ENERGY EFFICIENT AND CLIMATE PROTECTIVE GROWTH STRATEGY IN PAKISTAN

Getting a Temperature Check on SDGs!

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CITIZENS FOR A BETTER ENVIRONMENT

Friedrich Naumann STIFTUNG FÜR DIE FREIHEIT

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Compiled & Edited
By
Farhan Anwar

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Farhan Anwar did his Bachelors in Civil Engineering and Masters in Urban and Regional Planning. His portfolio includes urban sustainability planning, smart cities, public policy, climate adaptation, urban resilience, and institutional strengthening and change management. Anwar served as an Urban Reforms Consultant to the World Bank from 2006-2013 and is presently serving the World Bank in the capacity of Urban Planning Consultant on the Karachi Transformation Strategy project. He has also extended consulting services to the Asian Development Bank (ADB), the Japanese International Corporation Agency (JICA), the World Conservation Union (IUCN), WWF Pakistan and several prominent Pakistani consulting firms. Anwar is a Member, Provincial National Climate Change Policy Implementation Committee, and Government of Sindh. Anwar is also a Member, IUCN Commission on Environmental, Economic and Social Policy (CEESP) and the Standing Committee on Environment - Federation of Pakistan Chambers of Commerce and Industry (FPCCI). He presently serves as a Visiting Faculty at the Institute of Business Administration (IBA), Social Sciences & Liberal Arts Department, where he teaches a Bachelors course on Sustainable Cities & Communities and at the Indus Valley School of Arts & Architecture, Karachi, where he teaches Bachelors Course in Architecture on Urban Theories and Urban Open Space Design. Anwar is the Lead Author of the Sanitation Strategy, Government of Sindh and the Author of Pakistan's National Strategy and Action Plan for the Mangroves of the Future Regional Program.

Email: fanwarez@gmail.com

Shehri-Citizens for a Better Environment
88-R, Block 2, P.E.C.H.S, Karachi 75400 - Pakistan.
Tel/Fax: +92-21-34 53 06 46
E-mail: info@shehri.org, Web: www.shehri.org

With the support of

Friedrich Naumann Foundation for Freedom
House no. 1, Street 58, Sector F7/4
Tel: +92-51-2655750
Fax: +92-51-2655752
Email: pakistan@fnst.org, Web: www.southasia.fnst.org

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FOREWORD

Given the scale and scope of the environmental, economic and social development sectors being covered in the SDGs framework, it has become quite clear that the global development agenda for the world for the coming years is going to be determined by the SDGs. The SDG Agenda makes it quite clear that for the SDGs to have any chance of successful implementation, the process has to be inclusive, involving all critical stakeholders and transparent.

Shehri-Citizens for a Better Environment for long has strived to make processes of decision making at the government level having an impact on the lives of the ordinary people, open, transparent and inclusive. We have developed capacity within civil society actors for better and more informed engagement with their service providers. At the same time, we have made efforts to strengthen institutions of civic governance and make them socially accountable. In this regard, to be mentioned are our continuous efforts to make the social accountability tool of Right to Information more relevant and effectively used by the citizens.

We have a strong focus on environmental issues and continue to make every effort to protect the physical and natural environment of our cities from the adverse impacts of unplanned and often unauthorized development. Recently, our efforts have focused on the important concern of climate change and are working for raising awareness among citizens on this issue and researching for innovative solutions to effectively combat the consequences of climate change.

As such, Shehri-Citizens for a Better Environment feels very well placed to take up the SDG agenda, bring it to the attention of all important stakeholders and catalyze efforts for consensus building towards building an integrated approach. To begin with, we have conducted an intensive process of stakeholder engagement to gauge the level of understanding, identify constraints and outline some markers for future progress. We hope this effort will contribute to setting in place some important considerations and recommendations as we move forward in the SDG implementation process.

Amber Alibhai
General Secretary
Shehri-Citizens for a Better Environment
December, 2017

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SECTION 1 INTRODUCTION

The seventeen (17) Sustainable Development Goals (SDGs) were activated on January 01 2016, when the 2030 Agenda for Sustainable Development - earlier adopted by world leaders in September 2015 at an historic UN Summit - officially came into force. Now over the course of the next fifteen (15) years, countries all over the world are expected to mobilize efforts to bring an end to end all forms of poverty, fight inequalities and tackle climate change, in an equitable manner. The SDGs follow on the success of the Millennium Development Goals (MDGs) and have a much larger scope and mandate. While the MDGs focused five (5) areas related with urban poverty and development challenges and were applicable only on developing countries, the SDGs bring within their envelope, seventeen (17) thematic areas with a critical focus on sustainability and climate change and are applicable globally on all countries of the world. The goals are cognizant to the understanding that poverty can only be ended if efforts go hand-in-hand with strategies that stimulate economic growth and target a wide range of social needs that include education, health, services while tackling climate change and environmental protection.

PROJECT

Within the context of the SDGs, Shehri-Citizens for a Better Environment initiated, both for raising awareness, capacity building on the SDGs and also on getting the critical stakeholder input for facilitating participatory implementation, a series of dialogues and consultations held with stakeholders starting with Karachi city. Coupled with the consultations was an effort to develop publication material that helps in raising awareness on SDGs and our climate change challenges.

The whole process of consultations is now being documented to be disseminated to key stakeholders including the relevant government ministries and line departments mandated with the

implementation of the SDGs. The core objectives of the consultations that would determine the modes of engagement included:

- Raising Awareness
- Capacity Building
- Soliciting Views and Recommendations

The stakeholders to be engaged included:

- Academia and Youth
- Media
- Women groups
- NGOS and CBOs
- Professional technical bodies

CLIMATE CHANGE DIRECTORY

Another value addition the project has achieved has been the preparation of a document that highlights the key objectives, methodology and implementation process of the SDGs and their relevance to Pakistan. This documentation would be supported by listing key policies, legislative instruments relevant to climate change and the main government and civil society organizations engaged in the sector of Climate Change in Pakistan.

SECTION 2

Sustainable Development Goals
A Roadmap for Implementation

In the Conference of Parties (COP) 21 recently held in Paris, France, on the topic of climate, much faith was placed on the successful implementation of the SDGs as the most viable framework available for meeting the climate change challenge. All the national governments that include Pakistan, who have become signatories to the SDGs are now expected to take ownership and establish national frameworks for the achievement of the 17 Goals. Countries have the primary responsibility for follow-up and review of the progress made in implementation of the Goals, which will require good quality and timely data collection. Regional follow-up and review will be based on national-level analyses and contribute to follow-up and review at the global level.

SUSTAINABLE DEVELOPMENT GOALS

Goal 1: End poverty in all its forms everywhere
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3: Ensure healthy lives and promote well-being for all at all ages
Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5: Achieve gender equality and empower all women and girls
Goal 6: Ensure availability and sustainable management of water and sanitation for all
Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10: Reduce inequality within and among countries
Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12: Ensure sustainable consumption and production patterns
Goal 13: Take urgent action to combat climate change and its impacts
Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Understanding the SDGs

However, before focusing on the project, its objectives and outcomes, it would be appropriate to first gain an understanding of the SDGs - why they have been instituted, what are the critical processes attached to the goals and expected impacts.

What are the SDGs?

The Sustainable Development goals (SDGs) are successors to the 'Millennium Development Goals-MDGs'. The MDGs were adopted in year 2000 by governments to make global progress on poverty alleviation, education, health, hunger reduction and the environment. The MDGs expired at the end of 2015. During 25-27 September 2015, the member states of the United Nations converged in New York for the United Nations (UN) Summit on Sustainable Development and adopted the new global goals for sustainable development. The world leaders pledged their commitment to the new '2030 Agenda for Sustainable Development', encompassing 17 universal and transformative SDGs.

Why do we need a new set of goals?

The MDGs were highly influential in mobilizing international efforts to reduce poverty in the developing countries during 2000-2015. Although significant progress has been made in tackling poverty, the goal of reducing maternal mortality by three-quarters is unlikely to be met in Africa and much of Asia. While the MDG of reducing mortality of children aged under-five by two-thirds is unlikely to be achieved in sub-Saharan Africa, Southern Asia and Oceania.

Currently, around one billion people still live on less than $1.25 a day (the World Bank measure on poverty) and more than 800 million people do not have enough food to eat. Extreme events, and climatic changes are causing widespread damage to human and physical systems. Across the globe, women are still facing difficulties for their rights, and millions of women still die in childbirth. The MDGs' progress review clearly suggests that achieving environmental sustainability and human wellbeing is a challenge, especially while considering the emerging threats of climate change. The fossil fuel based economic growth, unsustainable consumption, income inequality, unchecked urbanization, deforestation and climate change remain barriers to ensuring sustainable development for all.

The global community has adopted SDGs to complete the MDGs unfinished development agenda and to meet sustainability challenges. The main difference between the MDGs and the SDGs is that the new proposed development goals are universal in nature. Therefore, they are meant to apply to all countries. 'Sustainable Development' is not something that only 'developing' countries should do. Each UN member state should work towards a sustainable world for future generations. The SDGs will expand the focus of development goals to rich countries. In short, these goals will now apply to the whole world.

What are the new global goals?

In September 2015, world leaders gathered in New York to agree on a new development plan or Agenda 2030 for Sustainable Development, incorporating the seventeen (17) Goals. The newly

adopted SDGs reflect a coherent, holistic, comprehensive and balanced framework incorporating the three dimensions of sustainable development: social, economic and environmental with recognition of the direct linkages between human well-being, economic development and a healthy environment. The SDGs aim to end poverty in all its forms, and promote healthy lives and wellbeing for all; end hunger for all; and ensure availability and sustainable management of water and energy for all. The six essential elements of SDGs provide conceptual guidance towards achieving all the SDGs. These elements are dignity, people, prosperity, our planet, justice and partnership.

After the adoption of the Agenda 2030 for Sustainable Development, the General Assembly of the United Nations set up the 'Inter-agency and Expert Group on SDG Indicators' (IAEG-SDGs) within the United Nations Statistical Commission to develop framework of indicators and statistical data to monitor progress, inform policy and ensure accountability of all stakeholders. The IAEG-SDGs submitted its first report on indicators to the UN Statistical Commission (UNSC) in January, 2016. During 47th session in April 2016, the UNSC presented final agreed 231 targets that will be validated by General Assembly later this year.[1]

Around 700 million people still live below the World Bank's poverty line, and billions more suffer deprivations of one form or another. Many societies have experienced a rise of inequality even as they have achieved economic progress on average. Moreover, the entire world faces dire environmental threats of human-induced climate change and the loss of biodiversity. Poor governance, official corruption, and in dramatic cases overt conflict, afflict much of the world today. The SDG Agenda responds to these compound challenges, and is therefore broader and more complex than the MDGs. Most importantly, it adopts sustainable development as the organizing principle for global cooperation, meaning the combination of economic development, social inclusion, and environmental sustainability. Hence, the overarching name "Sustainable Development Goals," as the key message to the world community. Furthermore, the SDGs and related agenda apply to all countries, developed and developing alike.

The post-2015 agenda calls for actors to move away from business-as-usual (BAU) approaches towards the sustainable use of resources and peaceful and inclusive societies. The outcome document for the SDG Agenda synthesizes the breadth of these issues by declaring that the SDG framework will stimulate action on five key themes: people, planet, prosperity, peace, and partnerships.[2]

[1] World Bank Development Statistics, Sustainable Development Knowledge Platform, Guardian Development - The Guardian.

[2] Getting Started with the Sustainable Development Goals - A Guide for Stakeholders, 2015, SDSN.

Taking stock and identifying priorities for implementation

Before embarking on SDG implementation, stakeholders should take stock of where their country, sector, region, or city stands with regards to achieving all seventeen goals. A quick 'temperature check' of the key dimensions of sustainable development, including economic development, social inclusion, and sustainable environmental management, can help develop a shared understanding of priorities for implementation. In this way, national and local government actors and other key stakeholders can commence a dialogue on implementation of the SDGs with a common understanding of current conditions and the business-as-usual (BAU) trajectory.

Quick indicators for assessing a country's or city's broad performance on the SDGs are selected based on several criteria: (i) maximum data availability, (ii) applicability in broad range of country settings,

(iii) broad coverage of goal priorities. Of course these metrics do not measure the full range of SDG challenges, and they should not be misunderstood as doing so. They can also not serve as a management tool or accountability framework for implementing the goals - they are just a basis for getting started quickly through a rapid self-assessment.

Since an initial snapshot is a rapid exercise to support initial national and local dialogues, data should be taken from existing official statistics including surveys, census, administrative records, geospatial imagery, or other forms of open data. The latest available data should be used and disaggregated to the greatest extent possible, so that it is possible to see how different socio-economic groups are faring in as close to real-time as possible.

In many cases there will be data gaps, but these are instructive in and of themselves, because they demonstrate which areas do not receive sufficient attention, where institutional capacity may be insufficient, or where deeper analyses are required to understand what needs to be measured and how.

This information can help discern where countries or regions are lagging far behind the SDG targets and to articulate priority goals. Identifying priorities does not mean choosing one goal at the expense of another; the SDGs were crafted as an integrated set, which are inter-dependent and complementary. Instead, prioritization means identifying those areas lagging furthest behind and catalyzing resources, awareness, and policy actions in those areas to spur rapid progress.

Prioritization can also mean identifying specific areas to pursue in the short or medium term as an entry point to the broader transformation towards sustainable development. For example, a country or region subject to acute drought may decide to focus on sustainable water resource management as one of its immediate objectives, recognizing that a comprehensive water resource management strategy will consider the balance of the local ecosystem (SDGs 14/15), water use within local industry (SDG 12), the impact of the water shortages upon poverty, agriculture and employment (SDGs 1/2/8), and so on.

A stocktaking and prioritization exercise is not only relevant for national and local governments. The SDGs are universal goals that apply to all key stakeholders and should serve as a lens for critical internal reflection. For example, companies should see the SDGs as an opportunity to take stock of their business practices in their interactions with customers, suppliers, and the natural environment; civil society should use them as an opportunity to think through more holistic, cross-sectoral approaches to poverty alleviation and environmental management; and universities and knowledge institutions should consider whether the evidence and knowledge they are generating contributes to the pursuit of a more sustainable world for people and planet. For this reason, stakeholders should also seek to establish a set of measures against which to take stock of their performance on the SDGs.

The Global Reporting Initiative, the World Business Council for Sustainable Development, and the Global Compact have already developed a set of Key Performance Indicators with which businesses

can measure their current performance on sustainable development and track their future contributions. The SDG Compass sets out an inventory of business indicators, mapped against the SDGs. It allows businesses "to explore commonly used indicators and other relevant indicators that may be useful when measuring and reporting your organization's contribution to the SDGs."

Civil society organizations, faith-based groups, and knowledge institutions should conduct a similar stocktaking exercise to consider how they contribute to each of the goals and identify priority areas for action. Each will need to consider its respective strengths and expertise as part of such an exercise.

Quick stocktaking exercises will be crucial to ensure that all stakeholders come to the table with a sense of their respective contributions towards the SDG agenda, as well as an informed opinion on priority concerns for the country, region, city, or sector.[3]

The Climate Change project of FNF positions itself at this stage of the SDG roll out agenda - the 'temperature check' - bringing out the state of the sectors linked with the SDGs, the perceptions, fears and expectations of the stakeholders and tries to do some basic mapping of how we need to move forward on the SDG roadmap.

Illustrative indicators for a quick assessment of a country's or region's starting position with regards to sustainable development

GOAL	HEADLINE INDICATORS
Goal 1	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)
	Poverty headcount ratio at national poverty lines (% of population)
Goal 2	Prevalence of undernourishment (% of population)
	Prevalence of obesity, BMIs 30 (% of adult population)
	Cereal yield per hectare
Goal 3	Mortality rate, under 5 (per 1,000 live births)
	Life expectancy at birth, total (years)
Goal 4	Lower secondary completion rate (% of relevant age group)
	PISA score
Goal 5	Proportion of seats held by women in national parliaments (%)
	School enrollment, secondary (gross), gender parity index (GPI)
Goal 6	Improved water source (% of population with access)
	Water Stress Score
Goal 7	Access to electricity (% of population)
	Alternative and nuclear energy (% of total energy use)
Goal 8	Share of youth not in education, employment or training, total (% of youth population)
	Average annual per capita GDP over the past 5 years
Goal 9	Mobile broadband subscription per 100 inhabitants
Goal 10	Palma ratio
	Gini index
Goal 11	Percentage of urban population living in slums or informal settlements
	Mean annual concentration of PM2.5 in urban areas

[3] Getting Started with the Sustainable Development Goals - A Guide for Stakeholders, 2015, SDSN.

Goal 12	Municipal solid waste generation (kg per capita)
Goal 13	CO2 emissions per capita
	Losses from natural disasters (% GNI)
Goal 14	Share of marine areas that are protected
	Fraction of fish stocks overexploited and collapsed (by exclusive economic zone)
Goal 15	Red list index
	Annual change in forest area
Goal 16	Homicides per 100,000 population
	Corruption Perception Index
Goal 17	For high-income and upper middle-income countries: International concessional public finance, including official development assistance (% GNI) For low and lower-middle-income countries: Government revenues (% GNI)
	Subjective Well-being (average ladder score)

Who should be engaged?

Developing SDG strategies and plans should be a multi-stakeholder process, engaging national and local government representatives, civil society, businesses, faith-based groups and representatives from academia and science. Inclusive development means "all stakeholders, acting in collaborative partnership, will implement this plan [SDG Agenda]." Effective multi-stakeholder engagement will build on the expertise of individual actors to do collective problem solving. Different actors will need clearly defined roles and responsibilities to make the process work. This section discusses what various stakeholders can contribute to the process and how they may best be included.[4]

Stakeholder Groups	
Category	**Examples**
National Governments	Professional staff within ministries; representatives from governments and municipalities
Civil Society Organizations	Non-governmental organizations, volunteer organizations, indigenous peoples' organizations, faith-based organizations, social movements, and community-based organizations
Business	Business leaders, chambers of commerce and industry, cooperatives and unions, economic development corporations, and manufacturers
Academic Institutions	National SDSNs, universities, technical institutions, research centers, National Academies, and schools of urban planning, social sciences, and public policy
Development Partners	Bilateral and multilateral donors, UN agencies, regional development and central banks, and international institutions such as the World Bank and IMF
Sub-national Governments	State/provincial governments or other forms of regional government are often responsible for urban and local development
Local Authorities	Local councils and elected representatives, public utility and service providers, planning bodies

[4] Getting Started with the Sustainable Development Goals - A Guide for Stakeholders, 2015, SDSN.

SECTION 3

Implementing the SDGs The Pakistan Context

For implementing the SDGs in Pakistan, the start was prompt and positive. Federal Minister for Planning, Development and Reforms (MoPDR), Ahsan Iqbal, stated that "Pakistan has accorded the highest priority to achieving the goals which will enable us to join the league of upper middle class countries by 2030". The government's Vision 2025, which is premised on seven pillars has been identified as the document that can provide the enabling space for the SDG implementation. Mr. Ahsan Iqbal, has stated that the pillars of this project are in complete harmony with the SDGs and emphasized that the project will enable the government to strengthen the data collection process and increase the coverage of household data at the district level. This will further lead to proper monitoring of poverty and vulnerability of the populations in all dimensions. Four key aspects that will enable the successful execution of this strategic undertaking include; sustained executive commitment & support, resources, macroeconomic stability, private sector engagement, and radical improvement in productivity.

The government has taken measures to advance the process; these include Pakistan Poverty Alleviation Fund (PPAF) - an apex governmental non-profit organization for community-driven development; a SDGs Monitoring and Coordination Unit in coordination with United Nations Development Programme (UNDP) the Prime Minister's Youth program- which includes schemes such as business loan scheme, interest-free loan scheme, skill development program and free laptop scheme; an agriculture package aimed at helping small and medium farmers through provision of direct cash support, soft loans and introducing new technologies in the sector and a national campaign for education in partnership with the provinces to enroll all out of school children into schools to achieve universal primary enrolment by 2018.In partnership with the MoPDR at the federal level and all provincial and regional planning and development departments, UNDP worked to create an enabling environment for integrating the SDGs into policy and institutional frameworks, strengthening monitoring and reporting, exploring innovative approaches to accelerating progress in priority areas, and finding new streams of financing.

In 2016, Pakistan progressed localization of the SDGs with the launch of an SDG support unit in Punjab to institutionalize the global agenda in planning and development processes[5], and support provincial government and line departments for further localization. With its government partners, UNDP organized awareness workshops at divisional level in Punjab, Khyber Pakhtunkhwa, Balochistan and Federally Administered Tribal Areas, developing in-depth understanding of the SDGs amongst district officials and sensitizing them on their role. By

[5] Issue Brief - Pakistan, The Road Towards Achieving the SDGs, Arhama Siddiqa, April 27, 2016, Institute of Strategic Studies.

mapping SDG indicators onto locally available disaggregated data where possible, UNDP supported the Pakistan Bureau of Statistics in identifying remaining data gaps. These will help develop processes for regular collection, monitoring and reporting of SDG data.

The quarterly Development Advocate Pakistan continued to bring together independent perspectives and generate informed debate on local development issues. In 2016, this was a forum for discussion on violent extremism in Pakistan, which poses a significant threat to peace and stability; on bringing growing inequality back into the public realm; on civil service reforms and its importance to achieve the 2030 Sustainable Development Agenda; and on the issue of water security in Pakistan and lessons for the future.[6]

	Goal	Pakistan Baseline
1	End poverty in all its forms	21.04% population below poverty line $1.25 60.19% population below poverty line $2
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	58.1% Food insecure Households 169 kcal/ person/ day Intensity of food deprivation
3	Ensure healthy lives and promote well-being for all at all ages	88 <5y mortality rate (per1000livebirths) 170 Maternal mortality ratio (per100Klive births)
4	Ensure inclusive and equitable quality education and promote life-long learning	58% Overall Literacy Rate 25.02 million Children (5-16) are not in school
5	Achieve gender equality and empower all women and girls	144 ranked out of 142 rank on women economic participation 132 rank on women education attainment
6	Ensure availability and sustainable management of water and sanitation for all	35% doesn't have access to safe drinking water 52% doesn't has access to improved sanitation
7	Ensure access to affordable, reliable, sustainable, and modern energy for all	91.4% Population with access to electricity <1% Share of renewable energy in total mix
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	53.1% Labour force participation rate 6.2% Unemployment rate
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	20.3% Industry's contribution in GDP 10.9% Population use Internet
10	Reduce inequality within and among countries	30 Income Gini coefficient 1.55 Palma Index (ratio of consumption of top 10 % to the bottom 40 %)
11	Make cities and human settlements inclusive, safe, resilient and sustainable	47% Urban population lives in 9 cities only 5.0 Cities population growth rate
12	Ensure sustainable consumption and production patterns	68.3% Electricity generation from fossil fuels 25% Energy losses in all sectors
13	Take urgent action to combat climate change and its impacts	310 m.t of CO2 eq. Total GHG emmissions 6% Budget allocation for climate financing
14	Conserve and sustainable use the oceans, seas and marine resources for sustainable development	222 rank on global Ocean Health Index 350 million gallon/ day raw sewage and untreated industrial waste flows into the Arabian Sea from Karachi
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	2.1% National forest cover 68 million hectares Land affected by desertification & degradation
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	9000 Avg. annual deaths from terrorist activities 3 million Cases pending before judiciary
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

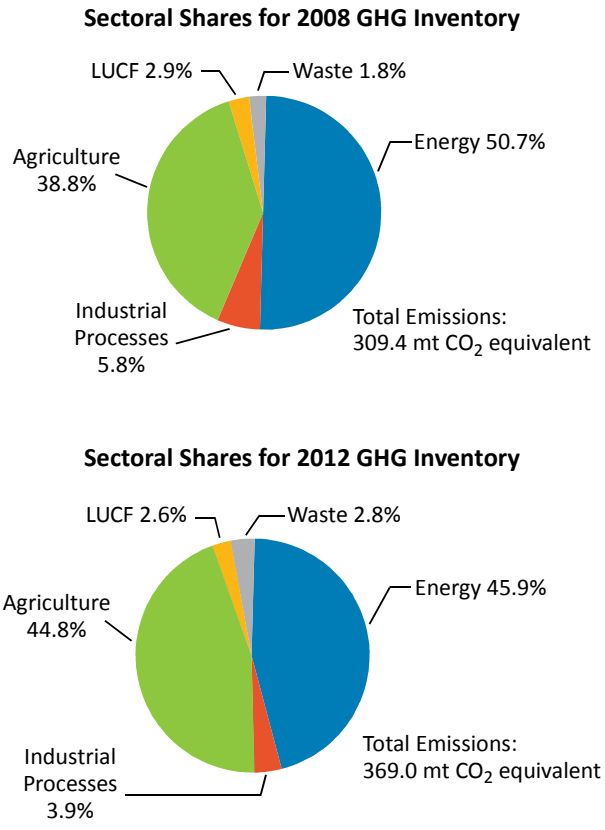
6 UNDP Pakistan Annual Report, 2016.

SECTION 4

Climate Change and the Energy Sector in Pakistan - Challenges, Opportunities and a Future Roadmap

According to the national Greenhouse Gas Emission Inventory of Pakistan for the year 2011-2012, its total Greenhouse Gas (GHG) emissions was at 369 million tons of carbon dioxide equivalent (MtCO2e) with 45.9% share of energy, 44.8% share of agriculture and livestock sector, 3.9% share of industrial processes, and 2.6% share of land use change for forestry sectors. The energy and agriculture livestock sectors alone account for 90.7% of the total emissions pool and have thus far remained the biggest emitters of GHGs since 1994. Pakistan has prepared four GHG emission inventories to date. ADB prepared the first one for the years 1989-1990, the Global Environment Facility (GEF) supported the second inventory (fiscal year 1993-1994), the Pakistan Atomic Energy Commission on the request of the Task Force on Climate Change of the Planning Commission of Pakistan prepared the third one for 2007-2008, and the Global Change Impact Studies Centre (GCISC) prepared the inventory for 2011-2012.[7]

Sector Share Comparison of Greenhouse Gas Inventories for Pakistan, 2008 and 2012



CO_2 = carbon dioxide, GHG = greenhouse gas, LUCF = land use change for forestry, mt = metric ton.
Source: K.A. Mir and M. Ijaz 2015, Greenhouse Gas Emission Inventory of Pakistan for the Year 2011-2012. Islamabad: Global Change Impact Studies Centre (GCISC).

[7] K. A. Mir and M. Ijaz. 2015. Greenhouse Gas Emissions Inventory of Pakistan for the Year 2011-2012. GCISC-PR-19. Islamabad: Global Change Impact Studies Centre (GCISC).

Pakistan's Global Greenhouse Gas Emissions Ranking

Total GHG per capita emissions = **135th**

Total GHG emissions = **31st**

GHG = greenhouse gas.

Source: The Global Economy. 2015. Country Ranking using Data on Carbon Dioxide Emissions. http://www.theglobaleconomy.com/rankings/Carbon_dioxide_emissions/ (accessed on 25 May 2015).

Pakistan ranks relatively low among countries on a per capita GHG emissions basis, due to its relatively low level of development and high population. According to a preliminary projection, the GHG emissions levels for Pakistan are expected to increase many times in the coming decades. This is based on the assumption that the GHG emissions intensity for the above-indicated five main sectors will remain essentially the same as during 1994-2008. Thus, the projected total GHG emissions of Pakistan-in line with the government's economic growth strategy-will be more than double by 2020 (compared to the emissions in 2008), and increase by around 14 times by 2050.[8]

Projected Greenhouse Gas Emissions by Sector in 2020 and 2050 Under Business as Usual Scenarios (in MtCO2e)

Sector	1994	2008	2012	2020	2050
Energy	86	157	169	358	2,685
Agriculture	72	120	165	245	1,395
Industrial processes	13	18	14	26	67
Land use change and forestry	7	9	10	14	38
Wastes	4	6	10	7	15
Total national emissions	182	309	369	650	4,200

GHG = greenhouse gas, $MtCO_2e$ = million ton of carbon dioxide equivalent.

Source: Government of Pakistan, Ministry of Planning, Development and Reforms. 2010. *Task Force Final Report on Climate Change*. Islamabad; K. A. Mir and M. Ijaz. 2015. *Greenhouse Gas Emission Inventory of Pakistan for the Year 2011–2012*. Islamabad: Global Change Impact Studies Centre (GCISC).

[8] Climate Change Profile of Pakistan, 2017, Asian Development Bank (ADB).

POTENTIAL IMPACTS OF CLIMATE CHANGE ON ENERGY SUPPLY

Changes in water availability affect hydropower generation

- Changes in precipitation patterns affect the hydrological cycle and river runoff, resulting in changing outputs from hydropower projects
- The retreat of glaciers may increase water discharge and consequent power generation in the short term, followed later by significant reductions in summer flows and power generation as glaciers disappear
- Climate change-induced changes in water use patterns and increases in water demand for other uses, such as irrigation, may lead to reduced water availability for power generation
- Increased sediment load may result in more rapid siltation of reservoirs and deterioration of turbines leading to lower power output

Changes to air and water temperatures affect thermal power generation efficiency

- Higher air temperatures reduce the generation efficiency of thermal power plants; this reduces power generation, which may occasionally coincide with peak demands during heat waves
- An increase in water temperature may adversely affect the operation of the cooling systems of thermal and nuclear power plants and violate ambient water quality standards
- Advanced cooling systems for thermal power such as dry cooling can reduce or eliminate freshwater dependency in areas forecasted to be water-scarce; however, these technologies are expensive and may lead to efficiency losses

Sea-level rise and changes in wind speed and cloud cover as well as in the frequency and intensity of extreme weather events have direct impacts on energy infrastructure

- Changes in wind speed and patterns, and cloud cover and atmospheric turbidity can affect the output of wind and solar photovoltaic projects, respectively
- Extreme precipitation and glacial lake outburst flooding can compromise dam safety and lead to unplanned large-scale release of water, and can cause floods downstream
- Energy infrastructure such as oil and gas refineries, storage tanks, and transmission lines in low-lying coastal locations are increasingly at risk of damage, disruption, and higher maintenance costs. This higher risk may result in increased insurance premiums for offshore and coastal facilities and increase production costs
- Saltwater intrusion may corrode materials used in energy production and distribution
- The structural integrity of energy infrastructure may deteriorate due to intense heat waves and unseasonal cold snaps

POTENTIAL IMPACTS OF CLIMATE CHANGE ON ENERGY DEMAND

- Warmer temperatures increase the demand for air conditioning, particularly during heat waves
- In higher latitudes, unseasonal increases in surface temperatures may reduce overall demand for domestic heating and commercial energy consumption
- Lowered water tables will increase energy demands for groundwater pumping. Increased pumping will, in turn, amplify vulnerability to water shortages and possibly lead to land subsidence
- While desalination may emerge as a response to regional surface or groundwater shortages, the process requires a large quantity of energy

Source: *Sector Briefing on Climate Change Impacts and Adaptation, 2012, Asian Development Bank (ADB)*

Impact of Climate Change on the Energy Sector

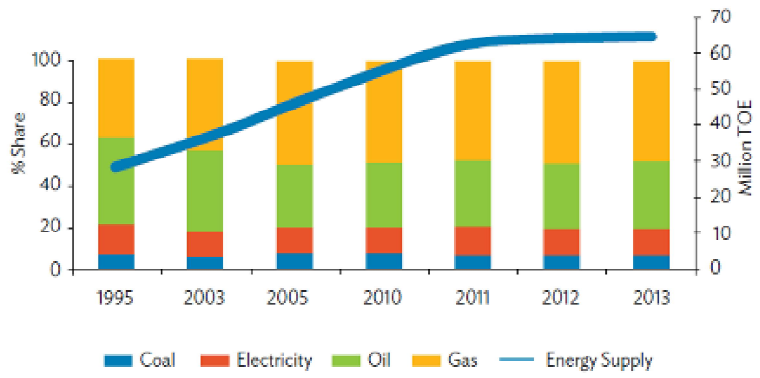
The Asian Development Bank (ADB) has recently (2017) released an extremely extensive Climate Change Profile of Pakistan, that among other sectors, also looks in detail on the interface between climate change and the energy sector in Pakistan.

According to the findings of the study, the energy sector is the major contributor to climate change through its high GHG emissions and is also sensitive to its impacts. It is predicted that rising population, economic growth, and changing patterns of consumption including rising demand for air conditioning in the summer months will likely increase energy demand and consequently increase GHG emissions from the energy sector in Pakistan.

In Pakistan, the energy sector is the largest contributor of GHG emissions. In 2012, energy sector emissions accounted for 46% of the total national GHG emissions inventory. The major likely impact of climate change on the energy sector is predicted to be changes in precipitation patterns, temperatures rising, and extreme weather events. The country's current energy needs are heavily dependent on oil and gas while the demand far exceeds supply, consequently translating into a severe energy crisis that has crippled the country since 2006.

The energy crisis, in terms of productivity loss due to many hours of load shedding, accounted for 7% of GDP losses in 2013 alone. The primary sources of energy in the country were gas (48%), oil (32%), hydropower (31%), coal (7%), and nuclear energy (2%) in 2013 (Figure 17). Pakistan is the largest consumer of gas in the region while it has the sixth largest reservoir of coal in the world. But the energy dependency on gas and oil are large compared to coal. It is estimated that even with moderate gas consumption, reserves will be depleted by 2025. The country imports crude oil, around 44.9 million barrels in 2014, an increase of 6.2% compared with 2013. Hydropower share decreased from 70% in 1980 to the current capacity of almost 29% mainly due to controversies about major hydropower projects. The share of coal in energy supply has been almost stagnant at 6% since 1995, but thermal capacity for generating electricity in the country as a whole stood at 67% in 2014.[9]

Primary Energy Supply by Sources in Pakistan



TOE = ton of oil equivalent.

Source: Government of Pakistan, Ministry of Finance. 2014 *Economic Survey of Pakistan 2013-2014* Islamabad.

[9] Climate Change Profile of Pakistan, 2017, Asian Development Bank (ADB).

Key Findings on Projected Climate Change Implications for Energy Sector in Pakistan

1. **Reduction in water availability for hydropower generation.** The most likely impact of global warming is the recession of Himalayan glaciers that is the largest source of fresh water supply in the country, and this would very likely affect the country's power generation systems.

2. **Extreme climate events damaging oil, gas, and power infrastructure.** The other major likely impact on the energy sector is damage to oil and gas infrastructure due to heavy precipitation leading to flooding.

3. **Hotter temperatures increase energy demand.** Due to increase in airconditioning requirements particularly in summer, energy demand is expected to increase. Further, climate change induces higher temperatures, and evaporation will increase electricity needs for pumping water for agriculture irrigation.

4. **Warmer air and water temperatures may affect efficiency of nuclear and thermal power plants.** Increase in water temperatures used for cooling of nuclear and thermal power plants will affect the power plants' efficiency.

Source: *Government of Pakistan, Ministry of Climate Change. 2012. National Climate Change Policy. Islamabad. R. Tariq and G.R. Athar. Possible Impacts of Climate Change on Energy Sector of Pakistan. Pakistan Atomic Energy Commission. http://nijesr.iefr.edu.pk/journalFolder/6/8e6bd.pdf*

The energy (specifically electricity) consumption pattern shows that the household sector (47%) consumes the largest portion of energy, followed by industries (29%), agriculture (10%), and other commercial users. To ensure energy security, the government is paying attention to alternative energy sources including wind, solar, and small hydropower plants, but most of the projects are still in the pipeline. With climate change in the future, the energy sector will largely be affected by extreme weather events such as flooding, storm surges, and drought that will affect energy sources, and the supply and distribution infrastructure.[10]

Pakistan's water resources are at severe risk to climate change. Presently, hydropower resources of Pakistan supply about 30% electricity and is projected to provide about 32.7 million kilowatts (kw) in 2030. The most likely impact of global warming is the recession of Himalayan glaciers that is the largest source of freshwater supply in the country. Uncertain water resources will reduce reliability of the hydro-electricity supply which is a key provider of the country's power sector, leading to the reduced reliability of the whole electricity generation system. Variations in water supply will be further aggravated by increased sedimentation of major reservoirs.[11]

[10] Global Facility for Disaster Reduction and Recovery. 2011. Climate Risk and Adaptation Country Profile. Washington DC, World Bank.
[11] Government of Pakistan, Ministry of Climate Change. 2012. National Climate Change Policy. Islamabad.

The climate change-induced natural hazards may damage oil and gas infrastructure due to heavy precipitation leading to flooding. Major gas fields are located in the vicinity of the Indus River. About one-third of the country's primary commercial energy supply is met by imported oil, transported via sea. The infrastructure damage of these resources may stop supply for a long time and put a large burden on the national economy. One example is the flooding in August 2010 that disrupted the supply of natural gas and fuel oil due to severe damage to some major installations and the transportation network. This disruption resulted in a shortfall of more than 3,500 megawatts of electricity for several days. Higher temperatures under climate change will increase evapotranspiration rates and increase electricity needs for pumping water for agriculture irrigation. Increased water temperatures used for cooling of nuclear and thermal power plants affects power plants' efficiency. Supply gaps may arise between maximum demand and the installed capacity during peak hours during some months, as cooling requirements increase. The increase in share of space cooling will make the peak more pronounced and the reliability of Pakistan's power system will further deteriorate. The operation and maintenance cost of the transmission and distribution system will also increase due to the higher rate of failures in extreme events.[12]

Climate change has direct consequences on energy with respect to its use and production. The main effects of changing climate are an increase in energy consumption in residential, commercial, and industrial sectors for different purposes such as for space cooling in response to increased temperature and industrial process cooling (in thermal power plants and steel mills), refrigeration, pumping water for municipal and agricultural irrigation. Energy delivery and fuel types such as electricity use for air conditioning and use of natural gas for heating are also affected. The idea of energy security relies on following three stages defined by Martín R et al. [3];

a. Availability and adequate supply of energy to meet increasing demand
b. Accessible energy resources
c. Potential of guaranteed fuel supply without any disturbance by external factors.

Wilbanks et al. [4] described that the most remarkable potential impacts of climate change as follows:

i. Increase in energy consumption for cooling purposes in residential, commercial, and industrial areas.
ii. High electricity consumption for residential and commercial refrigeration
iii. Increase in energy supply to such resources that are climate responsive, for example pumping water for irrigated agriculture and municipal uses
iv. Changes in the form of energy use and its type such as use of electricity for air conditioning and natural gas usage for heating purpose.
v. Changes in energy consumption in that climate sensitive sectors that play role in the economy, such as transportation, construction and agriculture.

[12] R. Tariq and G.R. Athar. Possible Impacts of Climate Change on Energy Sector of Pakistan. Pakistan Atomic Energy Commission. http://nijesr.iefr.edu.pk/journalFolder/6/8e6bd.pdf.

According to National Economic & Environmental Development Study Report during 2008-2009, Pakistan's net energy consumption was 37.3 million tonnes. This energy consumption was met from different sources including gas (43.4%), oil (29%), electricity (15.3%), coal (10.4%), and LPG (1.5%). All of these energy sources collectively account for 51% of the national greenhouse gas emission. In contrast to last ten years, use of petroleum has increased by 0.5% per annum, gas by 6.8%, electricity by 5%, and coal by 12.5% per annum. Whereas, in the last five years there has been an increase in gas consumption by 9%, an increase in coal consumption of 1.5%, and a reduction in oil consumption by 9.5%.[13]

Government Response - Policy and Financing

Highlighted below is a policy and institutional framework that addresses the need of transitioning to renewable sources of energy in Pakistan.

The Ministry of Climate Change

The Ministry of Climate Change is the focal institution for climate change in Pakistan. It evolved from the Ministry of Environment after the 18th constitutional amendment, in 2010, when the Ministry of Environment ceased to exist due to devolution of power to provincial governments. The environment is now under the jurisdiction of the provincial governments, but climate change remains federal, given the need for a national response and representation in international climate change negotiations.

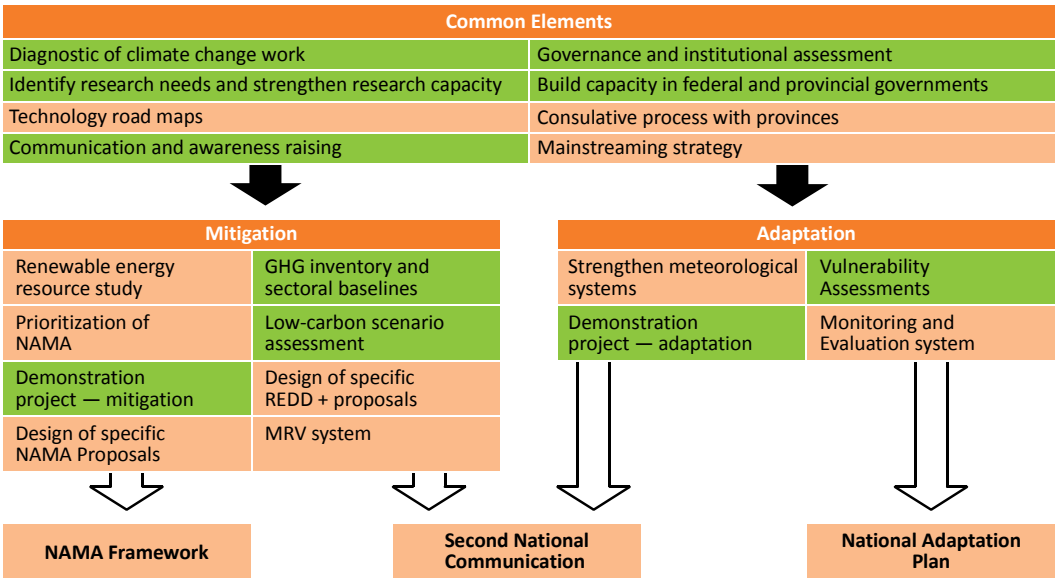
The Ministry of Climate Change handles and supports both the Clean Development Mechanism (CDM) and Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiatives in the country. Guided by the CDM Strategy (2006), the CDM cell inside the Ministry of Climate Change is the Designated National Authority (DNA) on CDM projects in the country. The strategy allows for unilateral, bilateral, and multilateral CDM projects, preferably in the areas of energy, including renewable energy, energy efficiency, energy conservation, and fossil fueled cogeneration; land use, land use change, and forestry (e.g., biodiversity protection, soil conservation, watershed maintenance and sustainable forest and rangeland management); agricultural and livestock practices; waste management (e.g., landfills, solid waste management, recycling, animal and livestock wastes); transportation (e.g., alternative fuel vehicles, mass transit systems, cleaner engines, compressed natural gas); and industrial processes.

Finally, there are ministries-of power, energy, food security, and research-with some responsibilities for climate change-related policies. The Ministry of Power is of particular interest as it is responsible for a key area of mitigation for power generation, and adaptation for water resources. The role overlaps with the Ministry of Climate Change's role, but transfer and delegation of oversight remains difficult and contested, due in part to the relative newness of the climate change institution, which has less political ownership and required resources. The National Climate Change Policy (NCCP)

[13] Zahra S, Batool M, Bashir QA (2016) Impact of Global Climate Change on Economy of Pakistan: How to Ensure Sustainable Food and Energy Production.

is the main document informing the policy framework for climate change in Pakistan. In early 2011, the Ministry of Environment, in collaboration with UNDP Islamabad, initiated the process to develop the country's first climate change policy. It took about 1.5 years of extensive consultation to formulate the policy. It was approved by the Federal Cabinet in September 2012, and then launched by the newly-formed Ministry of Climate Change in February 2013.[14]

Work Program for Climate Compatible Development in Pakistan



GHG = greenhouse gas, MRV = monitoring, reporting, and verification, NAMA = national appropriate mitigation action, REDD = Reducing Emissions from Deforestation and Forest Degradation.
Note: Priority actions in green.
Source: Government of Pakistan, Ministry of Climate Change. 2014. *Work Program for Climate Change Adaptation and Mitigation in Pakistan: Priority Actions.* Islamabad.

Framework for Implementation of National Climate Change Policy (NCCP) 2013

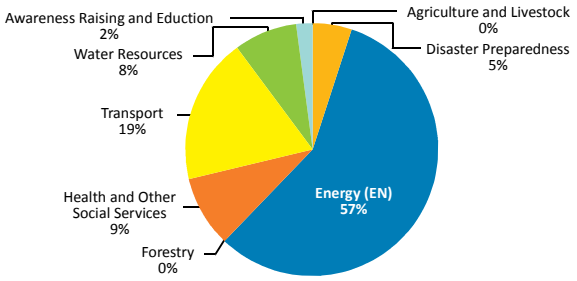
This framework provides a guideline for the implementation of the NCCP by considering both the current and future anticipated climate change threats to the country. Keeping in line with the NCCP's policy measures, it spells out a comprehensive list of both adaptation and mitigation strategies, and actions for each key sector primarily identified in the NCCP, while prioritizing the adaptation efforts at the sector level. The framework document aims to provide a basis and form the building block that will lead to the development of a National Adaptation Plan, National Appropriate Mitigation Action, and the preparation of the Second National Communication to the UNFCCC.[15]

14

15 Climate Change Profile of Pakistan, 2017, Asian Development Bank (ADB).

Alternative and Renewable Energy Policy, 2011

Sector Allocation of Expenditures to Climate-Relevant Tasks in the Public Sector Development Program of 2013-2014



PSDP = public sector development program.

Source: United Nations Development Programme. 2015. *Climate Public Expenditure and Institutional Review (CPEIR) Study, Pakistan. Islamabad.*

The Alternative and Renewable Energy (ARE) Policy 2011, developed by the Ministry of Water and Power, provides a road map for realizing the full potential of ARE in Pakistan. The Alternative Energy Development Board (AEDB), under the AEDB Act (2011), is empowered to develop the national strategy, policies, and plans for the utilization of ARE. ARE Policy 2011 has an expanded scope encompassing all ARE sources including solar, wind, small-scale hydropower, biogas, biofuel, and energy from waste. ARE Policy 2011 sets out some enhanced financial mechanisms and also addresses areas like rural energy services and biofuels. It aims to set the requisite infrastructure in place so it can be fully mainstreamed and integrated within energy planning, and economic and social development. Likewise, it has tried to resolve policy conflicts, addressed stakeholders concerns, and includes the proposed establishment of Alternative Energy Development Fund to promote this sector. To earn financing for the ARE initiatives, the focus of the ARE Policy is getting carbon credits by using Clean Development Mechanism (CDM). In this context, the AEDB is authorized to provide technical expertise to the (former) Ministry of Environment as the Designated National Authorities (DNA) in its role under the CDM. The AEDB assists in the development of local CDM capacities, as well as carries out CDM promotion and awareness of ARE. Another important focus is environmental and potential social impacts of alternative fuels, specifically biodiesel supply chains. Under the alternative fuel chapter, it identifies the EPA as the main agency to develop emissions standards for aldehyde and methanol production.[16]

Charting a Sustainable Energy Use Roadmap - Seeking Inspiration from the German Energy Revolution

Before a Roadmap is identified, profiled here is the German 'Energy Concept' whereby the German Government is relying on a mix of publically funded support schemes and economic incentives to promote renewable energies and energy efficiency. The planning and implementation model can very well serve as a guideline for developing an 'Energy Turnaround Program' for Pakistan. Despite the fact the Germany is one of the leading industrial nations of the world, while we are a struggling Third World country, it is felt that the relevant visioning, policy frameworks and public incentives that form part of the German Energy Concept can provide us with a very doable 'roadmap' with of course the required adaptations.

The strategy was based on two pillars:

- Entry into the renewable energy age;
- Massive increase in energy and resource recovery

[16] Climate Change Profile of Pakistan, 2017, Asian Development Bank (ADB).

Precise target setting has been a key to the successes made so far. The German Government set for itself a number of ambitious climate and energy targets. They are listed as follows:

Renewable energies: By 2020, electricity generation from wind, hydro, solar, geothermal and biomass is to account for one third of Germany's gross electricity consumptions, rising to 50% by 2030. The proportion is to increase to at least 80% by 2050. The renewable share of gross final energy consumption will increase as follows: to 18% by 2030, 30% by 2030, 45% by 2040 and 60% by 2050.

Energy efficiency: With more efficient use of energy, by 2020, primary energy consumption is to be 20% lower, and by 2050, a full 50% lower compared with the 2008 baseline.

Climate protection: Greenhouse gas emissions are to be cut by 40% by 2020 and 55% by 2030, 1990 being the base year for both measurements. In 2050, Germany should be largely GHGfree (target: an 8-95% reduction).[17] A high level of investments in developing climate and energy technologies is an important element of the overall strategy. Other than being utilized within the country it is being considered as a potentially extremely profitable export sector. A good climate change and energy efficiency policy therefore needs to be translated in terms of a good financial policy for it to succeed.

A well planned and designed transition

In 2008 alone, German companies produced climate and environmental goods with a value of Euro 75.9 billion. A critical policy decision that triggered this energy turnaround program was when the German Bundestag voted by a cross-party majority of more than 85% for the progressive phase out of nuclear power by 2020. This was primarily a reaction to the disaster at Japan's Fukushima nuclear reactor in March 2011. However, this transition is designed in a manner that there are no gaps in electricity supply during the nuclear phase out as the grids to which the nuclear power plants are connected will gradually be replaced with renewable energies.

The renewable energy age

Renewable technologies are now much less expensive in application. For example, the costs of solar generated electricity have decreased by around 60% since 2004. The total cost per installed kW of onshore wind power capacity has fallen from around 4,000 Euro/kW in the early 1980's to just 800-900 Euro/kW today. Taking full advantage of this cost reduction, the German government went in a big way in investing in renewables. Only ten years ago, renewable energies produced just over 6% of electricity generated in Germany. During the first half of 2011, the figure was already 20.8%. Now the Federal Government's aim is to increase the proportion of gross electricity consumption contributed by electricity from renewable energy sources to at least 80% by 2050, with renewable energies accounting for at least 60% of gross final energy consumption by that date.[18]

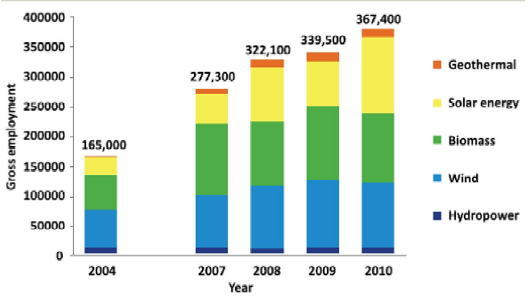
[17] Climate Protection and Growth - Germany's Path into the Renewable Energy Age, 2011, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

[18] Climate Protection and Growth - Germany's Path into the Renewable Energy Age, 2011, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Linking energy efficiency and renewable energy use and economic uplift

There was a time when any talk about environmental preservation was considered as 'anti-development' and 'financially non-viable'. Though this perception has not totally gone away but is much diminished as a vibrant 'green economy' is taking shape globally. An important element of the German turnaround program has been the focus that has been given to attaching the application of energy efficiency measures to greater financial viability of the macro and micro level economic sectors. It has been found that in the case of energy efficiency, the costs generally get recovered in quick time and it also serves as a very viable insurance against high energy prices. In the research work 'The Study Energy', prepared by McKinsey and company in 2009 it was found that by reducing energy consumption by around 21% by 2020, an energy cost saving of Euro 41 billion will be achieved. In addition, it was calculated that if Germany maintains its lead position in the energy technologies sector to 2020, up to 850,000 new jobs would be created. Trends globally also indicate that the costs of power generation from renewable energies are steadily decreasing, whereas oil, coal and gas prices are on an upward trend. The global market for environmentally friendly power generation amounted to around Euro 155 billion in 2007. According to projections by Roland Berger Strategy Consultants, the markets for photovoltaic systems, solar thermal energy and wind power will expand by around 20% per annum to 2020. In 2010 in Germany, around 370,000 people were employed in the manufacture of renewable energy installations, in their operation and maintenance, in the supply of biofuels, and in publically funded renewables research and administration.[19]

Job Development in the Renewable Energy Sector – 2004-2010



Source: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), 2011

Setting priorities and enacting legislations

The 'turnaround' program started with the enactment of a legislation giving the vision and direction to the process. The 'Act' is named the Renewable Energy Sources Act (Erneuerbare- Energien-Gestez -EEG) that came into force in the year 2000. The legislation, very importantly has a built in flexibility and continuity to it as it is regularly amended to bring it in sync with relevant technological and economic developments and the dividends are already showing. In 2010, the main source of Germany's electricity was liginite (23%). Nuclear energy came second with a share of (22%) and then hard coal (19%). Renewable energies at that time accounted for 17% of gross final power consumption, putting them in fourth place, which meant that there contribution was already more than gas, whose share was 13%. This trend is likely to increase in a manner and within a timeline already worked out.

It can all begin at your home!

The Climate Initiative launched by the Federal Environment Ministry provides support for projects to improve energy efficiency in private households. It specifically aims to raise consumer's awareness on how to use energy efficiently and helps them to identify and manage their own energy consumption. Based on personalized information about energy saving options, consumers are assisted in taking practical action aimed at improving their energy efficiency. The projects focus on topics such as energy saving in the home, heating, mobility and consumption, and are targeted at a broad cross section of the population.

Source: Climate Protection and Growth – Germany's Path into the Renewable Energy Age, 2011, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

[19] Climate Protection and Growth - Germany's Path into the Renewable Energy Age, 2011, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Power Sector

In future, it is planned and forecasted that most of the electricity demand will be met from renewable sources. This would require construction of new installations on an ongoing basis, with the development of additional wind farms with the old wind installations to be replaced by more powerful and modern ones. There will have to be carried out significant expansion in the storage capacity and expansion and modernization of electricity grids and smart grids to facilitate which, a Grid Expansion Acceleration Act (Netzausbaubeschlenunigungsgesetz) was passed in 2011. A particular emphasis would be on reducing electricity consumption. Again legislation plays a key role. From 2013, in Industry, energy and electricity tax concessions will only be granted to those industries that contribute to energy saving.

Transportation Sector

Transport accounts for about 18% of Germany's GHG emissions at present with more than 90% of those coming from road transport. For the transport sector, the target set in the 'Energy Concept' is for final energy consumption to fall by about 10% by 2020 and by about 40% by 2050, the baseline in this case being 2005.[20] Along with working on technological aspects like increasing renewable share in the sector by use of bio fuels, having private cars powered by electricity generated from renewable sources, increasing research in electro-mobility, alternative fuels, and storage and combustion engine technologies there is also a focus on promoting innovative transport strategies - for example, by creating residential structures and living environments with short, safe journeys for pedestrians and cyclists and providing the necessary incentives and design infrastructure so that people are encouraged to walk, cycle or use public transport and car sharing.

Industrial Sector

The industrial sector accounts for 8% of Germany's GHG emissions and is also responsible for a significant proportion of the emissions produced in energy generation. Emission trading (introduced in 2005) plays the most important role as a climate protection instrument and also the regulation on energy and electricity tax. The target here is an 80-95% decrease in GHG's by 2050 as compared with a 1990 baseline. The aim is to initiate processes for a continuous improvement in energy efficiency and a growing reliance on renewable energies. In addition, is being implemented research and development on low-carbon technologies and materials. Process related CO2 emissions from the steel and cement industry or refineries, for example which cannot be avoided, must be permanently stored in secure storage facilities.[21] There is an introduction of annual energy saving targets for the industrial sector and linkages are to be created with the EU Emissions Trading System (EU ETS).

[20] Climate Protection and Growth - Germany's Path into the Renewable Energy Age, 2011, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.
[21] Climate Protection and Growth - Germany's Path into the Renewable Energy Age, 2011, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Some markers for a sustainable energy agenda for urban Pakistan

Learning from the German experience and taking into account our own special needs and context some 'markers' are being placed for our Energy Turnaround Program:

- Developing a larger vision that while focused on the 'Energy' construct, also cuts across other sectors of development - socio-economic and environmental contexts
- Two broad areas of focus - transition into the renewables and use of fossil fuel based energy in an efficient manner
- Target setting - we need to set goals, targets and indicators that clearly outline the Roadmap of transitioning into the 'renewable age'. By what year how much of the energy needs will be met by renewables, what impact would that have on environmental uplift, economic benefits (job creation), improved health of communities etc.
- To effectively sell the Roadmap focus on the 'green economy' aspects - jobs and economic uplift. Both the direct economic impacts by the creation of new industries and jobs but indirect benefits such as improved health and cleaner environment
- Very clear policy frameworks, legislative instruments that include regulation and monitoring and standards setting that cut across every aspect of growth and development and are embedded in the DNA of the urban governance framework should underpin the reform roadmap
- Ensuring continuity and sustainability of reform measures that are not adversely impacted by change in governments
- Putting in place of specially structured supportive legislative covers for urban areas to facilitate ease of doing business, import of relevant technologies
- On an urgent basis develop an educational blueprint that aims to generate the future engineers, planners, economic experts, climate change experts that would form the core of the human personnel that would guide and sustain this reform roadmap and also use of academic institutions as spaces for research and innovation
- Have a strong role identified for civil society and communities by making the reform roadmap truly inclusive
- Have a very clear interface of the Energy Turnaround Program with the implementation of Sustainable Development Goals in Pakistan

SECTION 5

Engaging the Stakeholders - Getting a 'Temperature Check'!

A series of consultative sessions were held with key stakeholders in Karachi city to engage them in the SDG debate. Documented here are some interactive exercises conducted to get an input on how they see the process rolling out. The sessions served to gauge the understanding, perceptions and aspirations of stakeholders as they relate to the SDGS and their potential role in implementing them.

Sustainable Development Goals - A Roadmap for Implementation Engaging the Stakeholders			
S.No.	**Date**	**Venue**	**Stakeholder**
1.	Thursday, March 31, 2016	Department of Architecture & Planning, NED Engineering University, Karachi	NGOs
2.	Saturday, May 21, 2016	Department of Architecture & Planning, NED Engineering University, Karachi	Media
3.	Saturday, May 28, 2016	Department of Architecture & Planning, NED Engineering University, Karachi	Academia & Youth
4.	Wednesday, July 27, 2016	Reagent Hotel, Karachi	Women Groups
5.	Thursday, August 25, 2016	Institute of Engineers Building, Karachi	Professional Groups
6.	Tuesday, September 06, 2016	Department of Architecture & Planning, NED Engineering University, Karachi	Youth Groups
7.	Thursday, November 10, 2016	SZABIST University, Karachi	Youth Groups

Quite a few interactive exercises were conducted in the sessions for engaging the stakeholders. A glimpse is being provided here!

Backcasting - Tool for Designing SDG Strategies and Roadmaps

Sustainable development requires a long-term transformation, which in turn requires longer-term planning processes than the usual annual budgets or medium-term expenditure frameworks

The SDG framework calls for 15-year strategies that provide national roadmaps and coordinate stakeholders and activities for collective action. Some of the SDGs will require planning over a period of several decades

Best practice in long-term planning is backcasting

This means "generating a desirable future, and then looking backwards from that future to the present in order to strategize and to plan how it could be achieved. "In the context of the SDGs, backcasting is a problem-solving framework that envisions how development should progress, with

intermediate actions based on long-term quantitative targets. Unlike forecasting, which estimates the probabilities of various outcomes based on expected trends, backcasting begins with a projection of the desired outcome(s), and works backwards to understand what is needed for their realization

The core of the backcasting exercise is creating a long-term plan that maps out targets, milestones, and steps that need to be taken to achieve the desired endpoint by the desired date, including financing needs. The milestones are then translated into a quantified strategy -typically including an investment plan and financing strategy - that can be used within ministries and released to the public for broader consultation. Combined with a situational analysis, SDG backcasting helps to define the policies, institutional and technical reforms, public investments, and partnerships needed to achieve the SDGs by 2030.

Working Group - Environment

Backcasting for Charting a Roadmap for SDG Goals for Sustainability - Pakistan
The MDG Data provides the present status for the sector. You can make use of this data, its indicators and targets and then work on developing a basic roadmap for achieving the targets of three related SDG Goals

(Goal 13 - Climate Action, Goal 14 - Life below Water, Goal 15 - Life on Land)

The MDG Background
MDG 7 aims to promote sustainable development, and has the target of halving the proportion of people without sustainable access to safe drinking water and basic sanitation, and bringing about a significant improvement in the lives of slum dwellers.

Of the seven MDG 7 indicators, Pakistan's achievement is as follows: Better performance on protecting areas for wildlife conservation (11.6 percent against the target of 12 percent), improving access to safe drinking water (89 percent against the target of 93 percent). However, it is lagging on access to sanitation; currently 72 percent of the populations have access to this facility against a target of 90 percent. Pakistan has also made progress on increasing forest cover - currently 5.2 percent - but is still short of the 6 percent target

The MDG Status			
MDG	**INDICATOR**	**LATEST NATIONAL VALUE**	**TARGET**
Goal 7	Forest cover (%)	5.2	6
	Land Area Protected for Conservation of Wildlife (%)	11.6	12
Ensure Environmental Sustainability	Proportion of Population with Access to Improved Water Sources	89	93

Step 1: Analyze current national and/or local policies and strategies

POLICY FRAMEWORK

A possible policy framework that can be considered is provided by the *Climate Change Policy of Pakistan*

The main objectives of Pakistan's Climate Change Policy include:

1. To pursue sustained economic growth by appropriately addressing the challenges of climate change;
2. To integrate climate change policy with other inter-related national policies;
3. To focus on pro-poor gender sensitive adaptation while also promoting mitigation to the extent possible in a cost-effective manner;
4. To ensure water security, food security and energy security of the country in the face of the challenges posed by climate change;
5. To minimize the risks arising from the expected increase in frequency and intensity of extreme weather events such as floods, droughts and tropical storms;
6. To strengthen inter-ministerial decision making and coordination mechanisms on climate change;
7. To facilitate effective use of the opportunities, particularly financial, available both nationally and internationally;
8. To foster the development of appropriate economic incentives to encourage public and private sector investment in adaptation measures;
9. To enhance the awareness, skill and institutional capacity of relevant stakeholders;
10. To promote conservation of natural resources and long term sustainability

The SDG Goals and Indicators that need to be considered in your Group Work

Goal #	Goal Definition	Indicators
Goal 13	Climate Action	CO2 emissions per capita
		Losses from natural disasters (% GNI)
Goal 14	Life below Water	Share of marine areas that are protected
		Fraction of fish stocks overexploited and collapsed (by exclusive economic zone)
Goal 15	Life on Land	Red List Index
		Annual change in forest area

Step 2: Use long-term vision for sustainable development

A possible framework for sustainability could be structured around:

- Policy, planning and implementation related interventions
- Institutional Development
- Potential Stakeholders
- Role of Information Technology
- Global Linkages and collaborations

ENGAGING STAKEHOLDERS


Sustainable Development Goals
An Agenda for Implementation


Workshop
Sustainable Development Goals:
A Roadmap for Implementation
A Session with Media
Shehri-Citizens for a Better Environment
in collaboration with Green Media Initiative
with the support of
FÜR DIE FREIHEIT


USA - Pakistan


NO SMOKING


Regent Plaza


Sustainable Development Goals:
A Roadmap for Implementation
Shehri-Citizens for a Better Environment

Working Group - Education

Backcasting for Charting a Roadmap for SDG Goals for Sustainability - Pakistan
The MDG Data provides the present status for the sector. You can make use of this data, its indicators and targets and then work on developing a basic roadmap for achieving the targets of three related SDG Goals

(Goal 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all)

The MDG Background
MDG 2 intended to promote universal primary education by ensuring that the enrolment and completion/ survival rate from grade 1-5 are at a 100% and the literacy rate at 88%.

Rates of net primary enrolment and completion increased up to the mid-2000s, but thereafter slowed and fluctuated, and in 2011/12 were 57 percent and 50 percent respectively. The literacy rate is 58 percent overall, but this is highly skewed towards males - 70 percent of males are literate compared to 47 percent of females.

The MDG Status			
MDG	**INDICATOR**	**LATEST NATIONAL VALUE**	**TARGET**
Goal 2	Net primary enrolment ratio (percent)	57	100
	Completion/survival rate Grade 1 to 5 (percent)	50	100
Achieve Universal Primary Education	Literacy rate (percent)	58	88

RELEVANT INFORMATION

- 6% of children aged 6-16 dropped out of schools and 15% have never been enrolled in school
- Less than 50% of children could read words and sentences in English
- 15% of children in government school were absent and 10% in private schools
- 12% of teachers in government schools were absent and 7% in private schools
- Around 24% mothers and 48% fathers in the sampled household had completed primary education

Step 1: Analyze current national and/or local policies and strategies
The Government of Pakistan developed the National Plan of Action (NPA) on Education for All. The main objectives are to ensure access to education for disadvantaged rural and urban population groups, particularly girls and women; to promote community participation and ownership of basic education programs; and to improve the relevance and quality of basic education. The National Plan of Action estimates a total of 6.7 million primary-aged out of school children during 2013-16.

The 18th Amendment to Pakistan's Constitution, approved in 2010, abolished the Federal Ministry of Education and transferred full authority for education to the provinces, with the provision that education would be free and compulsory for all children between the ages of 5 to 16. Sindh's Education Sector Plan (SESP) is a response to this mandate, and represents the first such document

prepared by the province. It continues to be guided by the National Education Policy of 2009, but represents a significantly new vision of education goals and possibilities specific to the rapidly evolving context of the province itself

POLICIES

1. Establish uniform education system all over
2. Bridge the gap between private and public schools
3. Minimize education disparity
4. Improve the quality of education
   (National Education Policy, 2009)

KEY CHALLENGES

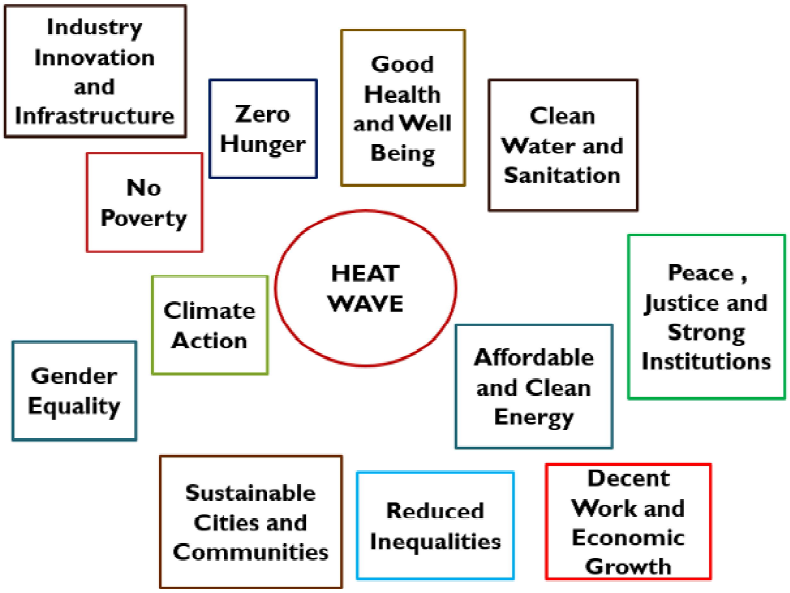
1. Weak governance
2. Political changes
3. Natural disasters
4. Lack of awareness
5. Poor quality of teachers and managers
6. Inadequate budgets
7. Poor monitoring and evaluation

Step 2: Use long-term vision for sustainable development

A possible framework for sustainability could be structured around:

- Policy, planning and implementation related interventions
- Institutional Development
- Potential Stakeholders
- Role of Information Technology
- Global Linkages and collaboration

How an event like 'Heat Wave' can find linkages with multiple SDGs



SECTION 6

Analyzing the stakeholder engagements: The Road Ahead

The engagements with a wide variety of stakeholders was a stimulating and learning experience. It was generally felt that while there was an understanding that SDGs have been activated and that they build on the agenda of the MDGs, the knowledge base on the details, processes involved and anticipated outcomes was limited among the targeted stakeholders. This was generally felt was because the government though it has structured some institutional constructs to manage the process, has not gone really beyond that. It is clear in the SDG agenda and outlined road map that the government has to assume a critical role in getting all the stakeholders on board and with their consensus, chalk out a framework for action that would include setting of targets, indicators and structuring the processes of implementation and monitoring.

In this context, some critical institutions like the local government and academic bodies were found very limited in their understanding of the SDG framework. Another matter of concern is that similar as has been the case with Climate Change, where a Climate Change Ministry has been made the focal point, the institutional centering of the SDG process is also being done. It is critical to understand that climate change, and the sectors being covered in the SDGs are all encompassing and for us to make a positive difference in managing the associated risks, our response has to be strategically embedded within the overall policy making, planning, and implementation and regulation construct of governance cutting across variety of sectors, a multiplicity of civil society stakeholders and all tiers of governance. This is yet to happen in our case.

However, despite the identification of some serious knowledge gaps, the consultation process was able to add value as the engaged stakeholders found themselves much better informed about and equipped to manage their possible contributions in achieving the related SDG agendas after our engagements. The formatting of consultation sessions was such that there was a detailed and interactive orientation made on the SDG background, context, its structural DNA that includes the setting of goals, targets and indicators, the institutional formal and informal platforms for engagement and decision making and then very critically, the processes of implementation, monitoring, learning and evaluation. A valuable effort was made to identify sector specific constraints and opportunities and possible role plays of stakeholders.

NGOs - Suggestions for Strengthening Sector role in SDG Roadmap
Greater networking among NGOs working on similar themes for consensus building
Networking and alliance building with regional and global NGO networks for exchange of ideas and skills transfer
Government to establish mechanisms for facilitating a meaningful role of NGOs
Need for capacity building among NGOs to better understand and manage their contributions
Need for data generation to set proper benchmarks for action
NGOS' to play a constructive role as 'watchdog' agencies ensuring transparency of actions of the government

Academia & Youth - Suggestions for Strengthening Sector role in SDG Roadmap
Government to facilitate through setting policy and other incentive frameworks for having established forums as 'Think Tanks' and centers for action research on implementing the SDG's agenda in Pakistan
Higher education institutions to set up dedicated 'disciplines/departments' for nurturing and producing the required human resource for carrying the SDG agenda forward. In this regard a critical role to be played by the Higher Education Commission (HEC)
Government to establish mechanisms for facilitating a meaningful role of Academic institutions
Financial assistance/scholarships programs dedicated to the SDG agenda to be instituted by relevant government agencies to help build capacity in our youth
Academic institutes to be generally consulted in the critical policy making, planning and project development phases
Universities to establish collaborative learning, action research and student exchange programs with relevant regional and global higher learning institutions

Women Groups - Suggestions for Strengthening Sector role in SDG Roadmap
An acknowledgement of the important role women play in all sectors related with SDG and not just limited to gender specific concerns
Greater networking among women groups working on various aspects of women empowerment to forge a consensus and joint action strategy for increasing pressure
Women law makers to be contacted for lobbying on issues related with gender empowerment and greater engagement in the SDG process
Need for capacity building among women groups to better understand and manage their contributions
Need for gender mainstreaming in all government policy and planning frameworks
The challenges faced by urban and rural women are different and need to be understood clearly

Media - Suggestions for Strengthening Sector role in SDG Roadmap
An urgent need of building capacity among journalists to be able to properly cover and report on the issues of SDG - the Media house owners and management needs to look into this urgently
A practice be put in place for assigning dedicated and specialized 'beats' to journalists and their capacity building
The print and electronic media to play a constructive watchdog role for ensuring government transparency
The government needs to share critical information in a timely and transparent manner
The media needs to take up the SDG's implementation in Pakistan as a national campaign to mobilize the people
Media representatives need to network with other media concerns on a regional and global basis for building capacity

Professional Bodies - Suggestions for Strengthening Sector role in SDG Roadmap
Government needs to engage professional bodies like the Institute of Engineers Pakistan (IEP) in a 'Think Tank' and consultative capacity on implementing the SDGs agenda in Pakistan
Professional bodies need to set up special 'cells' to specifically look into the SDG's
Professional bodies need to develop an 'Action Plan' for mobilizing their members
Professional bodies need to invest in research on issues relevant to SDG and their area of action
Professional bodies need to on their own assess the relevant policy, institutional, legislative, compliance and regulation systems and framework in place that could be used in the SDG implementation and advise government on how they can be strengthened
Professional bodies can also extend an outreach within other stakeholders like civil society and community groups

A number of useful recommendations were made by the stakeholder groups that have been documented. To begin with there is, it is felt, a need for stakeholders at their own levels to initiate actions on informing themselves better on the SDG modalities and building consensus in action.

At the side of the government, there is a need to disseminate information at a wider level. From the Planning Commission in Islamabad, the message needs to now filter down to the grassroots level such the district. A multi-tier approach is needed to mobilize action at all levels of governance and ensuring of a meaningful inclusion of the private sector, NGOs/CBOs, Media, Academia and students, professional bodies, etc.

A critical understanding is that most of the important battles will be fought on the urban scale. For the first time in human history, we now are populated more in the urban centers rather than the rural settlements and by the year 2050, it is expected that 75% of the global population will be residing in the large cities of the world. As such, city governments need to be strengthened rather than powers being taken away from them. A critical role has to be played by using the Information and Communication Technology (ICT) tools. Embedding ICT tools in the larger urban governance framework and that too on an urgent base is a must. The government needs to realize that the time for action is now. SDGs will define the global development agenda for the coming fifteen (15) years and maybe even beyond and we should make sure we do not miss the boat!

SHEHRI - CITIZENS FOR A BETTER ENVIRONMENT

88-R, Block-2, P.E.C.H.S., Karachi-75400, Pakistan. Tel : 021-34530646, 34382298, Fax : 021-34530646
E-mail : info@shehri.org Website : www.shehri.org, facebook.com/shehri.citizens, twitter.com/shehricbe