry of National Food Security & Research /** Provincial Agricultural Departments, LGRDDs, Federal & Prov. Research Institutes, NGOs	2.0
Objective 3: Increase and ensure protection and preservation of prime agricultural land and combat Desertification and Drought.		
Short term		
• Develop National Land Use Policies to protect land use planning and zoning of agricultural land	**Ministry of National Food Security & Research,** Ministry of Housing and Works, Prov. P&DDs, AJK's Land Use Deptt	1.5
• Use of organic fertilizer, crop rotation techniques for progressively improving land and soil quality.	**Ministry of National Food Security & Research /** Provincial Agricultural Departments & Research Institutes, LGRDD	2.5
• Promote environmentally sound multi-cropping and crop management practices.	**Ministry of National Food Security & Research /** Provincial Agricultural Departments& Research Institutes, LGRDD	3.0
• Enhance water retention in the soil through farming methods and systems such as residue management, conservation tillage, bunds, contouring and field leveling.	**Ministry of National Food Security & Research /** Provincial Agricultural Departments, LGRDD	4.0
Medium term		
• Build on-farm storage tanks, check dams and delay action dams to retain soil organic matter (SOM), enhancing soil water holding capacity and	**Ministry of National Food Security & Research /** Ministry of Water and Power, Prov. Irrigation DEptts.	10.0

moderating or reducing soil compatibility.		
• Control soil problems like water logging, salinity, sodicity and soil structure deterioration, soil and water erosion.	**PARC,** Agricultural Universities	12.0
Long term		
• Develop capacity of institutions on Remote Sensing and GIS techniques to assess temporal changes in land cover of different agro-ecological zones.	**Ministry of National Food Security & Research,** Financial Institutions, SUPARCO	2.5
Objective 4: Adoption of climate resilient techniques and measures for ensuring food security and sustainable agriculture.		
Short term		
• Promote water efficient and low-delta crops.	**Ministry of National Food Security & Research,** Provincial Agricultural Departments & Research Institutes, LGRDDs	5.0
• Explore new methods of cultivation suitable to changing climatic conditions such as terrace cultivation and contour farming.	**PARC, Agricultural Universities**, Federal & Prov. Research Institutes	4.5
• Adopt agricultural practices like crop diversification, proper cropping patterns, optimized planting dates keeping in mind the climate change trends.	**Ministry of National Food Security & Research,** Provincial Agricultural Departments & Research Institutes, LGRDD, NGOs, CBOs	2.5
Medium term		
• Develop climate resilient infrastructure and transport facilities for sustainable transportation of farm products.	National Highway Authority, Ministry of Communication, Prov. Communication & Public Works Deptts. Climate Change Centers/ EPAs	30.0
• Develop new varieties of crops which are resistant to heat stress, drought tolerant, less vulnerable to heavy spells of rains, and less prone to pests and diseases.	**Ministry of National Food Security & Research,** Provincial Agricultural Departments, PARC, Agricultural Universities	14.0
Long term		
• Remodeling and up gradation of the existing irrigation infrastructure in the country to make it resilient to climate change.	**Ministry of National Food Security & Research,** Provincial irrigation Departments	35.0
• Strengthen science-based organizations and technology innovations in order to enhance basic agronomic research into new varieties and climate resilient crops.	**PARC,** Agricultural Universities, Federal & Prov. Research Institutes,	3.0
• Conservation of indigenous germ plasm of crops and fruits for breeding and adaptation to climate change situation	**Ministry of National Food Security & Research**, Federal & Prov. Research Institutes, Prov. Agriculture Deptts.	2.5

2.1.4. Sustainable Buildings and Cities

Pakistan is the most urbanized nation in South Asia and its urban population has increased from 43.0 million to 75 million from1998 to 2015[10] and estimated to become pre-dominantly urbanized by the year 2025. At present about 47 per cent of the urban population lives in nine major cities, having a population exceeding one million each. More than 50 per cent population of major cities lives in slums and squatter settlements due to housing backlog, which has increased to about 9 million from 4.3 million in 1998 due to housing supply and demand gap. The primary factor in this conglomeration is an increase in rural-urban migration.

Pakistan faces serious environmental and administrative problems in cities. The challenges include unplanned urbanization; lack of adequate housing and basic services e.g. health, water, and sanitation. Moreover, inadequate implementation of master plans, overlapping institutional mandates, lack of infrastructure and deficient municipal and industrial waste management also identified as current challenges. Furthermore, accelerated urbanization include aggravating urban deficit, dilapidated buildings, eroding livability, productivity and efficiency of urban areas and degrading urban ecology extend the length of the list of challenges. Eradication of urban poverty is another challenge. Air pollution in the cities is increasing due to a surge in automobiles, insufficient emission standards, and absence of effective enforcement. Rapid urbanisation has also lead to a host of problems from poverty, unemployment, infrastructure deficits, and traffic congestion, natural and man-made disasters. The most devastating effects of climate change and natural disasters impacting the cities are earthquakes, urban flooding, and drainage problems and urban heat island phenomenon. These also affect human health due to wide spread vector, water, and air borne diseases.

2.1.4.1. Sustainable Building and Cities Action Plan

The main objectives of the action plan for sustainable buildings and cities include *enhancing the capacity of relevant institutions for sustainable, smart and green cities planning and management; and developing the policy, legal framework, and governance for integrated waste management.* The plan presents time frame, relevant lead agency, cost[11] and addresses prioritised SCP relevant SDG targets. The action plan focuses on preparing strategies, plans and regulatory frameworks for implementation of national policies such as National Housing Policy 2001, National Katchi Abadies 2001, National Sanitation Policy 2006 etc. and development of master plans of cities. The plan proposes to address the existing challenges of the major urban centers while planning ahead for the continued migration towards cities. The plan suggests urgently controlling unregulated urbanization and encroachment of fertile agricultural land through targeted legislation, responsive urban land use planning and strict zoning enforcement. The plan focuses on upgrading human settlements; adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change and resilience to disasters. The urban planning and housing issues to be addressed by digitization of land records; promoting vertical growth of buildings; rationalization of plot sizes, integrated planning at the district level, revision of Building Byelaws and town planning regulations. To enhance private sector participation in delivery of

10 Economic Survey of Pakistan, 2015-16

11 The cost have been estimated on the basis of cost proposed by the participants as well as reflected for similar activities in the respective annual development plans.

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services and infrastructure for making smart cities; revise, and implement town planning and building regulations in the light of SCP principles.

The Plan proposes a comprehensive strategy for waste management in Pakistan, which needs urgent attention. Also, rapidly growing waste streams such as electronic waste, waste plastics, and used oils and chemicals require special attention, aiming for higher material recovery rates. Therefore, an assessment of the quantities and characteristics of these waste streams was proposed to be carried out, to identify programmes and appropriate environmentally sound technologies to promote material and energy recovery.

Furthermore, the Plan emphasis on protection and maintenance of heritage sites and historical buildings; preventing encroachment of fertile agricultural and forest land; increasing green spaces and initiating projects for greening road network to enhance air quality; replace Katchi-abadis by providing affordable housing; undertake urban renewal programme. Pakistan is going to be predominantly urbanized by 2030 and implementation of actions proposed in the plan will help in addressing existing urban problems and building the capacity of the relevant institutions to effectively address the future emerging urban challenges. The implementation of the Action Plan (Table 4) will fulfill the SDG target 12.1 and 12.5, and in addition will also contribute to SDG targets 11.2, 11.5, 11.7b.

Table 4: National Action Plan on SCP for Sustainable Buildings and Cities

Objective 1: Enhance capacity of relevant institutions for Sustainable, Smart & Green Cities planning and management.		
Time frame / Actions	**Key Partner (Lead Agencies/**Other Stakeholders)	**Tentative Cost (Million US $)**
Short term		
• Initiate programmes for Capacity Building of relevant institutions and launching physical activities to integrate SCP principles for harnessing full potential of planned urbanization.	**Ministry of Planning, Development and Reforms,** Ministry of Climate Change, CADD, Provincial P & DD, Provincial Urban Units, LGRDD, Cantonment Boards	3.5
• Encourage Private sector participation in delivery of services and infrastructure for making smart cities.	**Ministry of Planning, Development and Reforms**, , Ministry of Climate Change, Ministry of Housing and Works, Provincial P & DD, Provincial Urban Units, Cantonment Boards	5.0
• Ensure implementation of existing legislations and policies e.g. National Housing Policy 2001, National Katchi abadi Policy 2001, National sanitation Policy 2006.	**Ministry of Housing and Works,** Provincial Housing and Town Planning Departments, Development Authorities, LGRDD, Cantonment Boards	2.0
• Revise town planning and building regulations in the light of SCP Principles and approved National Policies and ensure its enforcement.	**Ministry of Housing and Works**, Provincial P & DD, Provincial Urban Units, LGRDD, Cantonment Boards	2.5
• Develop mechanism for laying of infrastructure services like sewerage and drainage line as per town planning	**Provincial P & DD**, Provincial Urban Units, LGRDD, WASA, Cantonment	2.5

regulations and building by-laws.	Boards	
• Prepare a regulatory framework (rules, regulations and procedures) and a strategy for the implementation of the National Sanitation Policy 2006 including elimination of open defecation and hygiene services.	**Provincial P & DD**, Provincial Urban Units, LGRDD, WASA, Cantonment Boards	2.5
• Ensure adequate protection and maintenance of heritage sites and historical buildings in urban areas.	**Ministry of Information, Broadcasting and Heritage,** Provincial P & DD, Provincial Urban Units, LGRDD,	10.0
Medium term		
• Ensure strict compliance of provisions of building by-laws for construction of disaster resilient buildings and infrastructure.	**Ministry of Housing and Works**, LGRDD, Provincial P & DD, Provincial Urban Units	2.0
• Develop laws for provision of sewage and wastewater treatment facilities by developers of large schemes.	**Ministry of Housing and Works,** CADD, Provincial P & DD, Provincial Urban Units	2.0
• Prevent encroachment of fertile agricultural and forest land through, responsive urban land use, strict zoning enforcement and targeted legislation.	**Ministry of Climate Change**, LGRDD**,** Provincial P & DD, Provincial Urban Units	2.0
• Update the land use planning and governance legislations for ensuring planned urban development.	**Ministry of Climate Change**, LGRDD**,** Provincial P & DD, Provincial Urban Units	2.0
• Increase green spaces and initiate projects for greening road network to enhance air quality.	**Ministry of Communication,** Ministry of Climate Change , NHA, LGRDD, Development Authorities	10.0
Long term		
• Promote green building design by incorporating provisions of insulation and thermally efficient windows, and renewable energy technologies in the building by-laws to reduce heating costs and effects of GHG emissions. •	**Ministry of Climate Change,** Ministry of Housing and Works, LGRDD, NEECA, Provincial P & DD	3.5
• Replace Katchi abadis by low income residential buildings and service plots developed with local community participation.	**Ministry of Climate Change,** Development Authorities, LGRDD, Provincial P & DD, Provincial Urban Units	20.0
• Undertake urban renewal programme to ensure sustainable cities management.	**Ministry of Climate Change,** Development Authorities, LGRDD, Provincial P & DD, Provincial Urban Units	30.0
• Develop master plans for all cities including secondary cities and small towns	**Ministry of Climate Change,** Development Authorities, LGRDD, Provincial P & DD, Provincial Urban Units	3.0
Objective 2: Develop Policy, legal framework and Governance for Integrated Waste Management and support Best Practices and technologies for efficient management of waste.		

Short term		
• Revise Legal Framework on Solid Waste Management to advance a clear and efficient institutional set-up to support an SCP-based National / Provincial integrated waste management system.	**Ministry of Climate Change, EPA, LGRDD,** Prov. P&DDs, Urban Units, Federal & Prov. EPAs	2.0
• Prepare solid waste management plan for province with a focus on increasing energy production	**Prov. LGRDDs,** City Governments, Prov. P&DDs, Urban Units, Federal & Prov. EPAs	30.0
• Stop open burning of waste by enforcing rules and regulations.	**Prov. LGRDDs,** City Governments, Prov. P&DDs, Urban Units, Cantonment Boards, Federal & Prov. EPAs	2.0
• Integrate and coordinate national urban planning, land-use planning with waste management plans.	**Ministry of Climate Change, Federal & Prov. EPAs, LGRDD,** Prov. P&DDs, Urban Units, Development Authorities, Cantonment Boards	2.0
• Initiate awareness programmes and campaigns as a major tool to improve national awareness on waste management based on 5R Approach.	**Ministry of Climate Change,** Provincial P&DDs, M/o Information, Broadcasting & National Heritage, Cantonment Boards	5.0
• Empower local bodies with human and technical capacity to handle the collection, transport and disposal of solid waste.	**Prov. LGRDDs,** Prov. P&DDs, Urban Units, Development Authorities, Cantonment Boards	1.5
• Introduce training programmes for communities, hospitals and industries across the country for safe and environmentally sound handling, transportation and disposal of their waste.	**Ministry of National Health Services, Regulations & Coordination, Prov. LGRDDs,** Prov. P&DDs, Health Deptts, Urban Units, NGOs, CBOs	4.5
• Promote the concept of shared hospital waste incineration in big cities.	**Ministry of National Health Services,** Prov. P&DDs & Health Deptts, Urban Units	5.0
• Ensure implementation of Hospital waste Management Rules, 2005 at all levels through awareness raising and capacity building	**Prov. LGRDDs**, **Ministry of National Health Services,** Prov. P&DDs & Health Deptts, Urban Units, Hospitals' Management	4.5
• Introduce effective waste management system in all health and occupational facilities by developing rules and regulations		4.5
• Develop standard designs for collection, transfer and safe disposal of waste for major rural and urban areas of Pakistan.	**Prov. LGRDDs**, Prov. P&DDs, Urban Units	2.0
• Establish monitoring and reporting mechanism for waste collection, transportation and disposal to ensure reliable and satisfactory operation of the service.	**Prov. LGRDDs**, Federal & Prov. EPAs, Prov. P&DDs, Urban Units	12.0
• Identify regional disposal sites and convert them into engineered landfill sites.	**Prov. LGRDDs**, Federal & Prov. EPAs, Prov. P&DDs, Urban Units	20.0
Medium term		

• Develop policies and legislations for safe management and disposal of electronic waste.	**Ministry of Climate Change**, Federal & Prov. EPAs, Prov. P&DDs, Urban Units	2.0
• Develop and enforce legislation for prohibition of production and use of polythene bags and take steps to employ biodegradable alternatives.		2.0
Long term		
• Install plants for waste to energy conversion.	**PCRET,** AEDB, Ministry of Climate Change, Federal & Prov. EPAs, Prov. P&DDs	25.0

2.1.5. Sustainable Transport

The growth of urban centers and associated issues to improve urban mobility has posed some of challenges for the sustainable development of Pakistan. The transport sector is the most CO^2 intensive sector, contributing about 11% to Pakistan's gross domestic product and more than 6% to the country's overall employment. Pakistan produces more than twice the amount of CO^2 emissions from transport sector than the region's average[12].

The network of roads in majority of the cities in Pakistan are growing to accommodate the increasing number of vehicles, but most of the cities still do not have adequate mass transit system. Freight sector inefficiencies are costing the national economy about Rs150 billion annually, and low service quality is impeding Pakistan's regional competitiveness. Railways used to be the predominant mode of transportation in Pakistan from 1955-1960 and handled 73 per cent of freight traffic. Now Pakistan's cargo traffic rely on the road network and 96% of cargo is carried on road networks[13] due to deterioration of railways. Transport through road network is not environment friendly as it releases CO^2 in environment. In this scenario the plan proposes to take practical measures by targeting the key stakeholders to reduce the environmental impact and other issues associated with the transport sector of Pakistan.

Sustainable Transport Action Plan

The main objectives of the action plan on transport are *the development of sustainable mass transit system for reducing carbon footprint and increase efficiency and developing appropriate market tools to promote value chains of transport management* both for passengers and freight. The plan presents time frame, relevant lead agency, and tentative cost. The measures of the action plan include mass transit system, integrated mode of transport to facilitate accessibility and mobility for all; energy efficiency and other relevant standards for vehicles from manufacturing to dismantling stage; construct and earmark cycling and walking tracks in urban centers. Moreover, it comprised of developing policies and legislative system for promotion of intermodal transport system; encouraging hybrid and fuel-efficient vehicles and trains, environment friendly new fuels, efficient freight transport, adopting traffic management and GPS system, motor vehicle examination system and regular engine tuning. The plan also proposes safety and energy efficiency features into transportation infrastructure and support the development of interprovincial and trans-border transportation corridors ensuring integration of SCP principles. Implementation of the proposed actions will lead to fuel saving and GHG emission reduction. This will bring efficiency in the

[12]http://www.lead.org.pk/cc/attachments/Blogs_Discussions/WB_SA_CC_Strategy/8_The_Transport_Sector.pdf
[13] Strategic Environmental, Poverty and Social Assessment of Trade and Transport Sector Reforms. Report No 71812-PK, World Bank, 2012.

transportation of passengers and goods, increase trade and boost trade as well as national and regional economy, especially by providing connectivity to the land locked central Asian countries. The implementation of the Sustainable Transport Action Plan (Table 5) will fulfill the SDG target 12.1, and in addition will also contribute to SDG target 11.2.

Table 5: National Action Plan on SCP for Transport Sector

Objective 1. Development of Sustainable Mass Transit System for reducing carbon footprint and increase efficiency.		
Time frame/ Actions	**Key Partners (Lead Agency /** Other Stakeholder)	**Tentative Cost (Million US$)**
Short term		
• Develop Programmes for integrated mode of transport to facilitate accessibility and mobility for all by expanding network of BRT, Metro-circular train for cities through Public Private Partnership.	**Ministry of Communication,** Provincial Transport Authorities, PPPA	40.0
• Encourage and construct cycling and walking tracks in urban centers.	**City Development Authorities,** Prov. LGRRDs, Cantonment Boards	25.0
• Establish standards for vehicles from manufacturing to dismantling stage.	**NTRC, NEECA,** M/o of Communication, M/o Industries, M/o Trade & Commerce, Prov. P&DDs, Transport Deptts.	2.0
• Encourage public-private partnerships to expedite transport infrastructure development.	**Ministry of Communication,** Provincial Transport Authorities, NHA, Prov. LGRDDs, Local Development Authorities	50.0
Medium term		
• Introduce/ promote engine efficiency standards (EURO I, EURO II) for vehicles and branding of sustainable locally produced transport products and services.	**Federal & Prov. EPAs,** Ministry of Communication, Provincial Transport Authority, NEECA, Prov. Urban Units, P&DDs, NTRC	10.0
Long term		
• Reduce greenhouse gasses Emissions from transport by introducing hybrid vehicles	Federal & Prov. EPAs, Provincial Transport Authority, NEECA, Prov. Urban Units, P&DDs, M/o Trade & Commerce	5.0
• Incentivize fuel efficient vehicles and trains	**NTRC, Ministry of Railways,** Ministry of Communication, Ministry of Finance, CBR, M/o Trade & Commerce, Provincial Transport Authority, NEECA, P&DDs	30.0
• Development of new fuels that are environmental friendly and have lower impact on climate change.	**NTRC,** PCSIR, HDIP, Federal & Prov. EPAs, M/o Petroleum & Natural Resources, Oil Refineries	10.0

• Promote efficient supply chain system by upgrading existing and constructing new nodes for efficient freight transport.	**Ministry of Communication, Prov. LGRDDs**, Ministry of Railways, Prov. P&DDs	40.0
Objective 2: Capacity building of stakeholders and develop appropriate market tools to promote Value Chains of transport management.		
Short term		
• Improve transport services by adopting traffic management and GPS system.	**Ministry of Communication**, Prov. LRDDs, Prov. Urban Units, Transport Deptts.	10.0
• Improve and strengthen the motor vehicle examination system	**NTRC,** Prov. Transport Deptts. NEECA	10.0
• Promote computerized engine tuning.	**NEECA**, Ministry of Communication, NTRC	7.0
• Review National transport Policy and other legislations from the perspective of carbon emission reduction and enhancement of efficiency to update and enforce effective transport management system.	**NTRC, Ministry of Communication,** Ministry of Planning, Development and Reforms, NEECA, Federal & Prov. EPAs, Prov. Urban Units	1.5
• Develop policies for promotion of intermodal transport system for introduction of smart and integrated transportation system.	**Ministry of Communication,** Ministry of Planning, Development and Reforms, NHA, Prov. P&DDs, Transport Deptts, Federal & Prov. EPAs, Prov. Urban Units	2.0
• Review & improve rules and laws for licensing system for LTV & HTV to encourage termination of driving licenses on repeated violations of traffic rules and reissue licenses after re-qualifying driving test (e.g. seatbelts & use of mobile phones)	**Traffic and Motorway Police, Prov. Police Deptt; CADD**, M/o Interior	2.0
• Introduce measures to ensure reduction in transportation cost by introducing intelligent monitoring system using GIS/RS techniques; economize during rush hours etc.	**Ministry of Communication,** Ministry of Planning, Development and Reforms	10.0
• Rehabilitation of existing road networks by reducing distances among cities; improving road construction quality, inter-city signal free corridors etc.	**NHA**, M/o Communication, Prov. Public Works Deptt, LGRDDs.	20.0
• Introduce specific timings for allowing heavy duty vehicles into the city centers.	**Traffic Police**	1.5
Medium term		
• Limit import of second hand vehicles not older than five years.	**Ministry of trade and commerce**	1.0
• Incorporate safety & energy efficiency features into new and existing transportation infrastructure.	**NHA, M/o Communication,** Prov. Urban Unit, Cantonment Boards, Prov. LGRDDs	15.0
Long term		
• Support the development of interprovincial and trans-border transportation corridors ensuring integrating of	**M/o Planning, Development & Reforms, NHA, Ministry of**	50.0

SCP Principles.	**Communication, NTRC,** Prov. P&DDs, Transport Deptt; Urban Units	
• Establishment of intelligent transport system to enable various users to be better informed and make safer and more coordinated use of transport network.	**NTRC, Ministry of Communication,** Prov. Transport Deptt; Prov. LGRDDs, Cantonment Boards	10.0
• Establishment of smart transport management system comprising of three components including smart goods, smart vehicles and smart infrastructure for improving supply chain performance.	**Ministry of Communication, NTRC,** Ministry of Planning, Development and Reforms, Prov. P&DDs, Urban Units	15.0

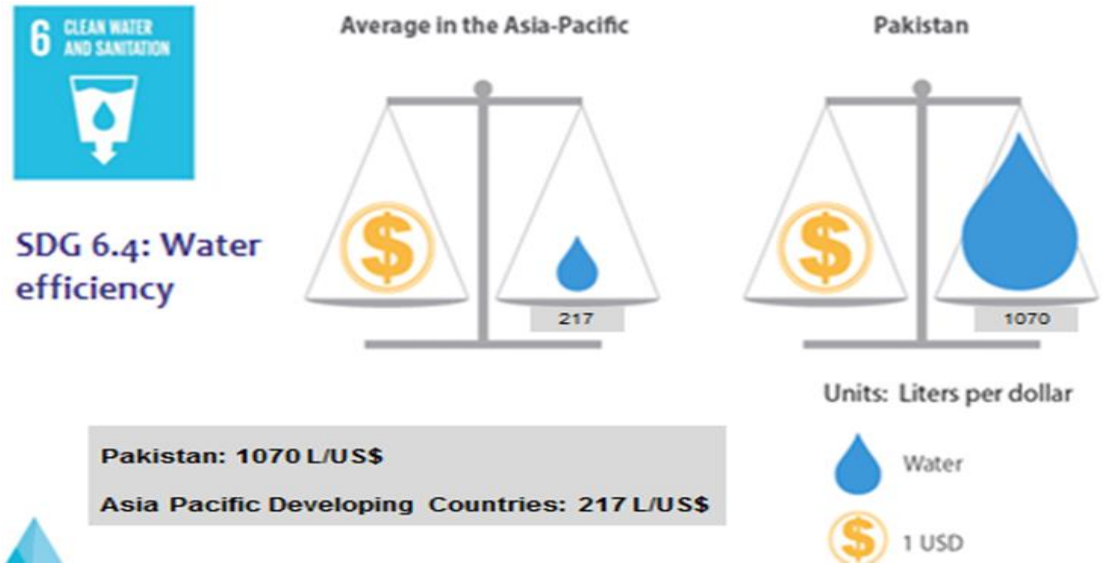
2.2. SDG Target 12.2.

By 2030, achieve the sustainable management and efficient use of natural resources

The sectors to address SDG target 12.2 include Water, Land Ecosystem and Marine Ecosystem.

2.2.1. Water

Ensuring sustainable consumption and production of water is a key challenge for Pakistan. Rapid rate of urbanization, high population growth, unsustainable practices of irrigation, industrialization as well as climate change have resulted in unprecedented stress on water resources availability. Per capita water availability has sharply declined from 2,900 m^3 in 1981 to around 1,100 m^3 in 2015. Based on current trends it is likely that per capita water availability will decline to a level of 800 m^3 by 2025, which will make Pakistan a water scarce country[14]. According to UN Environment, Pakistan's groundwater extraction on a per capita basis is twice the rate as compared with regional level water extraction. In 2015 with respect to water efficiency Pakistan used 1,070 liters of water to generate 1US$ GDP as compared to 217 liters of water by Asia Pacific developing countries and 18 liters of water in Asia Pacific OECD Countries[3].



[14] http://pwp.org.pk/wp-content/uploads/2015/02/World-Water-Day-Events-report-2015-Pakistan.pdf

Further, Pakistan lacks adequate water storage facilities and is losing 30MAF water to sea each year. The economic impact of this loss was calculated at US$18 billion per year[15]. The existing storage capacity is 100 MAF[16] which is sufficient to meet 30 days projected demand. Realizing this challenge Pakistan Vision 2025 aims at increasing the water storage capacity up to 90 days[17].

Substantial reduction in canal water supplies extraction of groundwater has experienced a sharp increase and is fast approaching unsustainable limits. In addition unsafe drinking water, water pollution from both municipal and industrial sources is also of matter of concern. Moreover, due to lack of proper implementation of policies and strategies the water sector in Pakistan has greatly suffered. Institutional structure for water management in Pakistan is fragmented and there a need of Integrated Water Resources Management (IWRM) at all levels.

2.2.1.1. Water Action Plan

The action plan on Water has four main objectives with time frame focusing on *promoting integrated water resource management, increasing efficient use of water, addressing water shortage capacity and improving water quality*. The action plan also presents time frame, relevant lead organization along with the cost to achieve the targets and addresses relevant SDG targets to SCP. The most important action in water sector is to finalise Water Policy incorporating Integrated Water Resources Management (IWRM) and to enhance capacity building at all levels. To improve consumption pattern, substantially increase water-use efficiency across all sectors by introducing water pricing, rainwater harvesting, and effective management of canal delivery water system and also through intensive information, education and communication campaigns. To improve water footprint, invest in technologies to minimize water wastage and also encourage water metering to check indiscriminate use of water for industrial and municipal purposes. Due to wastage of scarce water resources, which serves a lifeline for Pakistan economy, there is a need to construct small, medium, and large reservoirs in all provinces. For sustaining aquifer affected by over extraction of ground water, there is a need to construct artificial wetlands, delay action dams, and inverted wells etc. Efforts should be made to encourage recycling and reuse of industrial and domestic wastewater through efficient and cost effective scientific techniques. Promote integrated water shed management for ecological conservation and Pakistan being lower riparian country also needs to safeguard its water rights on trans-boundary water inflows according to international norms and conventions. Further, water quality monitoring and surveillance should be ensured of all public and private water supplies to meet the required standards. The implementation of the Action Plan on Water sector (Table 6) will fulfill the SDG target 12.2, and also contribute to SDG Targets 6.3 and 6.4.

Table 6: National Action Plan on SCP for Water Sector

Objective 1: Develop and strengthen relevant institutions, policies and framework to promote integrated water resource management with special focus on implementation of rules and regulations, financial mechanisms and capacity building.		
Time frame / Actions	**Key Partners**	**Tentative Cost**

[15]http://www.blackseagrain.net/novosti/pakistan-country-wasting-water-worth-18-billion-annually-irsa
[16]https://defence.pk/pdf/threads/pakistan-must-add-35-maf-of-water-in-10-years-to-its-current-reserve-or-face-a-sever-water-shortage.360817/
[17] Vision 2025

	(Lead Organizations and Other stakeholders**)**	**(Million US $)**
Short term		
• Review & approve Water Policy focused on Integrated Water Resource Management (IWRM) approach including protection, conservation of fresh and underground water bodies with technical advancements and social considerations to give response to the formidable challenge of water scarcity.	**Ministry of Water and Power**, Ministry of Planning, Development and Reform, Provincial P&DD, Capital Administration & Dev. Division	2.0
• Launch awareness programme for implementation of National Drinking Water Policy and National Standards for Drinking water at all levels.	**Ministry of Climate Change,** PCRWR, Provincial Local Government and Rural Development Department (LGRDD), Prov. PHED, NGOs, CBOs, UNICEF, WSP	8.0
• Develop and implement groundwater regulatory framework to control and optimize groundwater extraction.	**Ministry of Water and Power**, Ministry of Planning, Development and Reform, PCRWR, Federal & Prov. EPAs, Provincial P&DD	2.0
• Enforcement of National Environmental Quality Standards (NEQs).	**Federal & Prov. EPA**	10.0
• Initiate training programmes for enhancing water resource management at all levels.	**Technical Education & Vocational Trg. Authority (TEVTA),** NAVTTC, NGOs	3.0
• Adopt participatory approach in water management that will engage all stakeholders particularly marginal groups.	**Ministry of Water and Power**, Ministry of Planning, Development and Reform, CADD, Prov. P&DD, Pr. Irrigation Deptt; NGOs	3.0
• Fulfill the gap in data regarding water e.g. Percentage of total available water resources used.	**Ministry of Water and Power,** PCRWR, Prov. Irrigation Deptt; CADD	2.5
• Build capacity for hill torrent water conservation & management.	**Ministry of Water and Power**, Prov. Irrigation Deptt.	2.5
Medium term		
• Strengthen institutional mechanism to effectively manage canal delivery water system and other water sources in the country.	**WAPDA, Prov. Irrigation Deptt;** Prov. LGRDDs	3.0
• Enhance national capacities in remote sensing and GIS techniques for monitoring temporal changes in glaciers and snow cover.	**WAPDA, PMD, MoCC/GCISC,** NARC, SUPARCO, GBDMA, PDMA KP, UNDP	3.0
• Legislate and enforce principle "Polluter Pays" for water polluting industries.	**Federal & Prov. EPAs,** Environmental Protection Tribunals, Ministry of Industries	2.0
• Develop information management system and exchange to improve knowledge for better water management.	**WAPDA,** PCRWR, Prov. LGRDDs, Prov. PHED, Prov. Irrigation Deptt, Cantonment Boards	3.0
• Encourage water metering and effective control over wastage of municipal water.	**WASAs, CADD, Prov.** LGRDDs, Ministry of Water and Power, Cantonment Boards, CDA, CADD, Metropolitan Corporation Islamabad	5.0

• Enforce industrial and domestic wastewater treatment and management practices to protect water resources from further degradation	**Federal & Prov. EPAs,** Ministry of Industries, Prov. LG&RDDs, Prov. Industrial Deptt; Ministry of industries and Production, Ministry of Climate Change, FPCCI, Cantonment Boards, CDA, CADD, Metropolitan Corporation Islamabad	15.0
Long term		
• Establish and promote appropriate water pricing mechanism to ensure recovery of O&M and capital cost e.g. for municipal, industrial, agriculture etc.	**WASAs,** Prov. LGRDDs, Ministry of Water and Power, Irrigation Department, Planning and Development Department, Cantonment Boards, CBOs, CDA, CADD, Metropolitan Corporation Islamabad	2.5
Objective 2: Improve water quality management and protection of water resources through technical measures ensuring sustainable availability of water at macro and micro level through equitable access of water resources.		
Short term		
• Carry out periodic scientific monitoring of water aquifers and fresh water bodies and identify hot spot areas of contamination and their sources.	**Federal & Prov. EPA,** PCRWR, NGOs, CBOs	9.0
• Develop & launch intensive awareness campaigns to promote water conservation.	**WASAs,** Prov. LGRD, MoCC, Federal & Prov. EPA, PCRWR, Ministries of Water & Power, Information, Broadcasting & National Heritage, Cantonment Boards, Metropolitan Corporation Islamabad,	15.0
• Regularly monitoring of the quality of water being supplied to the consumers.	**WASAs,** Prov. LGRDDs, Cantonment Boards, Metropolitan Corporation Islamabad (MCI)	3.0
Medium term		
• Develop and implement fresh water and underground water conservation and management Act.	**Ministry of Water and Power**, MoCC, Federal & Prov. EPAs	2.0
• Encourage recycling and reuse of industrial and domestic wastewater through efficient and cost-effective scientific techniques such as bio-remediation, sand filtration, reverse osmosis and other techniques.	**WASAs, CADD,** Prov. LGRDDs, Federal & Prov. EPAs, PCRWR, Prov. PHED	15.0
• Construct artificial wetlands in katcha areas along the river banks and urban peripheries.	**Prov. LGRDDs,** Provincial irrigation Departments, Prov. P&DDs	20.0
• Develop public-private partnerships for enhancing access to safe drinking water, operation & maintenance of water supply systems, resource mobilization and capacity development.	**MoCC,** WASAs, MCI, Prov. LGRDDs, Prov. PHED, NGOs, CBOs	5.0
• Initiate programmes for monitoring of groundwater, including its quality, quantity, withdrawal and recharge potential.	**Federal & Prov. EPA**, PCRWR	10.0

• Emphasize equity on water sharing	**Min. of Water & Power,** IRSA, IPCC, Min. of Inter-Prov. Coordination	3.0
• Proper design and lying of pipelines to prevent cross-contamination. Specific distance as per NEQS should be maintained in lying water and sewerage lines.	**Federal and Provincial Development Authorities/** WASAs, Prov. LGRDDs, CADD, MCI, CDA	20.0
• Improve the quality of water by enhancing capacity of water research institutes through R & D.	**PCRWR,** NARC, PCSIR, Provincial research institutions, Academia	10.0
Long term		
• Up gradation of existing water supply infrastructure both in rural and urban areas.	**Federal and Provincial Development Authorities,** WASAs, Prov. LGRDDs, MCI, CDA	30.0
• Installation of water treatment plants as an integral component for reaching the target of "clean drinking water for all".	**Federal and Provincial Development Authorities,** WASAs, Federal & Prov. EPAs, MCI, CDA Prov. LGRDDs, PCRWR, PCSIR	30.0
Objective 3: Ensure efficient use of water in agriculture, irrigation, industry and domestic purposes.		
Short term		
• Invest in proven methods and technologies to minimize water wastage and promote conservation.	**Prov. PHED, Prov. LGRDDs,** PCRWR, NARC, Prov. Research Institutes, CDA, MCI, Prov. WASAs	15.0
• Create awareness and promote rain-water-harvesting at household and local levels.	**Prov. Irrigation Deptt;** Prov. Forest Deptt; Prov. LGRDDs, CDA, MCI, Prov. P&DDs, Ministry of Water and Power, MoCC, NGOs	10.0
• Reduce water footprint by encouraging industries, housing authority, cities to be resource efficient and transparent in their water use.	**Ministry of Industries and Production, MoCC, urban development authorities, Housing authorities**, WASAs, Prov. LGRDDs, NGOs, CBOs	10.0
Medium term		
• Encourage local manufacture on water efficient appliances and fixtures.	**Ministry of Industries and Production,** Ministry of Commerce and Trade, Ministry of Water and Power, CBR, Prov. Industries Deptts; FPCCI, PSQCA	10.0
• Adoption of high-efficiency irrigation system techniques e.g. Sprinkle and Drip irrigation	**Ministry of National Food Security and Research, Prov. Irrigation Deptt,** Ministry of Water and Power, MoCC, Prov. P&DDs, NGOs	30.0
Long term		
• Revise and enforce building by-laws having water efficiency equipment's for better water use efficiency.	**Ministry of Housing,** Ministry of Water and Power, Prov. Urban planning units, Cantonment Boards, CDA, MCI	5.0
Objective 4: Develop Contingency plans and adopt measures to increase water shortage capacity		
Short term		

• Conduct feasibility studies to promote integrated watershed management including ecological conservation practices in uphill watersheds.	**WAPDA,** Ministry of Water and Power, Prov. Forest DEptts; PCRWR, NARC, Academia, Prov. research institutes, IWMI	2.0
• Tap financial resources to maintain existing and develop new water infrastructure.	**Ministry of Water & Power,** WAPDA, MoCC, Prov. LGRDDs, WASAs, Prov. Irrigation Deptts; NDMA, PDMAs,	2.0
• Encourage construction of inverted wells to capture rainwater runoff.	**Urban Dev. Authorities,** Local Government, WASAs	2.0
• Ensure enforcement of rainwater harvesting system in all new public and private buildings.	**Ministry of Housing,** Prov. LGRDDs, Cantonment Board, CDA, MCI,	5.0
• Safe guard water rights on trans-boundary water inflows according to international norms and conventions.	**IRSA,** Ministry of Water and Power, Ministry of Planning, development and reforms, Prov. P&DDs, Ministry of Climate Change, World Bank	10.0
Medium term		
• GIS database development for all water infrastructures with detailed attributes for strong and efficient decision making.	**WAPDA, Ministry of Water and Power,** PMD, GCISC, Prov. Irrigation Deptts, SUPARCO	5.0
• Protect groundwater through management and technical measures like, water licensing, and building delay action dams for artificial recharge especially of threatened aquifers, and adopt concept of integrated water resources management.	**Federal and Prov. EPAs, Prov. LDRDD,** Ministry of Water and Power, PCRWR	20.0
• Develop techniques for use of grey water for flushing and gardening.	**Ministry of National Food Security & Research,** PCRWR, PARC, NARC, Prov. Research Institutes	10.0
• Cleaning of existing canals and dams to remove silt and increase storage capacity.	**Ministry of Water and Power, WAPDA,** Provincial Irrigation Departments, Local Government	30.0
• To address future urban water shortage, introduce laying of double water piping network (one for drinking and the other for domestic purposes).	**Local Government, Cantonment Boards**, Private Housing authorities	5.0
Long term		
• Rehabilitation of existing and construction of new canal system.	**Provincial irrigation Departments,** Ministry of Water and Power	50.0
• Mainstream disaster and climate resilience in developing water infrastructure.	**Provincial irrigation Departments, Ministry of Water and Power**, WASAs, Prov. LGRDDs, Prov. EPAs, Prov. Climate Change Centers/ Deptts; Prov. PHEDs, Cantonment Boards	10.0

• Construct small, medium and large dams applicable to the requirements of each province, in line with defined strategic needs and international benchmarks.	**Prov. Irrigation Deptts; Small Dams Organization, WAPDA,** Ministry of Water and Power;	20.0

2.2.2. Land Ecosystem

Pakistan is confronting daunting challenges of land degradation, desertification, and loss of biodiversity due to a high rate of deforestation, rapid urbanization, industrialization, destructive patterns of consumption and production etc. These are placing great stress on the country's natural resources, especially forests, rangelands, and biodiversity. Pakistan remains relatively more susceptible to land degradation than most nations in the arid-zone category.

The forest resources of Pakistan are deteriorating based on both quality and quantity. The annual land use rate during 1990- 2000 was 1.8% and during 2000-2005 was 2.1%. There is a serious threat of accelerated deforestation and forest degradation in many parts of the country due to an increasing population which relates to wood demands, besides weak governance of tenure, encroachments, land cover changes and adverse impacts of climate. Forests occupy a relatively small proportion of the land area in Pakistan approximately 5 %. It is estimated that the most valuable coniferous forest is declining at a rate of 40,000 hectares annually, and riverine and mangrove forests are also decreasing at the rate of 2,300 and 4,900 hectares annually. This is an alarming rate given the fact of high ecological value of these types of forests, as 70% of land in Pakistan is classified as arid and therefore vulnerable to desertification. The natural productivity of these pastures is generally low and they remain vulnerable to desertification. An FAO survey based on satellite imagery classified 85 per cent of the total rangelands as degraded[18]. Land Ecosystem degradation eventually translates into socio-economic problems, which retard development and growth.

2.2.2.1. Land eco-system Action Plan

The objective of Land eco-system action plan is to *sustainably manage forests, combat desertification, halt deforestation and reverse land and forest degradation and halt biodiversity loss*. The plan suggests adoption of three-pronged approach i.e. equitable sharing of benefits of land ecosystem management, increasing community management of natural resources, and integrating environmental issues into socio-economic development planning through the concept of Payment for Ecosystem Services (PES) to achieve sustainable development.

The emphasis of the plan is on integration of ecosystem management and biodiversity conservation into national and local policies, legislative, development framework and budgetary processes. Implementation of laws regarding biodiversity and forestry is necessary with the restoration of degraded forests and substantially increasing afforestation and reforestation. Implement national and provincial Biodiversity Action Plans and restore the ecosystem. To increase forest cover, implement Green Pakistan Programme and other measures including wood alternatives and REDD+ as defined in National Forest policy 2016. Mainstream Sustainable Land Management (SLM) principles and best land use practices as well as technologies into sectoral policies, strategies, programmes and development plans. Estimate the true economic value of sustainable "ecosystem services" provided by all types of forests and treat forests as a

[18] Pakistan Strategic Country Environmental Assessment Report, World Bank 2006

"natural capital". Incorporate and reflect forest value in national policy formulations including its due consideration during "National Finance Commission" awards.

Moreover, the plan includes implementation of integrated watershed and sustainable land management programme to combat desertification in Pakistan; protected areas management and promoting tourism in the country. It also includes promoting public-private and market oriented farm forestry initiatives along with targeted programmes for urban forestry as well as forests in flood plains, dry-lands, riverine and catchment areas and incorporating the role of indigenous communities, especially women, being the main custodians of forests. For informed decision making the plan stresses on adopting GIS based monitoring system of forests and other ecosystems including monitoring of urban sprawls and encroachments. Further, to recognize and enhance the roles played by wetlands in natural disaster protection and climate change mitigation, the plan proposes controlling the conversion of wetlands and their immediate surroundings for agriculture and grazing purposes. The implementations of Action plan recommendations will help in protecting our natural resource base to sustainably provide food, water and energy securities in the country. The implementation of the Action Plan on Land Ecosystem (Table 7) will fulfill the SDG target 12.2, and in addition will also contribute to SDG targets 15.1, 15.2, 15.3, 15.4, 15.5, 15.9, 15a and 15b.

Table 7: National Action Plan on SCP for Land Ecosystem

Objective 1: Sustainably manage forests, combat desertification, halt deforestation and reverse land & forest degradation, halt biodiversity loss.		
Time frame / Actions	**Key Partner (Lead Agencies/**Other Stakeholders)	**Tentative Cost (Million US$)**
Short term		
• Integrate ecosystem management and biodiversity conservation into national and local policies, development framework and budgetary processes.	**Provincial Forest Deptt;** P&DDs, EPD, Finance Deptt; Ministry of Climate Change, Prov. Climate Change Centers	3.0
• Mobilize and significantly increase financial resources to conserve and sustainably use biodiversity resources.		2.0
• Enforce SCP and Climate Change adaptation measures to protect biodiversity and ecosystem.		20.0
• Green Pakistan Programme to substantially increase afforestation, reforestation and take measures to protect ecosystems	**Provincial Forest, Wildlife & Fisheries Deptts;** P&DDs, Ministry of Climate Change, Prov. Climate Change Centers	20.0
• Develop appropriate programmes at the federal and provincial to increase forest cover on the lines of Green Pakistan Programme	**Provincial Forest Deptt;** P&DDs, Ministry of Climate Change, Prov. Climate Change Centers	2.0
• Set Biodiversity Indicators and tap financial resources for implementation of the Biodiversity Action Plan (BAP).	**Provincial Forest, Wildlife & Fisheries Deptts;** P&DDs, Ministry of Climate Change, Prov. Climate Change Centers	2.0

• Carryout an extensive "Technology Needs Assessment" at ecosystem levels to clearly identify the best available technologies that can be employed in the future to make a clean energy transition to reduce emissions by employing cleaner technologies and to adopt SCP principles.		5.0
• Substitute firewood in the upland ecosystems by providing incentives for alternative sources of energy, like piped natural gas, liquefied petroleum gas (LPG), solar energy and micro-hydel power stations to the local inhabitants	**Provincial Forest and Power/ Electricity Deptts;** P&DDs, Ministry of Climate Change, Prov. Climate Change Centers	40.0
• Encourage empirical research on flora and fauna in the context of their responses to current and historical climatic changes and ecosystem conservation	**Provincial Forest, Wildlife & Fisheries Deptts;** P&DDs, Ministry of Climate Change , Academia, NIO	5.0
Medium term		
• Implement the National Forest Policy 2016 and carry out intensive institutional and legal reforms both at the federal and provincial levels to promote good forest ecosystem management.	**Ministry of Climate Change**, Provincial Forest & Wildlife Deptts; Council of Common Interest	1.0
• Promote sustainable management of all types of forests to halt deforestation, and restore degraded forests by developing and implementing sustainable forest management plans	**Provincial Forest & Wildlife Deptts;** P&DDs, Ministry of Climate Change, NGOs, CBOs	20.0
• Promote sustainable forest management for biodiversity conservation and prevent the extinction of threatened species.		30.0
• Promote wood alternatives for fuel and building usage like LPG, G.I. sheets for roofs; and energy efficiency measures in building sector to reduce the forest degradation and enhance protection of natural habitat.	**MoCC,** Provincial Forest & Wildlife Deptts; P&DDs, Ministry of Climate Change, NGOs, CBOs	20.0
• Mobilize technical and financial resources to promote sustainable forest management	**Ministry of Climate Change**, Provincial Forest Deptt; P&DD,	2.0
• Promotion of REDD+ (Reduction of Emissions from deforestation and degradation) programme in Pakistan	**Ministry of Climate Change**, Provincial Forest Deptt; P&DD,	20.0
• Sustainable Land Management Programme to combat desertification in Pakistan	**Ministry of Climate Change**, Prov. P&DD, Provincial Forest Deptt;	13.0
• Sustainable Forest Management to Secure Multiple Benefits in High Conservation Value Forests	**Ministry of Climate Change**, Provincial Forest Deptt; P&DD,	9.0
• Protected areas management project		5.0
• Establish a National Centre of Excellence of Biodiversity and Ecosystem Sciences	**Ministry of Climate Change,** HEC, Prov. Forest & Wildlife Deptts; NIO	5.0
Long term		

• Promote biodiversity conservation and resource use efficiency.	**Ministry of Climate Change**, Provincial EPDs, P&DDs	5.0
• Develop and implement policies and regulatory framework for protection of biodiversity and land ecosystem in the country	**Ministry of Climate Change**, Provincial Forest Deptt; P&DD,	2.0
• Focus on the protection and preservation of watersheds, catchment areas for aquifers, national wetlands.		20.0
• Develop/ Review National Zoological Gardens' Act	**Ministry of Climate Change**, Prov. Forest & Wildlife Deptt; Prov. P&DD	0.5
• Process draft National Wetland Policy for approval by the Government	**Ministry of Climate Change**	0.5
• Enforce bio-safety rules and guidelines by adopting necessary bio-safety related legal framework	**Ministry of Climate Change**, Provincial P&DDs; Federal & Prov. EPAs	2.0

2.2.3. Marine Ecosystem

Pakistan has 1,000 km long coastline, which supports vibrant marine, plant and aquatic biodiversity but both natural and human interventions poses a threat to the sustainability and development of the marine environment. Pakistan has nine marine and coastal protected areas in the form of national parks and sanctuaries and a total of 19 Ramsar sites[19].

The marine and coastal resources of Pakistan are subject to relentless degradation resulting from industrialization, increased damming of the Indus River (resulting in decreased freshwater discharge to the coastal areas), ship breaking yard activities, lack of awareness and knowledge on values of coastal resources, and a burgeoning urban sprawl, which has caused high levels of pollution and overexploitation of resources. Approximately, 90,000 tons/year discharge from ships and more than 400 million gallons/day of industrial and municipal effluent is discharged in harbor areas. A large portion of 8000-10000 tons solid waste generated in urban areas along coast also finds its way to the harbors. Half of the original mangrove cover has been lost over the past few decades. Pakistan is facing impacts of this degradation in the form of higher maintenances costs of their vessels due to pollution in harbors[20].

In the marine ecosystem, besides pollution, the shrinking of mangroves has been a serious setback, partly due to excessive water withdrawal upstream of Indus, and as a result of deforestation. Regarding of pollution, the worst hit is Karachi coastline, which is being affected due to some of economic activities taking place in urban, industrial, port and shipping, and transport sectors. A major portion of untreated wastewater from these activities is discharged into the sea mainly through Lyari and Malir rivers. Many creeks and coastal waters in the Karachi area exhibit increased organic loads resulting in an increased productivity accompanied by oxygen depletion of water near the bottom (harmful to benthic shrimps such as penaeid and ground fishes). They have also given rise to noxious phytoplankton and algal blooms in recent years[21]. There has been a change in marine species composition, health, and diversity due to pollution and degradation of resources. This has reduced seafood quality and safety leading to problems

[19] Review Paper Status Of Coastal And Marine Ecosystem Management In South Asia
[20]https://www.mangrovesforthefuture.org/news-and-media/news/pakistan/2013/safeguarding-the-coastal-and-marine-resources/
[21] The Climate Change and Outlook of Pakistan, 2013

associated with loss of revenue to fisher folk, foregone export earnings, and hazardous health risks to local consumers[22].

2.2.3.1. Marine Ecosystem Action Plan

The objective of a National action plan for the marine ecosystem is to reduce marine pollution and sustainably use marine resources, including through sustainable management of fisheries, aquaculture and promote tourism. The plan presents time frame, relevant lead agency, cost and addresses prioritized SCP relevant SDG targets. Pakistan is endowed with rich coastal and marine resources and needs to be exploited for national food security and economic development purposes through technological and hygienic improvement. Conservation and sustainable use of oceans, seas and marine resources for sustainable development need appropriate legislation, designated responsibilities, well-defined procedures and the means of institutional capacity building. The Marine Pollution Control Council is required to be reactivated to reduce and control solid and liquid waste disposal in the bay areas by developing facilities of integrating waste management at source through Public Private Partnership. The plan also suggests development of hatcheries and nurseries for supporting sustainable harvesting of fish, shrimp and frogs and other permissible marine species to increase their export.

The action plan includes restoring the blue carbon sequestration, integrated coastal management plans for protection of marine life, increase area under mangrove cultivation and conservation, control pollution of marine areas and wetlands to protect aquatic habitat including marine flora and fauna. The plan focuses on protecting conversion of coastal areas into residential and industrial uses, conserve wetlands and their immediate surroundings and development of adaptation mechanisms for wetlands and communities dependent on wetlands threatened by climate change. The action plan will protect the coastal and marine ecosystem and increase the area under mangroves to build resilience against climate change impacts. The implementation of the Action Plan on Marine Ecosystem (Table 8) will fulfill the SDG target 12.2, and also contribute to SDG targets 14.1 and 14.2.

Table 8: National Action Plan on SCP for Marine Ecosystem

Objective 1: Reduce marine pollution and sustainably use marine resources, including through sustainable management of fisheries, aquaculture and tourism		
Time frame / Actions	**Key Partner (Lead Agencies/**Other Stakeholders)	**Tentative Cost (Million US $)**
Short term		
Control solid and liquid waste by developing legislation to curb the discharge of untreated solid and industrial waste as well as agricultural effluents without treatment into coastal waters.	**EPDs,** P&DDs & LGRDDs, Govt. of Sindh & Balochistan, Ministry of Climate Change, National institute of Oceanography (NIO), Karachi, Center of Excellence, University of Marine Biology, Karachi & Balochistan	50.0
• Design adequate procedures to control pollution of wetlands that includes flow of agricultural chemicals and pesticides into the wetlands		50.0

[22] IUCN, Sindh Strategy for Sustainable Development; http://www.iucn.pk/pdf/sssd/chapters/04-chapter-4.pdf

focusing on integrated treatment plants		
• Reactivate Marine Pollution Control Council to address coastal and marine pollution challenges including oil spills and monitor implementation of ICM programmes	**Ministry of Climate Change, Federal & Prov. EPAs**, Govt. of Sindh & Balochistan; MoCC, Pakistan Navi, Maritime Security Agency, Karachi Port Trust, MPCD	2.0
Constructing wastewater treatment plants and strengthening the capacity of EPA to effectively enforce the existing environmental laws and NEQS.	**EPA, Ministry of Climate Change,** National institute of Oceanography (NIO), Karachi, Center of Excellence, University of Marine Biology, Karachi & Balochistan	100.0
• Mitigating climate change through mangrove cultivation, conservation and restoring the blue carbon sequestration capacity of sea-grasses and tidal marshes	**Forest Departments of Govt. of Sindh & Balochistan**, MoCC, P&DDs of Govt. of Sindh & Balochistan, Sindh Coastal Development Authority (SCDA)	2.0
• Protect fish habitats against both encroachment and pollution.	**Fisheries Deptt;** P&DD, EPDs, Govt. Sindh & Govt. Balochistan; Ministry of Climate Change , NIO, Center of Excellence, University of Marine Biology, Karachi & Balochistan	2.0
• Monitor sustained freshwater flows into the marine eco-systems.		2.0
● Undertaking research and studying the impacts of climate change on the coastal areas.	**Ministry of Climate Change, National institute of Oceanography (NIO),** Karachi, Center of Excellence, University of Marine Biology	10.0
Medium term		
• Harvest fisheries and other marine resources on a sustainable yield basis through capacity building	**Fisheries Deptt;** P&DD, EPD, Govt. Sindh & Govt. Balochistan Ministry of Climate Change , NIO	5.0
• Preparing an updated data bank on the physical, climatic, hydrological, and ecological features and processes of the Sindh and Balochistan coast	**EPDs,** P&DDs & LGRDDs, Govt. of Sindh & Balochistan, Ministry of Climate Change, National institute of Oceanography (NIO), Karachi, Center of Excellence, University of Marine Biology, Karachi & Balochistan	5.0
• Improve quality management for export and domestic fish catches through capacity building and demonstrations	**Fisheries Deptt;** P&DD, EPD, Govt. of Sindh & Govt. of Balochistan, Export Promotion Bureau, NIO	5.0
• Establish Integrated coastal management (ICM) model projects in coastal ecosystem and scale up the successful models along the entire coastal belt.	**Prov. EPDs** & P&DDs Govt. of Sindh & Govt. of Balochistan; Ministry of Climate Change, NIO, Karachi	10.0
• Use the optimal potential of inland fisheries to develop aquaculture on sustainable basis through capacity building	**Fisheries Deptt;** P&DD, EPD, Govt. Sindh & Govt. Balochistan Ministry of Climate Change , NIO	5.0
• Develop hatcheries & nurseries for supporting sustainable harvesting of fish, shrimp and frogs and other permissible marine species to increase their export.		10.0

• Promote ecosystem management and bio-remediation to save water wastage, reduce soil problems and improve environmental conditions to support increase water discharge for river Indus.	**Indus Water Commission**, Ministry of Water and Power, Provincial Planning and Development Departments Govt. of Sindh & Balochistan	50.0
• Construct embankments/ barriers and vegetative cover near the low lying coastal areas against rising sea level and cyclones.	**Sindh & Balochistan Coastal Dev. Authority, Govt. Sindh**, P&DD & EPD, Govt. Sindh & P&DD &EPD Govt. Balochistan, Ministry of Climate Change, NIO	30.0
Long term		
• Prepare and implement integrated coastal zone management plans for protection of marine life.	**Sindh & Balochistan Coastal Dev. Authority,** P&DDs & EPDs, Govt. of Sindh & Balochistan, Ministry of Climate Change, National institute of Oceanography (NIO)	2.0
• Increase area under mangrove, protect conversion of coastal areas into residential and industrial uses to strengthening resilience of the coastal zone, and take action for their restoration in order to achieve healthy and productive oceans.		10.0
• Develop adaptation mechanisms for wetlands and communities dependent on wetlands threatened by climate change.	**Sindh & Balochistan Coastal Dev. Authority,** P&DDs & EPDs, Govt. of Sindh & Balochistan, Ministry of Climate Change, NIO, NGOs	20.0
• Conserve wetlands and their immediate surroundings for sustaining ecosystem services		20.0

2.3. SDG Target 12.6. & 12.4

Target 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

2.3.1. Industry

Industry plays a major role in the development of the economy due to its multi-dimensional direct and indirect linkages and has spillover effects on other sectors of the economy. In Pakistan, sustainable industrial development poses a serious challenge due to lack of adequate support infrastructure, skilled and un-skilled manpower and modern technology. These deficiencies are seriously impacting the country with high level of pollution and discharge of untreated effluents from industries in air, water and land ecosystem. Further, due to low investment and lack of R & D the industrial sector is not able to maintain sustainable growth.

In Pakistan awareness on SCP in industrial sector is still limited. The manufacturing sector lacks know-how and capacity for application of sustainable production technologies and awareness of the environmental impacts and potential financial benefits associated with them. In terms of material footprint which measures consumption perspective of resource use and actual resource productivity of nations,

Pakistan consumes 3.1 kg for producing one US$ of GDP compared to 0.7 kg by Asia Pacific OECD countries consume[23].

2.3.1.1. Industry Action Plan

The action plan on industrial sector has three main objectives focusing on *greening the supply chain by resource efficiency and clean technologies, value addition and environmental compliance and encouraging establishment of eco-industrial zones.* The plan presents time frame, relevant lead agency, cost[24] and addresses prioritized SCP relevant SDG targets. The action plan emphasizes that the country's need to strengthen public-private partnerships, collaboration between industries, and trade bodies to move towards resource use efficiency and cleaner production for sustainable industrial development. Formulate and implement the National Industrial Policy with focus on the concept of SCP. Encourage self-monitoring and reporting (SMART) mechanism, to assist industries to structure and implement their environmental improvement plan.

To achieve paradigm shift, the proposed actions will lead to creating opportunities for industries to move their production from low value to high value products by upgrading and modernizing technologies. Develop and implement eco-standards, labeling and internalize environmental costs into pricing mechanisms to meet international standards particularly related to SCP. For resource conservation, develop and enforce Pollution Penalty Rules for the violators of NEQS. Organize eco-forums for entrepreneur's training and awareness on SCP and introduce Green Awards for Industries. Develop integrated sustainable framework by establishing eco-industrial parks, technology parks, incubators and cleaner production centers. Better industrial and legal framework would help to achieve the long-term objective of sustainable development in the country. The implementation of the Action Plan on Industry (Table 9) will fulfill the SDG target 12.6, 12.4 and 12.7, and in addition will also contribute to SDG targets 9.2, 9.3 and 9.4.

Table 9. National Action Plan on SCP for Industry Sector

Objective 1: Harmonizing and reinforcing policies and mechanisms to support the introduction of resource efficiency and clean technologies in industry for sustainable consumption and Production (SCP).		
Time frame / Actions	**Key Partners (Lead Organizations /** Other stakeholders**)**	**Tentative Cost (Million US$)**
Short term		
• Formulate and implement National Industrial Policy with focus on SCP concept.	**Ministry of Industries and Production**, M/o Trade and Commerce, MoCC, Prov. P&DDs, FPCCI	0.5
• Mainstream SCP in Strategic Trade Policy Framework, 2016.	**Ministry of Commerce and Trade**, M/o Industries & Production, MoCC, FPCCI	0.3
• Enforce National Environmental Quality Standards (NEQs) by enforcing self-monitoring and reporting	**Federal & Prov. EPAs**, M/o Industries & Production, MoCC, FPCCI, Prov. P&DDs	20.0

[23]Natural Resources and SDGs, Pakistan, 2016.
24 The cost have been estimated on the basis of cost reflected for similar activities in the respective annual development plans.

(SMART) programme, to assist the industry to implement their environmental improvement plan.		
• Develop and Enforce Pollution Penalty Rules for the violators of NEQS.	**Federal & Prov. EPAs,** Ministry of Industries and Production, MoCC, FPCCI, OICCI	2.0
• Develop specific audit campaign for data collection of resource use and pollutant discharge/emissions with the aim of building a national database.		2.5
• Strengthening public-private partnerships, collaboration between industries, industrial associations, Chambers of Commerce and trade bodies for sustainable industrial development.	**Ministry of Industries and Production,** Federal & Prov. EPAs, Prov. P&DDs, MoCC, FPCCI	10.0
• Enforce implementation of Occupational Health and Safety standards in industries and institute strict monitoring system.	**Ministry of Industries and Production,** Federal & Prov. EPAs, M/o Health	2.5
Medium term		
• Formulate rules, regulations, guidelines for achieving resource conservation and value addition in industrial sector and set effective monitoring and reporting system through energy and chemicals audit.	**Ministry of Industries and Production**, Federal & Prov. EPAs, MoCC, NEECA, Prov. P&DDs	5.0
• Attract Foreign Direct Investments (FDIs) for enhancing capacity for efficient utilization of resources by industries.	**Local Financial Institutions (FIs),** Ministry of Finance, Ministry of Industries and Production, FPCCI, International development organizations, MoCC, Prov. P&DDs	4.0
• Streamline green procurement system in public and private sector based on quality compliance and standard rating scale of the product.	**Ministry of industries and Production**, FPCCI,OICCI, PSDQCA, PNCA, PPRA	2.5
• Develop programmes for sensitizing business and government for sustainable procurement & its effectiveness as a tool to promote SCP & greener economies.	**PPRA,** Ministry of Industries and Production	4.0
• Regulate SMEs through preparation of national and provincial policies and laws.	**Ministry of Industries and Production**, SMEDA, , Prov. P&DDs, Federal & Prov. EPAs	2.0
Long term		
• GHG monitoring of the industrial zone to be carried out and published.	**Federal & Prov. EPAs**, MoCC	15.0
• Provide incentives to the industries for carbon trading.	**Ministry of Industries and Production,** Local Financial Institutions (FIs), international development organizations, MoCC, FPCCI	5.0
Objective 2: Enhance the capacity and capability of industrial units and sectors for resource conservation, value addition, environmental compliance and competitiveness.		
Short term		

• Develop programmes in collaboration with national and international entities for upgradation and modernization of technologies for enhancing resource conservation and value addition.	**Ministry of Industries and Production,** International development organizations, FPCCI, NEECA, MoCC, Federal & Prov. EPAs, Prov. Industrial & P&DDs	5.0
• Reduce taxes and tariffs on R & D equipment to encourage investment in new technologies and innovations.	**Ministry of Finance,** CBR, Ministry of Industries and Production, FPCCI,OICCI, Prov. P&DDs, MoCC	
• Develop programmes for capacity building and skill enhancement through public and private institutions.	**Ministry of Industries and Production, TEVTA, NAVTTC,** FPCCI, MoCC, Federal & Prov. P&DDs	5.0
• Develop and implement Eco-standards and labeling to meet international standards particularly related to SCP.	**Pakistan National Accreditation Council (PNAC), Ministry of Industries and Production** Federal & Prov. EPAs & Industrial Deptts.	3.0
• Promote ISO Certification and global accreditation in manufacturing and service institutions to access international market.	**Pakistan National Accreditation Council (PNAC), Ministry of Industries and Production,** Federal & Prov. EPAs & Industrial Deptts.	2.5
• Develop, disseminate and enforce regulations on products regarding health impacts, lifecycle and compliance rating.	**Ministry of industries and Production,** Federal & Prov. EPAs, M/o Health	2.0
• Entrepreneur's awareness through trainings and forums on SCP and cleaner production.	**Ministry of Climate Change,** Cleaner Production Centers, Ministry of industries and Production, FPCCI,OICCI, Federal & Prov. EPAs	5.0
• Develop market-based instruments to support the adoption of SCP by compiling and disseminating success stories and lessons learned from existing initiatives related to SCP in the industrial sector.	**Ministry of industries and Production**, FPCCI,OICCI, MoCC	2.5
• Implement awareness campaigns to engage the consumer in SCP practices and initiatives and promote dynamism in the green industry market (leaflets, TVs spots, webpage, hotline, etc…) by engaging the civil society organizations and NGOs in the awareness campaigns, and events targeting the producers and the consumers and support on-going efforts in this area.	**Ministry of industries and Production,** Ministry of Climate Change, Civil Society, Ministry of Information, Broadcasting and National Heritage, Federal & Prov. Industrial Research Institutions, FPCCI, NCPC, NGOs	5.0
• Monitoring and tracking the movement of hazardous chemicals.	**Ministry of Industries and Production**, FPCCI, MoCC, Federal & Prov. EPAs	2.0
• Regular checks by inspectors' in respective industrial units to ensure that safety measures as defined are being followed according to relevant rules for handling of chemicals and petrochemicals in all industrial units processing chemical and fertilizers.		5.0
Medium term		
• Promote R & D to produce goods and services of global standards, develop a regional innovation	**Ministry of Industry and Production,** FPCCI, OICCI, trade Associations, Academia and other	

system to facilitate transfer of knowledge and technology from universities and public research centers to the business sector.	research institutions, Prov. Industrial Deptts.	
• Introduction of Green Awards for industries.	**MoCC,** FPCCI, Federal & Prov. EPAs	2.0
• Impart training for strengthening Pakistan's carbon accounting and management capacity to assist public and private sector to explore opportunities for carbon trade.	**Ministry of Industry and Production, TEVTA, NAVTTC,** MoCC, FPCCI,OICCI	3.0
• Initiate programmes for internalization of environmental cost into pricing mechanism.	**Ministry of Planning, Development and Reforms,** Ministry of industries and Production, MoCC, Federal & Prov. EPAs, Prov. P&DDs	2.0
• Introduction of Automatic Identification System (AIS) for the Scheduled Chemicals from air, sea and land ports through Wide Area Net Work (WAN) System.	**Ministry of industries and Production,** National Authority for Chemical Weapons Convention (CWC), Ministry of Foreign Affairs, M/o Trade & Production	5.0
• Conduct studies for life cycle assessment of products and services to integrate SCP in value chain.	**Ministry of industries and Production,** MoCC, Federal & Prov. EPAs, NGOs.	3.0
• Initiate accredited training programmes for technicians, managers etc.	**TEVTA, NAVTTC,** PNCA, M/o Industries & Production, Prov. Industrial Deptts	5.0
• Design CSR specifically for reduction of greenhouse (GHG) emissions.	**Private Industrial Associations**, MoCC, Federal & Prov. EPAs	2.0
• Technology verification, calibration and replacement of obsolete equipment.	**Ministry of industries and Production,** Private Industrial Associations/Businesses, M/o Science & Technology, FPCCI	10.0
• Promote business-academic partnerships for designing and implementing innovations in industrial sector.	**Ministry of industries and Production,** Research institutions, Federal & Prov. EPAs, FPCCI, Universities	2.0
• Supports harmonize allied industries.	**Ministry of industries and Production,** FPCCI, Prov. Industrial Deptts; Federal & Prov. EPAs	2.0
Long term		
• Incentives to industrial sector for production of renewable energy.	**Ministry of industries and Production,** Ministry of Water and Power, FPCCI, AEDB, Federal & Prov. EPAs	10.0
Objective 3: Encourage environment friendly industrial zones and also support medium and small scale industries to green their supply chain.		
Short term		
• Undertake the initial survey to identify the industries that need technological improvement for emission reduction in their supply chain.	**Ministry of Industries and Production**, FPCCI, Federal & Prov. EPAs	2.0
• Ensure polluting industries to construct individual wastewater treatment plants.	**Ministry of Industries and Production,** Ministry of Climate Change, Federal & Prov. EPAs, Prov.	5.0

	LGRDDs	
• Secure landfills for industrial solid waste disposal.	**City District Government (CDGs)** , Cantonment Boards	10.0
• Conduct feasibility studies for identification of potential industrial zones and harmonize small, medium and large industrial units.	**Ministry of Industries and Production,** FPCCI, Ministry of Climate Change , SMEDA, Prov. P&DDs	2.0
Medium term		
• Installation of Combined Effluent Treatment Plants (CETPs) in major industrial estates.	**Ministry of Industries and Production,** FPCCI, Ministry of Climate Change , Local Financial Institutions, Public and Private Industrial Associations Federal & Prov. EPAs	20.0
• Establish linkages between SMEs and consumer by eliminating the role of middle man.	**Ministry of Industries and Production,** SMEDA	2.0
• Upscale production of traditional craftsmanship to provide employment.	**Ministry of Industries and Production, SMEDA,** FPCCI, Local Financial Institutions	2.0
• Increase financial services to SMEs through establishing dedicated credit lines for soft term loans.	**FPCCI, Ministry of Industries and Production,** Local & international Financial Institutions (FIs)	20.0
Long term		
• Develop integrated sustainable framework for industrial estates.	**Ministry of Industries and Production,** Prov. Industrial Deptts, FPCCI	3.0
• Provide incentives for the SMEs to upgrade existing skills, processes and technologies.	**Ministry of Industries and Production,** SMEDA, FPCCI	10.0
• Establishment of Eco-industrial parks, technology parks and incubation centers to enhance technology base and efficiency for creating competitive products and services in the global context.	**Ministry of Industries and production,** Private Industry Associations, MoCC, M/o Planning, Development & Reforms, Federal & Prov. EPAs, FPCCI, Prov. P&DDs	20.0

2.4. SDG Target 12.8:

By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

2.4.1. Education

Education for sustainable consumption is a key instrument to achieve resource efficiency and low-carbon lifestyles. Education can make a significant difference both in production and consumption patterns by value addition and resource conservation as well as prevention of waste. In Pakistan, the social indicators reflect serious deficiencies in the education sector as it ranks 113th out of 120 countries in UNESCO's Education for All Education Development Index. According to the estimates done by UNESCO, there are 30% of Pakistani's who live in extreme education poverty. Another issue is the parallel education systems in the country which include English, Urdu medium as well as strictly religious education. These need to be streamlined and made coherent.

According to the Pakistan Economic Survey 2015-16, the literacy rate of the population is 60 per cent as compared to 58 per cent in 2013-14 showing an increase of 2 per cent. The literacy level remains higher in urban areas (76 per cent) than in rural areas (51 per cent), and is more prevalent for men (82.0 per cent) compared to women (69 per cent) in urban areas. However, the country still has low net enrolment ratios and has the world's second highest out-of-school population of children. Public sector expenditure on education is barely 2% of GDP which needs to be increased. Moreover, at present, the Education Policy do not address SCP concepts and principles in the curricula at all levels of formal and informal stream of education.

2.4.1.1. Education Action Plan

The action plan for education has two main objectives focusing on *achieving resource efficiency and low-carbon lifestyles and creating inclusive and effective learning environment* with the time frame in order to address the prioritized SCP relevant SDG targets. The action plan proposes revision of education policies with the overall objective of integrating the concept of "Education with Sustainable Consumption and Production" in the curriculum at all levels from primary to tertiary and also in technical and vocational training programmes. Encourage public private partnerships to promote quality and affordable education. Establish linkages between technical colleges, universities, and industries for applied research through the establishment of the Incubation Centers and develop guidelines for accredited labeling and rating standards for resource efficiency. Develop and implement information and awareness-raising campaigns; knowledge and information sharing platforms and networks; are the tools to anchoring the education for sustainable lifestyles at all levels. Introduce uniform education policy and improve the quality of public schooling and vocational institution. Moreover, there is a need to increase investment in human resources both at formal and vocational streams of education as it plays a vital role in development of a knowledge baseeconomy in the highly competitive global environment. The implementation of the Action Plan on Education (Table 10) will fulfill the SDG target 12.8, and in addition will also contribute to SDG targets 4.7 and 4.7a.

Table 10: National Action Plan on SCP for Education Sector

Objective 1: Achieve resource efficiency and low-carbon lifestyles by integrating Sustainable Consumption and Production (SCP) into education in order to acquire knowledge and skills needed to promote sustainable development and lifestyles.		
Time frame /Actions	**Key Partners (Lead Agencies/** Other Stakeholders**)**	**Tentative Cost (Million US $)**
Short term		
• Integrate the needs of youth in the National & Provincial Education policies.	**Ministry of Federal Education and Professional training**, HEC, NEVTTC, TEVTA, Provincial Education Deptts.	10.0
• Promote improvement in the quality of education through effective information, communication and technology (ICT) initiatives and develop a knowledge based industry fostering innovation and entrepreneurship	**National / Provincial Education Depts, HEC,** Ministry of Federal Education and Professional training	10.0
• Re-evaluate and revise curriculum for integration of	**National / Provincial education**	20.0

SCP concepts and education on sustainable lifestyle principles and procedures at primary, secondary, tertiary, technical and vocational level.	**Departments**, Board of Intermediate and Secondary Education, HEC, NEVTTC, TEVTA	
• Ensure inclusion of sustainable lifestyle and other SCP concepts in the training module for teachers, professionals from relevant disciplines both in formal and informal education system.	**Ministry of Federal Education and Professional training,** Provincial education Department	25.0
• For behavioral and lifestyle changes disseminate concept of SCP at primary, secondary, tertiary and at vocational levels.	**School education Department, Universities, Vocational training Institutes**, NGOs	1.5
• In consultation with religious leaders establish and mainstream concept of SCP in madrasas curriculum.	**Ministry of Federal Education and Professional training,** Religious leaders	1.0
• Include teachers in the process of curriculum and education policy development.	**Ministry of Federal Education and Professional training**	20.0
• Provide incentives to students to develop and support their initiatives for sustainable development and lifestyle and engaging with the local communities and other stakeholders.		
Medium term		
• Encourage Public private partnerships to promote quality and affordable education and establishment of vocational training centers at UC level.	**Community driven Institutes**, NGOs	15.0
• Introduce and follow up programmes for career counseling of students and parents.	**Federal & Provincial Education Departments,** NGOs	5.0
• Awareness session on behavioral change about technical education.	**Federal & Provincial Education Departments,** NGOs	3.5
• Arrange specialized reorientation training workshops for higher management on benefits of SCP in manufacturing, trade and business sector.	**Ministry of Climate Change, Ministry of Federal Education and Professional training, Ministry of Industries**, Prov. Education Deptt., National & Prov. Education Foundations	6.0
• Increase investment in human resource development at tertiary level so that they can play a vital role in sustainable development.	**Ministry of Federal Education and Professional Training, HEC,** Prov. Education Deptts., Prov. Planning and Development Department	3.5
• Establish environmental & SCP clubs in all educational institutions.	**Federal and Provincial Education Department**, NGOs	3.5
Long term		
• Establish linkages between technical Colleges/ Universities and industries for applied research through establishment of Incubation centers.	**Vocational training Institutes, Universities, Ministry of Industry and Production, Ministry of Federal Education and Professional Training, HEC,** Prov. Education Deptts.,	3.0
• Conduct training programmes & equip teachers with latest tools and techniques to keep pace with	**Federal/Provincial Educational Departments,** NEVTTC, TEVTA, Pakistan	20.0

the latest trend in education of the 21st century	Institute of Carrier Development	
• Encourage research at university and college level with a focus to increase resource use efficiency in the country	**Universities and Colleges**, HEC	3.5
• Introduce uniform education policy in order to discourage class based education system.	**Ministry of Federal Education and Professional training**, Prov. Education Deptts.	5.0
• Establish SCP Centre and develop programmes in collaboration with universities and industries.	**Ministry of Climate Change,** Ministry of Federal Education and Professional training, Prov. Education Deptts.	3.5
Objective 2: Create Inclusive And effective learning environment by building and upgrading education facilities.		
Short term		
• Introduction of comprehensive reforms such as governance and proper infrastructure in the educational system to improve the quality of public schooling.	**Ministry of Federal Education and Professional Training, Prov. LGRDDs**, **Ministry of Planning, Development and Reforms,**, Prov. Education Deptts.	20.0
• Provide incentives for improving existing and establishing new vocational training institutes.	**NAVTTC, TEVTA,** Ministry of Federal Education and Professional training, Prov. Education Deptts.	20.0
Medium term		
• Increase girl's enrolment in schools by provision of female teachers, and necessary infrastructure e.g. toilets, boundary walls, and clean drinking water.	**Ministry of Federal Education and Professional Training, Provincial Education Departments,** NGOs, National & Provincial Education Foundations	15.0
• Educational budget to be increased by the Government emphasizing on education for sustainable life style.	**Ministry of Planning, Development and Reforms, Ministry of Finance, Prov. Finance & Education Deptts.** P&DDs	
Long term		
• Strengthen mechanisms of modern communication, information and extension networks and utilize them effectively for the promotion of sustainable lifestyle.	**Ministry of Federal Education and Professional training**, Prov. Education Department	3.0

2.5. Harmonisation between NAP-SCP and Vision 2025

Pakistan's Vision 2025 gives top priority to mainstreaming SCP in the sectoral policies of the Government to achieve sustainable development. National Action Plan on SCP has been prepared taking into consideration sectoral goals and targets of Vision 2025. The harmonization between objectives of the Pakistan's NAP on SCP and identified priority actions of Pakistan Vision 2025 are as follows:

Table 11: The Harmonization between Pakistan's NAP on SCP and Pakistan's Vision 2025.

Pakistan's NAP-SCP Objectives	Vision 2025 Priority Actions

Climate Change	
Objectives: Take urgent action to combat climate change and its impacts	• Design water, food and energy security policies and plans of the country with specific reference to the profound challenges posed by climate change. • Explicit recognition of the relevant risks and associated economic and social costs and • Implementation of well-defined mitigation and adaptation strategies / measures. • Promote long term sustainability, conservation and protection of natural resources. • Leverage CDM mechanism to earn carbon credits to reinvested in relevant projects. • Access Green Climate Fund and funding under Nationally Appropriate Mitigation Actions (NAMA). to get resources for mitigation and adaptation to climate change.
Energy Sector	
Objective 1: Strengthening of relevant institutions, policies, rules and regulations, financial mechanisms, innovative and accessible resources for energy efficiency. **Objective2:** Promote R & D for clean energy technology and tap Pakistan's huge potential for indigenous and renewable resources and technologies such as micro-hydel, bio-fuel (biogas) solar, wind, geothermal and hydrogen energy. **Objective 3:** Reduce the carbon footprint by promoting energy efficiency.	• Address demand management by increasing usage of energy efficient appliances/products. • Optimize energy generation mix between oil, gas, hydro, coal, nuclear, solar, wind and biomass with reference to its indigenousness, economic feasibility, scalability, risk assessment and environmental impact. • Tap Pakistan's huge potential for alternative energy. • Maximize distribution efficiency and cut wasteful losses through investment in transmission and distribution infrastructure and effective enforcement of controls • Address institutional fragmentation and decay of the sector due to poor capacity. • Focus on demand management and conservation to ensure prioritization in allocation, elimination of wasteful use, incentives to use more energy efficient equipment and appliances and achieve better balance between peak and off-peak hours. • Introduce institutional reform and strengthen regulatory frameworks to improve transparency and efficiency. • Adoption of clean coal combustion technologies, along with strong policies to make its use ecofriendly, to conform to international standards. • A national initiative towards the conservation of energy

	will be taken to use the available capacity more effectively.
Sustainable Food System	
Objective 1: Promoting SCP concept in agriculture by adopting Sustainable agriculture practices, technologies for sustainable production system and to meet food security. **Objective 2:** Reduce food loss and waste and ensure quality nutrition. **Objective 3:** Increase and ensure protection and preservation of prime agricultural land and combat Desertification and Drought. **Objective 4:** Adoption of climate resilient techniques and measures for ensuring food security and sustainable agriculture.	• Educate and incentivize farmers to make efficient use of inputs, adopt leading farming techniques, optimize crop selection and maximize their yield. • The broad-based agriculture growth will be achieved through narrowing the yield gaps and diversifying toward high-value agricultural products. • Create a modern, efficient and diversified agricultural sector – aligned with associated water and energy infrastructure, pest and disease surveillance, agro processing, creation and administration of a regulatory and legislative framework; addressing externalities such as enhancing sustainability and adopting environmentally friendly activities. • Optimize production and supply mix in line with current and projected needs. • Ensure that the entire supply-chain related to food security is geared towards provision of stable and affordable access to adequate, nutritious and safe food for a healthy life. • Use the resource base in an efficient and sustainable manner–with outcome-based benchmarks agreed in line with regional and global standards. • Invest significantly in research and development (R&D) in agricultural universities to realize the increased productivity foreseen in the agriculture sector. • Proper water pricing and crop-based price variations will to be used as tools for promotion of water efficient crops and discouraging wasteful crops particularly at the tail-end of various irrigation zones. • Improving service delivery to farmers and introducing support mechanisms for timely access to quality inputs will be made through establishment of Rural Business Hubs (RBHs). • Replace the current wheat procurement system with a more rationalized programme that procures the quantities needed to provide subsidized wheat or flour to the most food insecure consumers through well-defined and explicitly targeted interventions. • Targeted productivity enhancement programmes will be

	introduced for farmer's livestock owners below subsistence level.
Sustainable Buildings and Cities	
Objective 1: Enhance capacity of relevant institutions for sustainable Cities planning and management to integrate SCP Principles. **Objective 2:** Develop the Policy, legal framework and Governance for Integrated waste Management and support Best Practices and technologies for efficient management of waste.	• Transforming the urban areas into creative, eco-friendly sustainable cities through improved city governance, effective urban planning, efficient local mobility infrastructure (mass transit systems) and better security to make urbanization an important driver of growth. • Zoning laws will be revised to cater to the growing demand for commercial and parking space in large urban centers. • A 'Housing information system' to provide data on housing demand and supply will be established. • The private sector will be encouraged to provide housing facilities. • Katch abadis will be replaced by low income residential buildings with adequate provision of sewerage, clean water, and basic utilities such as gas and electricity. • A move towards vertical expansion in city centers will provide residential facilities in addition to commercial space to city inhabitants. • Community based participation will be promoted to transform our cities into 'creative' cities where local and innovative solutions are found to local problems through community organization in collaboration with city governments. • Developing 'smart cities' - cities that are capable of adapting to increasing complexity and demand for knowledge communication given urban expansion. • Ensure that Pakistan's cities are digitally connected, equipped with wireless network sensors and there is e-connectivity in all parts where the free flow of information is possible • Providing access sanitation and hygiene services for all, eliminating open defecation. • With increased urban expansion, there is an additional demand created for public services such as fire and rescue services, emergency medical services including ambulances as well as law enforcement. • To cut down usage of private transport in urban centers, public transport including mass transit systems will be carefully devised and implemented. In addition, cities

	will be made pedestrian friendly. These measures will not only reduce demand for oil and fuels, but will also lead to cleaner more eco-friendly cities. • Protection and maintenance of heritage sites and buildings in urban centers. • Hospital waste management practices will be improved to have minimal environmental impact.
Sustainable Transport	
Objective 1. Development of Sustainable Public and Private Transport System for reducing carbon footprint and increase efficiency. **Objective 2:** Sensitize and educate stakeholders and develop appropriate market tools to promote Value Chains of transport management.	• Establish an efficient and integrated transportation system that will facilitate the development of a competitive economy • Build necessary logistics like quality transportation to support GDP growth. • Railways will be revived as a socially and financially viable organization, road density in rural and urban areas will be increased, ports and airports will be equipped with modern cargo handling techniques and operational capacity will be expanded according to the requirement of the growing economy. • Initiation of strategic programme for regional connectivity.
Water Sector	
Objective 1: Develop and strengthen relevant institutions, policies and framework to promote integrated water resource management with special focus on implementation of rules and regulations, financial mechanisms and capacity building. **Objective 2:** Improve water quality manage and protect water resources through technical measures ensuring sustainable availability of water at macro and micro level through equitable access of water resources. **Objective 3:** Ensure efficient use of water in agriculture, irrigation, industry and domestic purposes. **Objective 4:** Develop Contingency plans and adopt measures to increase water	• Increase water storage capacity, applicable to the requirements of each province, in line with defined strategic needs and international benchmarks: from currently 30 days to 45 days by 2018, and 90 days by 2025. • Invest in proven methods and technologies to minimize wastage through rationalization of pricing. • Establish institutional mechanisms (e.g. a National Water Commission) to effectively manage all sources of water (surface, subsurface, rain) and their sectoral and regional allocations (agriculture, industry, urban). • Provision of access to a minimum baseline of suitable water to every person in Pakistan. • Implementation of a comprehensive National Water Policy. • Establishment of strict criteria to ensure effective contamination management in Rivers. • Providing access to safe drinking water, promoting water

shortage capacity.	conservation, domestic and industrial wastewater treatment and reuse, reducing pollution from water sources, water resource management, water related disaster resilience and sustainable extraction from water resources. • The government will carefully reconsider applying reasonable water usage charges and incentives to encourage efficient and effective use of our scarce resource. • Launching awareness drive to educate people about the benefits of judicious consumption and shared consequences of wastage. • Due consideration will be provided to harvest rain water in lakes and ponds and also at the household and community levels.
Land Ecosystem	
Objectives: Sustainably manage forests, combat desertification, halt deforestation and reverse land & forest degradation, halt biodiversity loss.	• Integration of environmental considerations in development strategies • Conserve life support systems, habitats, species and genetic diversity as the assets of mankind and promote tangibly defined efforts such as doubling of forest cover by 2030.
Industry Sector	
Objective 1: Harmonizing and reinforcing policies and mechanisms to support the introduction of resource efficiency and clean technologies in industry for sustainable consumption and Production (SCP). **Objective 2:** Enhance the capacity and capability of industrial units and sectors for resource conservation, value addition, environmental compliance and competitiveness. **Objective 3:** Encourage environment friendly industrial zones with focus on SCP and also support small and medium scale industries to green their supply chain	• Develop and enforce relevant industry standards and strengthening of Pakistan standards and Quality Control Authority. • Vocational training responsive to emerging technologies and to the changing needs of the private sector. • Participation of female in the workforce will be encouraged. • Promote innovation by mobilizing investments in new product areas and export to new markets. • Encourage investment in new technologies and innovation, by reducing tariffs and taxes on R&D equipment, raw materials and costs related to human resource development. • Value addition of goods or services by promoting close connections between technology developments in agriculture, manufacturing and services with productive

	enterprises. • Technology parks will be established to enhance the national technology base, develop efficient systems in public and private sectors, promote R&D, produce goods and services of global standards, develop a regional innovation system. • Facilitate the transfer of knowledge and technology from universities and public research centers to the business sector. • Formulation of new industrial policy to provide time-bound incentives for key industries to assist them in moving up the global value chain. Focus will be placed on export of high skilled value added services to generate foreign exchange. • Micro-businesses will be encouraged, thus promoting entrepreneurship and innovation. • Manufacturing and services sectors will focus on high value-added products to increase productivity.
Education	
Objective 1: Achieve resource efficiency and low-carbon lifestyles by integrating Sustainable Consumption and Production (SCP) into education in order to acquire knowledge and skills needed to promote sustainable development and lifestyles. **Objective 2:** Create Inclusive And effective learning environment by building and upgrading education facilities.	• Establishing new universities, in particular world class technology and engineering institutes. • Improve the quality of existing engineering and technology universities and create models with a focus on quality research. • A university campus shall be established in each district and online programmes shall be strengthened to provide greater access to higher education. • An apex body, in consultation with religious leaders, will be established to mainstream madrasas and update their curriculum to meet new challenges. • Comprehensive reforms, comprising of detailed actions in curriculum, pedagogy, technology, governance, assessment as well as social and economic relevance will be made in the educational system. • Modernized teaching methods will be adopted, including the use of emerging technologies for educational purposes such as e-education, mobile-education and online distance learning as the paradigm of literacy shifts from pen to computers and tablets. • Special efforts will be made to increase the enrolment of girls. This includes provision of female teachers, and necessary physical factors (e.g. boundary walls and

	adequate toilets in girls' schools). • Global languages will be introduced in schools to prepare students to take their place in a globalized world. • Increase investment significantly in human resources (software) at the higher education level. • Develop smart campus systems to facilitate instant networking among campuses to improve the learning environment which will allow sharing information and knowledge among institutions. • Promote customized curriculum in the universities and tailored academic degree programmes to respond to the demand of industry and to bridge the gap between what universities teach and what businesses and industry need.

CHAPTER 3: IMPLEMENTATION & MONITORING MECHANISM

3.1 Institutional framework

The NAP-SCP is an over-arching document, which will be implemented by the respective ministries, departments and provincial governments. The relevant ministries, departments and agencies shall devise their own programmes and develop projects to implement the actions reflected in the NAP for SCP in the short, medium and long-term perspective in accordance with their respective area of responsibility. Similarly, the provincial governments, AJK, Gilgit-Baltistan, Federally Administered Tribal Areas (FATA) and local governments shall also devise their own strategies, and programmes for implementation of the Provincial Action Plans for SCP.

At the Federal level to ensure effective implementation and to oversee progress of NAP-SCP, the existing notified "National Climate Change Policy Implementation Committee" will also serve as the "NAP for SCP Implementation Committee". Moreover, other task for NAP-SCP committee is to regularly monitor, evaluate and to update the NAP for SCP at every five-year intervals. The National Action Plans for SCP Implementation Committees shall meet biannually. The composition of the committee is as below:

I. National Action Plan for SCP Implementation Committee at the Federal Level

1. Federal Minister of Climate Change (Chair)
2. Secretaries of Ministries responsible for Climate Change/ Planning and Development / Foreign Affairs/ Science and Technology/ Industries and Production/Finance/ Water and Power/ Food and Agriculture/ Health/ Defense;
3. Member Infrastructure PC/Additional Chief Secretaries Provincial Planning and Development Departments;
4. Chairman NDMA/ Federal Flood Commission;
5. Secretaries of Provincial/ AJK/GB/FATA Environment Departments;
6. Heads of PMD/ GCISC/ Pak EPA/NEECA
7. Chief Environment, Planning and Development Division;
8. Three representatives from the corporate sector/ Chambers of Commerce and Industries;
9. Three eminent experts/professionals;
10. Three representatives from Civil Society Organizations;
11. Director General (Climate Change) Member/ Secretary.

For monitoring and evaluation at the provincial level the notified "Provincial Climate Change Policy Implementation Committees" will also serve as the "Provincial/AJK/GB/FATA Action Plans for SCP Implementation Committees". One of the tasks of these committees will be regularly monitoring and evaluation of the Provincial/ AJK/GB/FATA Action Plans and update on the progress of NAP-SCP at five year intervals. The composition of the committee is as under:

II. Provincial/AJK/GB/FATA Action Plans for SCP Implementation Committee

1. Provincial Minister for Environment (Chairperson)
2. Chairman/Additional Chief Secretaries Planning and Development Department;
3. Secretaries Environment/Agriculture/Forest/Irrigation/Local Government/ Public Health Departments;

4. DGs PDMAs
5. Three representatives from corporate sector/Chambers of Commerce and industries;
6. Three representatives from Civil Society Organizations;
7. Three eminent experts/professionals ;
8. Director General Environmental Protection Agency, member/ Secretary.

The "Provincial/AJK/GB/FATA Action Plans for SCP Implementation Committees" will meet biannually. The Provincial Committees, will be the key actors in implementation of the proposed Provincial/AJK/GB/FATA Action Plans for SCP, and will report the status of implementation of the Action Plans to the National Committee.

3.2 Means of implementation

It is proposed to launch following programmes and projects to create enabling environment for facilitation of smooth implementation of SCP in Pakistan:

- **Legislative and regulatory steps including timeline**
  - Mainstream SCP in national sectoral policies, strategies and planning.
  - Integration of policy guidelines on Green Building Codes into National Building Code of Pakistan.
  - Prepare guidelines for segregation, environmentally safe management and disposal of municipal, industrial, hazardous & biomedical waste.
- **Capacity for sustainable governance**
  - Design and implement projects to provide environmentally sound alternatives for phasing out plastic bags
  - Design waste to energy projects to promote environmentally sound disposal of waste as well as their utilization to overcome energy crisis.
  - Launch programmes and projects for minimization of food waste.
- **Awareness raising and communication/ Science, Technology, and Innovation**
  - Launch awareness programmes for dissemination of SCP principle at primary, secondary and tertiary education level. Conduct Summer/Winter School Programmes in collaboration with UN Environment at national & provincial levels.
  - Designing of coarse material for teaching SCP in the priority subjects identified by the SCP pilot on tertiary level curriculum.
  - Integrate SCP in vocational training and distant learning programmes.

3.3 Monitoring and Evaluation (M&E):

The M&E is essential for continuous validation of the action plan. There should be a specific M&E mechanism for each sector that has been tackled through the action plan with specific sector related indicators reflective of sustainable consumption and production activities and results. A set of suggested impact and output indicators related to SCP for monitoring of different sectors are described in Annex-V.

Annexures

Annex I:

SDG Targets Closely Related With SCP

Target #	Relationship of the SCP with the target
1.4	Ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance by 2030.
2.4	Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality by 2030.
3.9	Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate by 2030
4.7	Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development by 2030
6.3	Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally by 2030
6.4	Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity by 2030
7.2	Increase substantially the share of renewable energy in the global energy mix by 2030
7.3	Double the global rate of improvement in energy efficiency by 2030
8.4	Improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead
9.1	Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all
9.2	Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries
9.4	Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities by 2030

11.2	Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries by 2030
11.6	Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities by 2030
11c	Support least developed countries, including through financial and technical assistance, for sustainable and resilient buildings utilizing local materials
12.1	Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries
12.2	Achieve the sustainable management and efficient use of natural resources by 2030
12.3	Halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 2030
12.4	Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment by 2020.
12.5	Substantially reduce waste generation through prevention, reduction, recycling and reuse by 2030
12.6	Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
12.7	Promote public procurement practices that are sustainable, in accordance with national policies and priorities
12.8	Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature by 2030
12a	Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production
12b	Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products
12c	Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities
13.3	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
14.7	Increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism by 2030

15.2	Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally by 2020
17.11	Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020
17.16	Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries
17.18	Enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts by 2020

Annex II

On-going SCP Related PSDP, Multi-Lateral Donors and DFIs Funded Projects

Project name	Cost (Million Rs)
Land and Forest Resources	
1. Green Pakistan Programme	
2. Sustainable Land Management Programme to Combat Desertification in Pakistan	1400.00
3. Sustainable Forest Management to Secure Multiple Benefits in High Conservation Value Forests	900.00
4. Mountain and markets: Biodiversity & Business in Northern Areas	329.00
5. Support for the Revision of the NBSAPs and Development of Fifth National Report to the CBD	44.00
6. REDD+ Readiness Preparation Project	390.00
Energy Sector	
7. Promoting Sustainable Energy Production and Use from Biomass in Pakistan	716.00
8. Productive Uses of Renewable Energy in Chitral District, Pakistan (PURE-Chitral)	565.00
9. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (GEPCO:	3577.000
10. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (HESCO)	2500.000
11. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (IESCO)	2717.860
12. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (LESCO)	3273.000
13. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (MEPCO)	3606.000
14. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (PESCO)	1689.000
15. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (FESCO)	2318.000
16. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (GEPCO)	1125.000
17. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor	2622.000

Installation & Energy Efficiency (ADB) (HESCO)	
18. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (IESCO)	2633.390
19. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (LESCO)	2346.000
20. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (PESCO)	2305.820
21. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (QESCO	8731.660
22. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (FESCO)	2576.000
23. Power Distribution Enhancement Project; (Tranche-I & II) Rehabilitation Capacitor Installation & Energy Efficiency (ADB) (MEPCO)	3678.790
24. Quaid-e-Azam Solar Park, Bahawalpur (MEPCO)	763.000
25. Water Conservation through High Efficiency Irrigation Systems in ICT	52.401
26. Provision of Solar System at Pakistan Railways Headquarter Office, Lahore	36.000
27. Quaid-e-Azam Solar Park at Lal-Suhanra (Phase-II) Evacuation of 600 MW Solar (Proposed to be carried out by NTDC)	4065.730
28. Evacuation of power from wind power projects at Jhimpir and Gharo Wind Clusters	12572.660
29. 4 MW Hydel Project at Thack Nullah Chilas (ADB)	1320.117
30. Construction of 14 MW Hydel Power Project Naltar-V	3843.753
31. Construction of 16 MW Hydel Power Project Naltar-III	2900.000
32. Establishment of Hydropower Training Institute (HPTI) Mangla (AFD)	486.151
33. Golan Gol Hydro Power Project (106 MW) (Chitral)	28202.402
34. Keyal Khawar Hydro Power Project, Khyber Pakhtunkhwa, (Battagram) (122 MW)	27803.010
35. Neelum Jhelum Hydro Power Project (969 MW) (China Kuwait Saudi Arabia	274882.590
36. Pattan Hydro Power Project (2800 MW) (Kohistan) (Study)	731.233
37. Refurbishment & Up-gradation of Generation Units of Mangla Power Station (310 MW)	52224.307
38. Shyok Dam Multipurpose Project (Feasibility Study)	159.583
39. Tarbela Fourth Extension Hydro Power Project (1410 MW) (Swabi)	83601.040

40. Thakot Hydro Power Project (2800 MW) (Battagram) (Study)	719.628
41. 1200 MW LNG Based Power Plant Baloki	81406.000
42. 1200 MW LNG Based Power Plant Haveli Bahadurshah	81406.000
Transport Sector	
43. Pakistan Sustainable Transport Project	7802.0
44. Green Line Bus Transit System from Municipal Park, Sadder to KESC Power House Chowrangi, Surjani, Karachi	16085.000
45. NTRC Axle Load Survey on National Highways & Motorways	46.937
Water Sector	
46. Water Distribution Network for RCB/CCB based on Khanpur Dam Water Source (Phase-III) (Rawalpindi) Punjab	699.500
47. Expansion of Raw Water Filtration Plant & Supply Network for Supplying Clean Water to Hyderabad (Hyderabad Package)	935.000
48. Greater Karachi Water Supply Scheme (K-IV) (Karachi)	12755.000
49. Necessary Facilities of Fresh Water Treatment, Water Supply and Distribution Gwadar (CPEC)	11396.000
50. Demarcation of Groundwater Quality Zones in Indus Plain and Marginal Areas for Sustainable Development and Management of Groundwater (Lower Indus Plain) PCRWR	54.946
51. Integrated Water Resources Management in the Highly Depleted Pishin-Lora Basin of Balochistan, PCRWR	48.857
52. Indus 21 Water Sector Capacity Building & Advisory Services, Islamabad (World Bank)	7659.060
Agriculture Sector	
53. Augmentation of Irrigation Water in Islamabad Capital Territory.	53.175
54. Enhancement of Agriculture Production through Installation of Water Conveyance Network in ICT	56.530
55. Water Conservation through High Efficiency Irrigation Systems in ICT	52.401
56. Remedial Measures to Control Waterlogging due to Muzaffargarh & TP Link Canal, Kot Addu, District Muzaffargarh	8565.288
57. Research Studies on Drainage, Land Reclamation, Water Management & Use of	348.335

Drainage Water (IWASRI, Mona & LIM) (All Pakistan)	
58. Extension of Pat Feeder Canal for Utilization of Indus Water in Balochistan	2370.000
Industry Sector	
59. Sustainable Energy Initiative for Industries	3475.00
60. Promoting Employment & Productivity in the Garment Industry	300.00
61. Pak-Korean Garments Technology Training Institute, Karachi	609.330
62. GEF UNIDO Cleantech Programme for SMEs	536.00
Sustainable Cities Sector	
63. Greater Karachi Sewerage Plant (S-III) (Karachi)	3991.000
64. Water Supply & Drainage Scheme of Tando Jam (Hyderabad Package) (District Hyderabad)	131.820
65. Construction of Drainage (Waste Water Channel) Existing Saim Nullah at Mamoon Kanjan, Tehsil Tandlianwala, District Faisalabad (Federal Share)	251.000
Climate Change Sector	
66. Establishment of Geomatic Centre for Climate Change and Sustainable Development	48.885
67. Scaling-Up of Glacial Lake Outburst Flood (GLOF) Risk Reduction in Northern Pakistan	3600.00
68. Generating Global Environmental Benefits from Improved Decision Making Systems and Local Planning in Pakistan	1935.00
69. Flood Emergency Reconstruction and Resilience Project (Punjab & AJK)	6500.00
Marine Ecosystem Sector	
70. Establishment of National Central Marine Research Laboratory at NIO, Karachi. Phase-I	39.500
71. Rehabilitation & Renovation of Karachi Fish Harbour, External services. Phase-I (R: 1438.021)	1438.021
72. Strengthening and Improvement of Fish and Shrimp Hatcheries in Sindh	784.013
73. Development of Public Water (lakes) & surveillance of Coastal waters to improve productivity & enhance availability of fish	57.796
74. Rehabilitation of Pilot Shrimp Farm Garho as Training & Research Centre	261.792
Education Sector	

75. Pak-China Technical & Vocational Institute at Gwadar (CPEC)	984.000
76. Establishment of National Capacity Building Institute (NCBI) for Water Quality Management at Islamabad	323.573
77. Capacity Building of TTIs and Training of Elementary Schools Teachers in ICT, FATA, FANA & AJK	730.828
78. Financial Management for Good Governance (FMGG) Phase-II, Islamabad	43.223
79. Modernization and Standardization of Examination System	50.000
80. Prime Minister's Special Initiatives (PMSI) for Hunarmand Pakistan Programme (NAVTTC)	4648.000
81. Provision of Quality Education Opportunities for Students of Balochistan, FATA & 3 PMUs	481.360

Annex-III

Pakistan's Performance against SCP relevant SDG indicators and comparison against the average for Asian developing countries[25].

SDG Goal	SDG Target	IAEG Indicator[1]	Year 2015 Pakistan	Year 2015 Asia-Pacific Developing
6 CLEAN WATER AND SANITATION	**6.4** – Increase water-use efficiency	**6.4.1 – Water Intensity** *(litres per US dollar)*	1,070	220
7 AFFORDABLE AND CLEAN ENERGY	**7.2** – Increase share of renewable energy	**7.2.1– Renewable energy** share in total primary energy supply[2] *(percentage)*	36.9%	18.3%
	7.3 – Improve energy efficiency	**7.3.1 Energy Intensity** *(megajoules per dollar)*	25.4	25.1
8 DECENT WORK AND ECONOMIC GROWTH	**8.4** – Resource efficiency and decouple economic growth from environmental degradation	**8.4.1** and **12.2.1 – Material Footprint**		
		Total *(million tonnes)*	577	40,728
		Per capita *(tonnes)*	3.1	10.8
		Per dollar *(Kilograms per dollar)*	3.4	4.5
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	**12.2** – Sustainable management and efficient use of natural resources	**8.4.2** and **12.2.2 – Domestic Material Consumption**		
		Total *(million tonnes)*	814	47,813
		Per capita *(tonnes)*	4.3	12.7
		Per dollar *(kilograms per dollar)*	4.7	5.3
17 PARTNERSHIPS FOR THE GOALS	**17.11** – Exports of developing countries	**17.11.1** – Developing countries and least developed countries **export value**		
		Exports *(million dollars)*	21,573	3,189,657
		Exports (*million tonnes*)	32.9	2,304
		Unit price of exports *(dollars per kilogram)*	0.7	1.4

[1] According to the "Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators", Item 3 (a) of the provisional agenda, Forty-seventh session of the Statistical Commission on 8-11 March 2016 at http://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-SDGs-Rev1-E.pdf

[2] Share of Renewables and Hydro of the Total Primary Energy Supply.

[25] Natural Resource Use and SDGs, Pakistan by UN Environment and SWITCH-Asia, April 2016

Materials

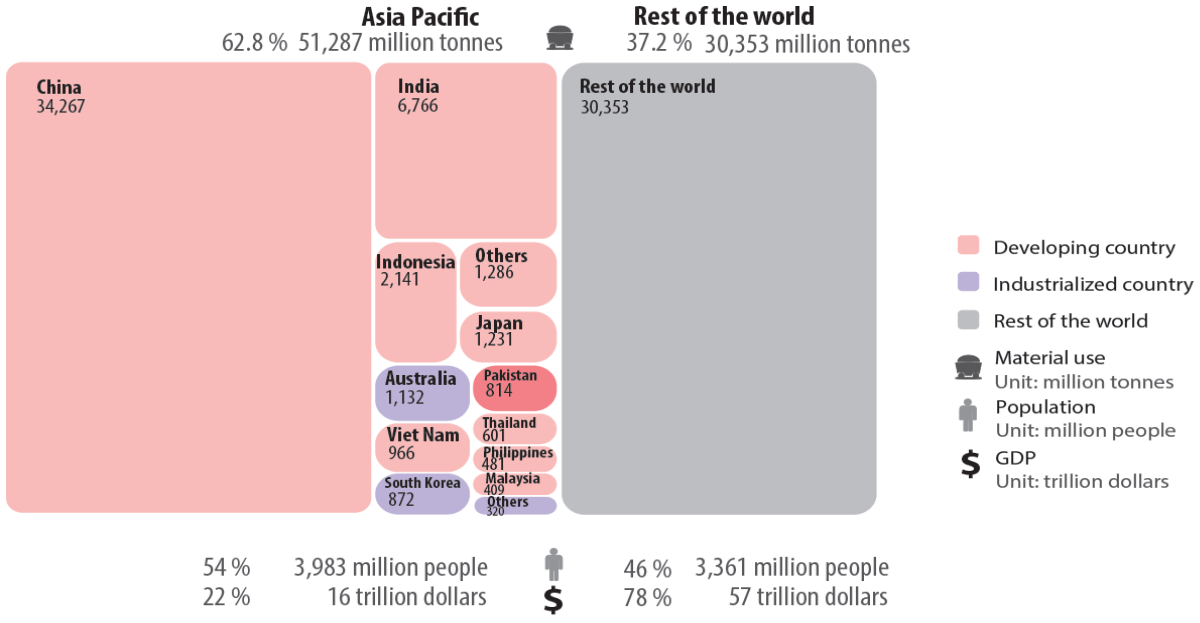
Materials are the 'things' that make up the products and infrastructure of our society. They include biomass (crops, livestock, forest products, fish), fossil fuels (coal, oil, gas), metals and minerals.

These materials underpin human nutrition and health, fuel energy systems and provide the structural base for buildings, transport networks, vehicles and all consumer goods.

The SDGs relevant to materials are:

SDG Target	IAEG Indicator	Pakistan 2010	Pakistan 2015	Asia-Pacific Developing 2010	Asia-Pacific Developing 2015
8.4 – Resource efficiency and decouple economic growth from environmental degradation **12.2** – Sustainable management and efficient use of natural resources	**8.4.1** and **12.2.1** – **Material Footprint**				
	Total *(million tonnes)*	469	577	28,833	40,729
	Per capita *(tonnes)*	2.7	3.1	7.9	10.8
	Per dollar *(Kilograms per dollar)*	3.4	3.4	4.4	4.5
	8.4.2 and **12.2.2** – **Domestic Material Consumption**				
	Total *(million tonnes)*	661	814	33,885	47,813
	Per capita *(tonnes)*	3.8	4.3	9.3	12.7
	Per dollar *(Kilograms per dollar)*	4.7	4.7	5.2	5.3

IAEG indicator 12.2.2:
Pakistan has a domestic material consumption of 814 million tonnes of materials per year. It grew by 23% between 2010 and 2015.

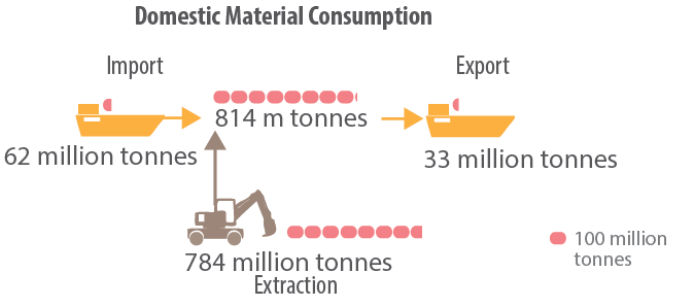


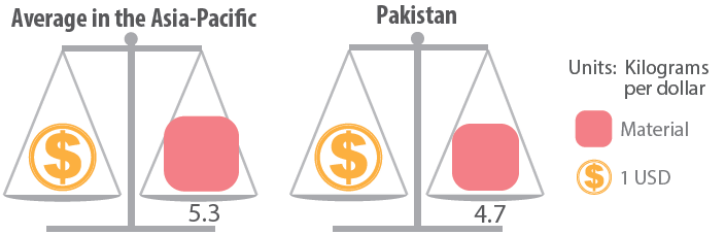
IAEG indicator 12.2.1:

Pakistan's Domestic Material Consumption is 813 million tonnes. This consists of 784 million tonnes of extraction from its environment, and 62 million tonnes of imports. From that we subtract the 33 tonnes of materials that were exported.

IAEG indicator 12.2.2:

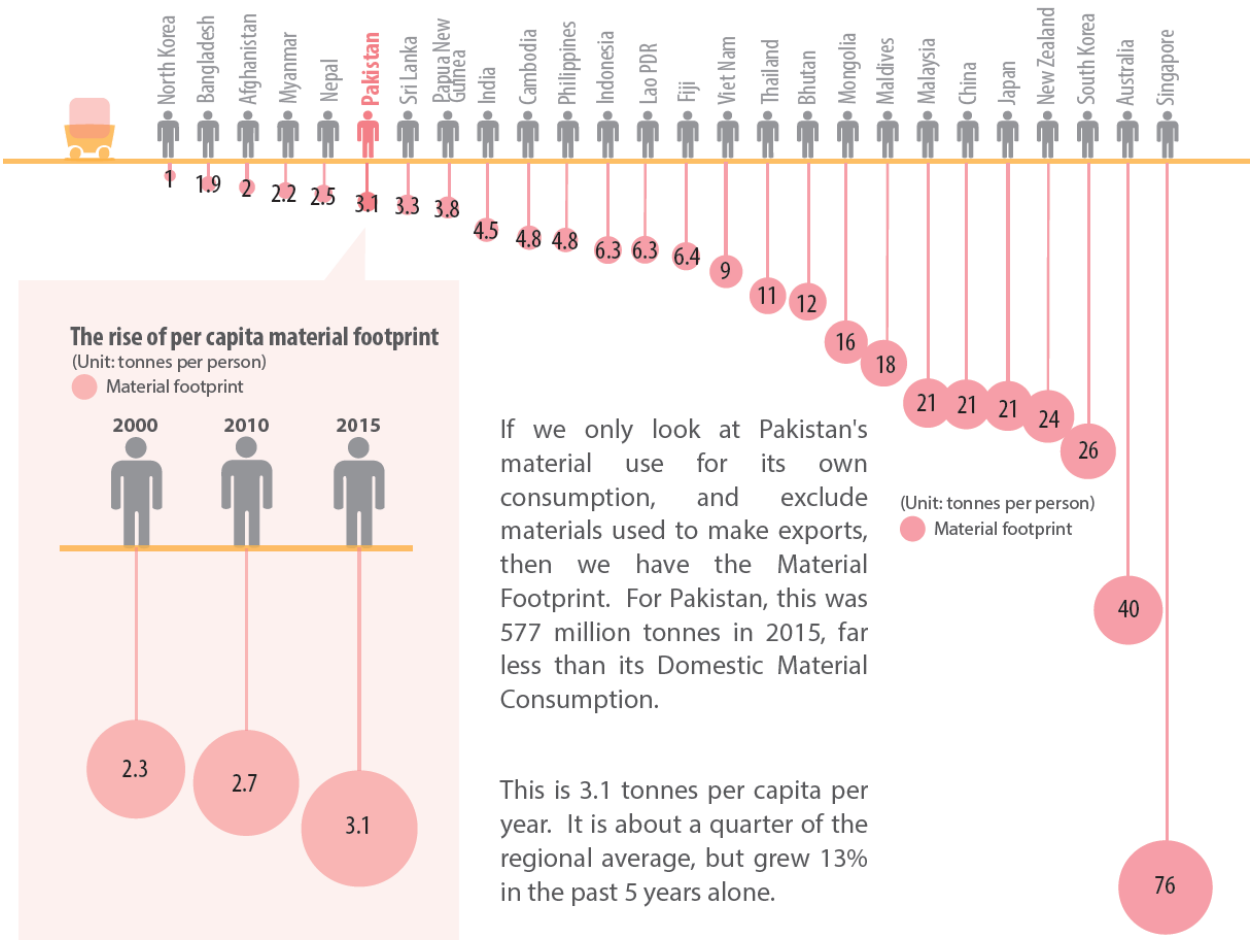
Pakistan uses 4.7 kilograms per dollar – this is called material intensity. It is higher than the average for other Asia-Pacific developing countries (5.3 kilograms per dollar).





IAEG indicator 12.2.1

What about material footprint per capita in 2015?



If we only look at Pakistan's material use for its own consumption, and exclude materials used to make exports, then we have the Material Footprint. For Pakistan, this was 577 million tonnes in 2015, far less than its Domestic Material Consumption.

This is 3.1 tonnes per capita per year. It is about a quarter of the regional average, but grew 13% in the past 5 years alone.

Energy

Energy use is measured with the indicator primary energy supply. This indicator reports the total amount of energy (in joules) available to businesses and households in an economy by summing up domesticallyproduced energy and energy imports and subtracting energy exports. The supply of primary energy may come from different energy sources including coal, petroleum, natural gas, uranium, and renewable energy sources such as hydro, solar and wind. Electricity is only included if it is exported or imported – in all other cases it is derived from one of the energy sources already measured.

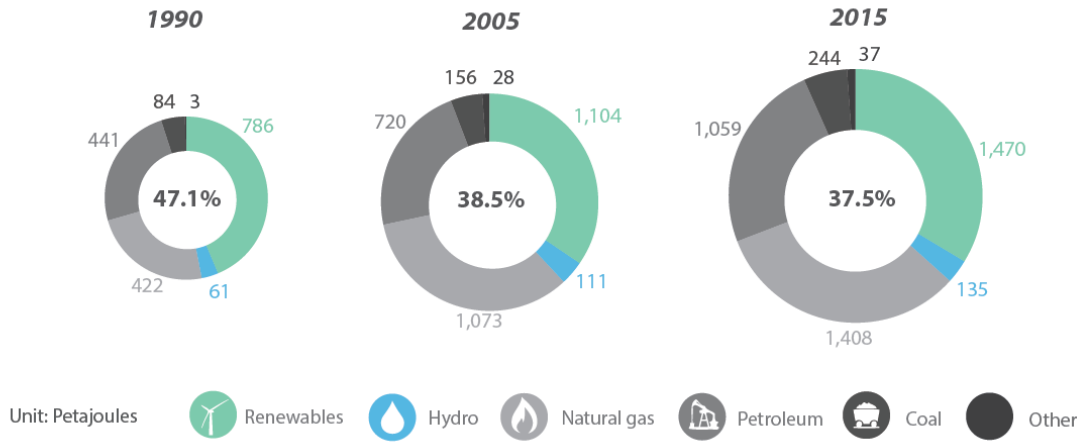
The SDGs relevant to materials are:

SDG Target	IAEG Indicator	Pakistan		Asia-Pacific Developing	
		2010	*2015*	*2010*	*2015*
7.2 – Increase share of renewable energy	**7.2.1** – **Renewable energy** share in total primary energy supply[3] *(percentage)*	37.5%	36.9%	17.7%	18.32%
7.3 – Improve energy efficiency	**7.3.1** – **Energy Intensity** *(Megajoules per dollar)*	25.4	25.4	25.0	25.1

IAEG indicator 7.2.1:

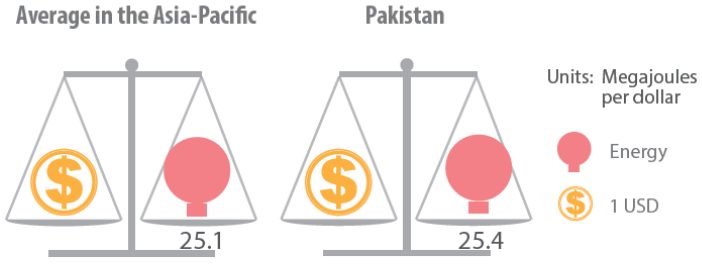
Pakistan used 4,353 petajoules of energy in 2015. Of this, 37% was renewable.

The amount of renewable energy grew each year, but the amount of non-renewable energy grew faster, therefore the share of renewable energy is declining.



IAEG indicator 7.3.1:

Pakistan's energy intensity is 25.4 megajoules per dollar GDP. Pakistan's energy intensity is comparable with the average for Asia-Pacific developing countries.



[3] For this report we include "renewables" and "hydro" as renewable energy sources.

Trade

No country is 100% self sufficient in its resource use. Each country imports products that complement domestic supplies, and exports products to generate export earnings. SDG target 17.11 calls on developing countries to increase their share of global exports, measured in economic value. Countries may wish to monitor the amount of natural resources that are exported as well as the value. This will determine whether developing countries are able to increase their share of exports by adding value to their natural resource exports or by increasing the physical amount of exports.

The SDGs relevant to materials are:

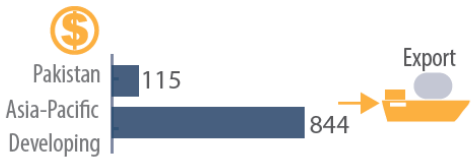
SDG Target	IAEG Indicator	Pakistan		Asia-Pacific Developing	
		2010	*2015*	*2010*	*2015*
17.11 – Exports of developing countries	**17.11.1** – Developing countries and least developed countries **export value**				
	Exports *(million dollars)*	20,401	21,573	2,299,614	3,189,657
	Exports (*million tonnes*)	27	33	1,706	2,305
	Unit price of exports *(dollars per kilogram)*	0.8	0.7	1.3	1.4

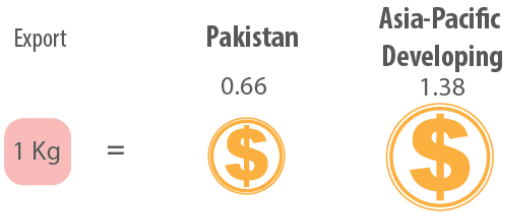
Pakistan exported 33 million tonnes of materials in 2015. On a per capita basis, this is 175 kilograms per year.

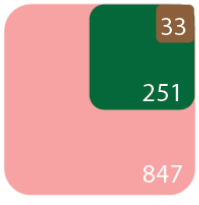
In 2015 the value of exports was 22 billion dollars in total, or 115 dollars per capita. Pakistan's exports per capita are much less than the average for Asia-Pacific developing countries (844 dollars per capita).

The unit price for exports was $0.66 per kg, which is lower than the regional average of $1.33kg.

The footprint of the exports was 251 million tonnes in 2015, which was 30% of materials entering into Pakistan's economy.







Materials exported: 33 million tonnes
Materials needed to produce exports: 251 million tonnes
Materials entering Pakistan's economy: 847 million tonnes

Water

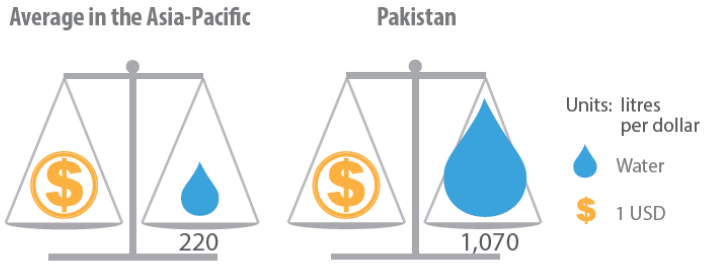
Unlike other natural resources, water is often reused multiple times in the same year. Furthermore, the great majority of it is extracted from sources which will replenish themselves naturally, via the hydrological cycle, so issues of its usage are really those of managing a renewable resource flow rather than managing a depleting non-renewable resource stock. The water use indicator presented here reports total fresh water abstractions for use in agriculture, industry and in the residential sector, from all surface and underground sources. Direct rain fed onto crops is not included. The total water withdrawals indicator by itself is not an indicator of water stress as it does not include information on the natural availability of water in the region where withdrawals take place.

The SDGs relevant to materials are:

SDG Target	IAEG Indicator	Pakistan		Asia-Pacific Developing	
		2010	*2015*	*2010*	*2015*
6.4 – Increase water-use efficiency	**6.4.1** – **Water Intensity** *(litres per US dollar)*	1,318	1,070	304	220

IAEG indicator 6.4.1:

Pakistan used 1,070 liters of water per dollar in 2015. This is more than four times the average for Asia-Pacific developing countries.



Annex IV:

National Multi stakeholder Technical Committee Members for formulation of National Action Plan on SDG 12 (Sustainable Consumption and Production) and revision of NSDS

Sr #	Name, Designation and Institution	Position	Email & contact detail
1	Mr. Irfan Tariq, Director General, Ministry of Climate Change, Government of Pakistan, Islamabad	Chairman	mirfantariq@gmail.com
Federal Government Representatives			
2	Mr. Syed Mahmood Nasir, IG Forest, Ministry of Climate Change	Member	0307-5743450 igf.moenv@gmail.com
3	Mr. Jibran Malik, Joint Secretary, Budget and Implementation, Min of Finance	-Do-	0333-3669003 jibranm@yahoo.com
4	Mr. Zarar Haider, Joint Secretary, Ministry of Industries	-Do-	9213599 zararhaider52@gmail.com
5	Mr.Zafar ul Hassan, Chief, Poverty Alleviation & SDG Section, Min. of Planning, Dev. & Reforms	-Do-	9201998 Zafar_fsd@hotmail.com
6	Ms. Ismat Gul Khattak, DG, PNAC, Min. of Science & Technology	-Do-	0333-3226339 dg@pnac.org
7	Dr.Dawood Shah, Director (Training), M/o education & training	-Do-	051-9260610 aepam_dawood@yahoo.com
8	Mr. Asif Sahibzada, Dir (Env and Policy), Ministry of Climate Change	-Do-	asifsahibzada67@gmail.com
9	Mr.Usman Yaqoob Khan, Deputy Secretary M/o Water &Power	-Do-	
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Annex V:

National Action Plan Impact and Monitoring Indicators

Sector	Objectives	Impact Indicators	Monitoring Indicators
Climate Change	**Objective 1:** Take urgent action to combat climate change and its impacts	• No. f deaths, missing people, injured, relocated or evacuated. • Establishment of integrated low-carbon, climate-resilient, disaster risk reduction development policies and strategies. • Percentage increase in financing for climate change adaptation and mitigation measures.	• No of Policies integrated with SCP Principle. • Establishment of national and regional Expert Groups on Climate Change. • No. of measures taken to manage climate triggered disasters. • Financial Resources increased to strengthen disaster management institutions at Federal, Provincial and District levels. • Establishment of national cell for sharing, networking and regularly updated climate change related data • National and provincial Fund for catalyzing matched financing for climate change initiatives established. • Formulation of "River Flood Plain" regulations and laws to prevent growth of settlements in flood plains. • Best available technologies identified through "Technology Needs Assessment" to make a clean energy transition to reduce emissions. • Percentage of forest area increased • Water, food and energy security policies prepared and implemented. • Measures taken for strict monitoring of GHG emissions from all sectors like industries, agriculture and livestock, transport etc. • National and Provincial Implementing Entities (NIE & PIE) created to deal with adaptation and mitigation projects at federal and provincial levels. • Percentage increase in resilient Infrastructure, including telecommunication, power, utilities and transport. • No. of schools infrastructure made resilient to natural disasters. • Evacuation strategies prepared for disaster management. • SCP and its related climate change curricula developed. • GHG emission inventory updated on scientific lines.
Energy	**Objective 1:** Strengthening of relevant	• Percentage increase in population with access to electricity.	• No. of studies undertaken to revise National Energy Conservation Policy, revised policy document prepared • No. and type of measures taken to adopt Power Policy

	institutions, policies, rules and regulations, financial mechanisms, innovative and accessible resources for energy efficiency	• Total GHG emissions from energy generation stations. • Percentage decrease in energy consumption per capita • Overall energy consumption per unit of GDP •	2015 • No. of Environment Examination (IEE) and Environment Impact Assessment (EIA) carried out before commencement of energy projects • No. of training workshops conducted for EPA staff to build their capacity in examining IEE and EIA reports and number of gender-wise beneficiaries • No. of Hands-on training, refresher courses, Staff exchange programmes and Coordination with the local and foreign academia and technical institutions and number of beneficiaries in innovative and accessible resources for energy efficiency and reducing transmission losses and number of gender-wise beneficiaries • Amount of money raised through public private partnership for energy efficiency • No. of guidelines developed for climate resilient energy infrastructure • No. and type of measures taken to provide tax rebate on energy efficient appliances, equipment's and machineries • Percentage of line losses before and after upgrading transmission lines • No. of studies undertaken to review and streamline Public Procurement rules and regulations with SCP to include energy efficiency criteria • No. and type of investment friendly initiatives and financially attractive policies introduced to promote renewables • Amount of Foreign development investment (FDI) in energy sector • No. of provincial energy resource and information centers establiashed • Energy conservation legislation and audit standards enacted and number and type of measures taken to enforce these • No. and type of incentives provided to promote solar energy • No. of punitive laws developed to protect illegal connections • No. of measures taken to develop in house technological capacity for manufacturing of renewable power generation in the country • No. and type of adaptation measures undertaken in catchment areas of major power stations as well as power project sites

			• No. and capacity of transmission lines in thickly populated urban centers
	Objective2: Promote R & D for clean energy technology and tap Pakistan's huge potential for indigenous and renewable resources and technologies such as micro-hydel, bio-fuel (biogas) solar, wind, geothermal and hydrogen energy.	• Percentage increase Renewable Energy in total energy. • Number of Wind, Solar, Hydel, Biogas Energy projects in place and their contribution to total energy. • Percentage of population with primary reliance on clean fuels and technology. •	• Type of baseline data on wind, solar, biogas, hydrogen and geothermal energy potential • No. of training workshops, seminars, demonstrations and study visits on biogas, bio-methane bottling, clean coal technology and community-driven micro-hydels and gender-wise beneficiaries • Amount of royalty provided to provinces/AJK/GB for using hydel power sources • No. and capacity of plants installed to generate power from municipal waste and geo-thermal energy • No. and capacity of small and medium size Hydro and Combined Power Cycle Power Plants installed • No. of awareness campaigns launched to promote exploration & production of Indigenous natural gas, and Liquefied Petroleum Gas (LPG) over import of oil and gas • Center of excellence established to explore possibilities and options for power generation through innovative and clean energy technologies • No. of demonstrations of Hydrogen fuel from agricultural waste
	Objective 3: Reduce the carbon footprint by promoting energy efficiency.	• Percentage increase in energy use efficiency in buildings. • Percentage increase in energy efficient appliances. • Financial mechanisms in place to support energy efficiency. •	• No. of studies undertaken to modify sectoral policies to align utility incentives with the delivery of cost-effective energy efficiency, and modify rate making practices to promote energy efficiency investments • No. of demonstrations of fuel efficiency cookers and energy saving devices • Percentage usage of energy efficient bulbs in public and open spaces, streetlights, buildings, industries and commercial places and solar water heaters • No. of sensors demonstrated/ installed to increase energy efficiency • No. and type of Certification standards introduced for efficient heating and cooling appliances, equipment's and machineries • No. and type of measures undertaken to introduce energy performance labeling • No. and type of incentives provided for local manufacturing of renewable power generation equipment • No. and type of measures undertaken to improve operations and quality of oil products

Sustainable Food System	**Objective 1:** Promoting SCP concept in agriculture by adopting Sustainable agriculture practices, technologies for sustainable production system and to meet food security.	• Percentage of agricultural area under sustainable agricultural practices • Percentage of eco-friendly fertilizers, pesticides and insecticides use • Percentage increase in water use efficiency. • Rank Improvement in Global Food Security Index. • Percentage of organic farms. • Total Factor Productivity • Percentage change in import and export tariffs on agricultural products.	• Percentage increase in sprinkler and trickle irrigation. • Financial mechanisms in place to increase water use efficiency in agriculture. • Identified optimized dose of fertilizers and pesticides. • Percentage of recycled grey water and its use in agriculture. • Number of training programmes organized to expose farmers to successful farming practices. • Number of farmers trained to utilize SCP practices in agriculture. • Agriculture and National Food Security Policy approved and Strategies / Action Plans developed. • Programmes initiated to encourage use of bio-pesticides and IPM techniques. • Percentage increase in use of indigenous and non-hybrid variety of seeds. • Number of reforms to ensure fair price to farmers, and mop up marketable surpluses for processing and packaging. • Number of projects to improve cold chain infrastructure through public – private partnerships. • Number of safety nets to provide food to poor at affordable prices. • Percentage of poor people getting benefited by safety nets. • Regulatory and legislative framework in place to adopt environmentally friendly agricultural practices. • Percentage increase in on-farm water management • Number of Rural Business Hubs (RBHs) developed to promote SCP concept and save resources. • New Research and development taking place for more carbon responsive crops. • Legislation passed for water metering in agriculture. • Introduce water metering for effective control over wastage of irrigation water. • Incentives provided to farmers to grow cash crops • Percentage increase in export of fruits. • Percentage increase in productivity. • Number of products packaged and eco-labelled. • Number of programmes for availability of certified seed and planting material.

	Objective 2: Reduce food loss and waste and ensure quality nutrition.	• Percentage decrease in food loss and waste.	• Percentage increase in use of harvesting tools to reduce agriculture waste. • Percentage increase in storage facilities for agricultural products and food items.
	Objective 3: Increase and ensure protection and preservation of prime agricultural land and combat Desertification and Drought.	• Percentage improvement in soil quality. • Percentage increase in agricultural land • Change in nitrogen use efficiency in food systems.	• National Land use Policy approved for land use planning and zoning of agricultural land • Percentage increase in use of organic fertilizer. • Number of storage tanks, check and delay action dams constructed. • Percentage decrease in soil and water erosion. • Number of Remote sensing and GIS trainings conducted. • Number of studies conducted to assess temporal changes in land cover of different agro-ecological zones
	Objective 4: Adoption of climate resilient techniques and measures for ensuring food security and sustainable agriculture.	• Percentage increase in climate resistant crops	• Percentage increase in low delta crops. • Number of studies conducted to explore new methods of cultivation suitable to changing climatic conditions. • Number of projects started to construct climate resilient infrastructure and up gradation of existing irrigation infrastructure. • Steps taken to ensure fair price for food items to consumers. • Increased number of agronomic research institutions • Number of Programmes/Projects started to conserve indigenous germ plasm of crops and fruits. •
Sustainable Buildings and Cities	**Objective 1:** Enhance capacity of relevant institutions for sustainable Cities planning and management to integrate SCP Principles.	• Number of buildings complying green building codes • Percentage increase in financial support that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings and cities. • Percentage increase in green spaces.	• No. of trainings for city planners and management committees. • No. of projects started through private sector participation for sustainable cities • Percentage improvement in sanitation system of cities. • Regulatory framework (rules, regulations and procedures) and a strategy for the implementation of the National Sanitation Policy prepared. • No of heritage sites and buildings renovated. • No. of large development schemes provided with wastewater treatment and solid waste management facility. • Percentage of wastewater flows treated to national

		• Percentage increase in sanitation of cities. • Reduction in air borne diseases	standards and reused • Land use planning and governance legislations updated on the principle of SCP. • Percentage increase in the green spaces in cities. • Increase green spaces and initiate projects for greening pillars of bridges to enhance air quality. • Percentage increase in use of Solar PV, solar water heaters and other energy efficient devices in cities. • Percentage increase in replacement of Katchi abadi's by low income residential buildings. • No. of urban renewal programmes. • Mean urban air pollution of particulate matter (PM10 and PM2.5) • Reduction in consumption of ozone-depleting substances
	Objective 2: Develop the Policy, legal framework and Governance for Integrated waste Management and support Best Practices and technologies for efficient management of waste.	• Generated and collected municipal solid waste per city • Reduction in Municipal Solid waste Generation • per centof landfilled or incinerated waste • Percentage reduction in landfilled /incinerated waste • National recycling rate, tons of material recycled. •	• Legal Framework on Solid Waste Management revised. • Percentage of waste burnt in open spaces. • Percentage decrease in open burning of waste. • No. of projects/campaigns started for awareness on waste management. • No. of incentives/trainings provided for Municipal authorities, communities, hospitals and industries to collect, transport and disposal of waste. • Percentage increase in the safe disposal of domestic and hazardous waste including hospital and industrial waste. • Standard design developed for collection, transfer and safe disposal of waste. • Percentage of urban solid waste collected and well managed • Monitoring and reporting mechanism established for waste management. • No. of engineered landfill sites developed. • No. of pilot projects started for waste segregation at source. • Legislations developed for safe management and disposal of electronic waste. • Percentage decrease in the use of polythene bags. • No. of units installed for recycling of waste. • No. of plants installed for waste to energy recovery.

Sustainable Transport	**Objective 1.** Development of Sustainable Public and Private Transport System for reducing carbon footprint and increase efficiency.	• Proportion of the population that has convenient access to public transport, disaggregated • by age group, sex and persons with disabilities. • Percentage reduction of emissions from transport sector. • Percentage shift from private to public transport.	• No. of Programmes developed for integrated mode of transport. • Percentage increase in cycling and walking lanes in urban centers. • No. of public-private partnerships developed to expedite infrastructure development. • Percentage increase in population getting benefited by mass transit system • Engine efficiency standards introduced. • Number of hybrid vehicles and CNG Buses. • No. and type of Incentives provided fuel efficient vehicles and trains. • No. of research grants for development of environment friendly fuels. • Percentage increase in new nodes for efficient freight transport.
	Objective 2: Sensitize and educate stakeholders and develop appropriate market tools to promote Value Chains of transport management.	• Percentage increase in transport infrastructure. • No. and type of rules and regulations developed for better transport management.	• Percentage increase in use of GPS system for traffic management • No. of programmes started for computerized engine tuning. • National transport Policy and other legislations reviewed. • Develop policies for promotion of intermodal transport system for introduction of smart and integrated transportation system. • Timing introduced for allowing heavy duty vehicles into the city centers. • Percentage decrease in import of second hand vehicles not older than five years. • No. of projects started for development of interprovincial and trans-border transportation corridors ensuring integrating of SCP Principles.
Water	**Objective 1:** Develop and strengthen relevant institutions, policies and framework to promote integrated water resource management with special focus on	• Legislation on water security developed and approved by the government. • Draft Water policy approved and implemented • SOPs on Water developed and approved by the government	• Number of Water policy's gap analysis studies in the context of IWRM & SCP • Draft Water policy developed and approved by the government • Number of IWRM & SCP integrated water policies/strategies/Action Plans reviewed and approved • No. of legislations on principle "polluter pays" for water polluting industries and water metering developed and its enforcement initiated • Proportion of total water resources used

	implementation of rules and regulations, financial mechanisms and capacity building.	• Management information system developed.	• No. of mass awareness campaigns/ programmes on drinking and irrigation water quality launched • No. of national and provincial groundwater regulatory framework developed and implemented • No. of industries and institutions complying NEQS • No. and type of accredited and non- accredited trainings, workshops, seminars, and study visits conducted for capacity building and skill enhancement through public and private institutions in fields including water sector in the context of SCP, hill torrent management for water conservation and management of the large, complex canal delivery water system in Pakistan and remote sensing and GIS techniques for monitoring temporal changes in glaciers and snow cover & No. of beneficiaries with gender • No. of books, booklets, leaflets, pamphlets, Information management systems etc. developed for water sector in the context of SCP and hill torrent management for water conservation and management of the large and complex canal delivery water system in Pakistan • No. of households adopting water metering and number of agencies adopting water pricing mechanism • No. of CBOs formed and No. of communities/ CBOs engaged in water sector with a focus on IWRM/ SCP • Baseline data for water, IWRM and its context with SCP for number of districts, tehsils and villages covered • SOPs on Water developed and approved by the government • MIS for water developed
	Objective 2: Improve water quality manage and protect water resources through technical measures ensuring sustainable availability of water at macro and micro level through equitable access of water resources.	• Percentage of wastewater safely treated • Percentage of bodies of water with good ambient water quality • Percentage of total available water resources used, taking environmental water requirements into account (level of water stress)	• No. of legislations on fresh water and underground water conservation and management developed and its enforcement initiated • No. and type of accredited and non- accredited trainings, workshops, seminars, and study visits conducted for capacity building and skill enhancement through public and private research institutions in fields including water quality. • No. of books, booklets, leaflets, pamphlets, Information management systems etc. developed for water sector in the context of SCP and hill torrent management for water conservation and management of the large and complex canal delivery water system in Pakistan • No. of sites surveyed and programmes initiated for periodic scientific monitoring of water aquifers and

			fresh water bodies, including its quality, quantity, withdrawal and recharge potential and number of hot spot areas of contamination and their resources identified • No. of mass awareness campaigns/ programmes on drinking and irrigation water quality launched • Number of households served with improved quality water as per approved water quality standards • Percentage of wastewater treated to comply with NEQS and used for agricultural, industrial and domestic purposes • No. of public-private partnerships developed for enhancing access of safe drinking water, operation & maintenance of water supply systems, resource mobilization and capacity development • Percentage distribution of water sharing between provinces • Distance between water and sewerage lines • No. of water supply schemes in rural and urban areas & quality of water supplied • No. of water treatment plants & quality of water supplied • Percentage of bodies of water with good ambient water quality
	Objective 3: Ensure efficient use of water in agriculture, irrigation, industry and domestic purposes.	• Percentage change in water use efficiency over time. • Percentage decrease in water footprint. • No. of mass awareness programmes on water use efficiency launched	• No. and type of methods & techniques applied to minimize wastage of water • No. and type of rain-water-harvesting structures at household and local levels • No. and type of water efficiency equipment purchased and in use • No. and type of water efficiency equipment produced locally • Water Foot printing • No. and type of high-efficiency irrigation system techniques adopted with number of acreages • No. of studies to revise building by laws, number and type of measures improved and enforcement initiated • Percentage change in water use efficiency over time
	Objective 4: Develop Contingency plans and adopt measures to increase water	• No. of dams constructed • Degree of integrated water resources management	• No. of feasibility studies conducted to promote integrated watershed management including ecological conservation practices in uphill watersheds • Amount of financial resources tapped to maintain existing and develop new water infrastructure

	shortage capacity.	implementation • No. & capacity of rainwater harvesting structures established	• No. of mass awareness programmes on drinking and irrigation water quality launched • Enforcement measures adopted for rainwater harvesting system in all new buildings • Type of GIS database development for all water infrastructures with detailed attributes for strong and efficient decision making • Management and technical measures adopted to protect groundwater, number of adoption sites • No. and type of techniques applied to use grey water for flushing and gardening • Length of canals and number and capacity of dams cleaned to remove silt and increase storage capacity • No. and length of new canal systems rehabilitated and constructed. • No. of sites and length of water infrastructure mainstreamed with disaster and climate resilience • No. and capacity of small, medium and large dams constructed
Land Ecosystem	**Objective 1:** Sustainably manage forests, combat desertification, halt deforestation and reverse land & forest degradation, halt biodiversity loss.	• Number of national development plans and processes integrating biodiversity and ecosystem services values • Percentage increase in forest area • Percentage increase in forest cover under sustainable forest management • No. of protected areas increased. • Percentage decrease in wildlife and wildlife products that are illegal. • Public expenditure on conservation and sustainable use of biodiversity and ecosystems.	• Ecosystem management and biodiversity conservation integrated into national and local policies, and development framework. • Increased financial resources to conserve and sustainably use biodiversity. • National Forest Policy 2016 implemented. • Percentage decrease in deforestation. • Preventive measures taken to promote sustainable forest management. • Number of programmes developed under REDD+. • Programmes initiated for Sustainable Land Management and forest management. • No. of protected areas increased. • National Centre of Excellence of Biodiversity and Ecosystem Sciences established. • No. of policies developed and implemented for protection of biodiversity and land ecosystem in the country • National Zoological Gardens' Act reviewed. • Draft National Wetland Policy approved and implemented.
Marine	**Objective 1:**	• Percentage	• Percentage decrease in solid and liquid waste

Ecosystem	Reduce marine pollution and sustainably use marine resources, including through sustainable management of fisheries, aquaculture and tourism	of coastal and marine development • with formulated or implemented integrated coastal • management • Proportion of fish stocks within biologically • sustainable levels • Percentage increase in sustainable marine yield. • Budget allocation to research in the field of • marine technology as a percentage of total budget for research	disposal in the bay areas • Strategies developed to control pollution of wetlands • Reactivate Marine Pollution Control Council reactivated • Percentage increase in mangrove cultivation. • Percentage increase in sustainable yields of fisheries and quality management. • No. of projects established for integrated coastal management (ICM). • No. of hatcheries & nurseries developed for supporting sustainable harvesting of fish, shrimp and frogs and other permissible marine species. • Integrated coastal zone management plans prepared and implemented.
Industry	**Objective 1:** Harmonizing and reinforcing policies and mechanisms to support the introduction of resource efficiency and clean technologies in industry for sustainable consumption and Production (SCP).	• Number of SCP integrated revised policies/strategies/Action Plans. • National database for resource use in the country. • Research and development expenditure as a percentage of GDP. • Percentage increase in the use of clean technologies.	• Number of SCP gap analysis studies in the context of SCP • Number of SCP integrated revised sectoral policies/strategies/Action Plans • No. and type of steps taken to enforce/ comply NEQS related to SCP • No. and type of steps taken to implement Occupational Health and Safety standards in industries • Monitoring system in place. • No. and type of projects/ activities initiated under public-private partnership for sustainable industrial development • No. of industries reporting as per SMART parameters to the respective EPAs • No. and type of rules, regulations, guidelines for achieving resource conservation and value addition in industrial sector • No. & type of reports monitoring environmental, water

			and energy audit generated • Amount of Foreign Direct Investments (FDIs) approved and received for enhancing capacity for efficient utilization of resources by industries and the number and type of initiatives taken with this investment • Steps taken to measure GHG emissions in industrial sector • No. and type of reports generated and published on GHG emissions in industrial sector. • No. & type of incentives provided for carbon trading in industries.
	Objective 2: Enhance the capacity and capability of industrial units and sectors for resource conservation, value addition, environmental compliance and competitiveness.	• Material Consumption in Industries • Percentage reduction in material and water consumption after application of SCP Principles. • Manufacturing value added as a percentage of GDP. and per capita • Percentage increase in energy use efficiency by industries • Number of wastewater treatment plants • Percentage reduction in hazardous waste generation.	• Number & type of programmes, projects and activities initiated for upgradation and modernization of technologies for enhancing resource conservation and value addition • No. and type of accredited and non- accredited trainings, workshops, seminars, study visits and outreach activities initiated for capacity building and skill enhancement through public and private institutions in industries • No. and type of industries introduced Eco-standards and labeling to meet international standards particularly related to SCP • Value addition and energy conservation achieved through Eco-standards and labeling • No. and type of industries introduced ISO Certification and global accreditation in manufacturing and service institutions to access international market • No. and type of steps taken to promote value added precious minerals and agro-products • No. and type of measures taken to improve health impacts, lifecycle and compliance rating • No. and type of SCP related initiatives taken by entrepreneurs as a result of capacity building and outreach activities • No. of entrepreneurs following SCP related initiatives • No. and type of industries receiving Green awards during an year. • No. and type of industries following green procurement system based on quality compliance and standard rating scale of the product • No. and type of studies conducted for life cycle assessment of products and services to integrate SCP in value chain

			• No. and type of initiatives taken for promotion of local raw materials/natural resources • No. and type of industries utilizing local raw materials/natural resources in their production system • No. and type of initiatives taken for compliance of 5Rs for water efficiency • No. of linkages established between industries, Academia, R & D institutes and consumers for promoting SCP in industries • No. and type of industries, Academia, R & D institutes and consumers having linkages with each other for promoting SCP in industries • No. and type of steps taken through corporate social responsibility (CSR) specifically for reduction of greenhouse (GHG) emissions and SCP • No. and type of obsolete equipment replaced to promote SCP in industries • No. and type of supporting and allied industries harmonized with the SCP concepts • No. and type of incentives to industrial sector for production of renewable energy • No. and type of incentives to internalize environmental cost, related to SCP into pricing mechanism • No. and type of industries having individual wastewater treatment/ pre-treatment plants.
	Objective 3: Encourage environment friendly industrial zones with focus on SCP and also support small and medium scale industries to green their supply chain	• Percentage share of small-scale industries in total industry value added • Percentage of small-scale industries with a loan or line of credit to promote SCP. • Number of industrial zones developed.	• No. and type of surveys taken and reports generated to identify the industrial zones that need major technological improvement for emission reduction and SCP • No. and capacity of landfills for industrial solid waste disposal for industrial zones • No. and type of feasibility studies for identification of potential industrial zones and harmonize small, medium and large industrial units • No. and capacity of Combined Effluent Treatment Plants (CETPs) in all industrial estates and its compliance with NEQS • No. and type of trainings of craftsmanship to promote SCP and provide employment within relevant industries and industrial zones • Soft loans for promoting SCP provided to SMEs and no. of beneficiary SMEs • No. of eco-forums to propagate the idea of Eco-Industrial Parks/zones to identify the opportunities for exchange of materials

			• No. and type of Sustain able frameworks developed for industrial estates • No. and type of incentives for the SMEs in and outside industrial zones to upgrade existing skills, processes and technologies related to SCP • No. and type of Eco-industrial parks established. • Manufacturing value added as a percentage of GDP and per capita GHG Emissions • Percentage reduction in energy consumption by industry • Percentage improvement in resource use efficiency • Research and development expenditure as a percentage of GDP • Percentage share of small-scale industries in total industry value added • Percentage of small-scale industries with a loan or line of credit • Percentage of value added medium and high-tech industry • Number of wastewater treatment plants • Number of industrial zones developed • Percentage reduction in hazardous waste generation.
Education	**Objective 1:** Achieve resource efficiency and low-carbon lifestyles by integrating Sustainable Consumption and Production (SCP) into education in order to acquire knowledge and skills needed to promote sustainable development and lifestyles.	• Percentage of students enrolled in primary and secondary school demonstrating at least a fixed level of knowledge of SCP. • Courses and trainings introduced on the principle of SCP. • Revised Curriculum for integration of SCP • National/Provincial Education Policies, Strategies and Action Plans with integrated concept of SCP. •	• National/ Provincial Policies integrated with SCP Principle. • Revised curriculum at primary, secondary, tertiary and vocational level. • No. of courses introduced on SCP. • No. of teachers, professionals from relevant disciplines and technicians trained with the training module on SCP Principle. • No. of vocational training centers established. • No. of projects started by public-private partnerships to enhance education quality. • No. of programmes developed for career counseling. • No. of awareness campaigns for behavioral change about vocational training. • No. of workshops organized for higher management officials on benefits of SCP in manufacturing, trade and business sector • Percentage increase in investment at tertiary level. • No. of programmes developed for sensitizing business

			and government for sustainable procurement. • Percentage decrease in unemployment. • No of environmental clubs established. • No. of partnerships established between technical Colleges/ Universities and industries for applied research. • Percentage of teachers provided with latest technology like laptops and internet facilities. • Encourage research at university and college level with a focus to increase resource use efficiency in the country. • No. of Research and demonstration (R&D) trails dealing with SCP; • No. of persons attending field/ farmer days on R&Ds.
	Objective 2: Create Inclusive And effective learning environment by building and upgrading education facilities.	• Percentage of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with focus on special children needs; (e) single-sex basic sanitation facilities; and (f) basic handwashing facilities (as per the Water, Sanitation and Hygiene for All (WASH).Percentage increase in girl's enrollment.	• Percentage/number of schools in rural areas provided with proper infrastructure. • Percentage increase in girl's enrollment. • Percentage increase in budget allocation for education by the Government.